June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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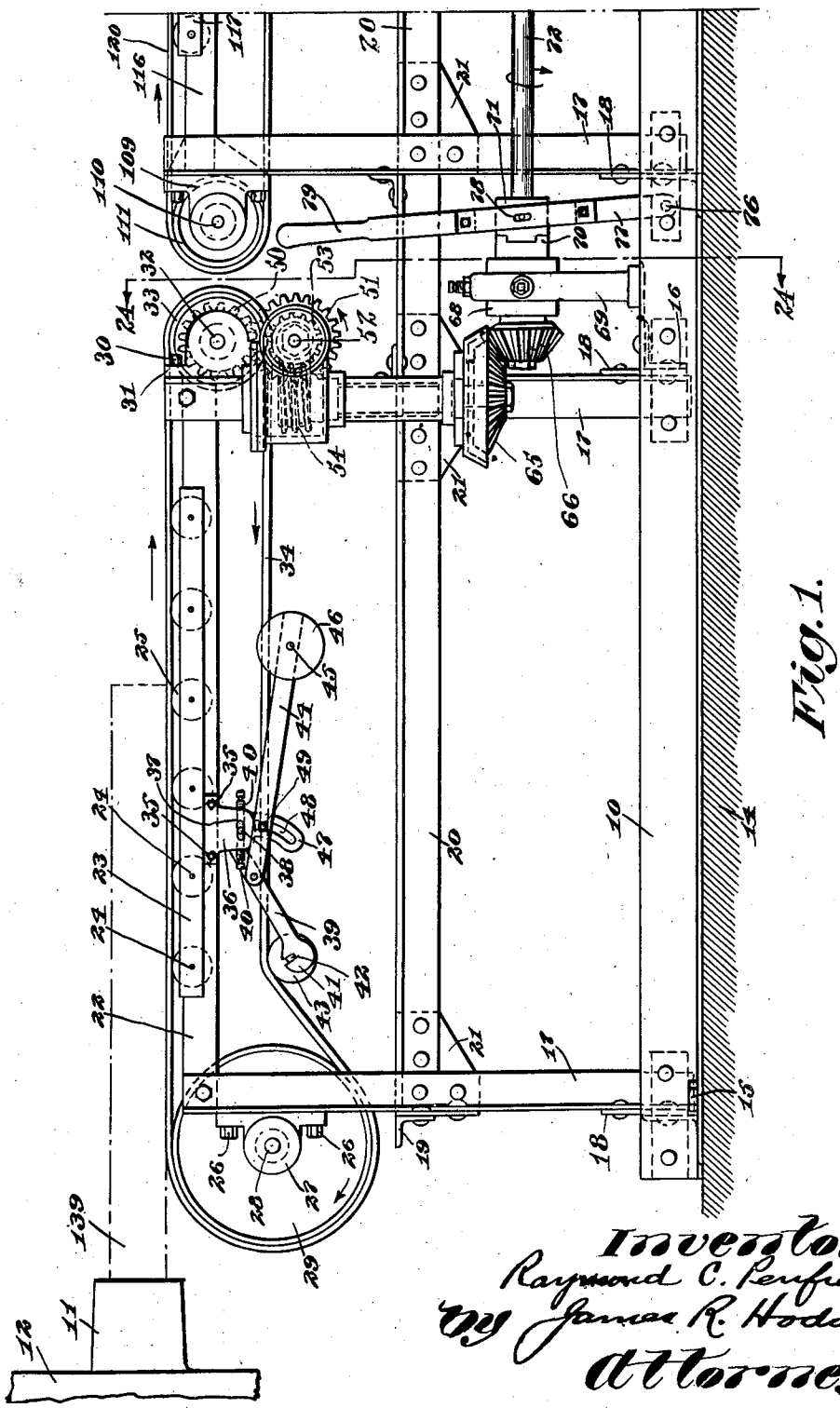


Fig. 1.

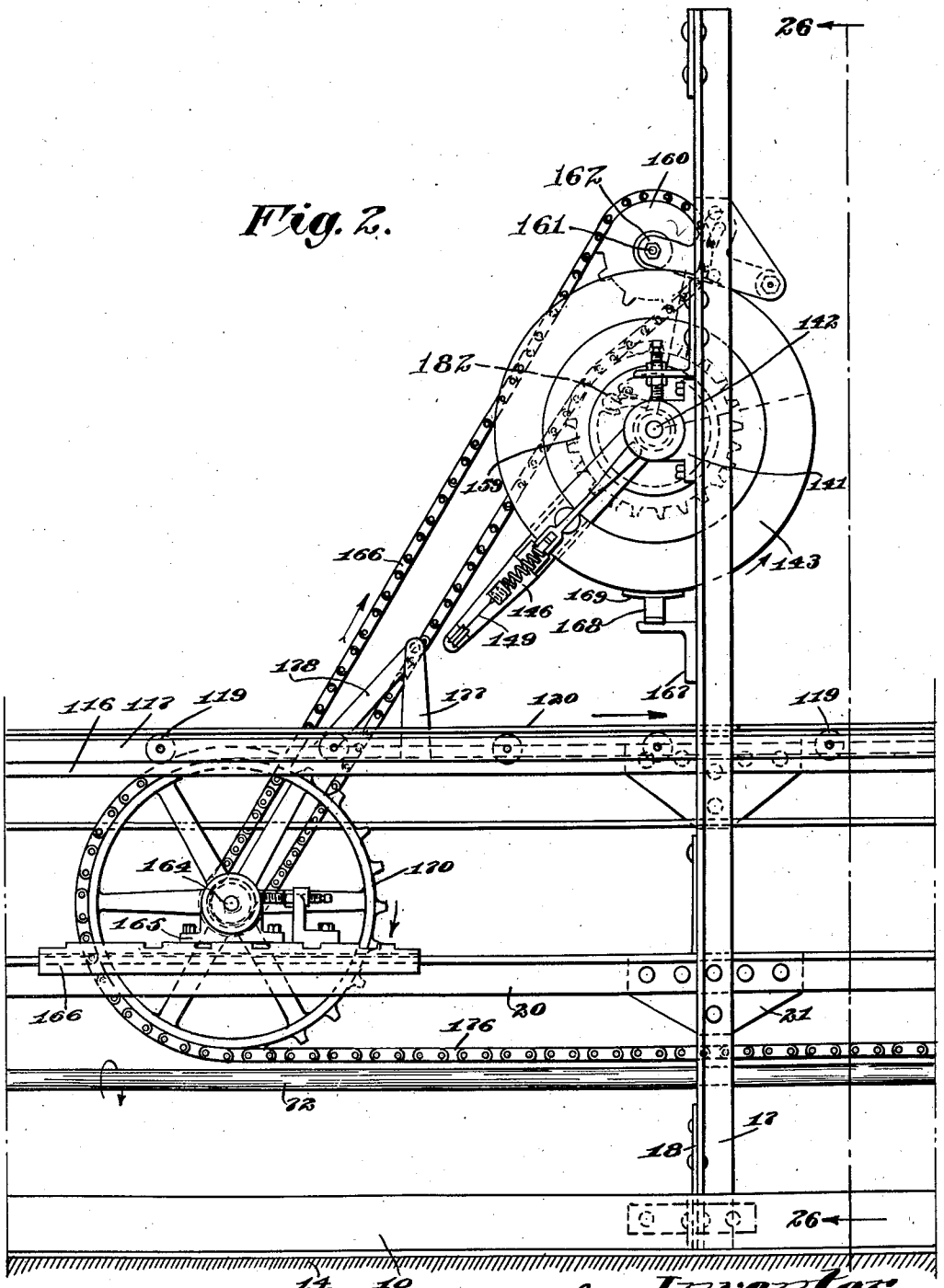
Inventor
Raymond C. Penfield
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 2

Fig. 2.



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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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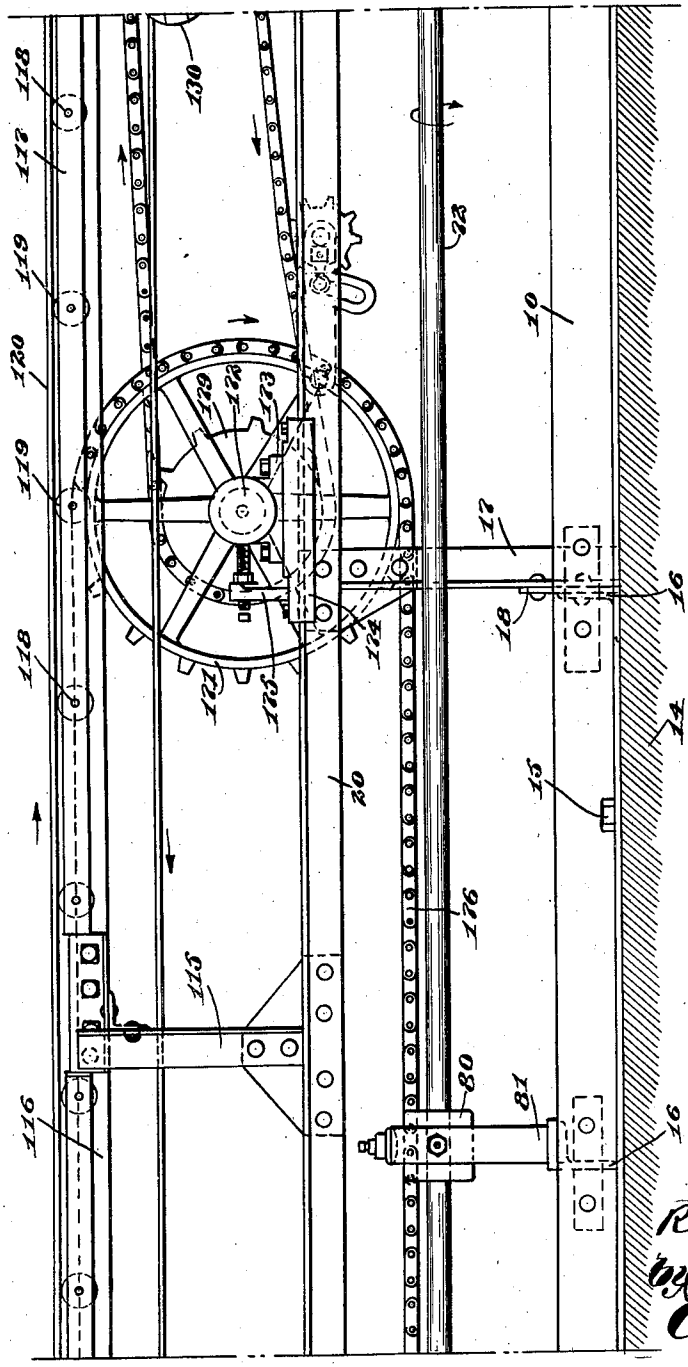


Fig. 3.

Inventor
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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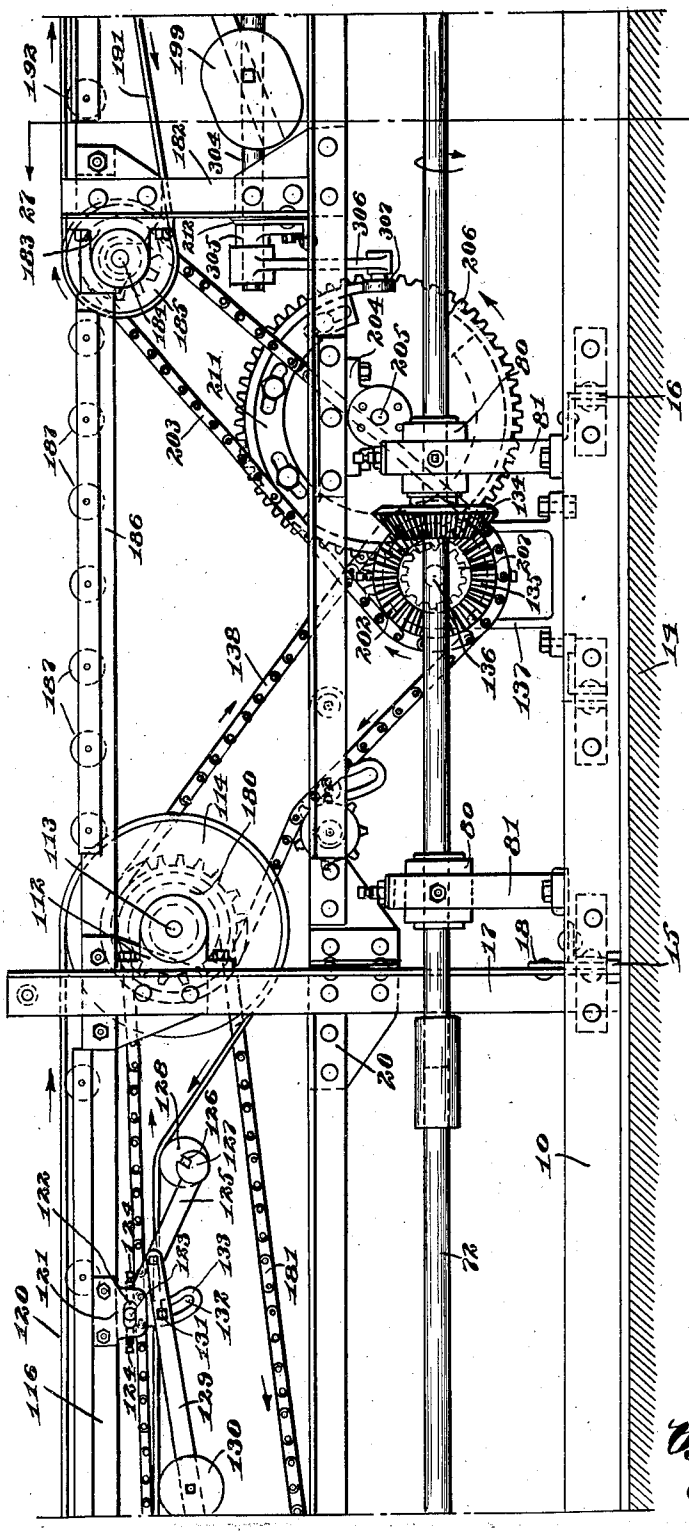


Fig. 4.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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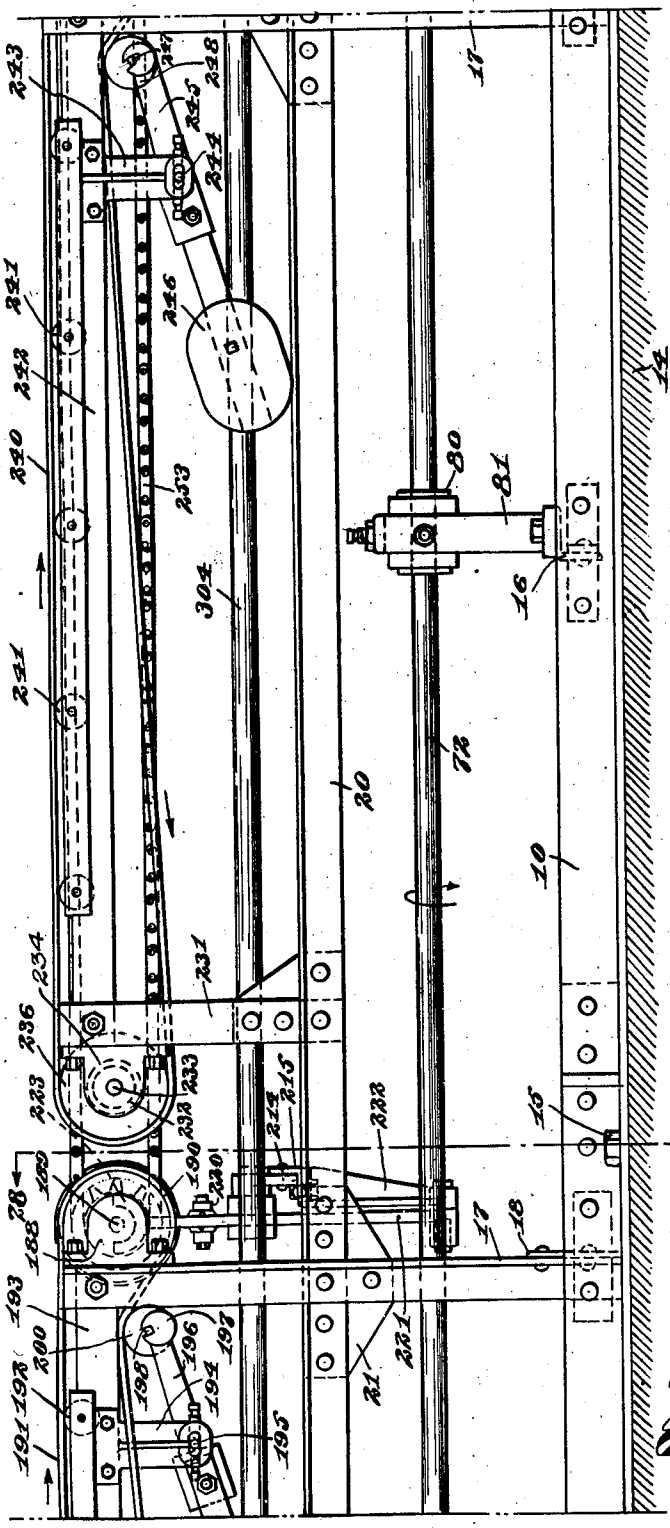


Fig. 5.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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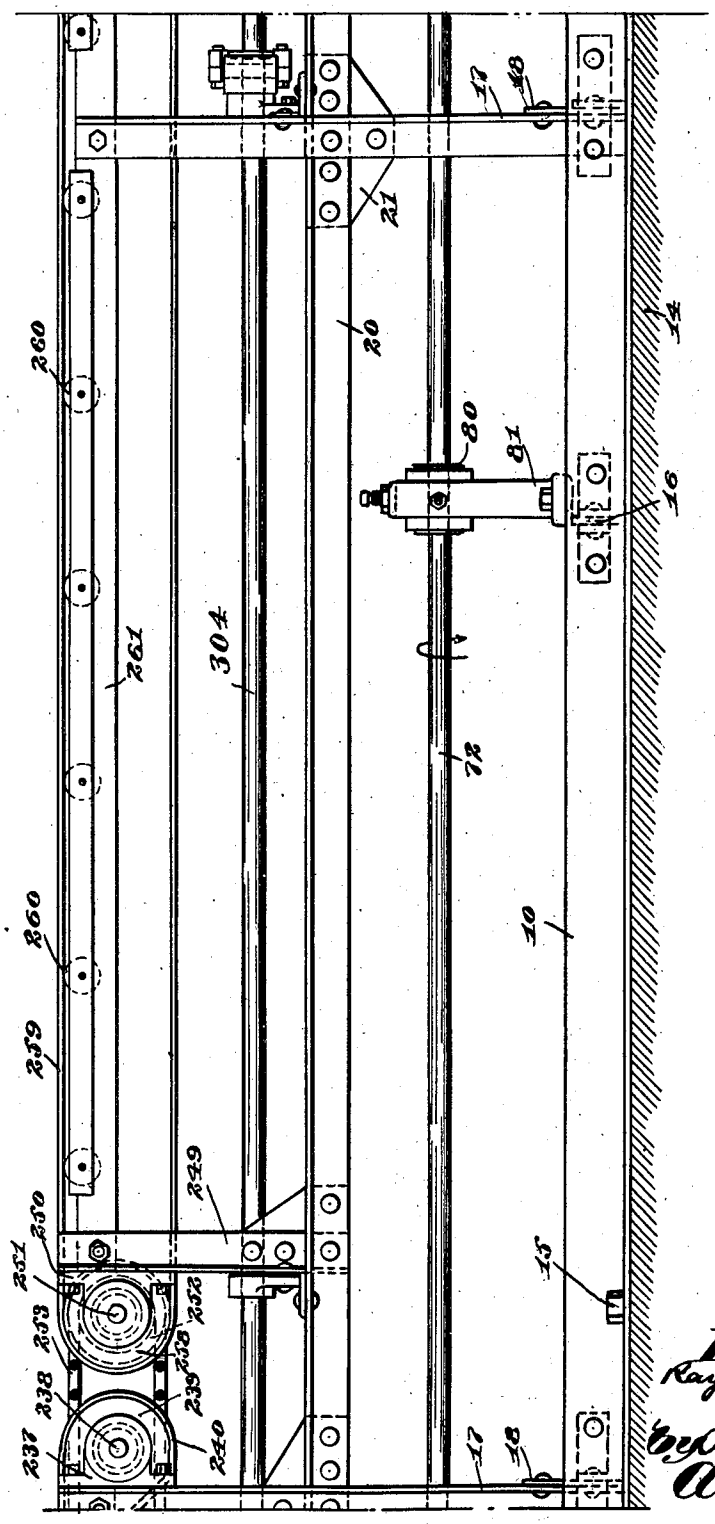


Fig. 6.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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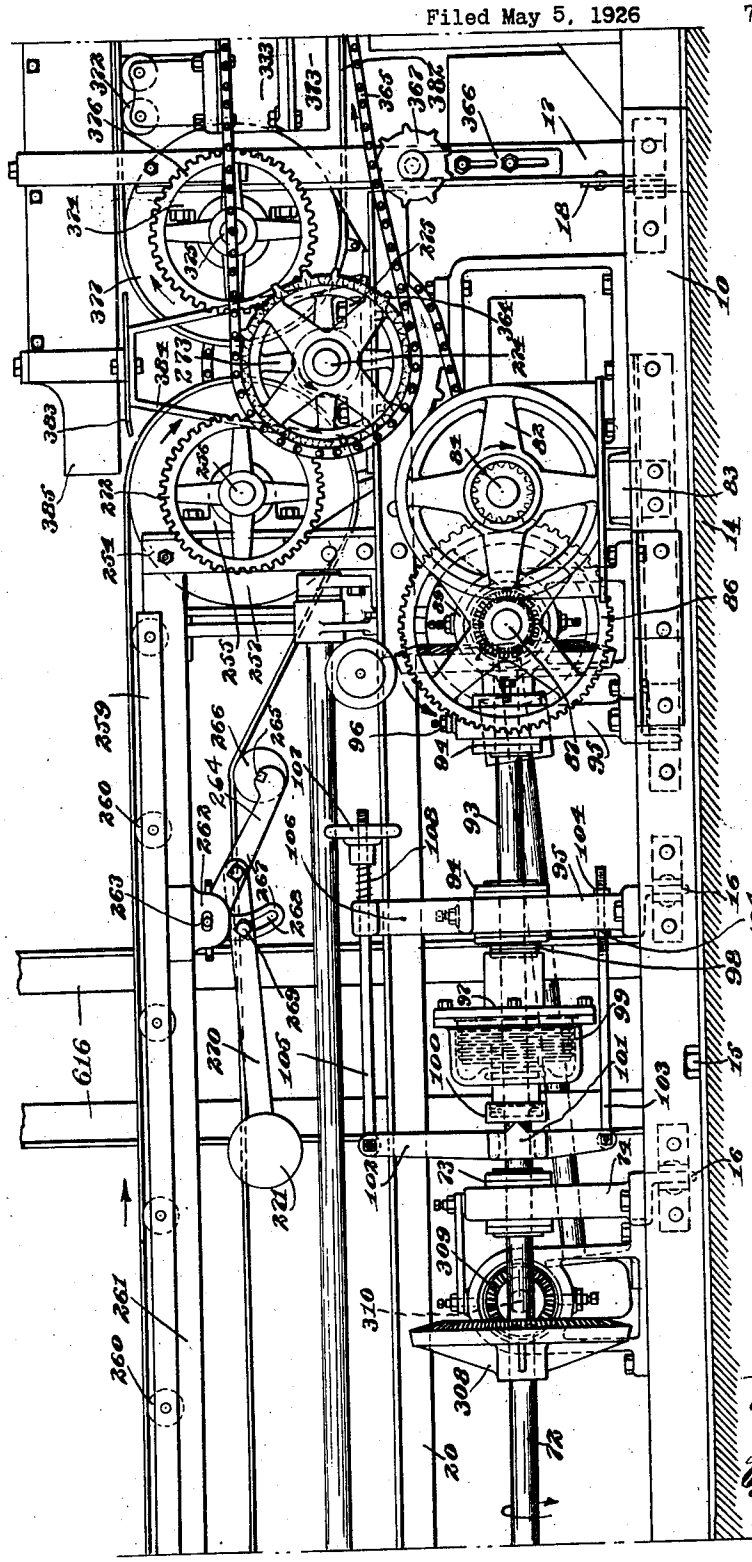


Fig. 7.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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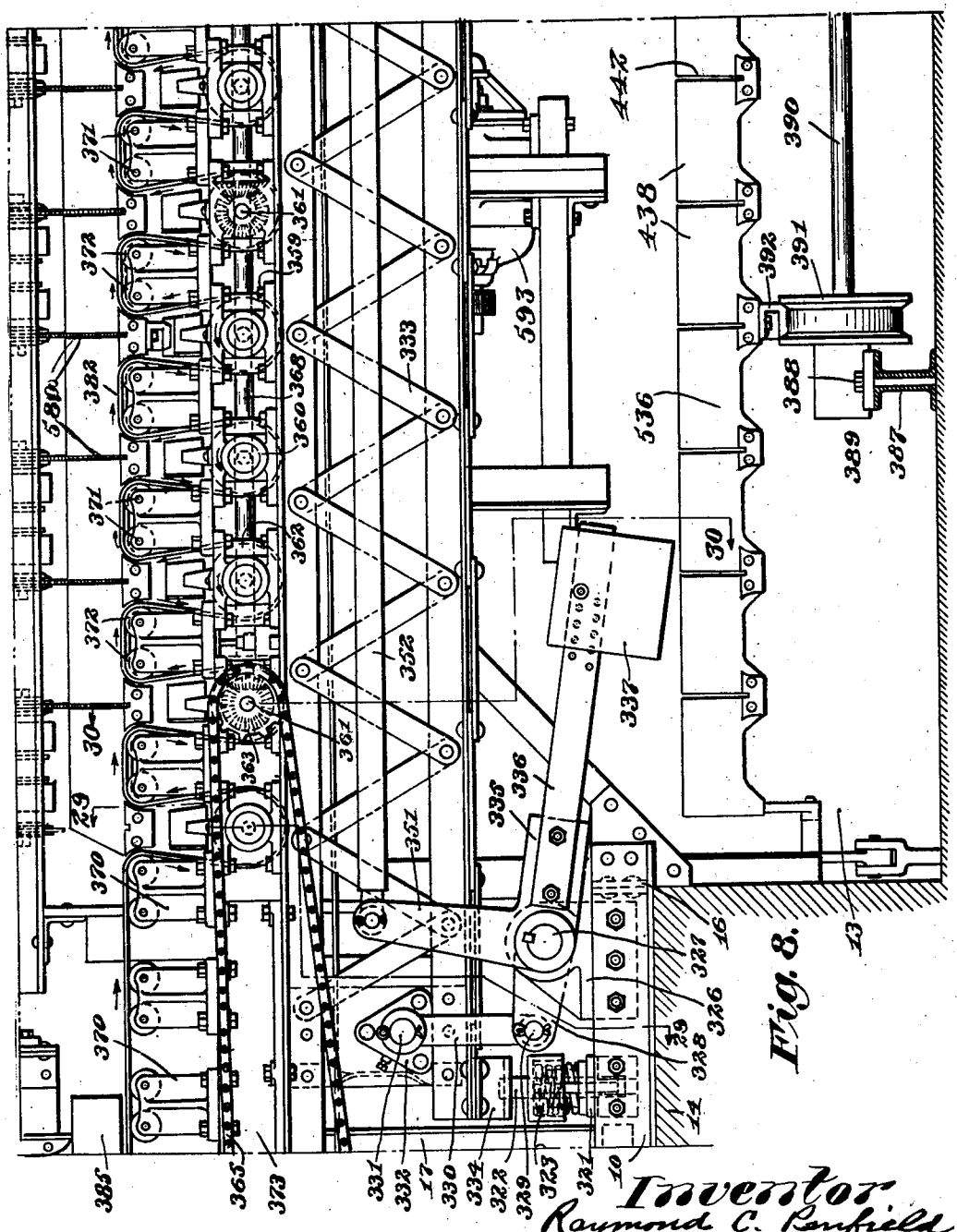


Fig. 8.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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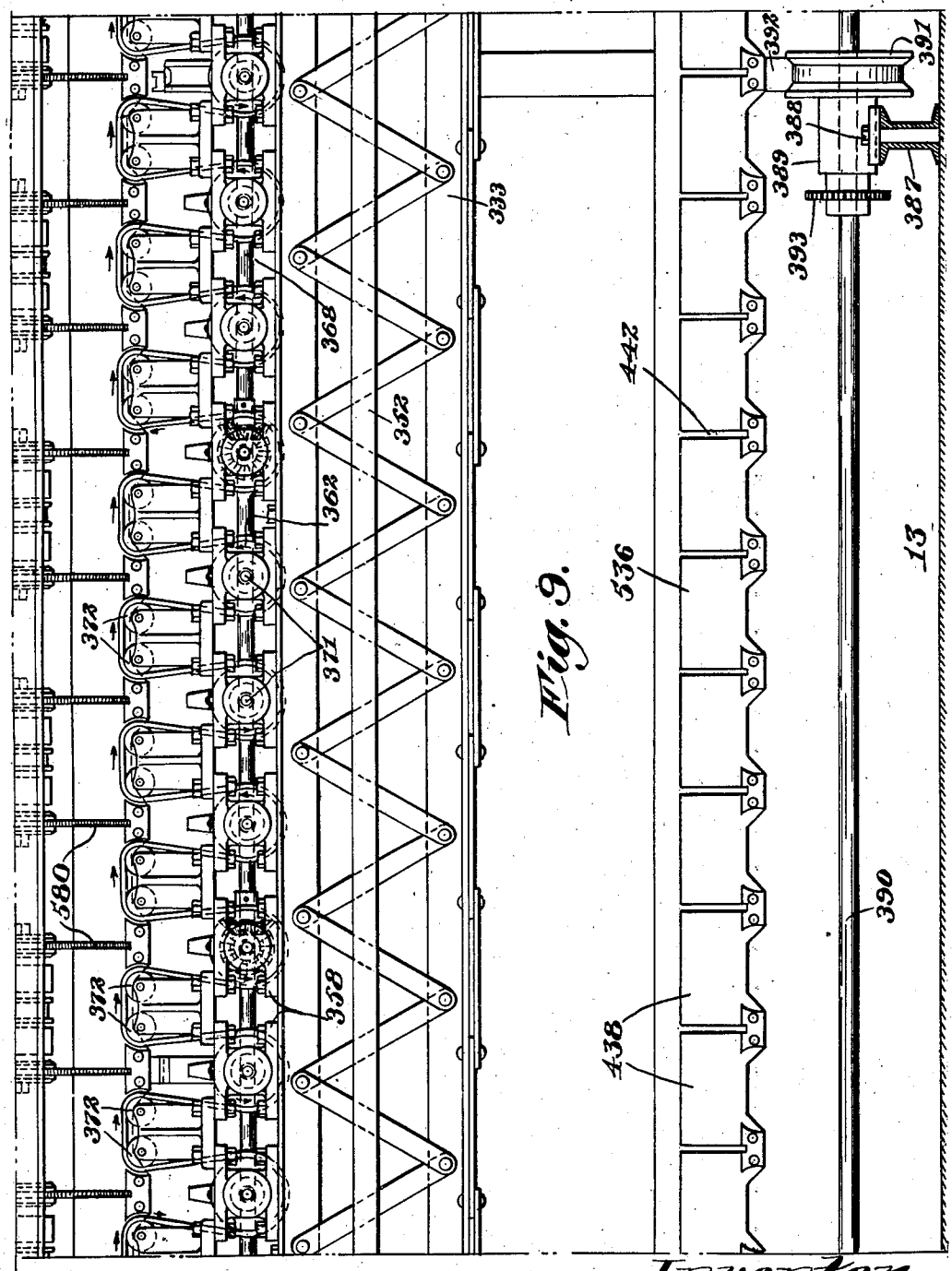


Fig. 9.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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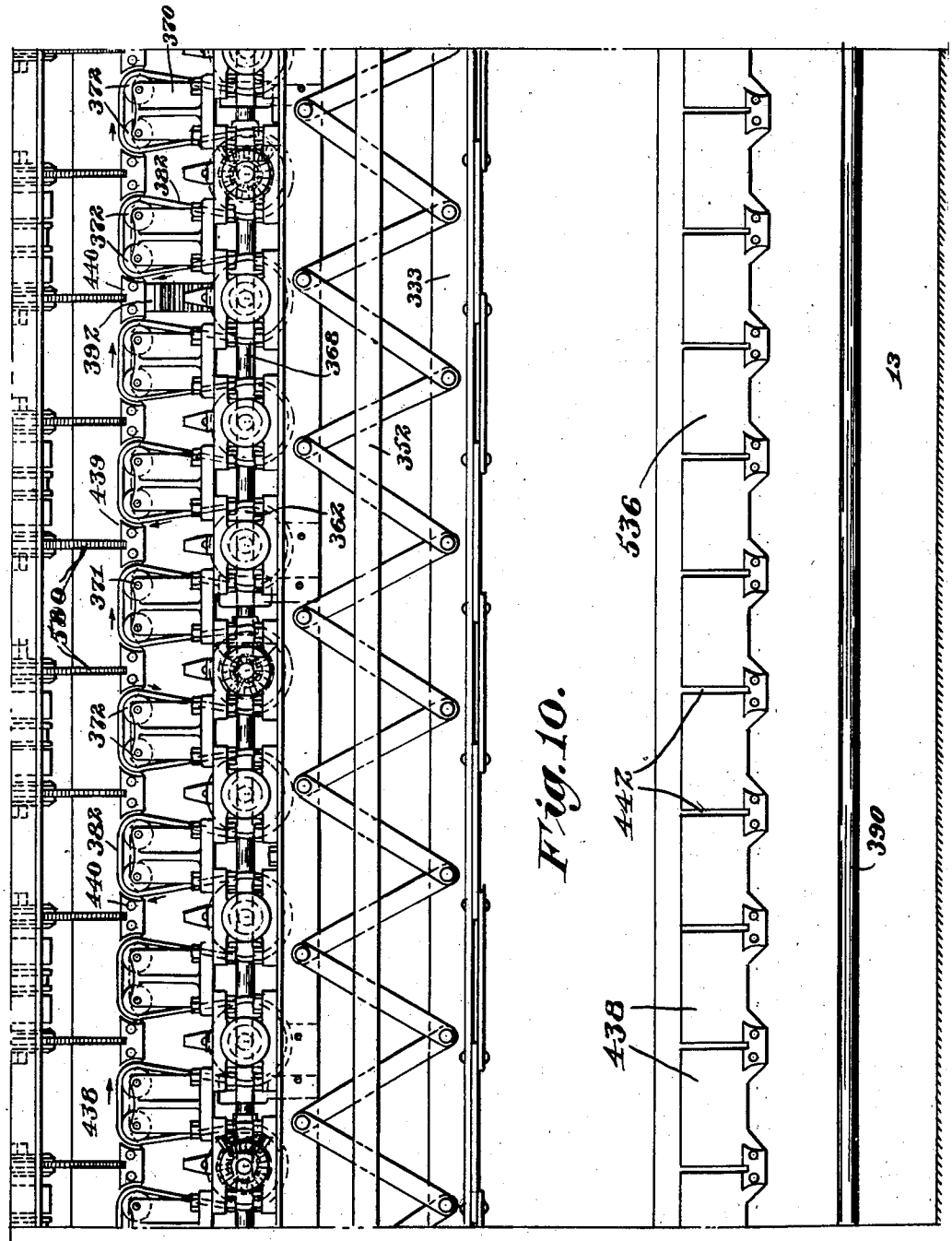


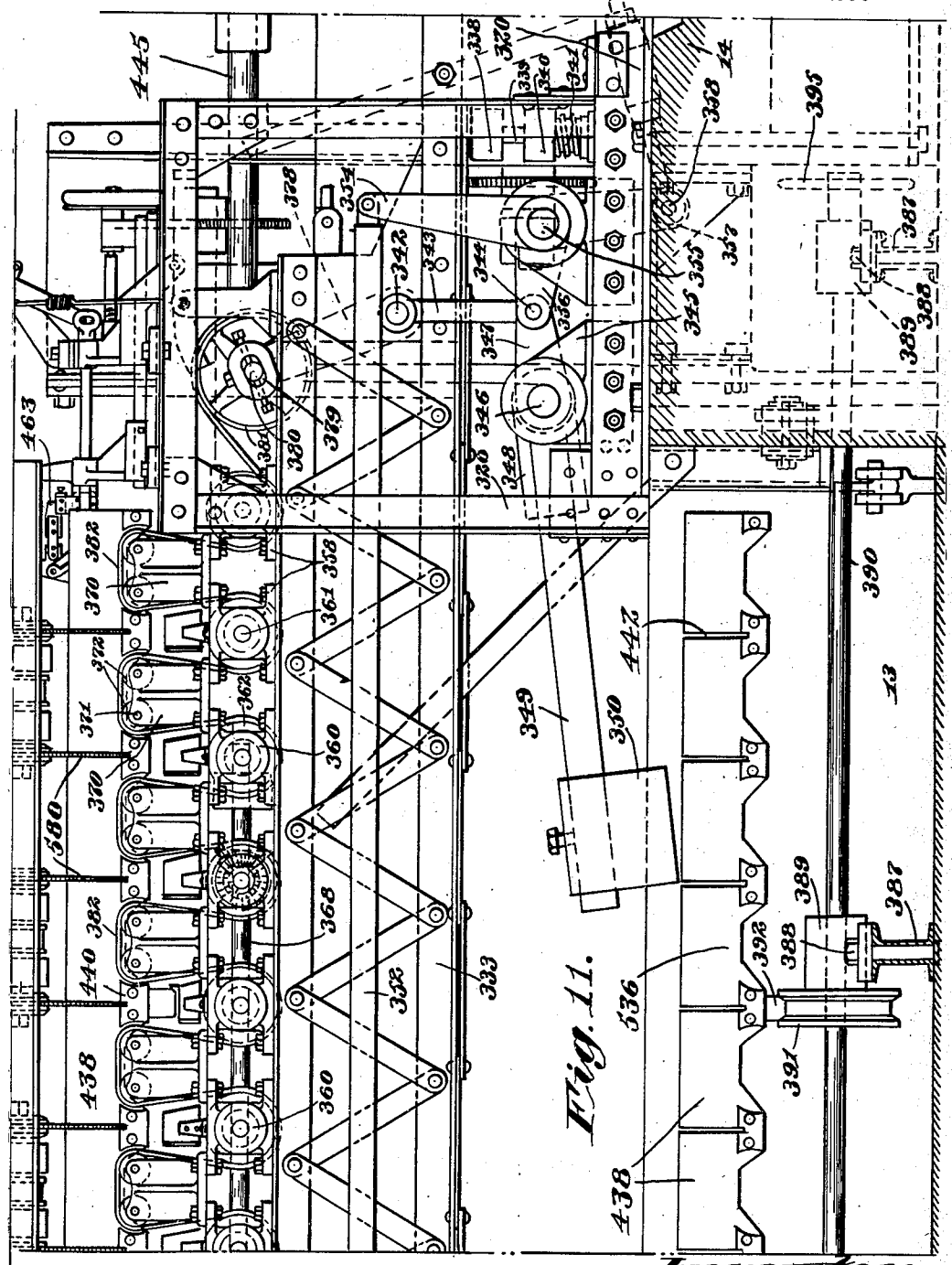
Fig. 10.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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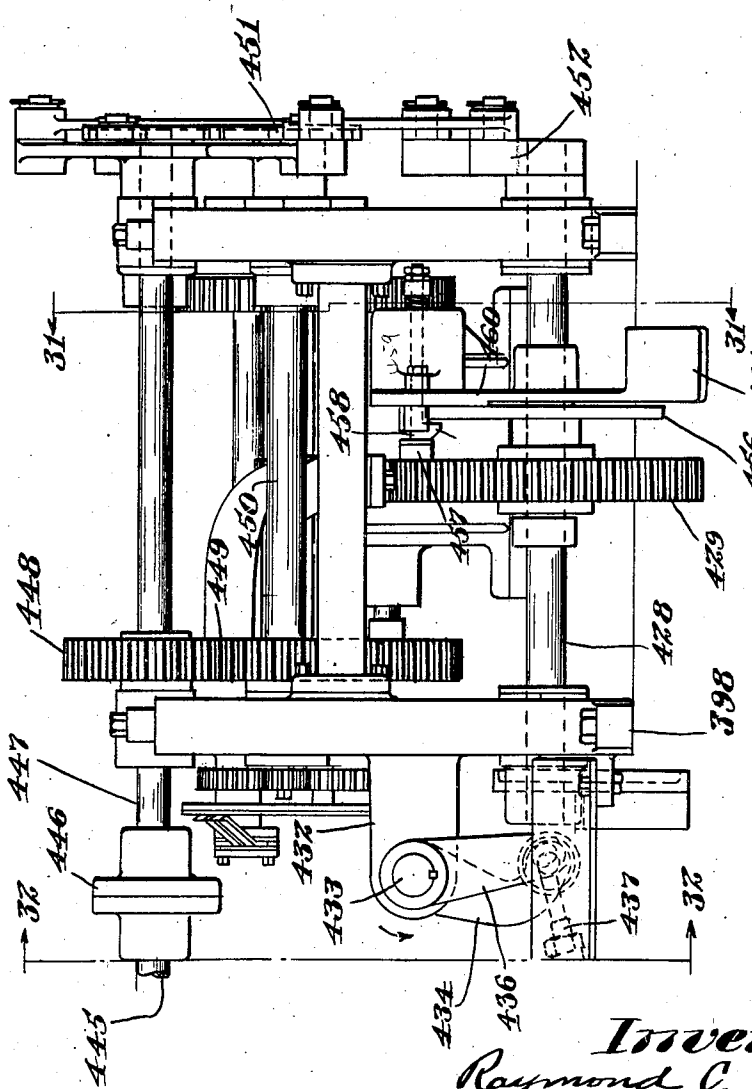


Fig. 12.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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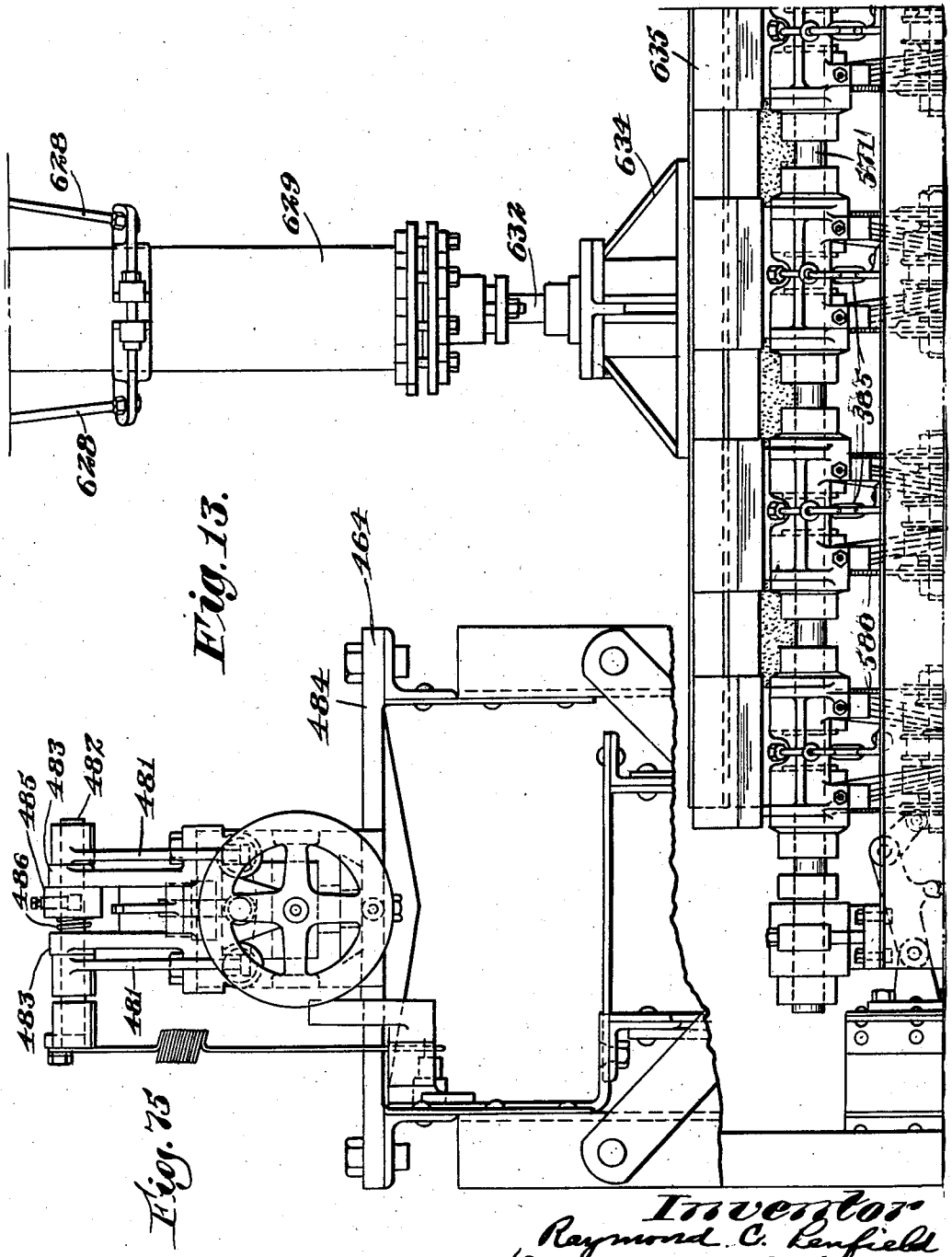


Fig. 13.

Fig. 75

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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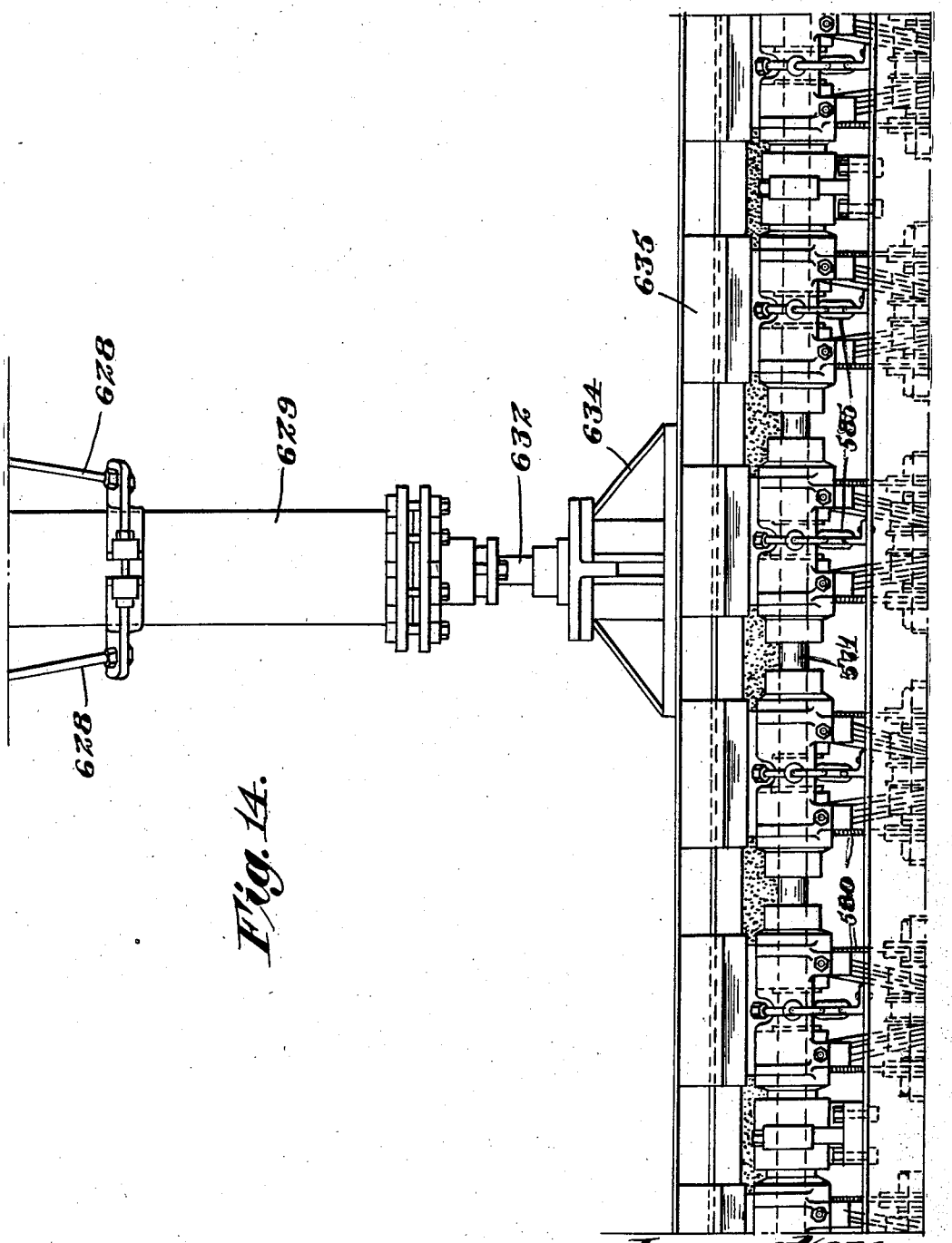


Fig. 14.

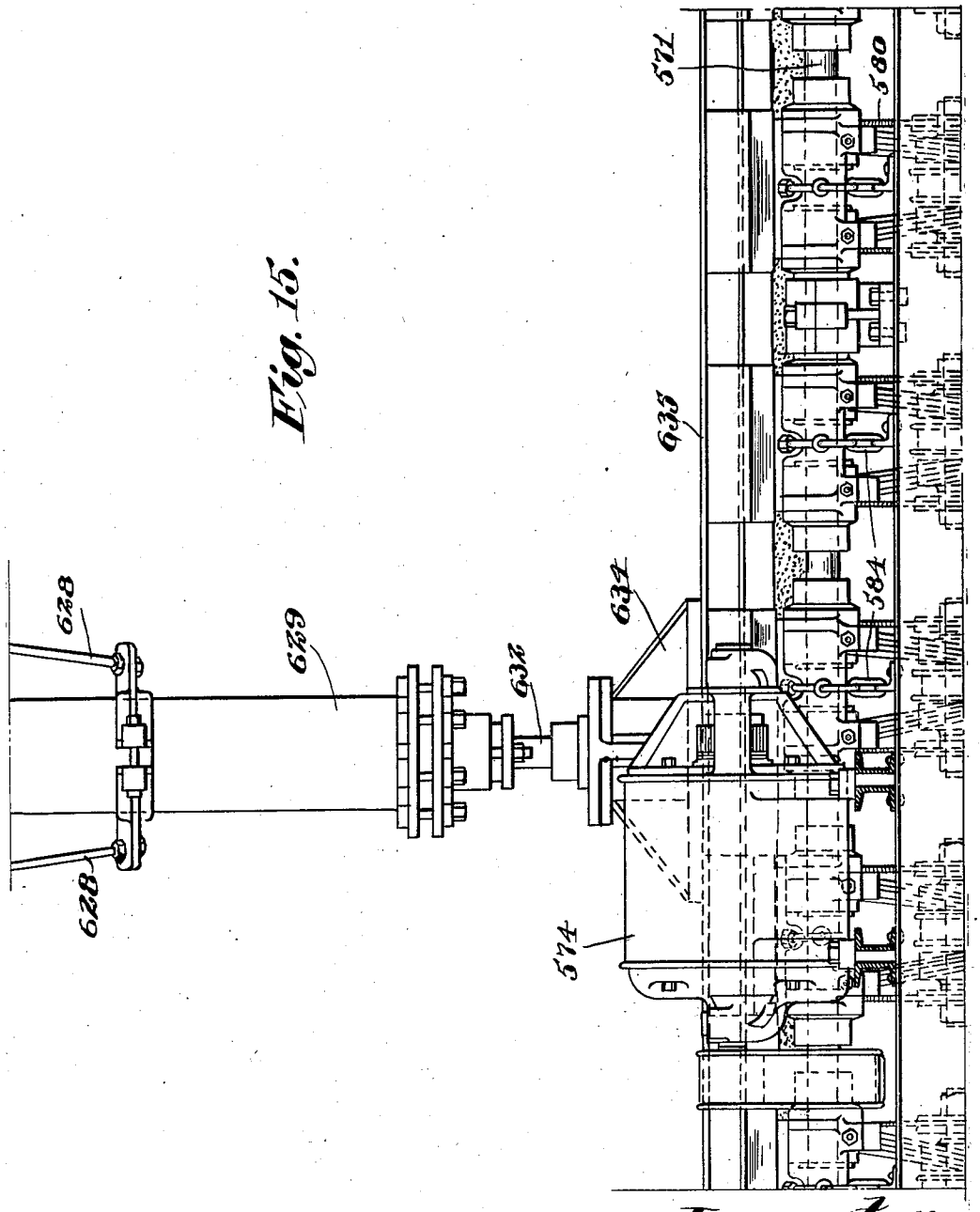
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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Fig. 15.



Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 16

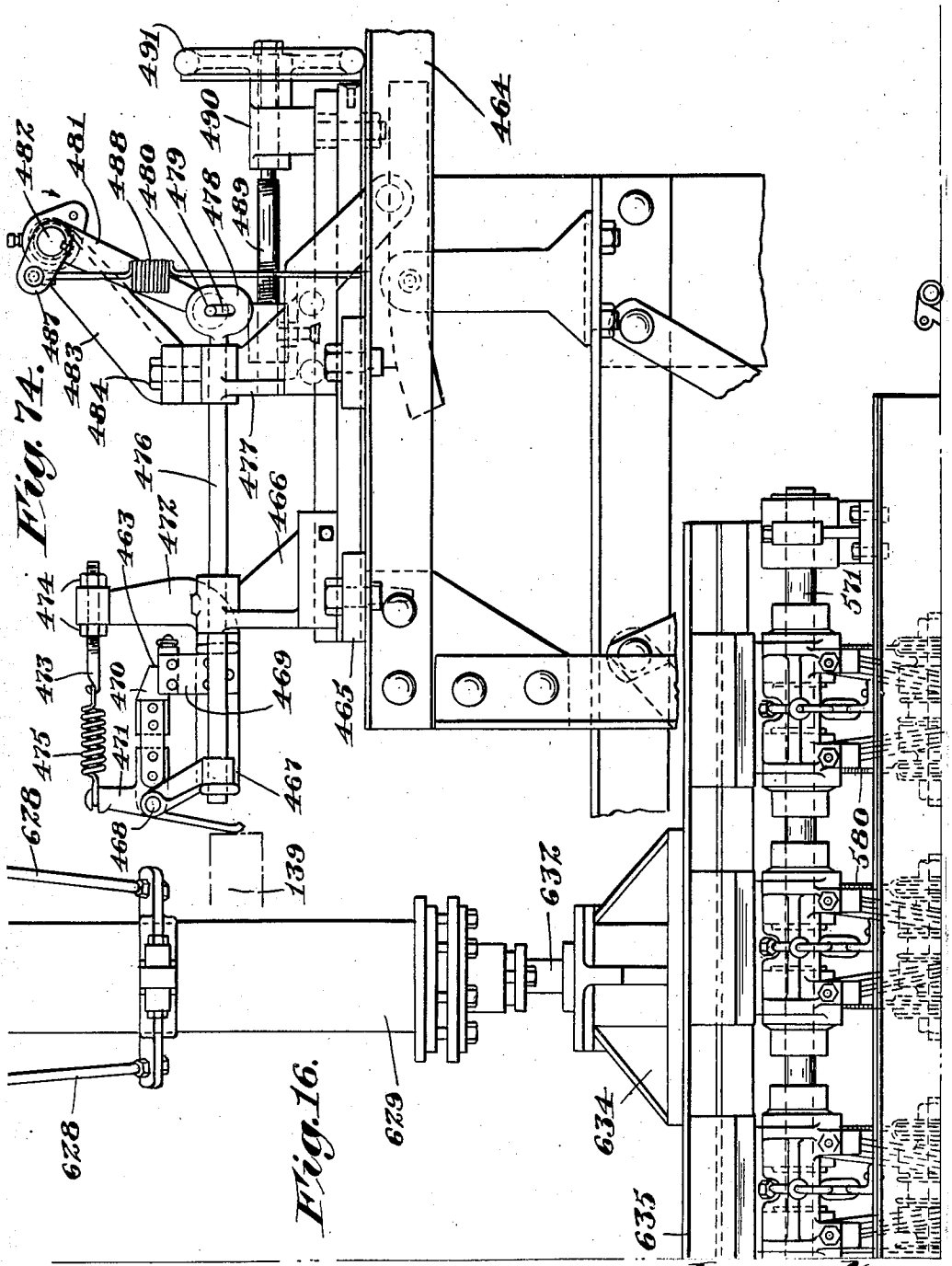


Fig. 14.

Fig. 16.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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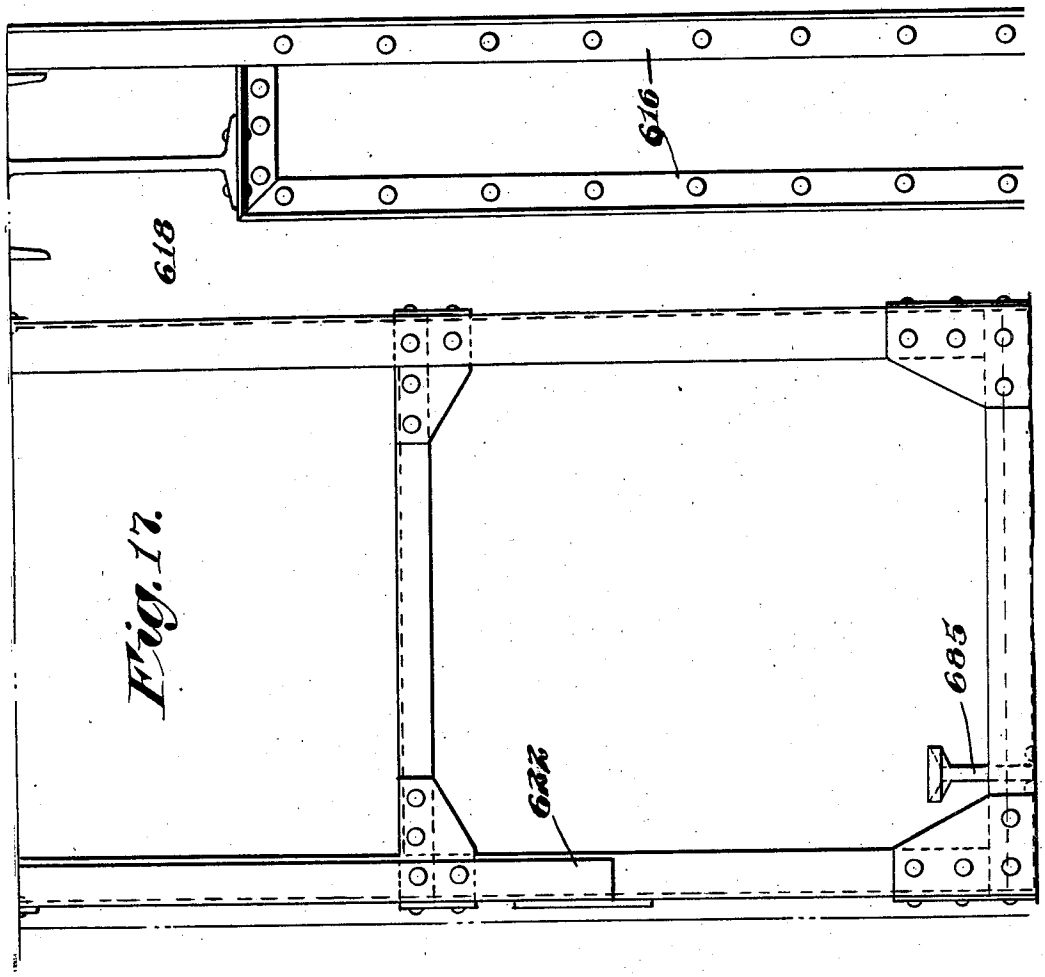


Fig. 17.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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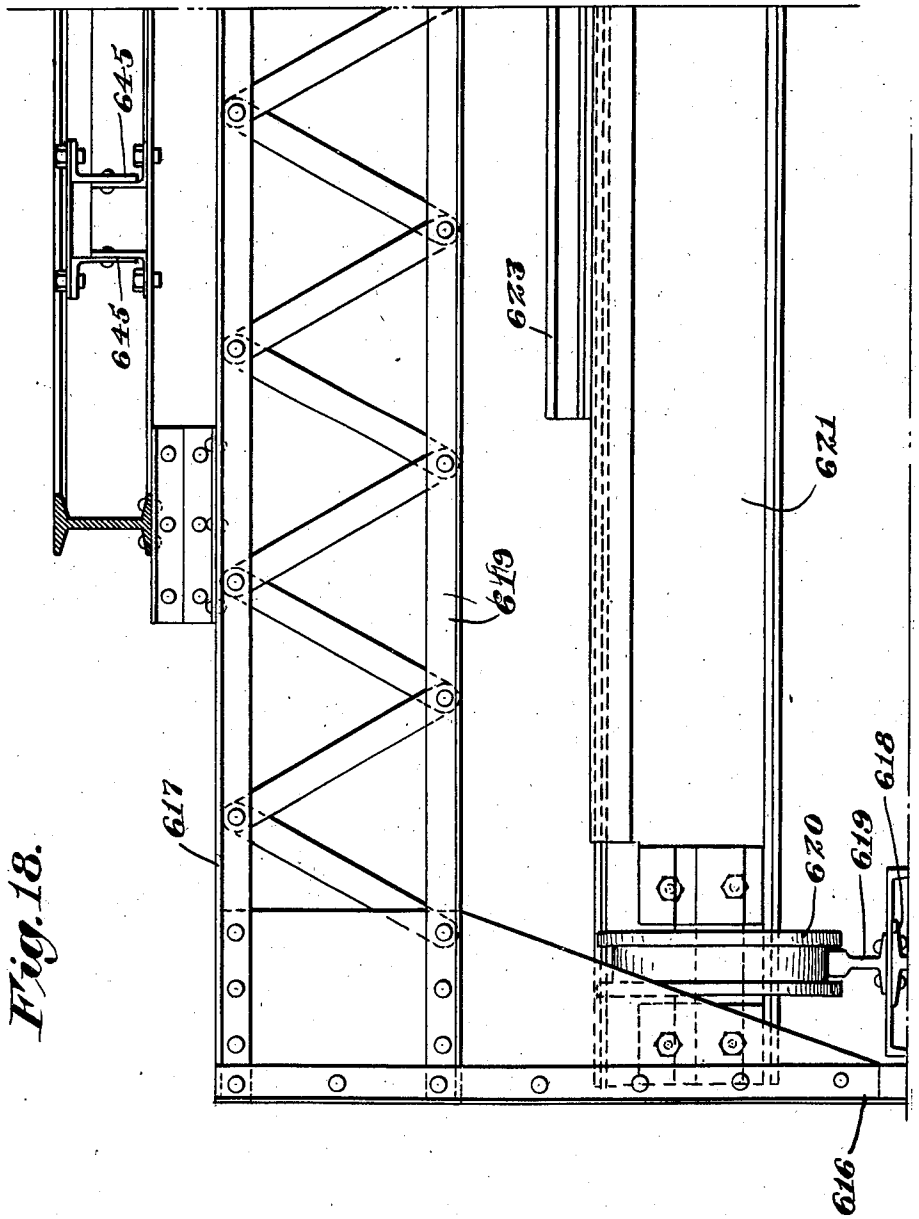


Fig. 18.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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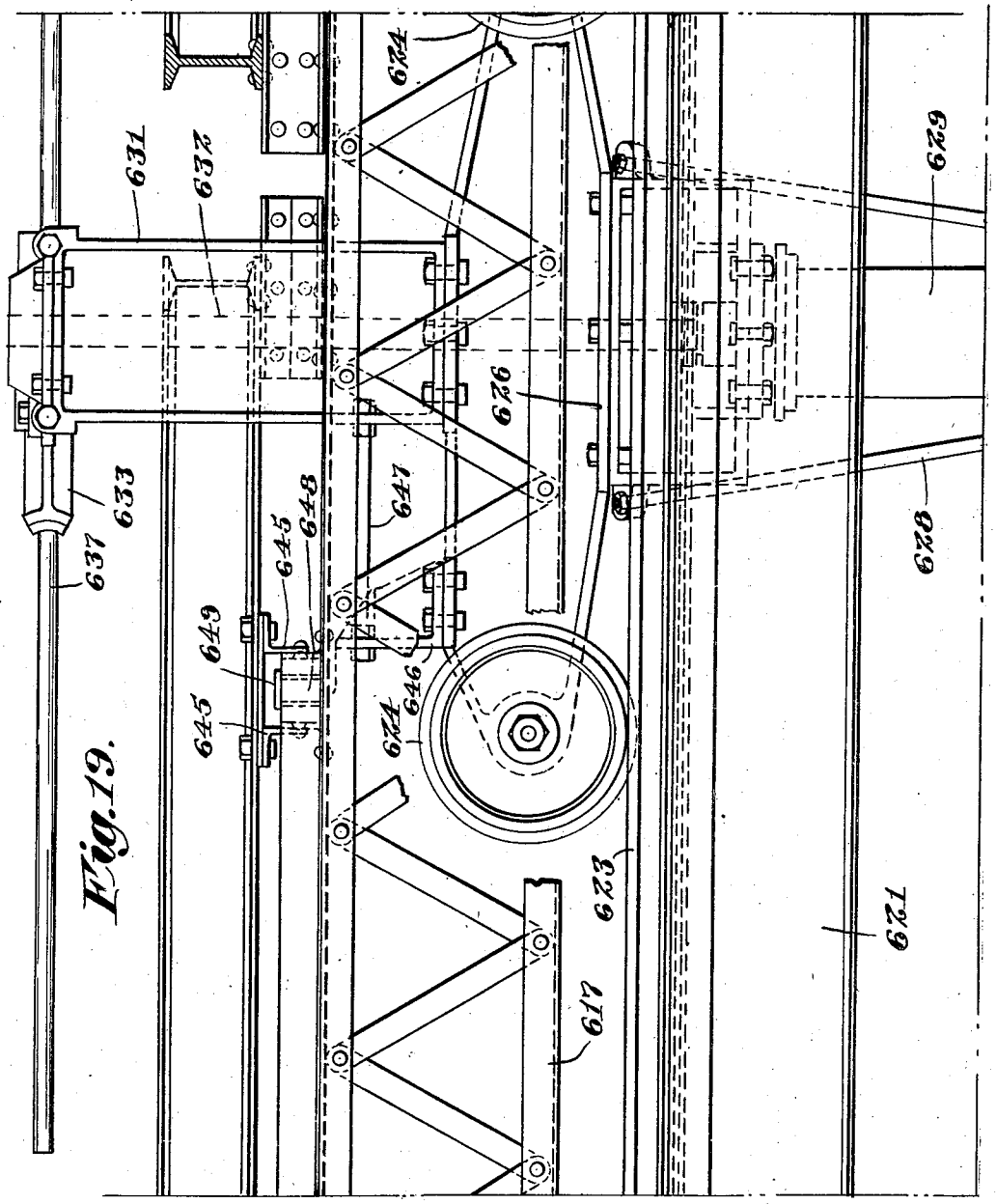


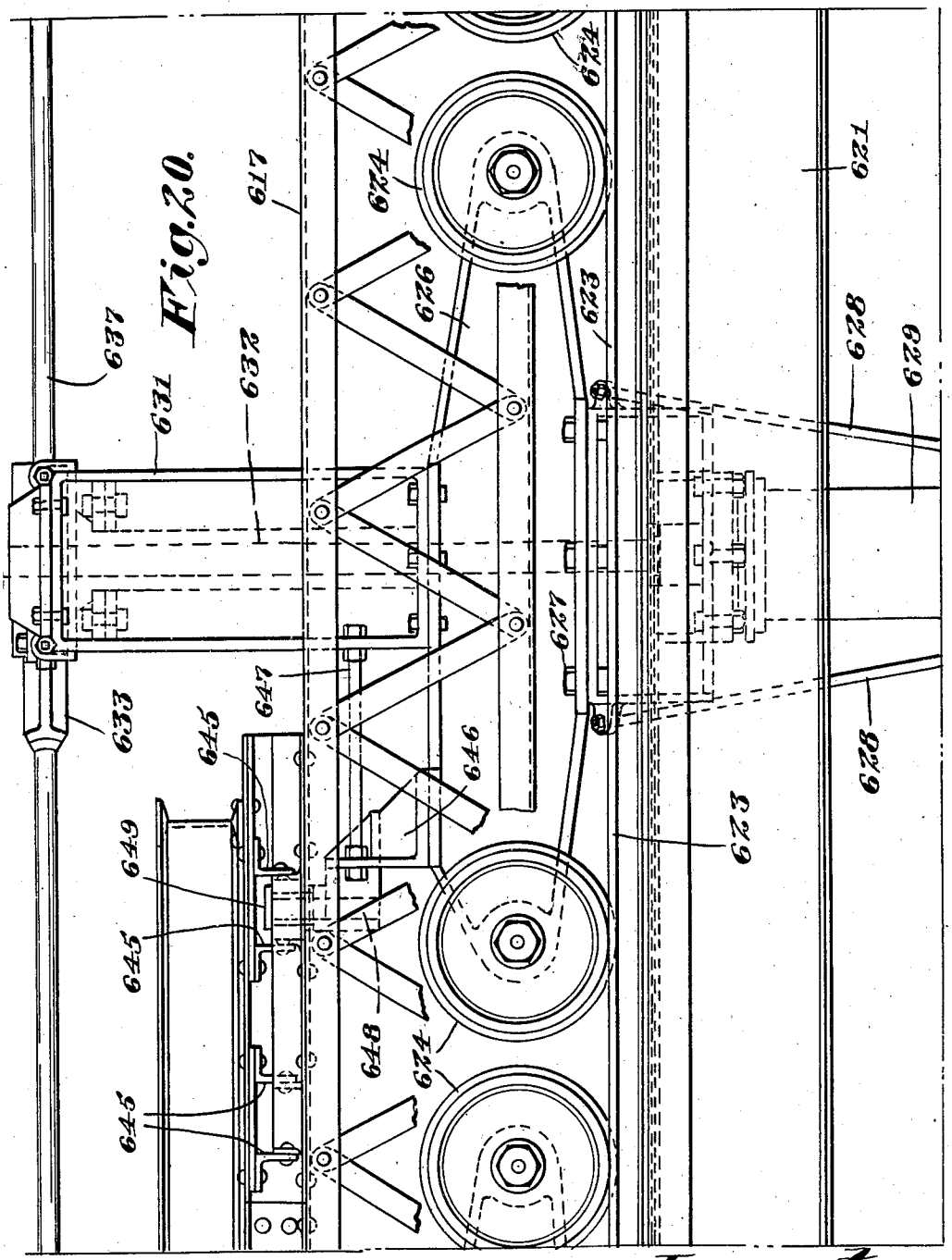
Fig. 19.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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Inventor
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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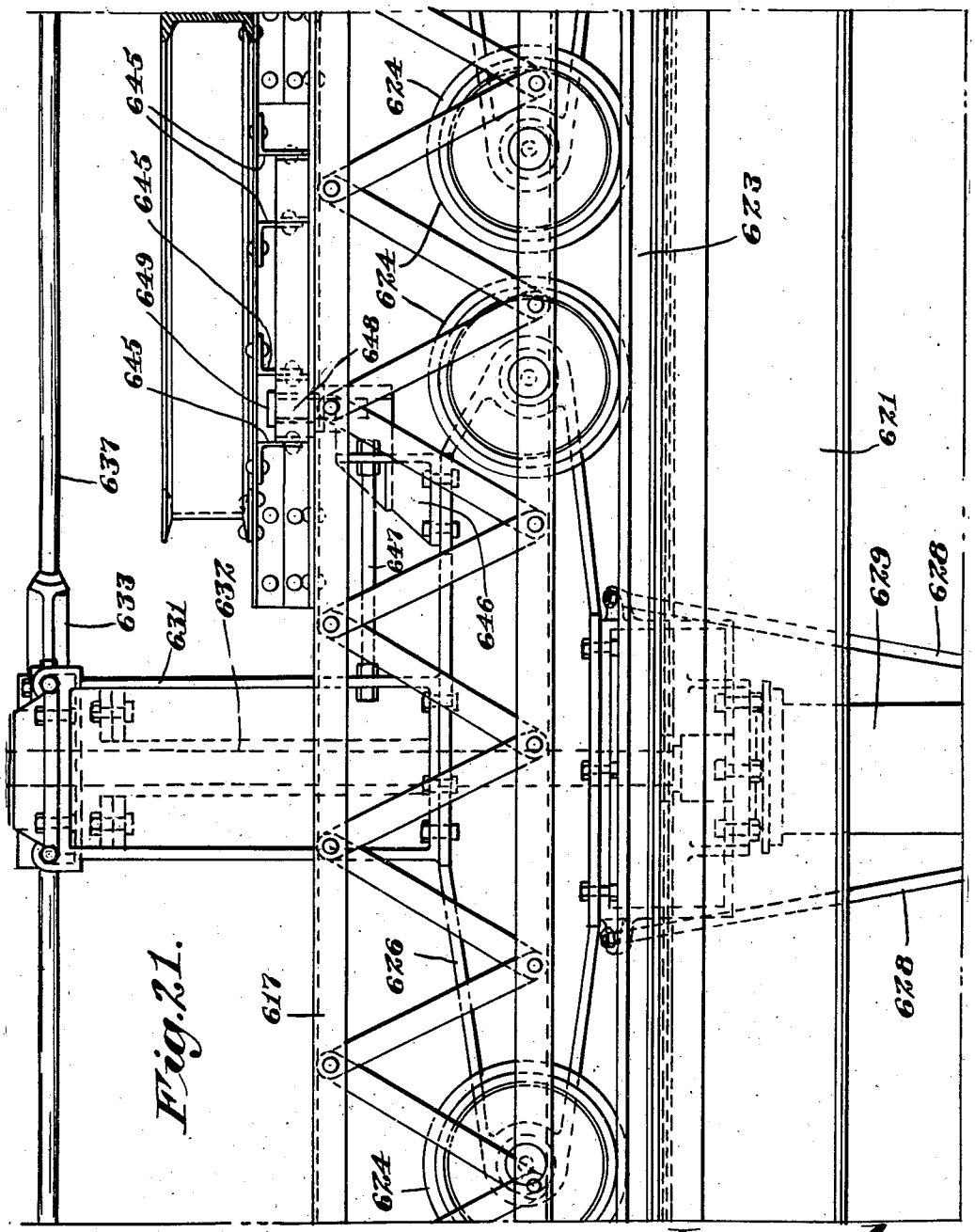


Fig. 21.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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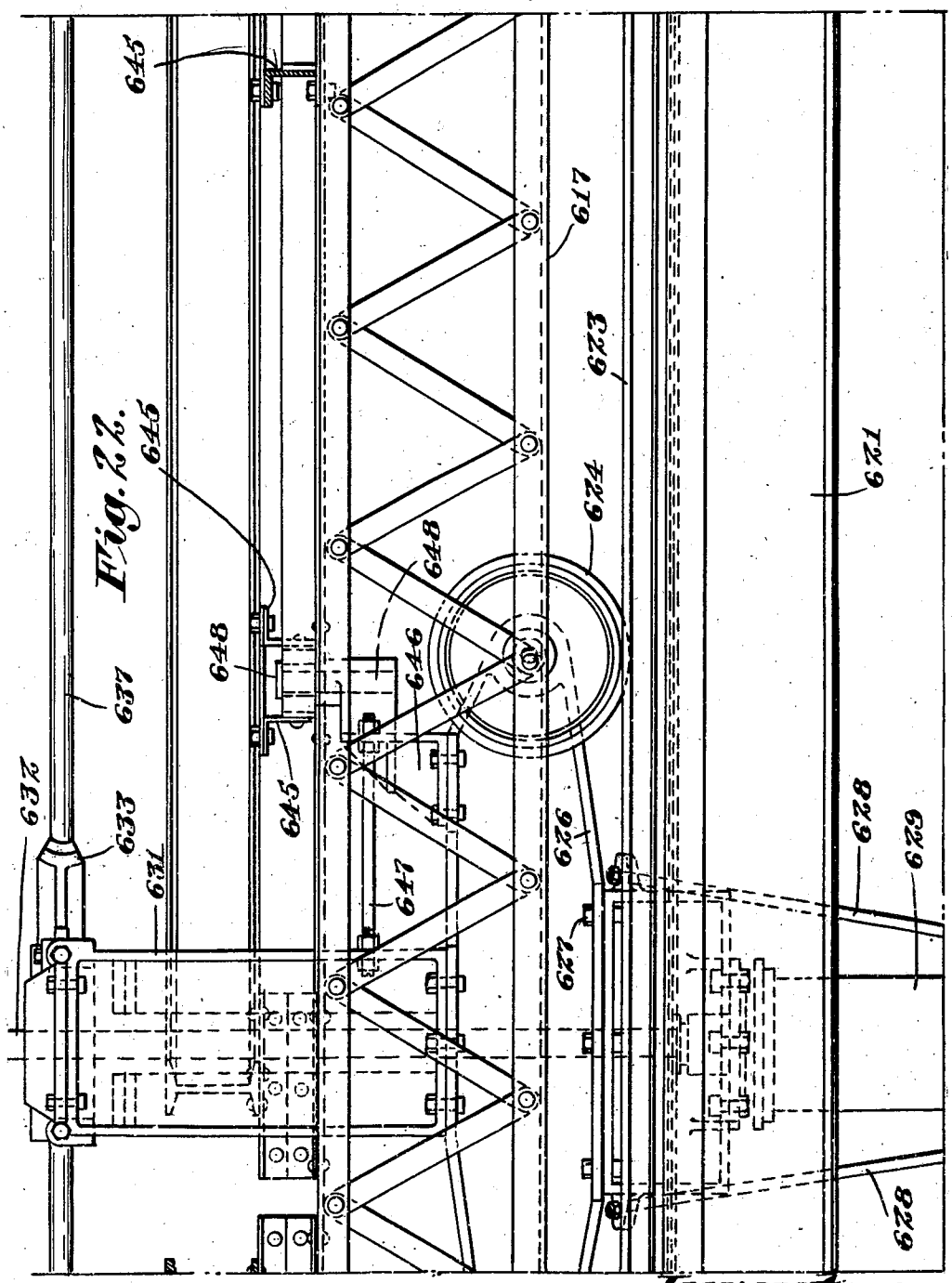


Fig. 22.

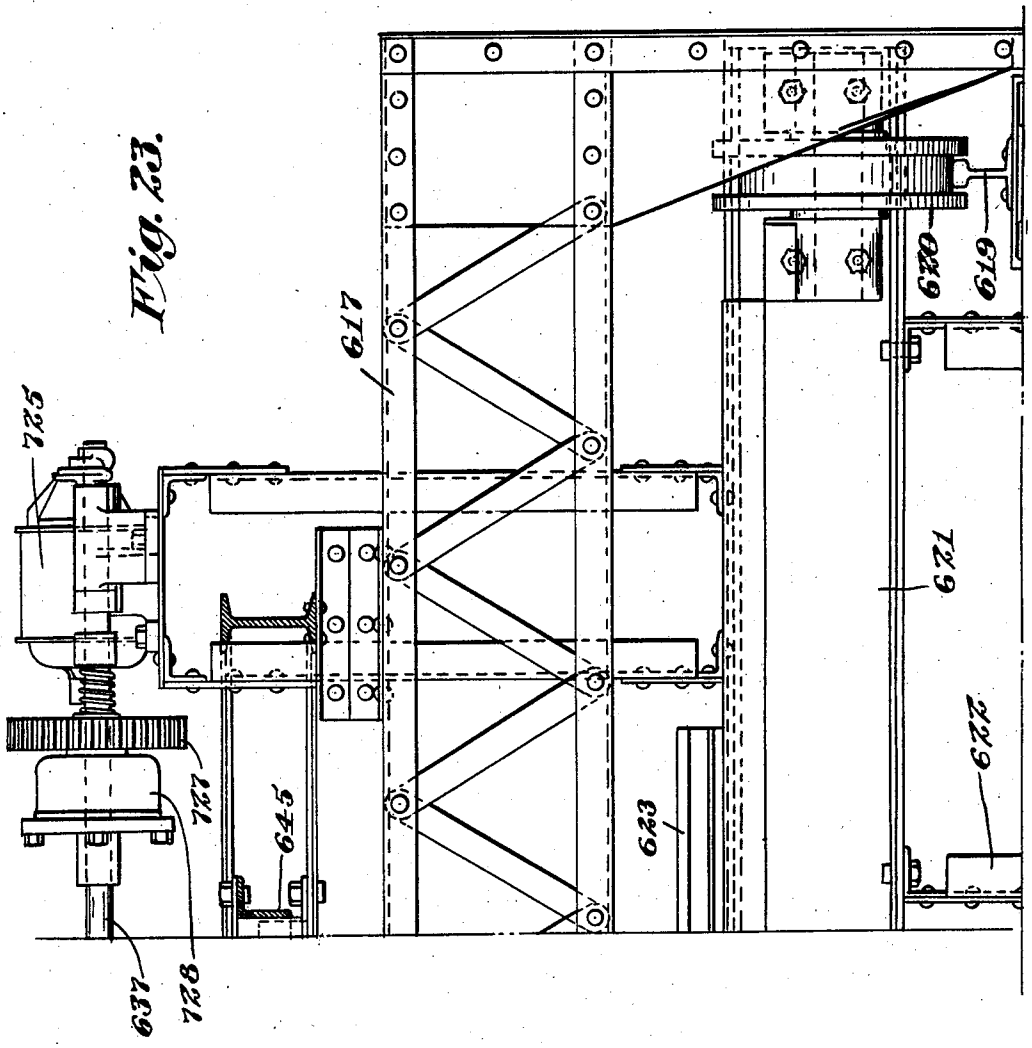
Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 23

Fig. 23.



Inventor
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 24

Fig. 24.

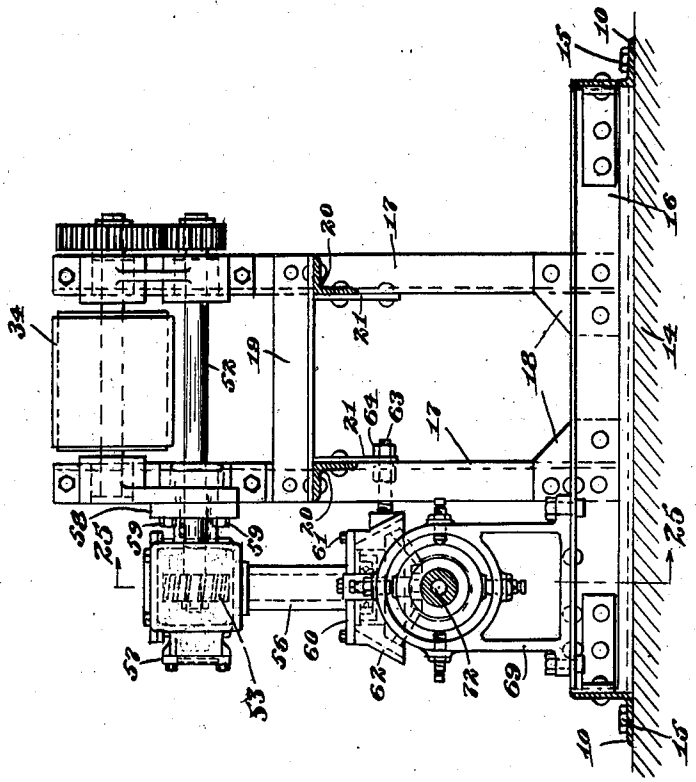
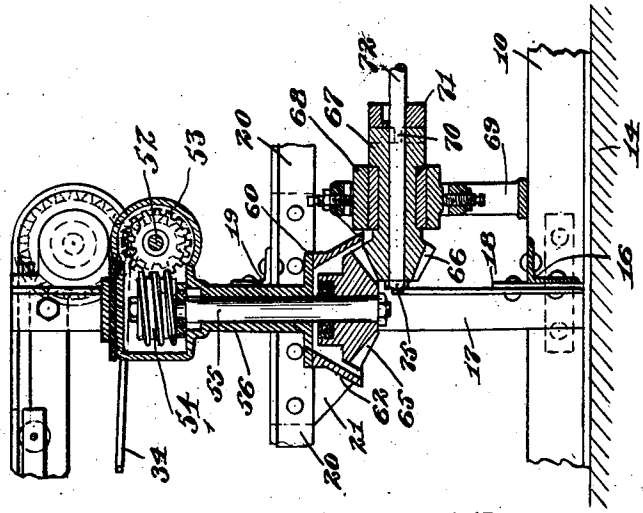


Fig. 25



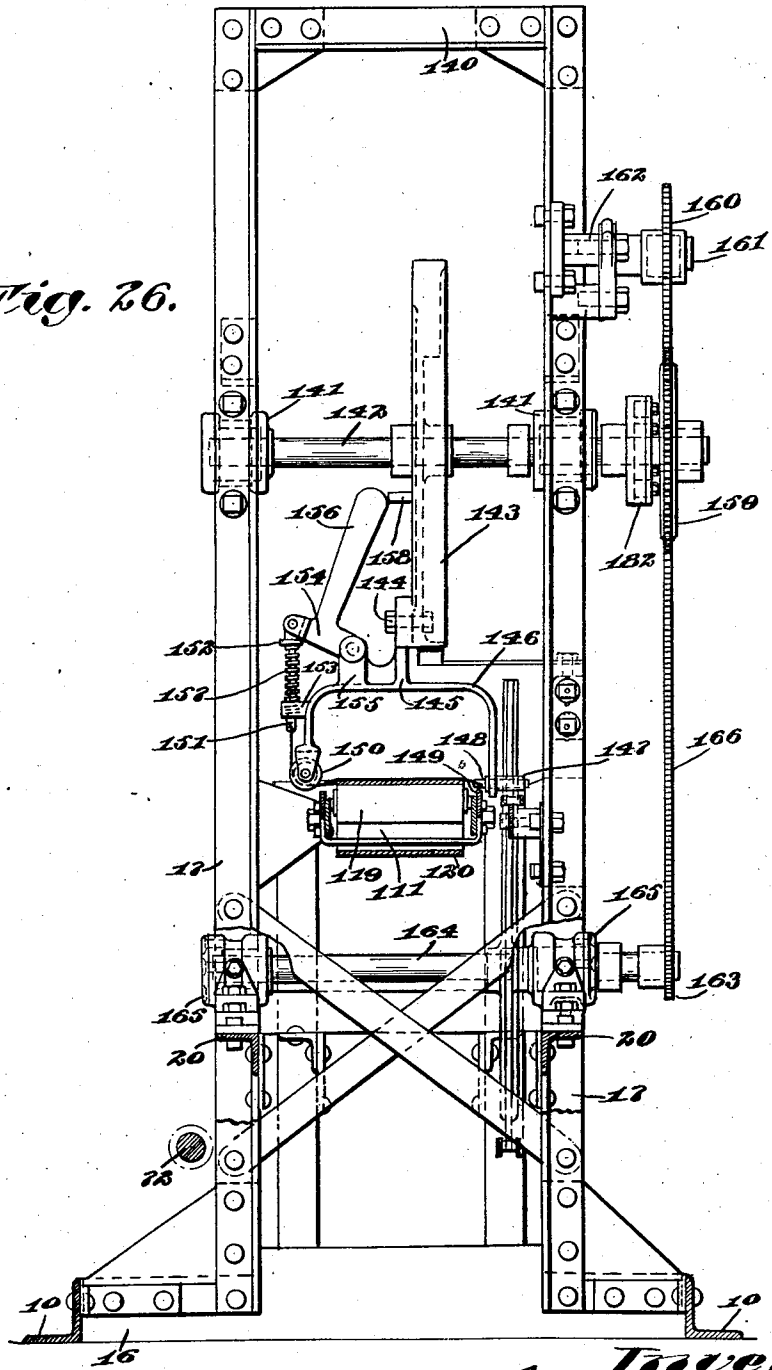
Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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Fig. 26.



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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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Fig. 78.

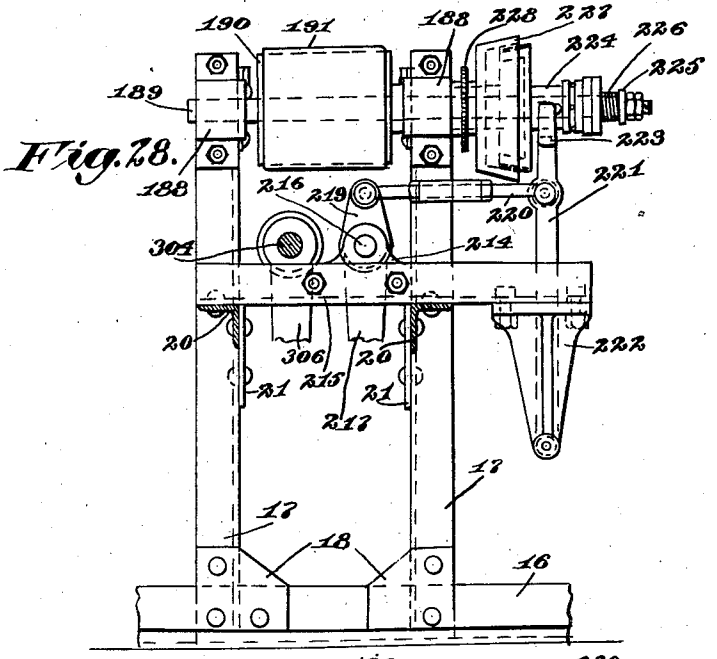
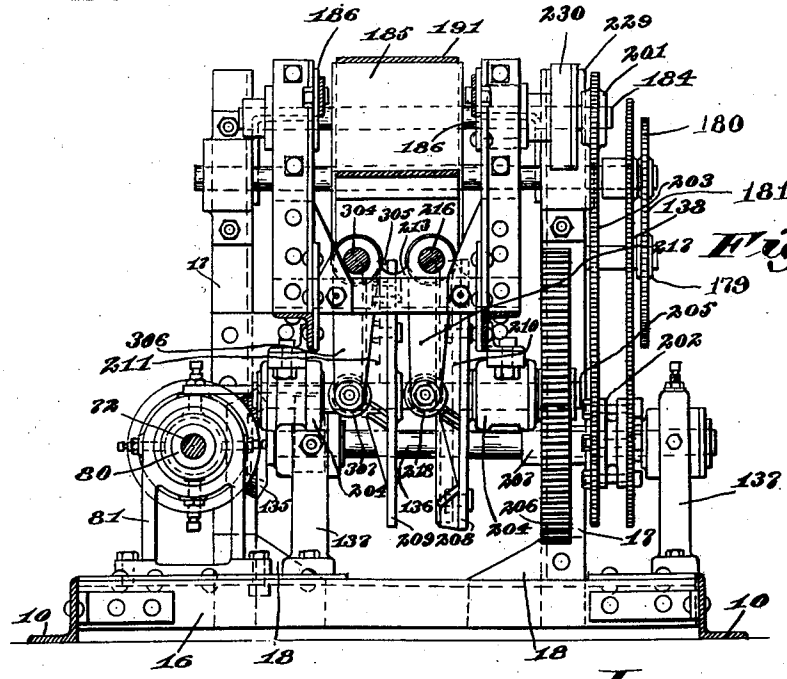


Fig. 77.



Inventor:
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 27

Fig. 30.

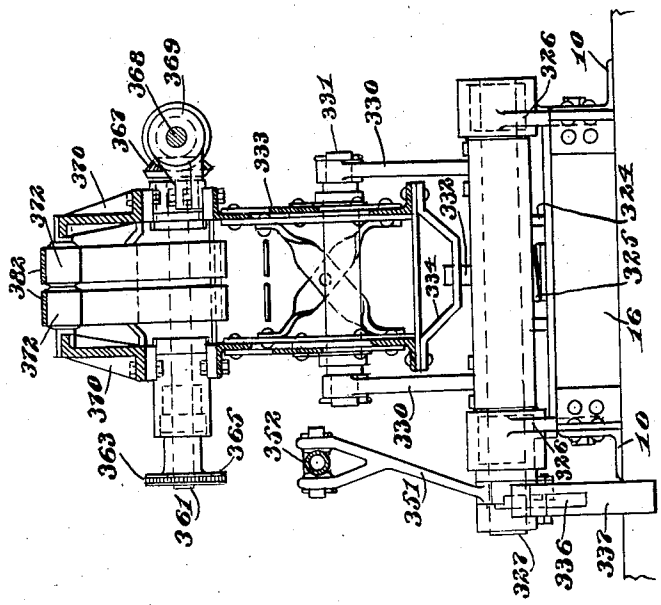
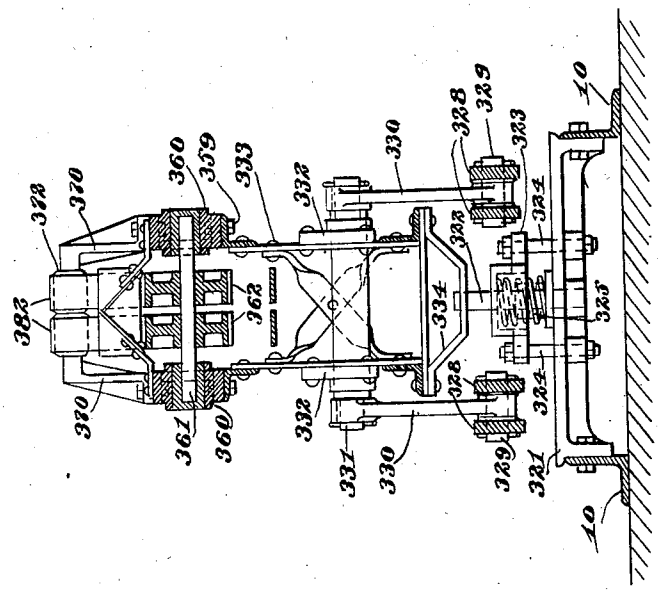


Fig. 29.



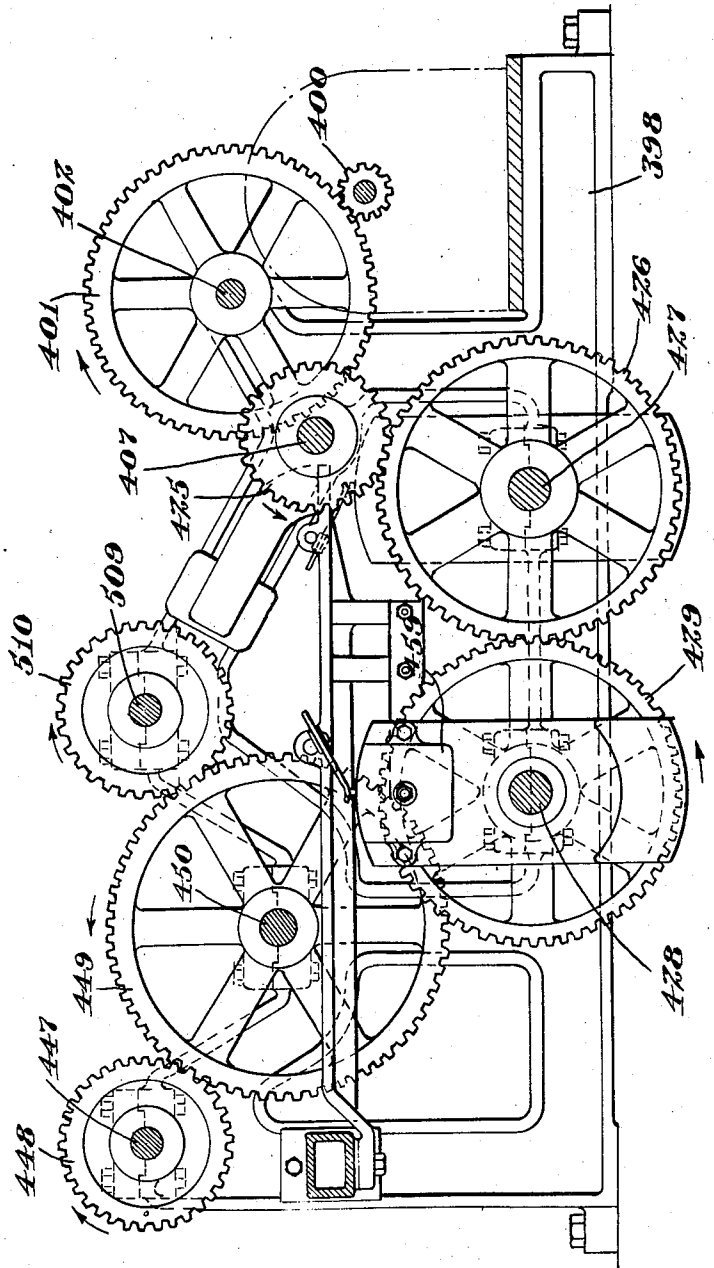
Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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Fig. 31.



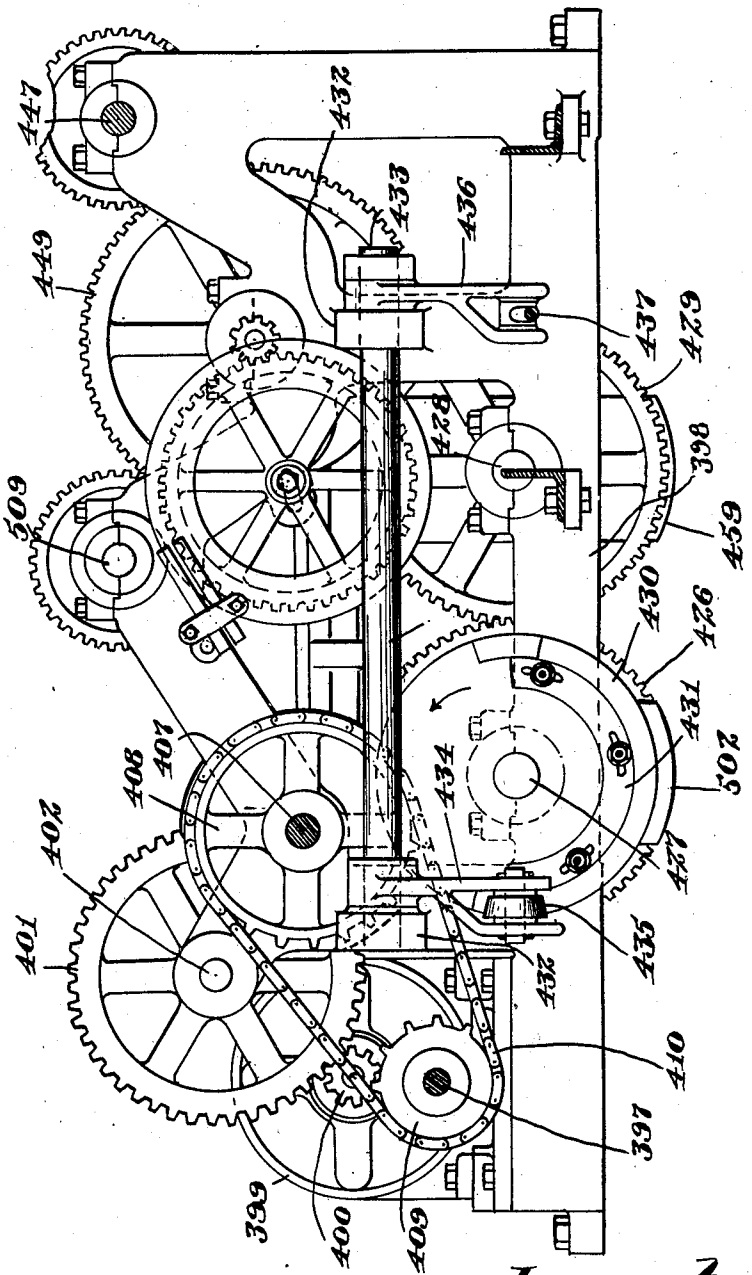
Inventor:
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 29

Fig. 32.



Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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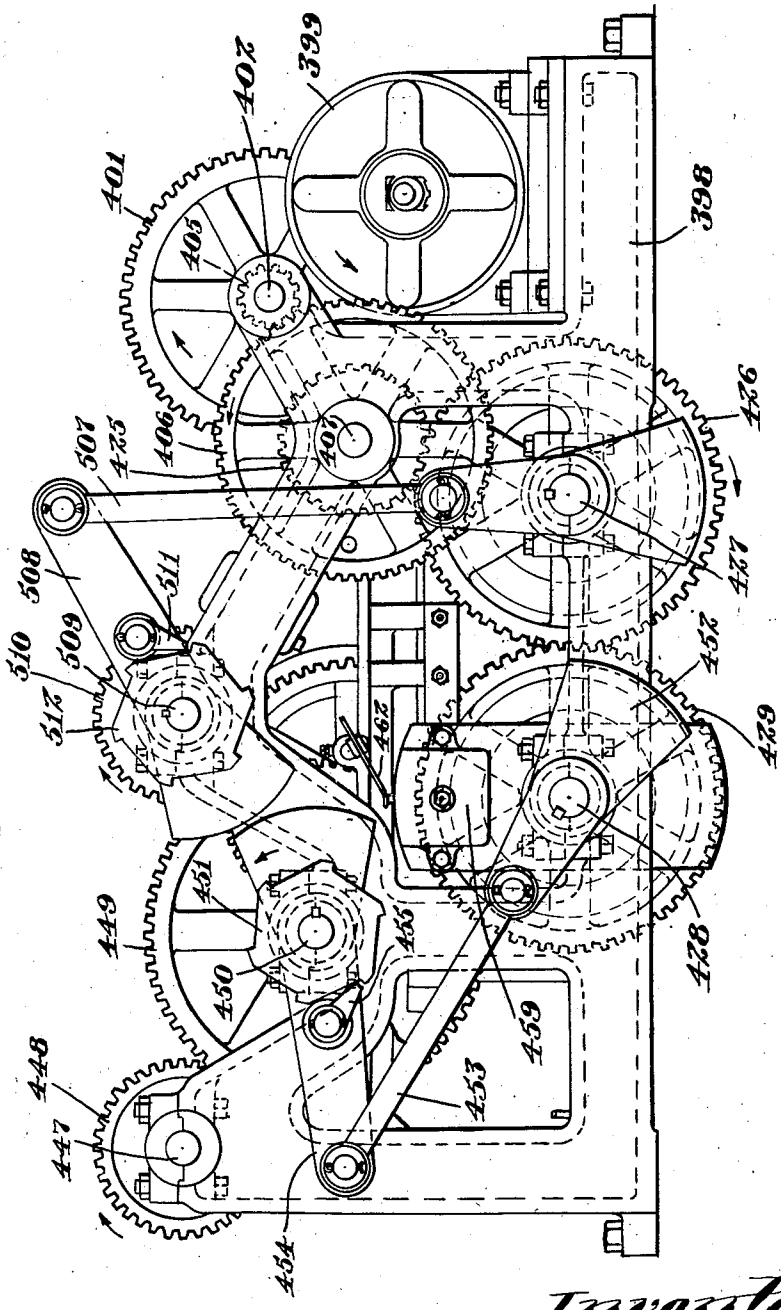


Fig. 33.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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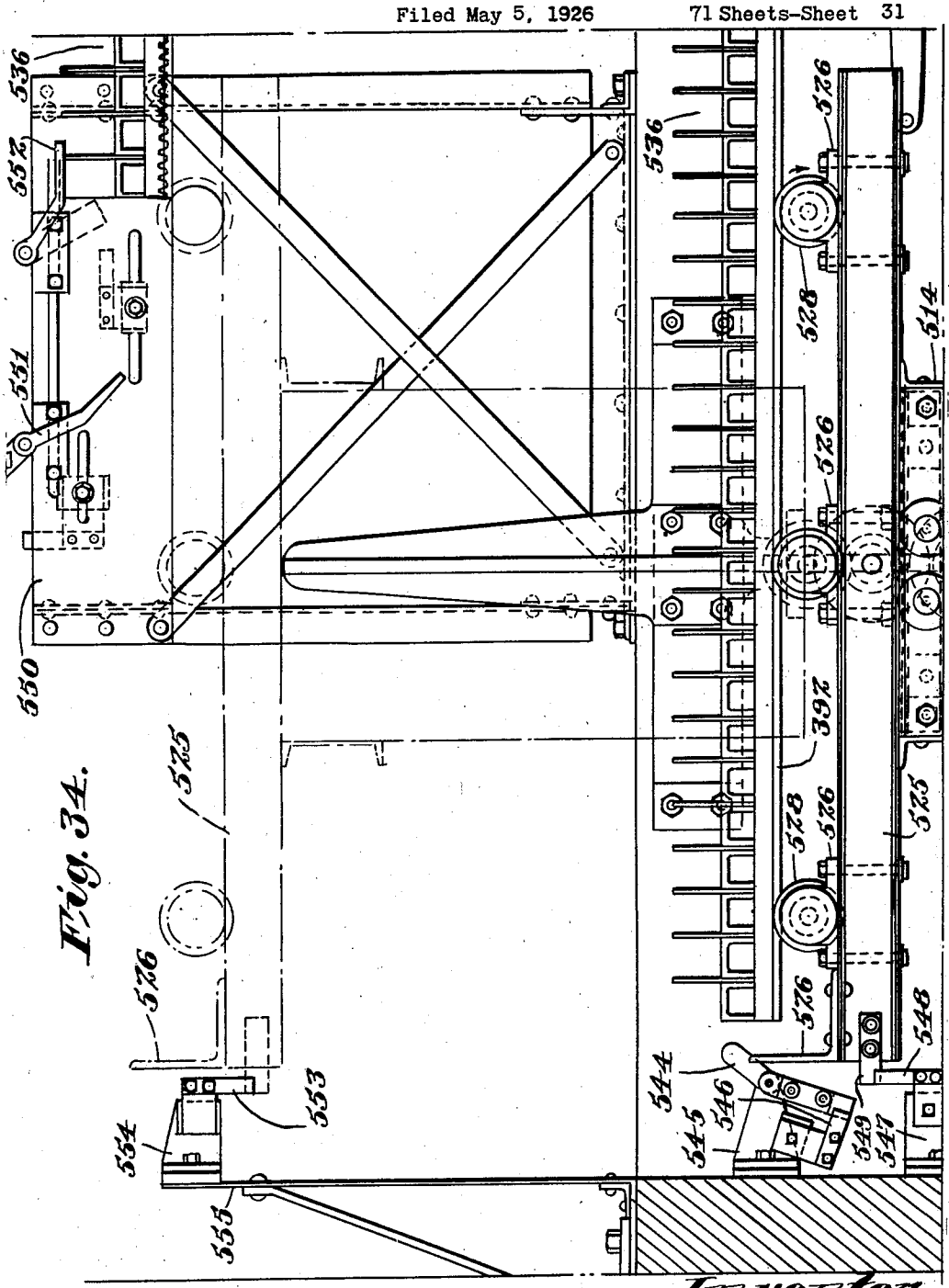


Fig. 34.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 32

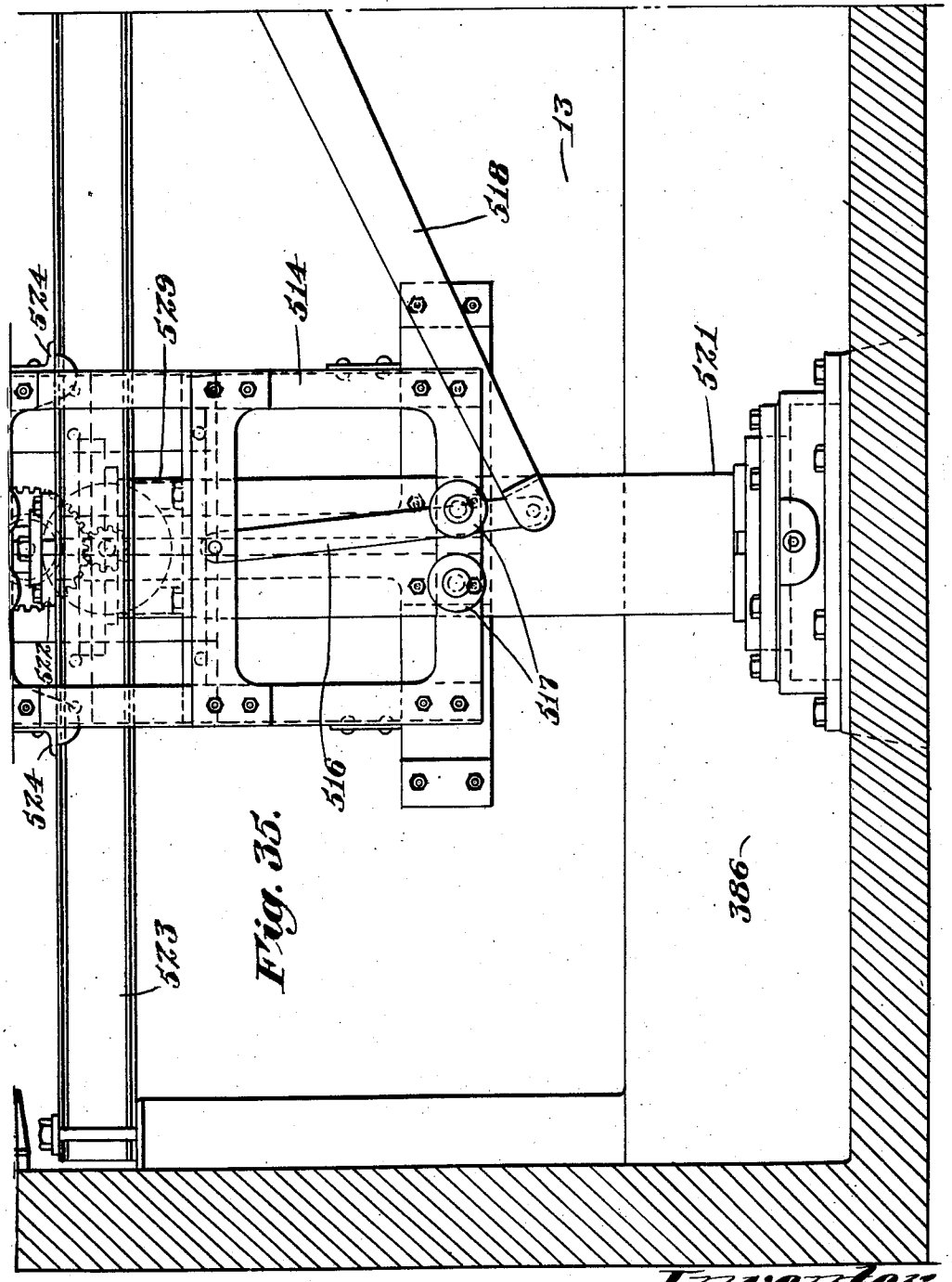


Fig. 35.

Inventor:
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By Attorney

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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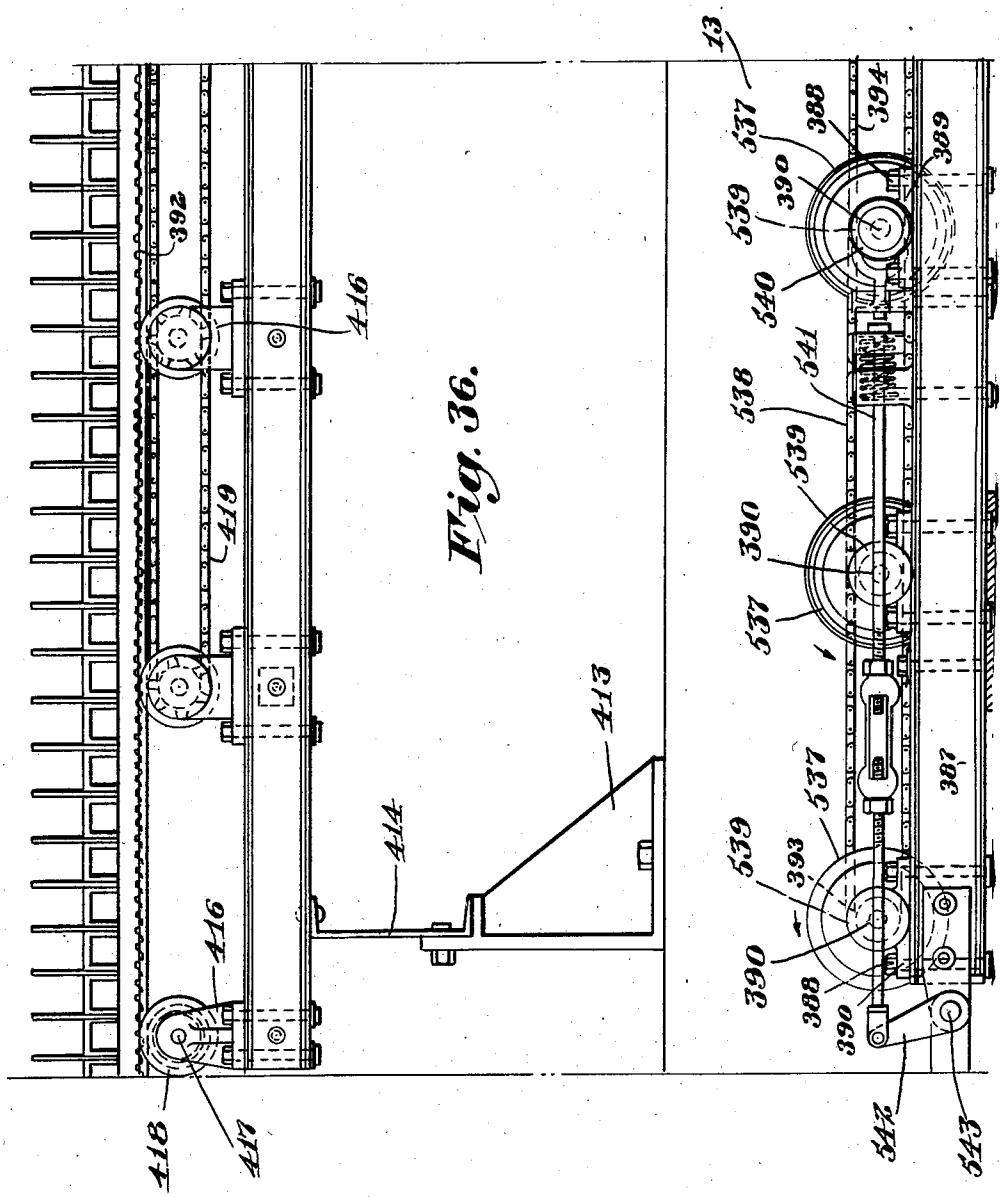


Fig. 36.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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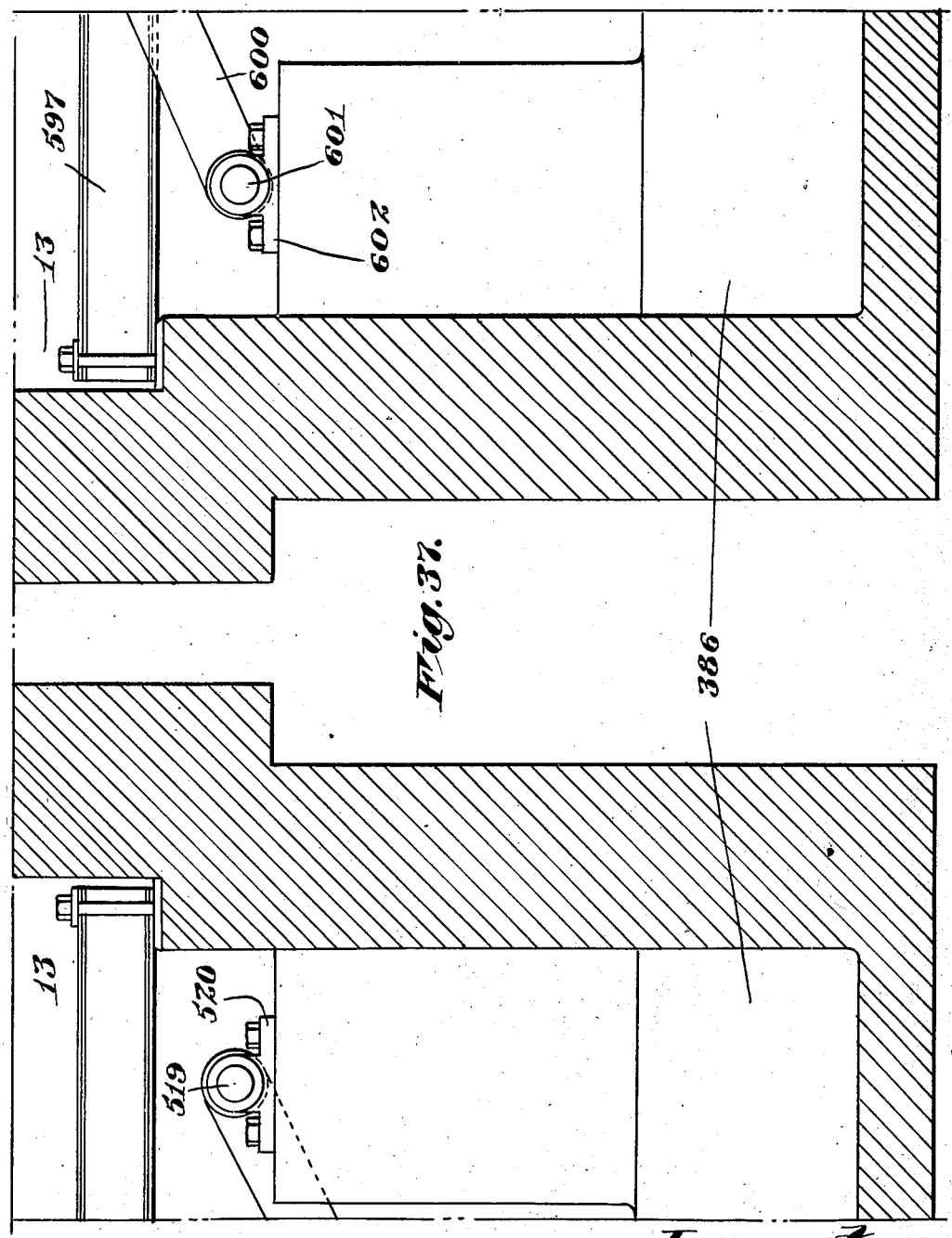


Fig. 37.

Inventor
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Attorney

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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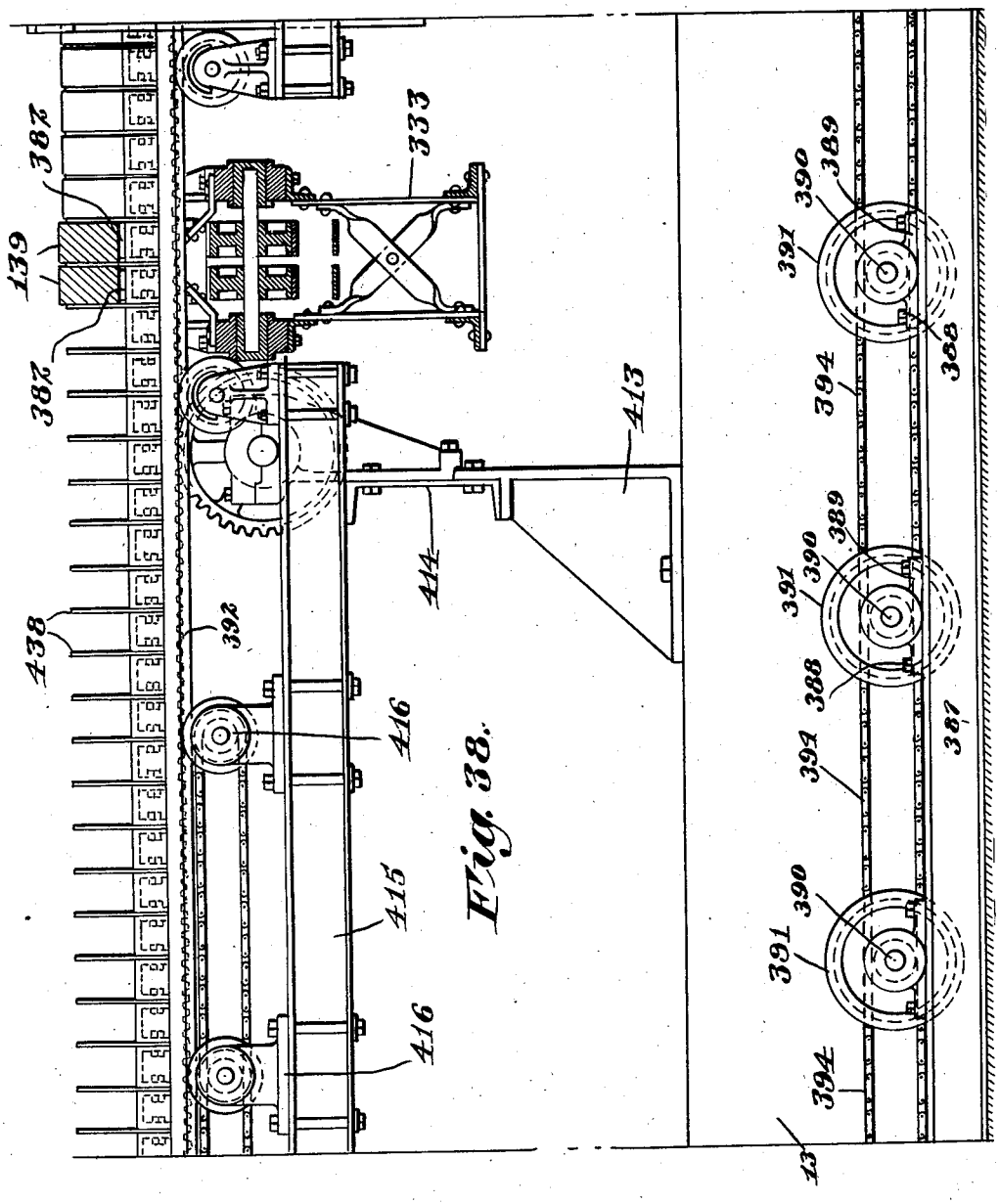


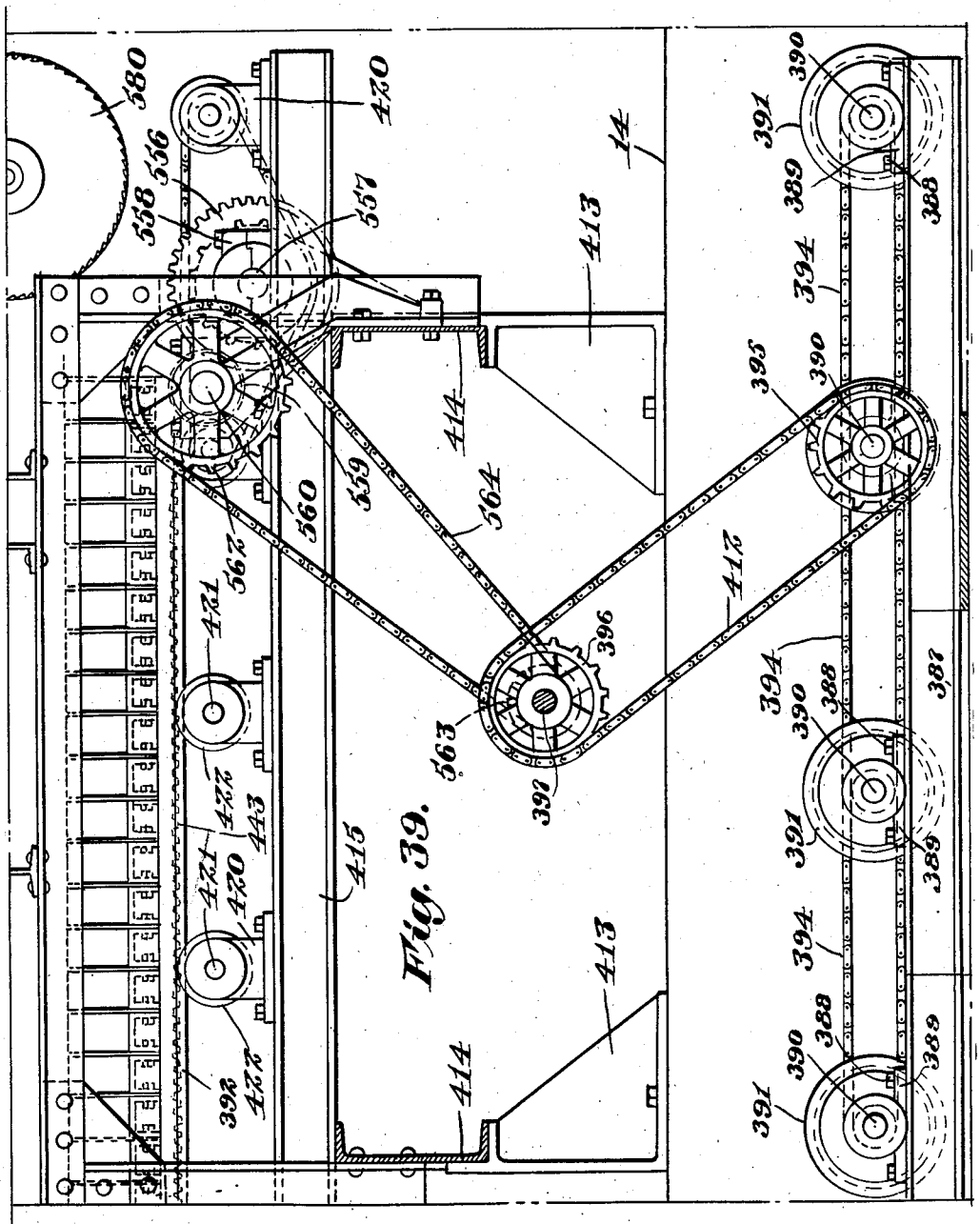
Fig. 38.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 36



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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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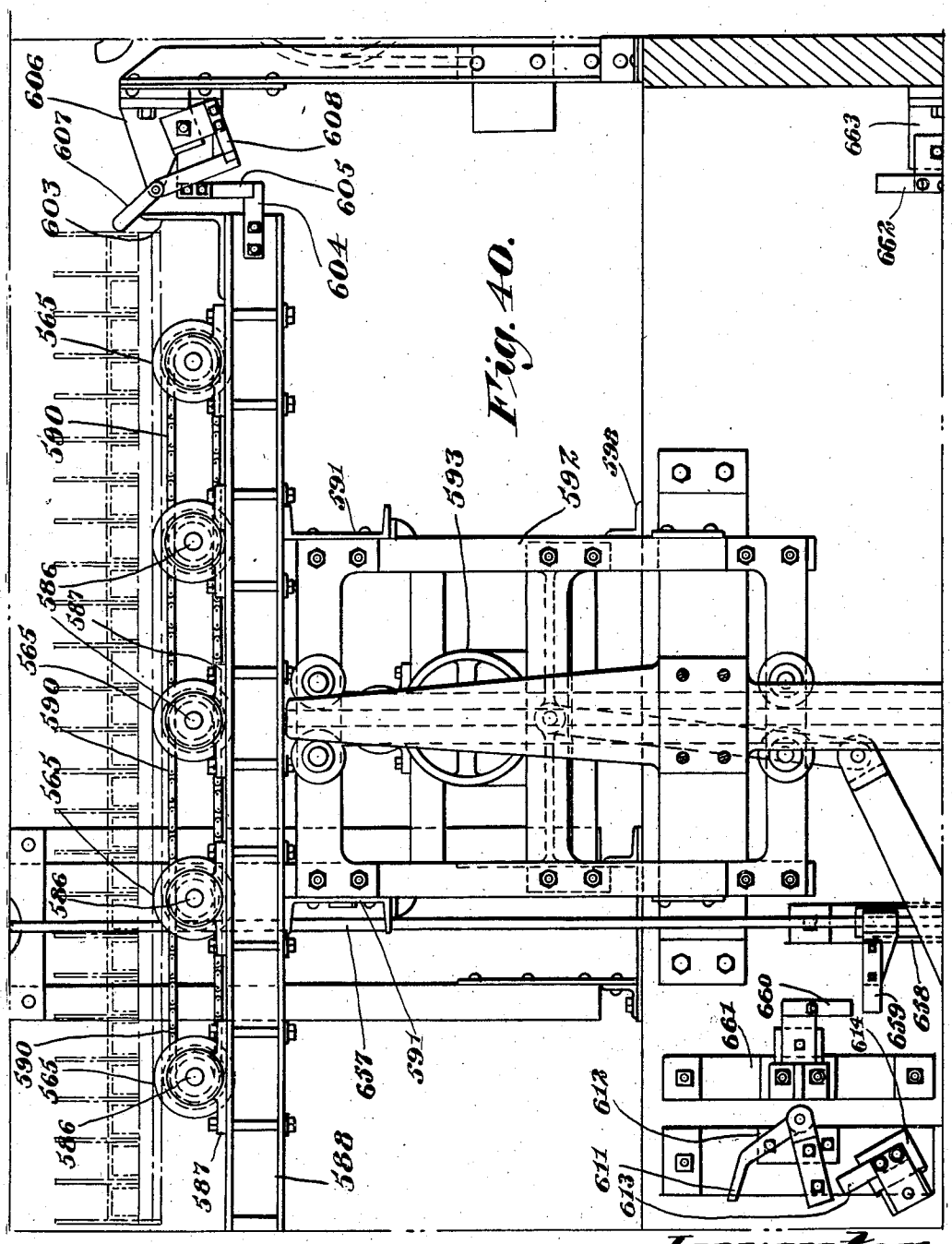


Fig. 40.

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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 38

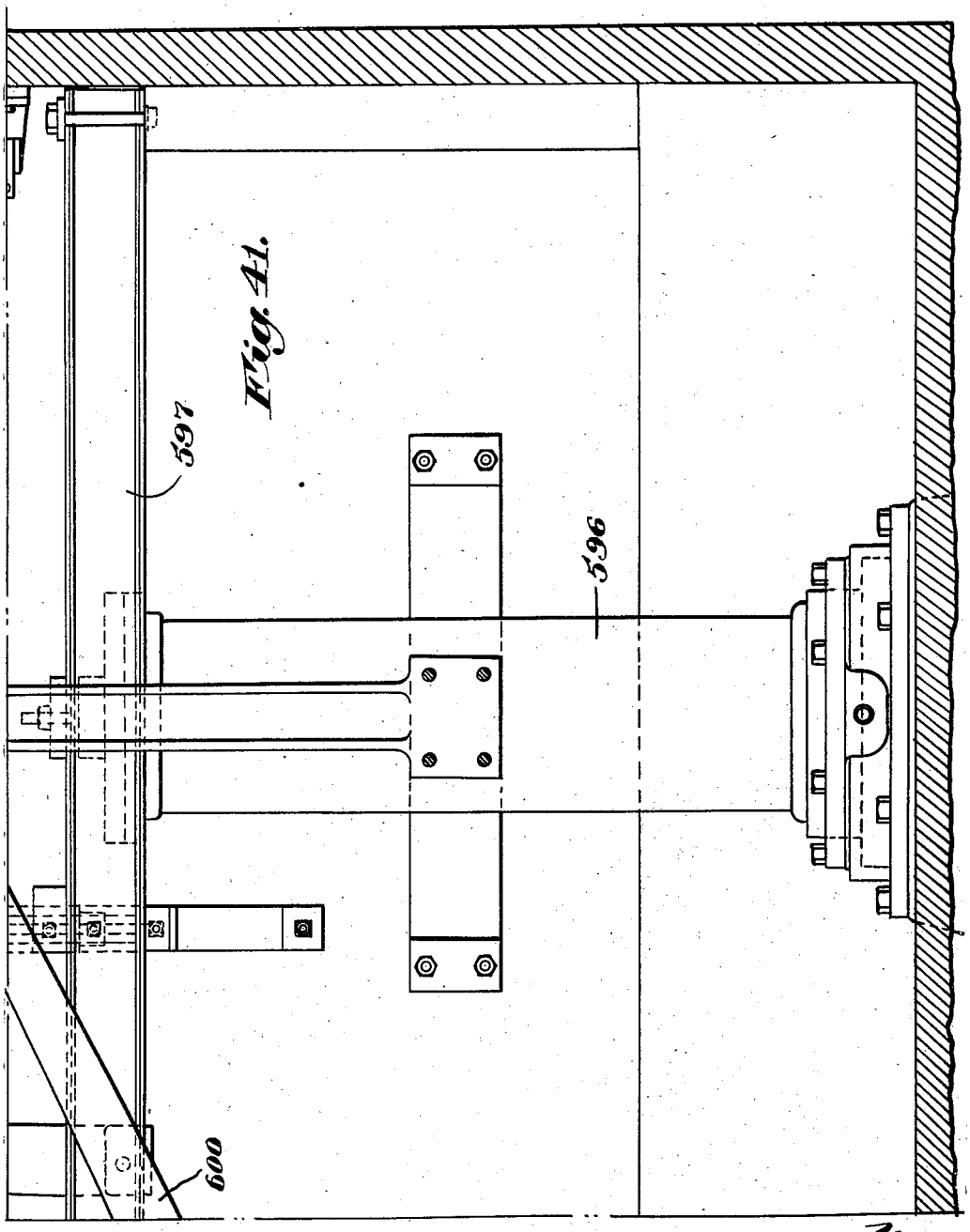


Fig. 41.

Inventor
Raymond C. Penfield
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 39

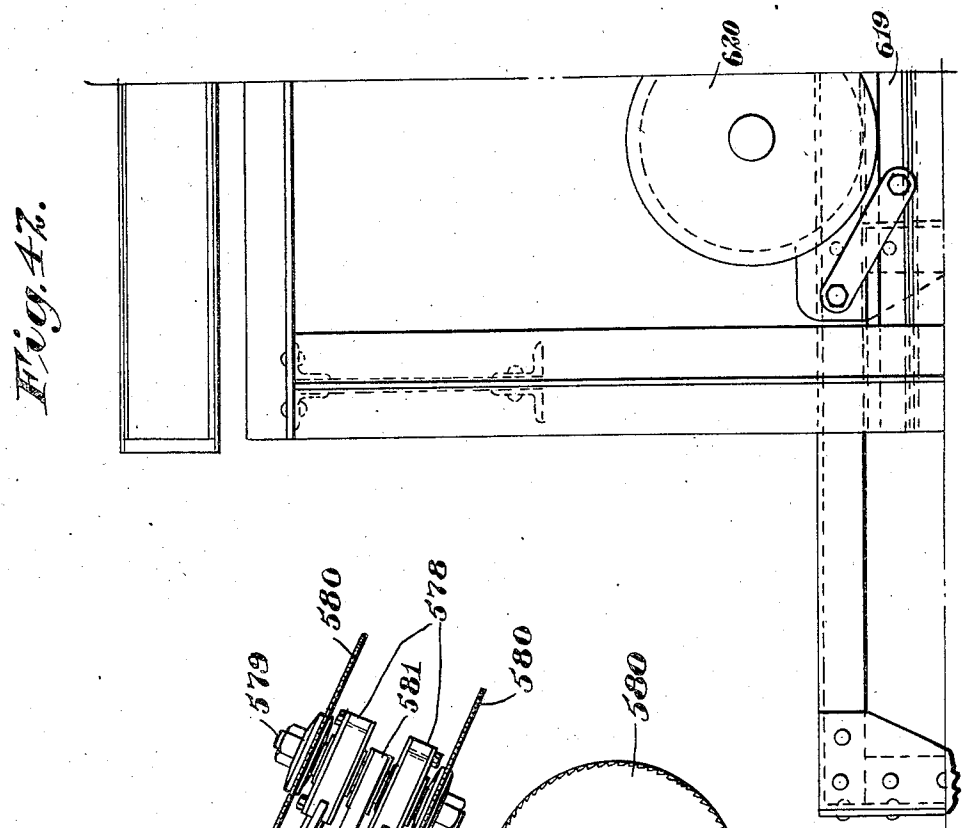


Fig. 47.

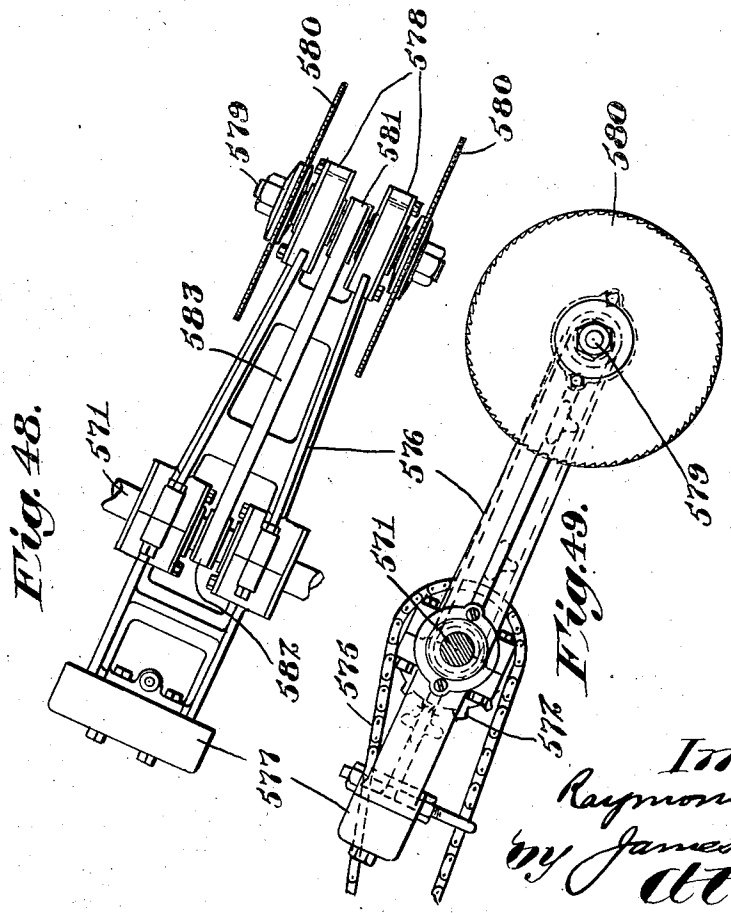


Fig. 48.

Fig. 49.

Inventor
Raymond C. Penfield
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 40

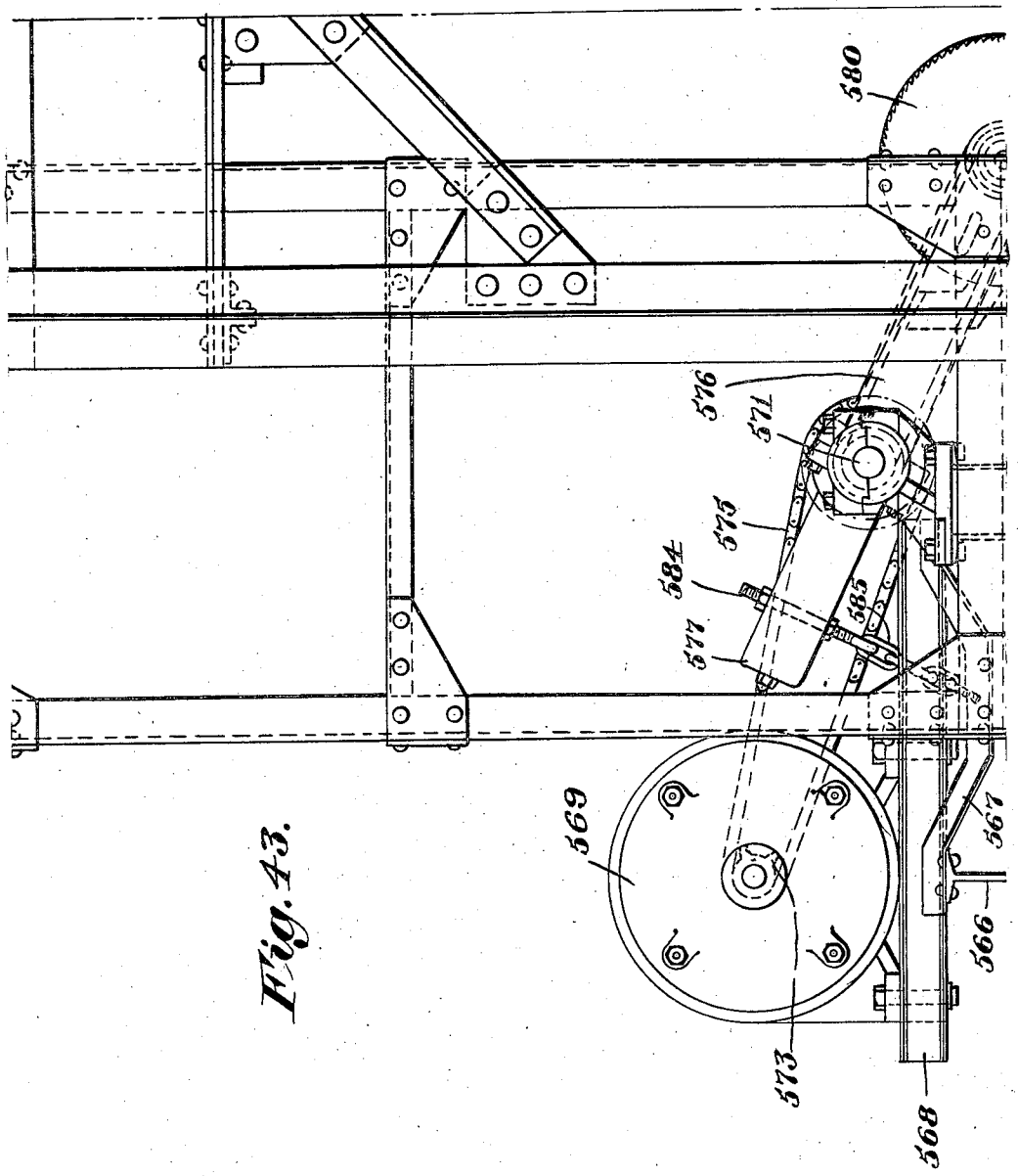


Fig. 43.

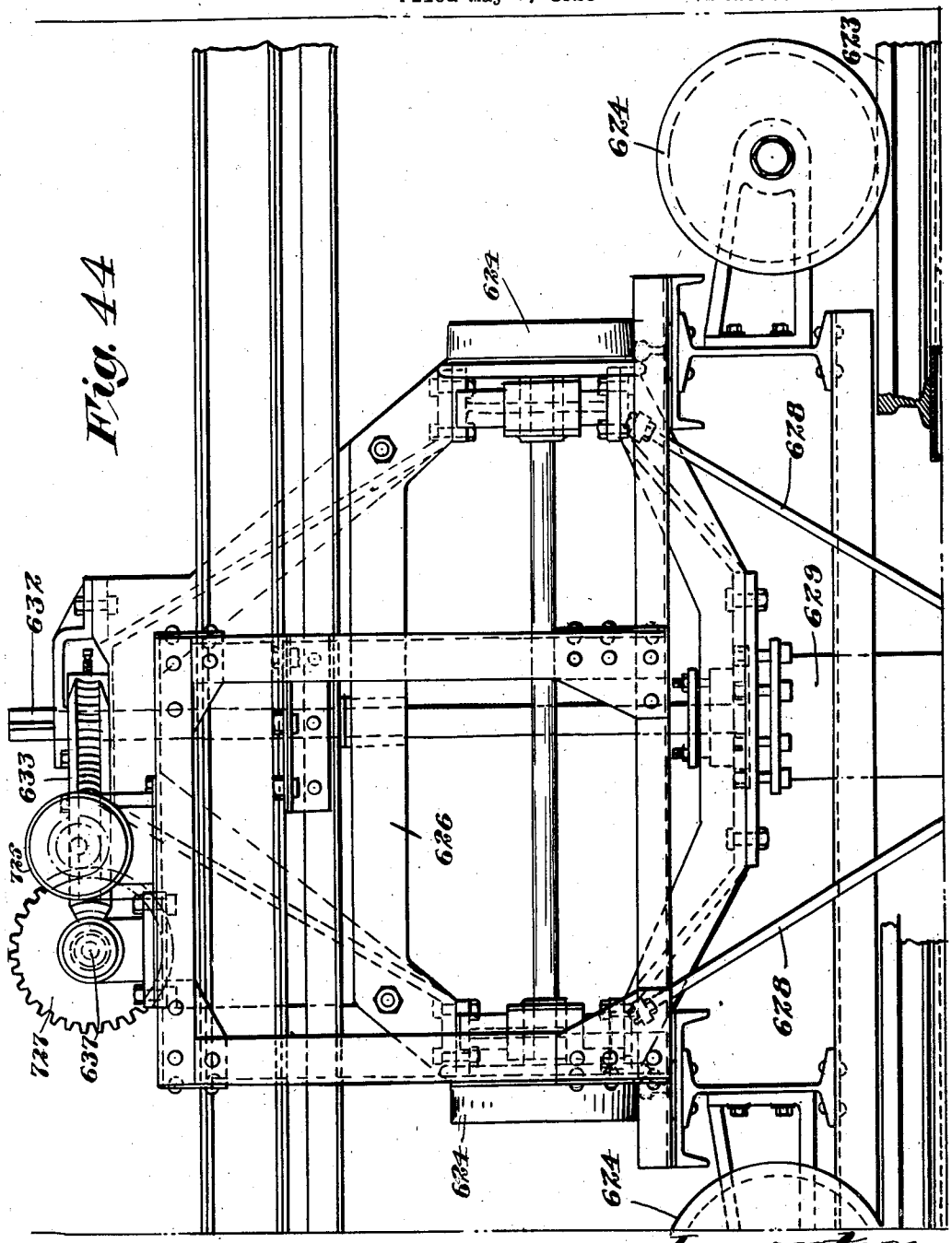
Inventor
Raymond C. Penfield
By James R. Hodder
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 41

Fig. 44



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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

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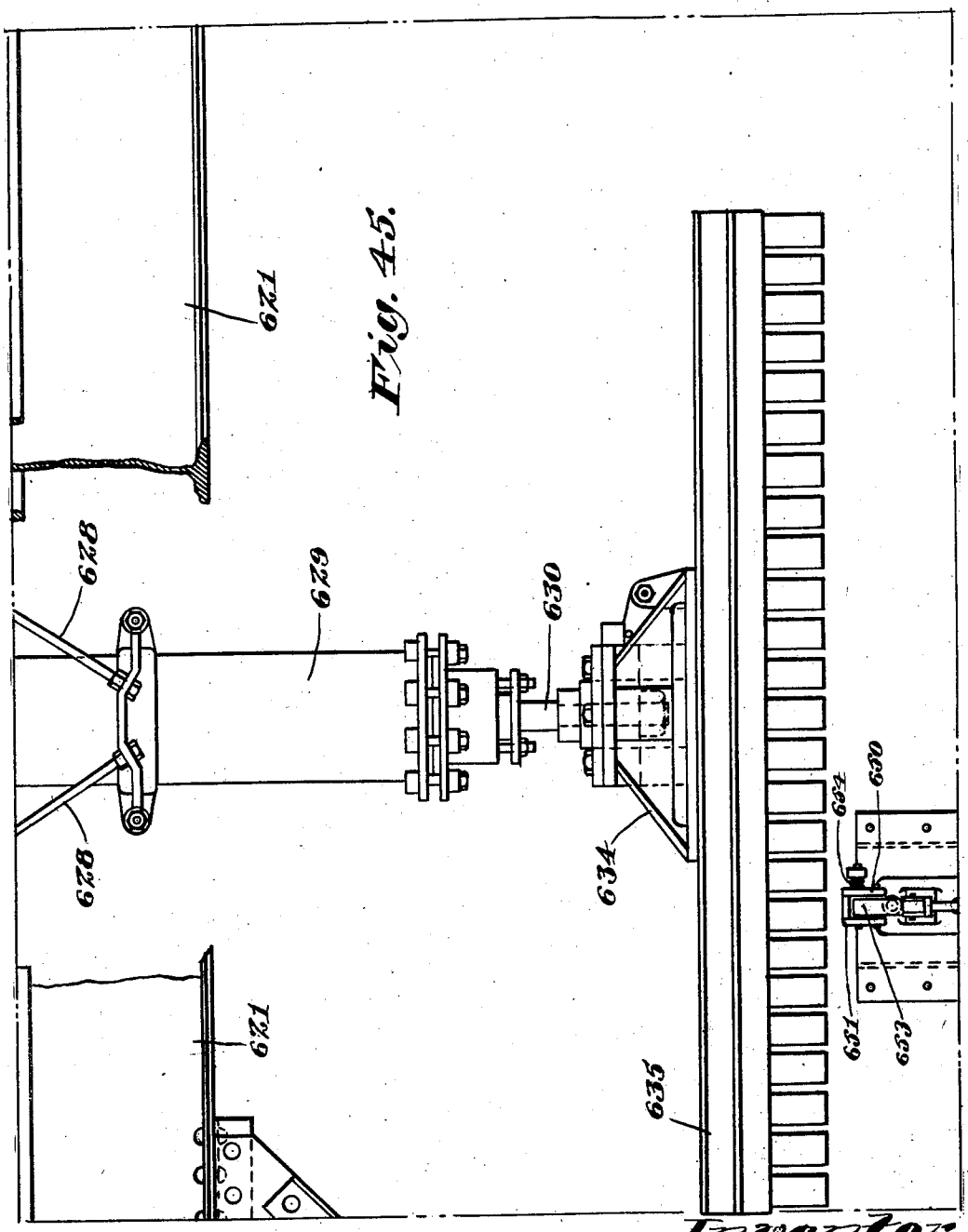


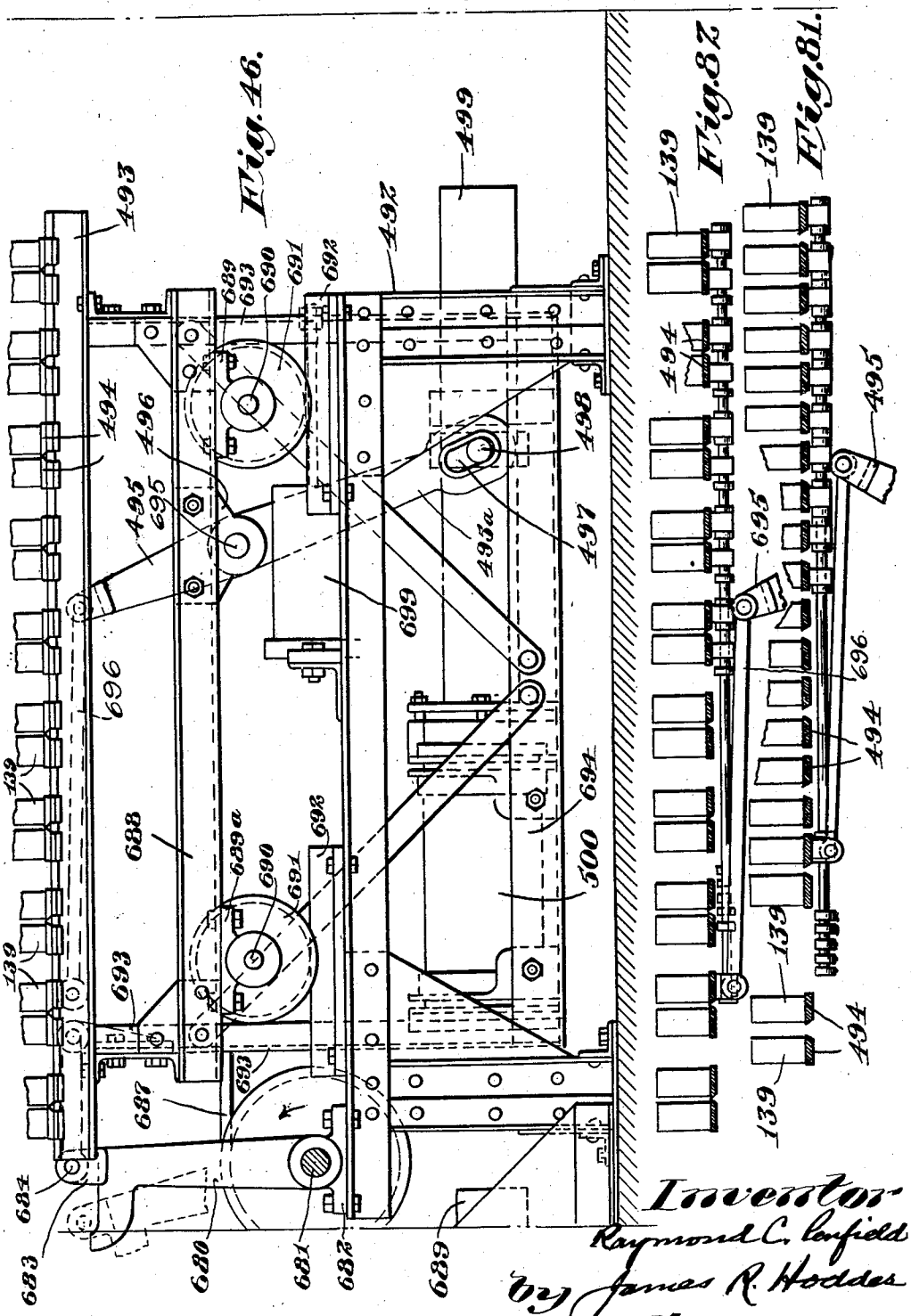
Fig. 45.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 43



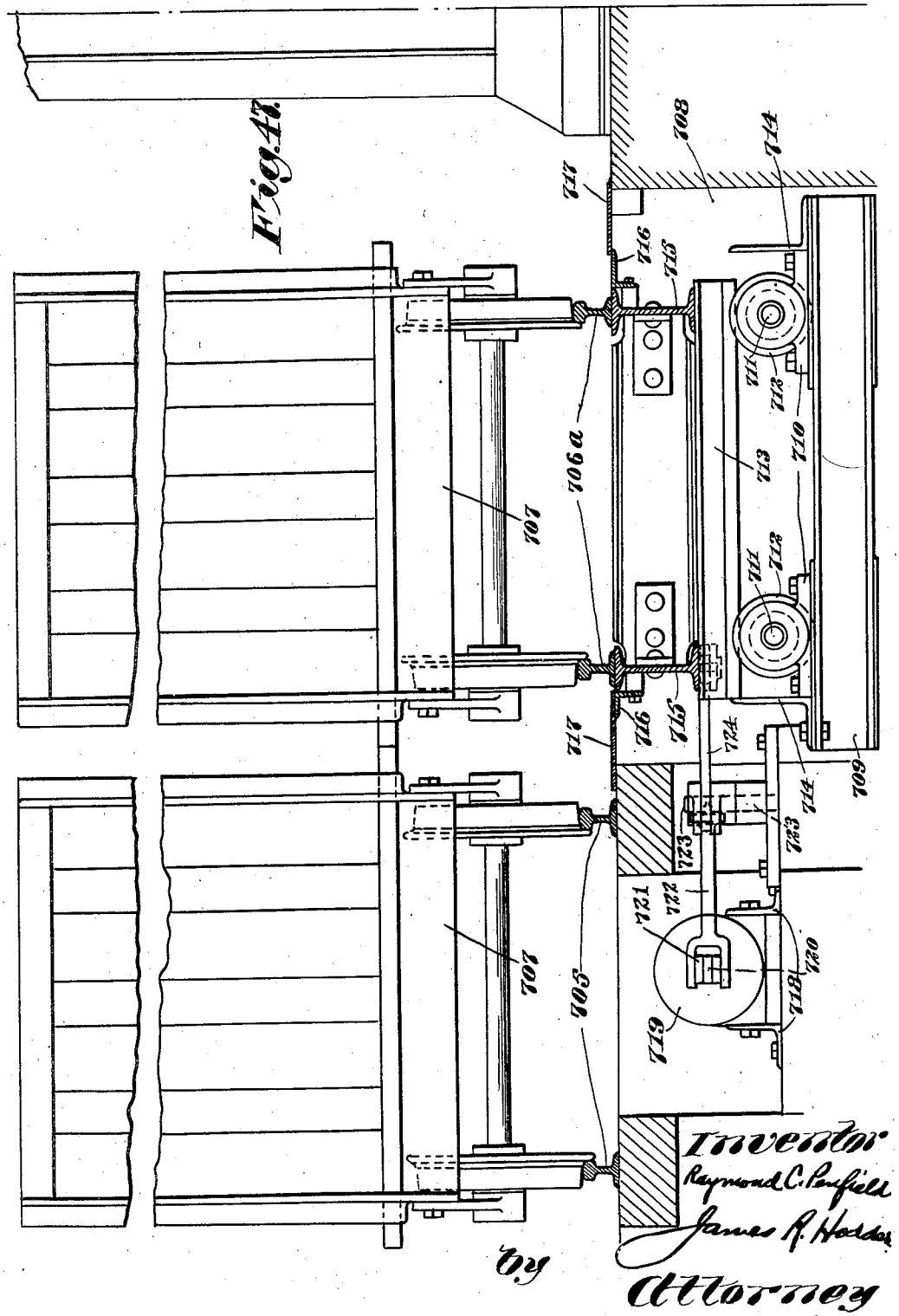
Inventor
Raymond C. Penfield
By James R. Hodder
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 44

Fig. 47.

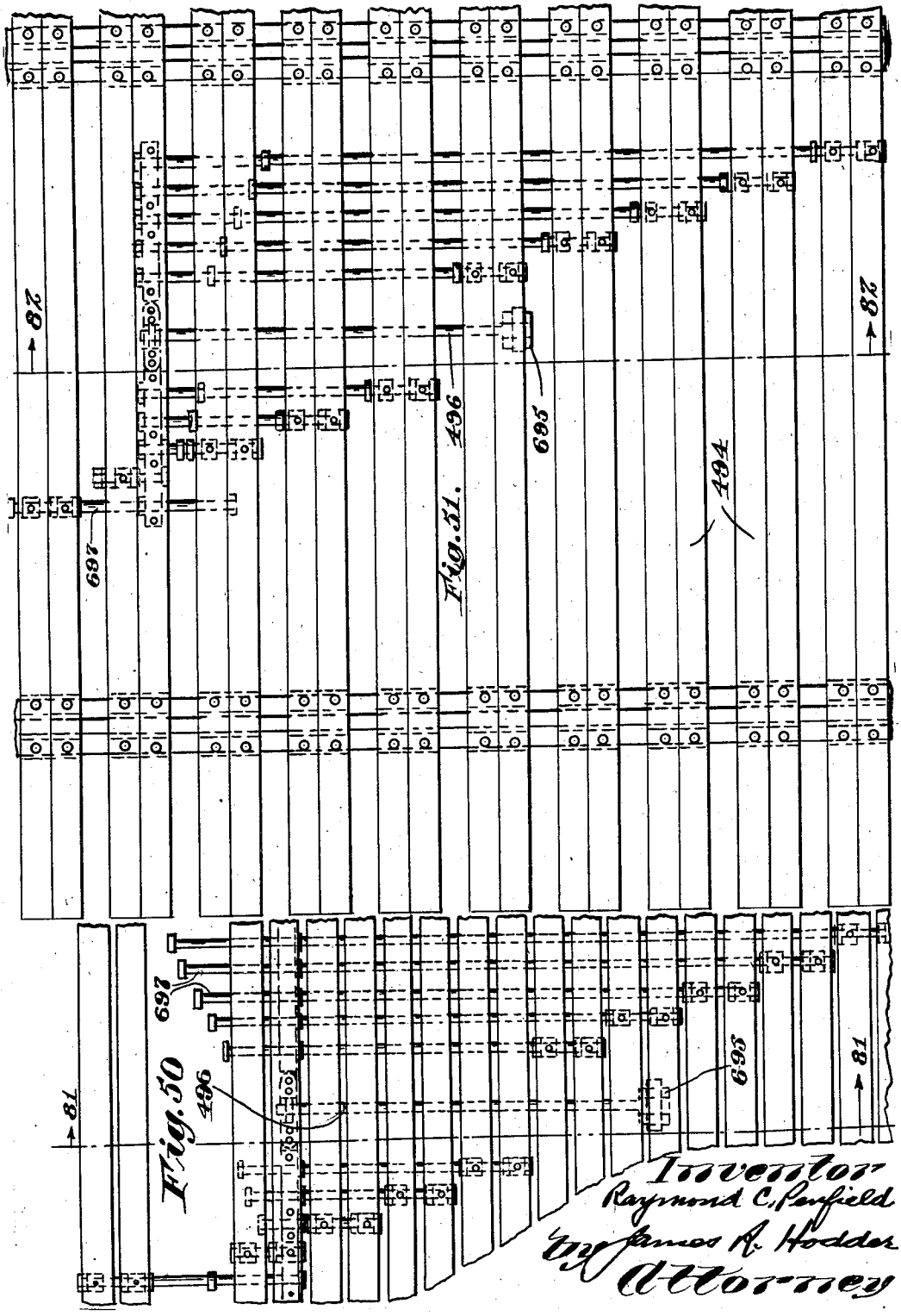


Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 45



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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 46

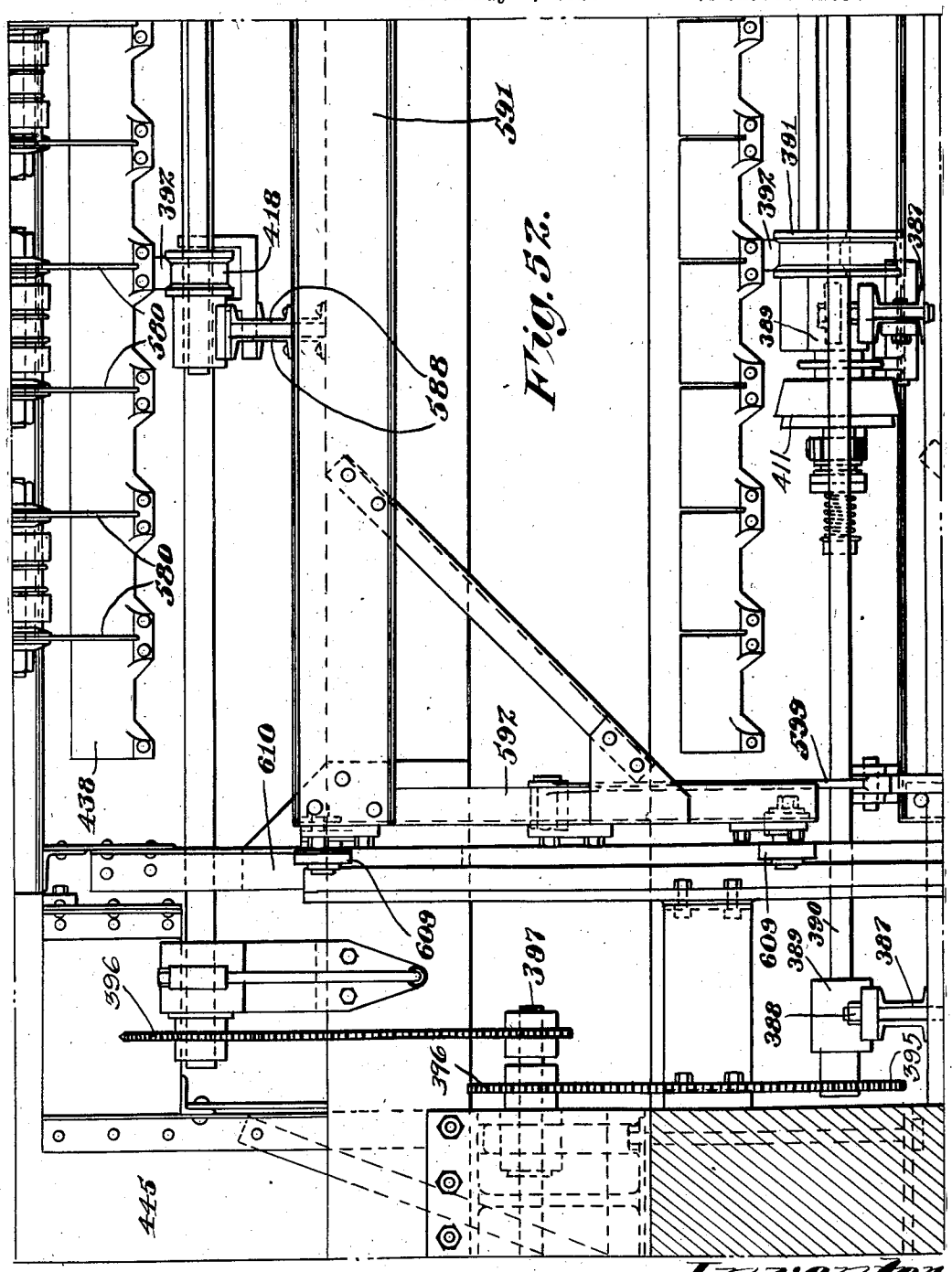


Fig. 52.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 47

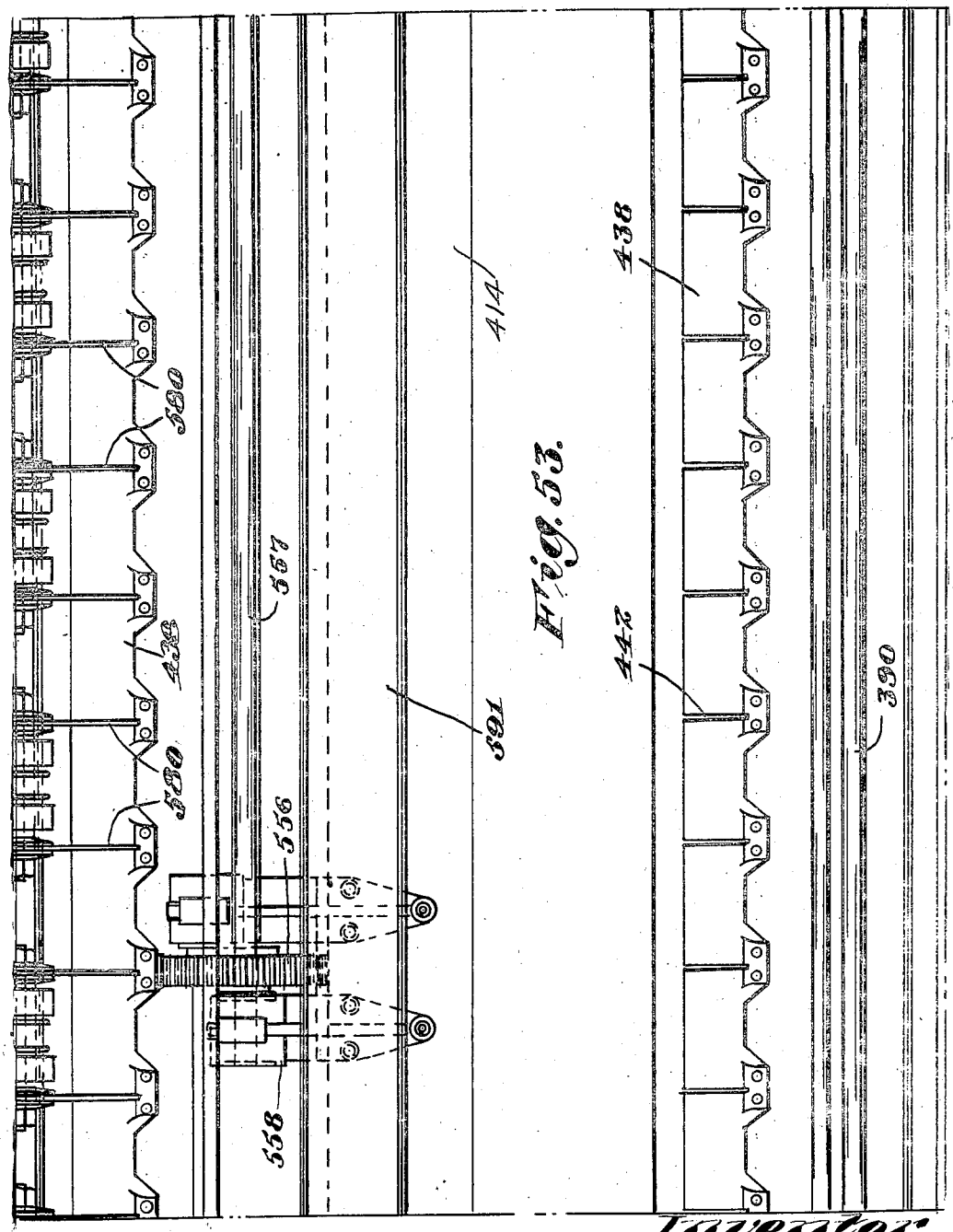


Fig. 53.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 48

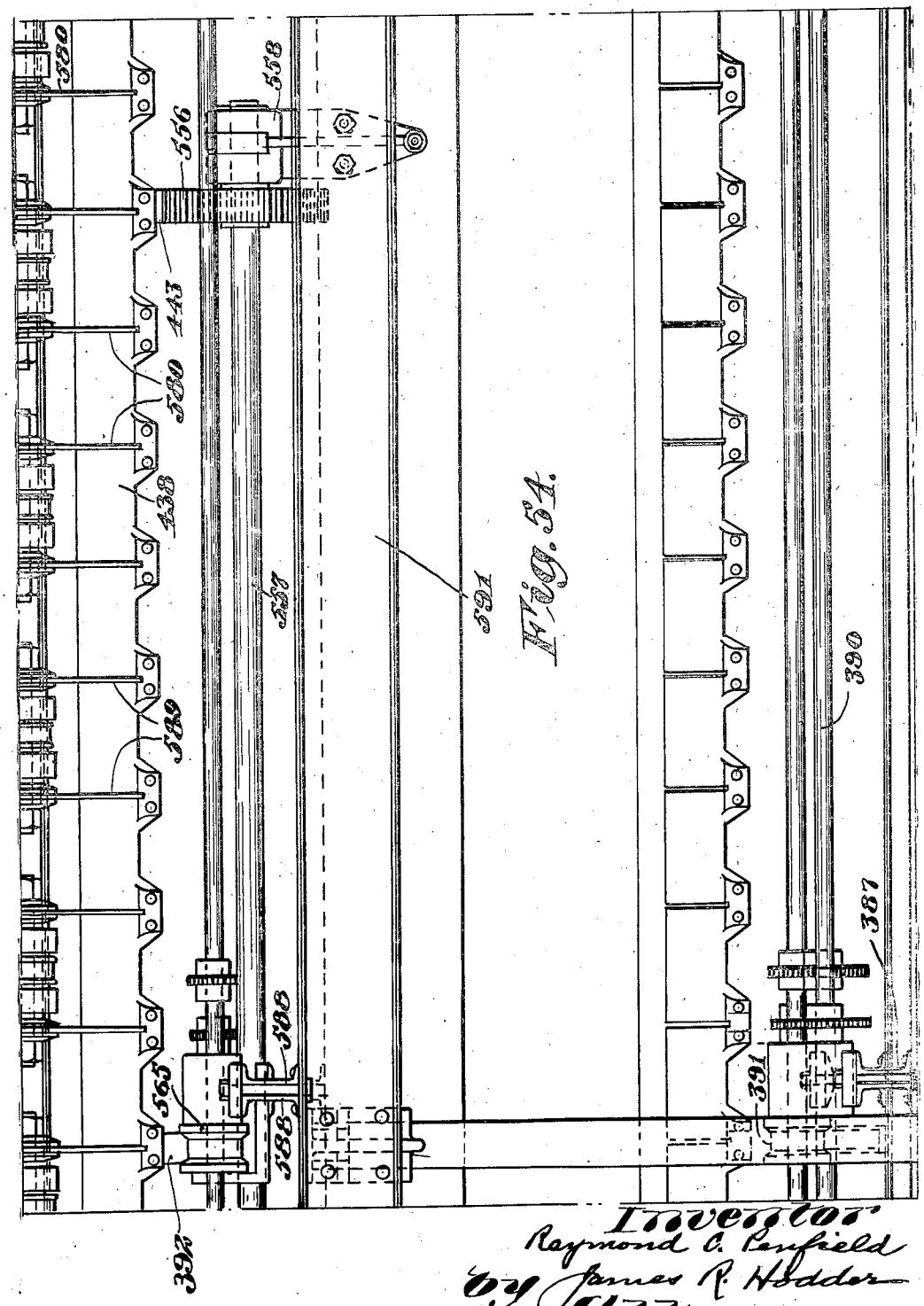


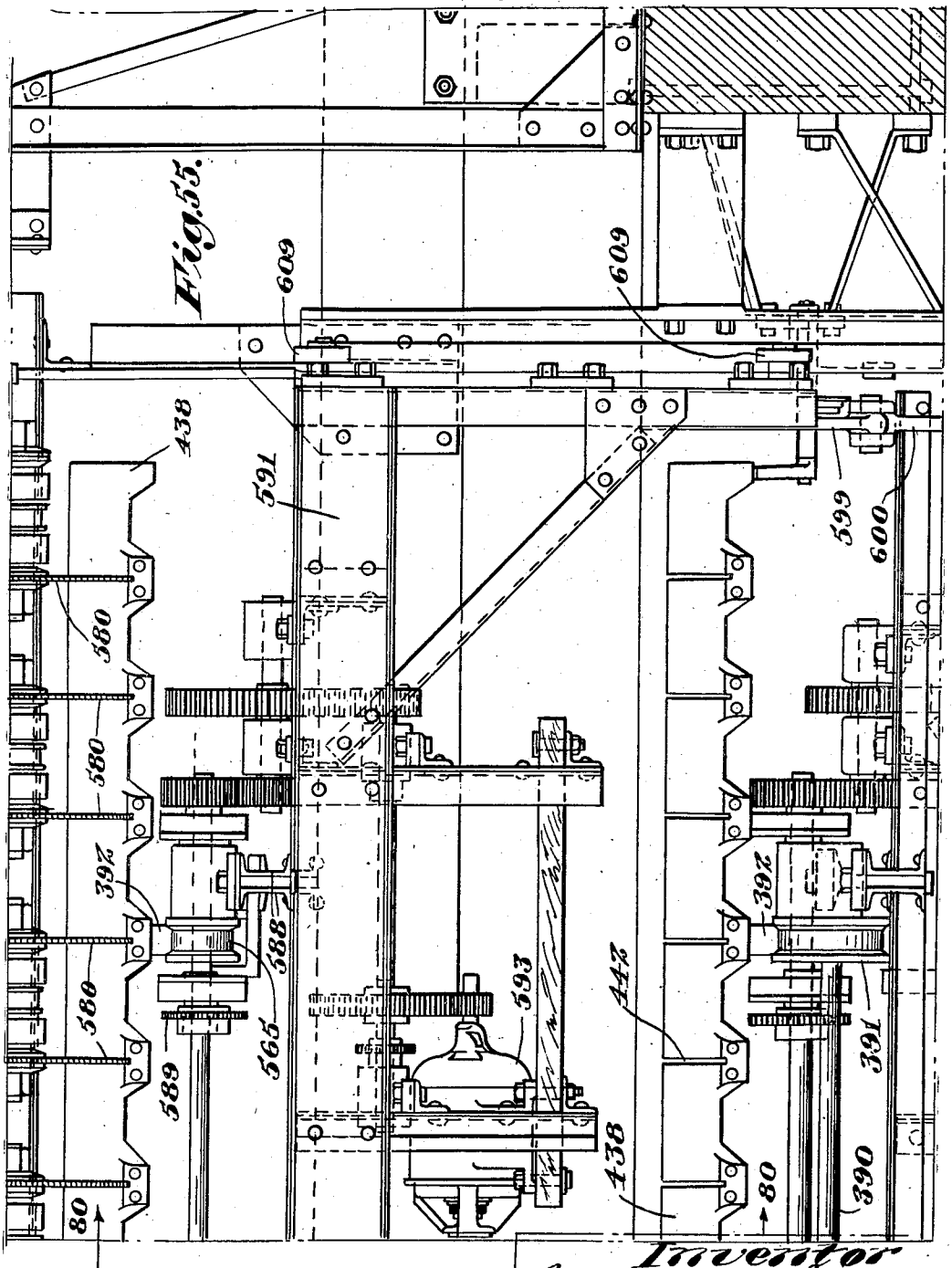
Fig. 54.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 49



Inventor
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 50

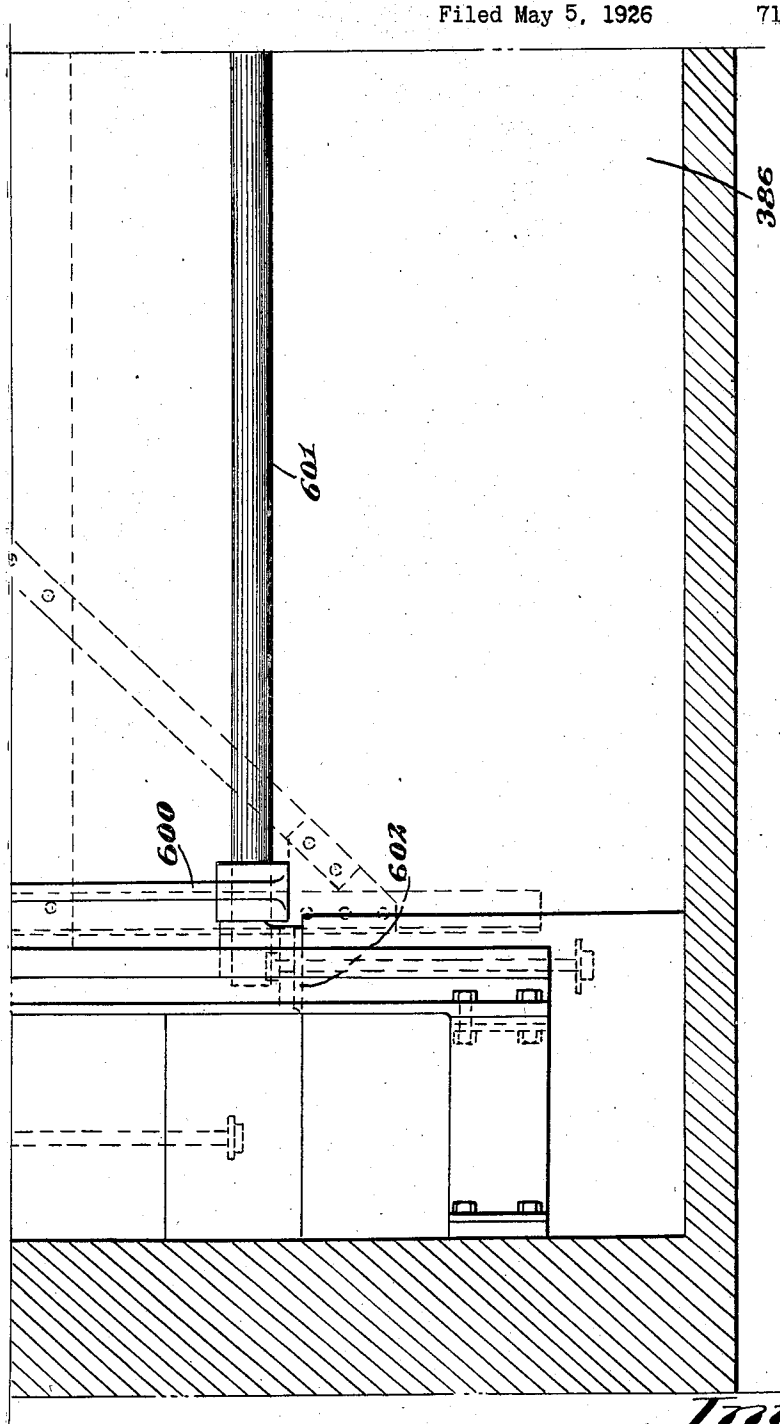


Fig. 56.

Inventor
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By James R. Holden
Attorney

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 51

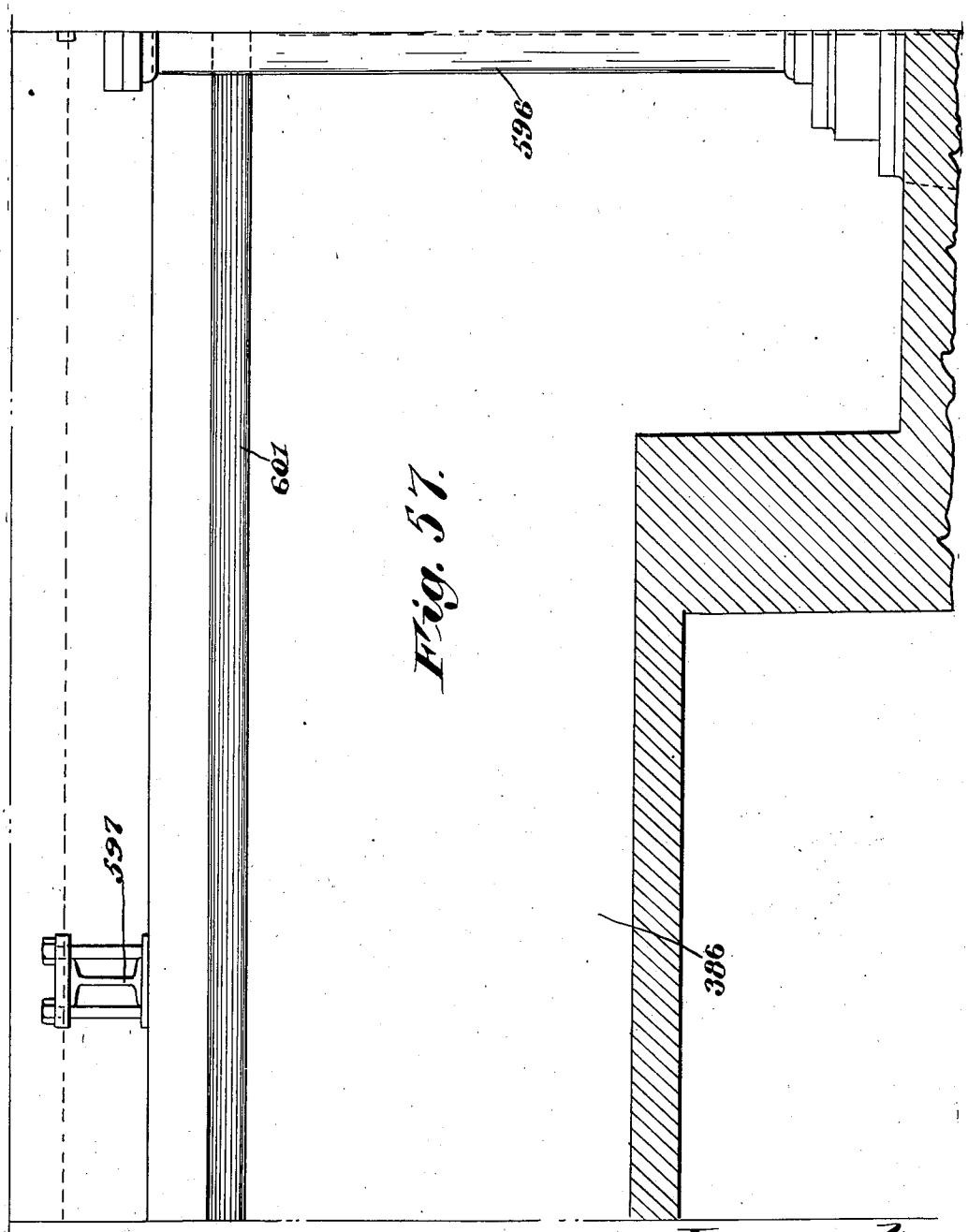


Fig. 57.

Inventor
Raymond C. Penfield
by James R. Hodder
Attorney

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 52

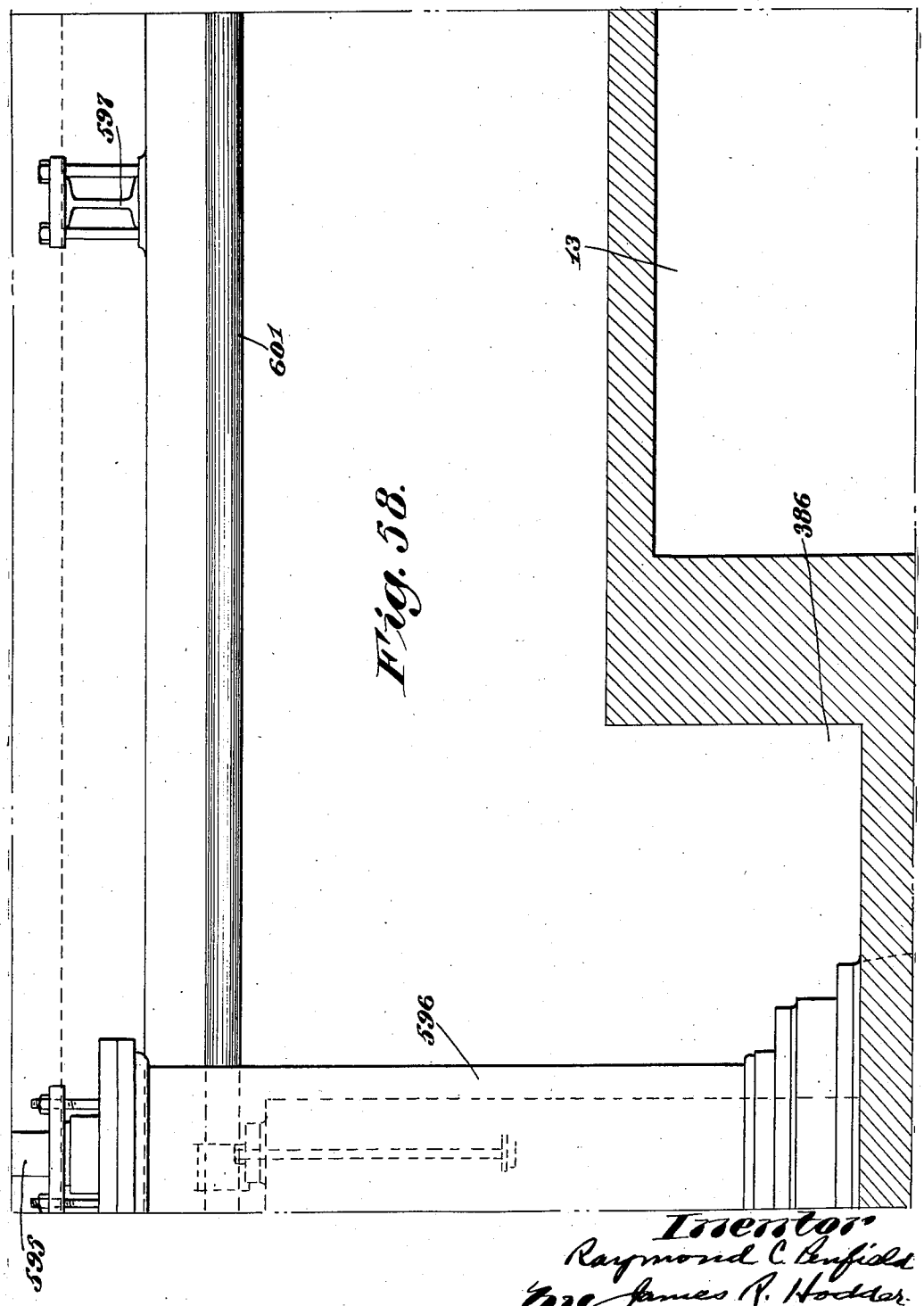


Fig. 58.

Inventor:
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 53

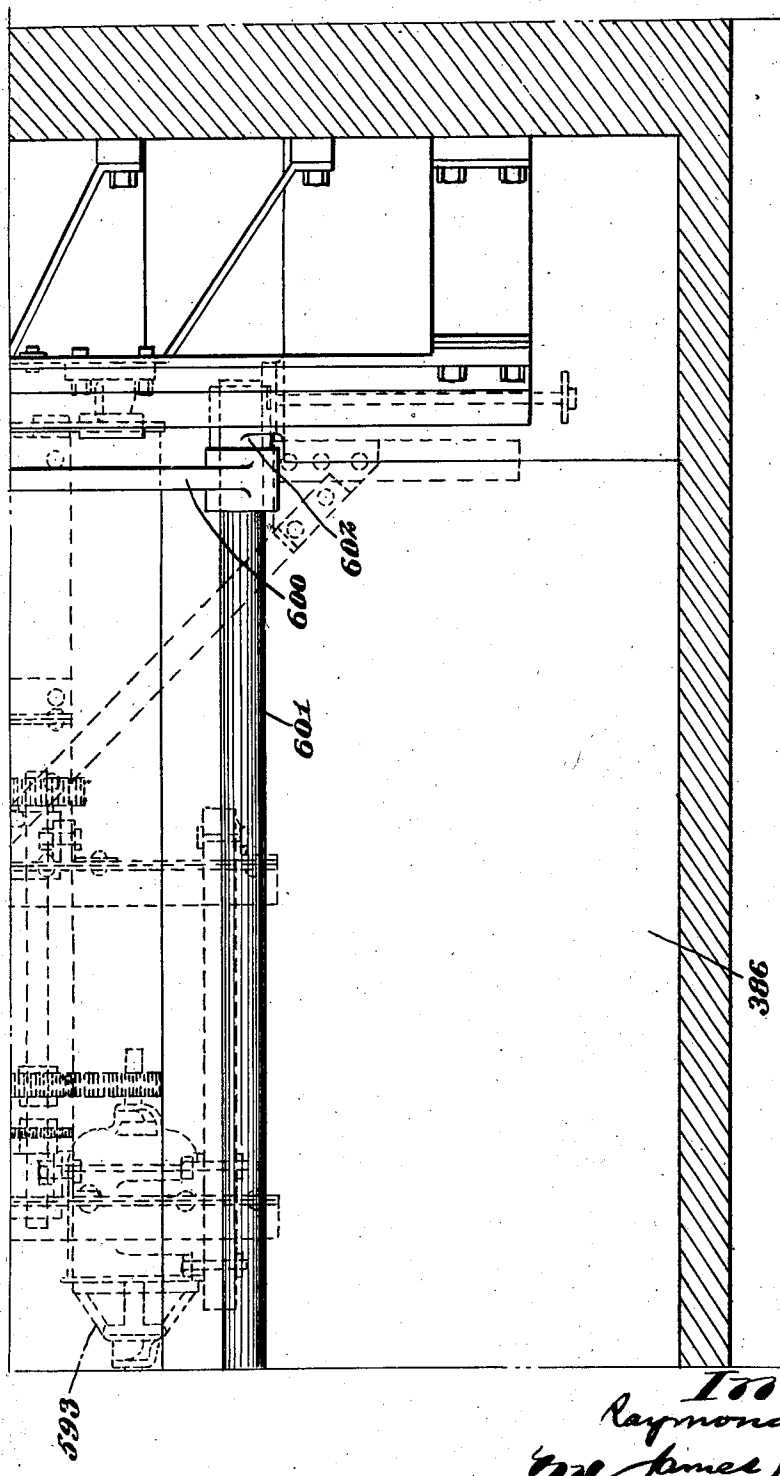


Fig. 59.

Inventor:
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 54

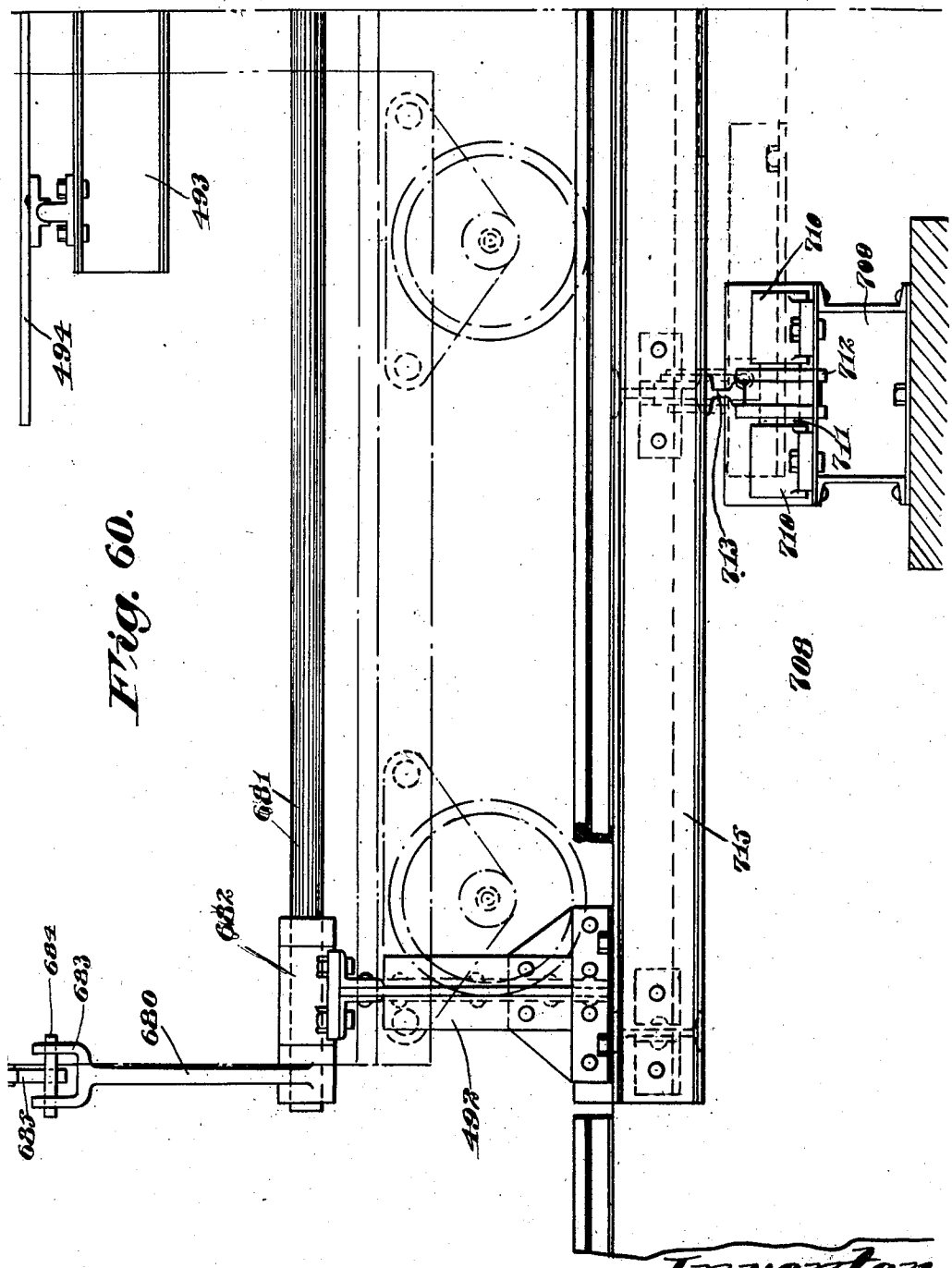


Fig. 60.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 55

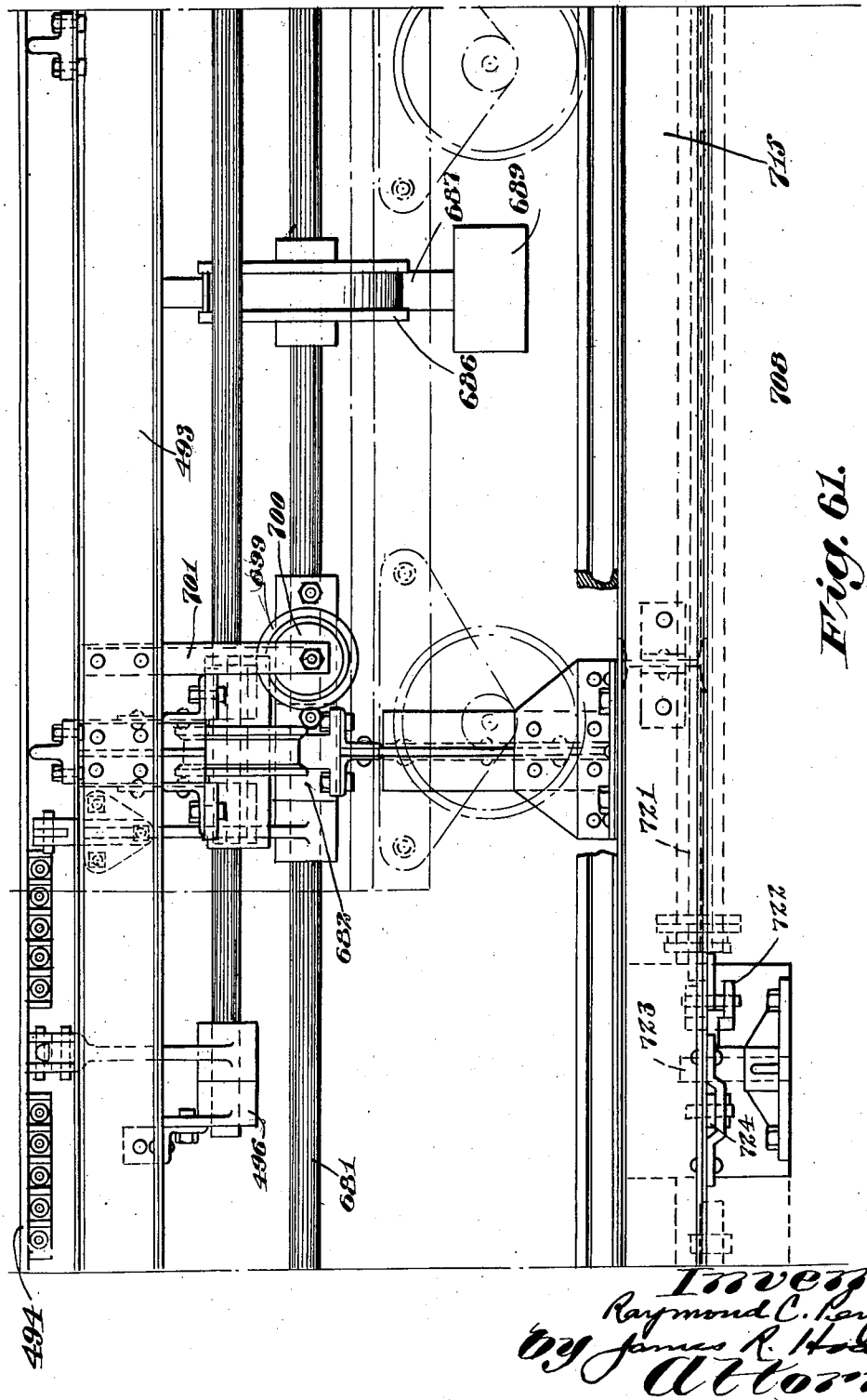


Fig. 61.

Inventor
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By James R. Holden
Attorney

June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 56

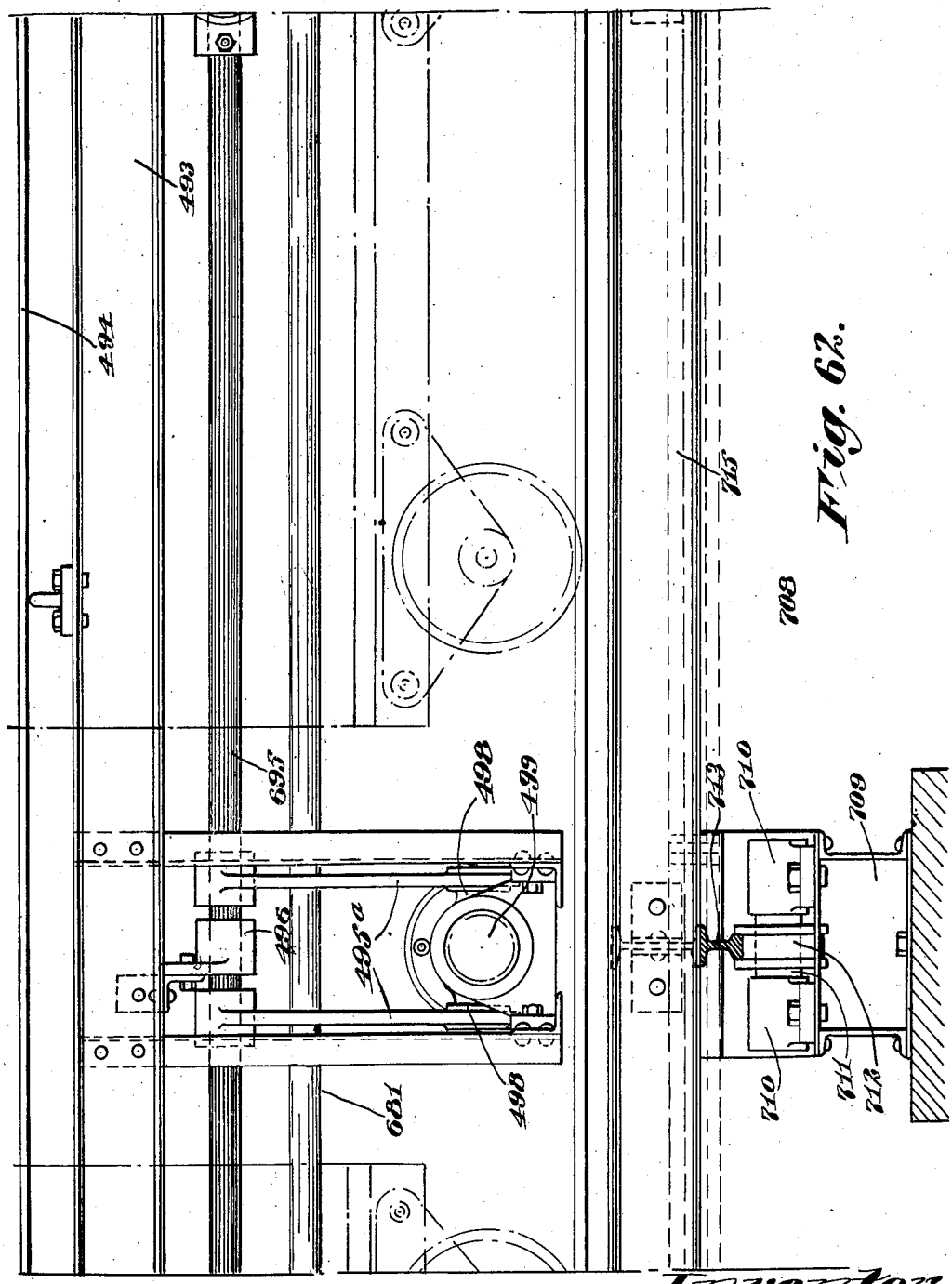


Fig. 62.

Inventor
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By James R. Hodder
Attorney

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 57

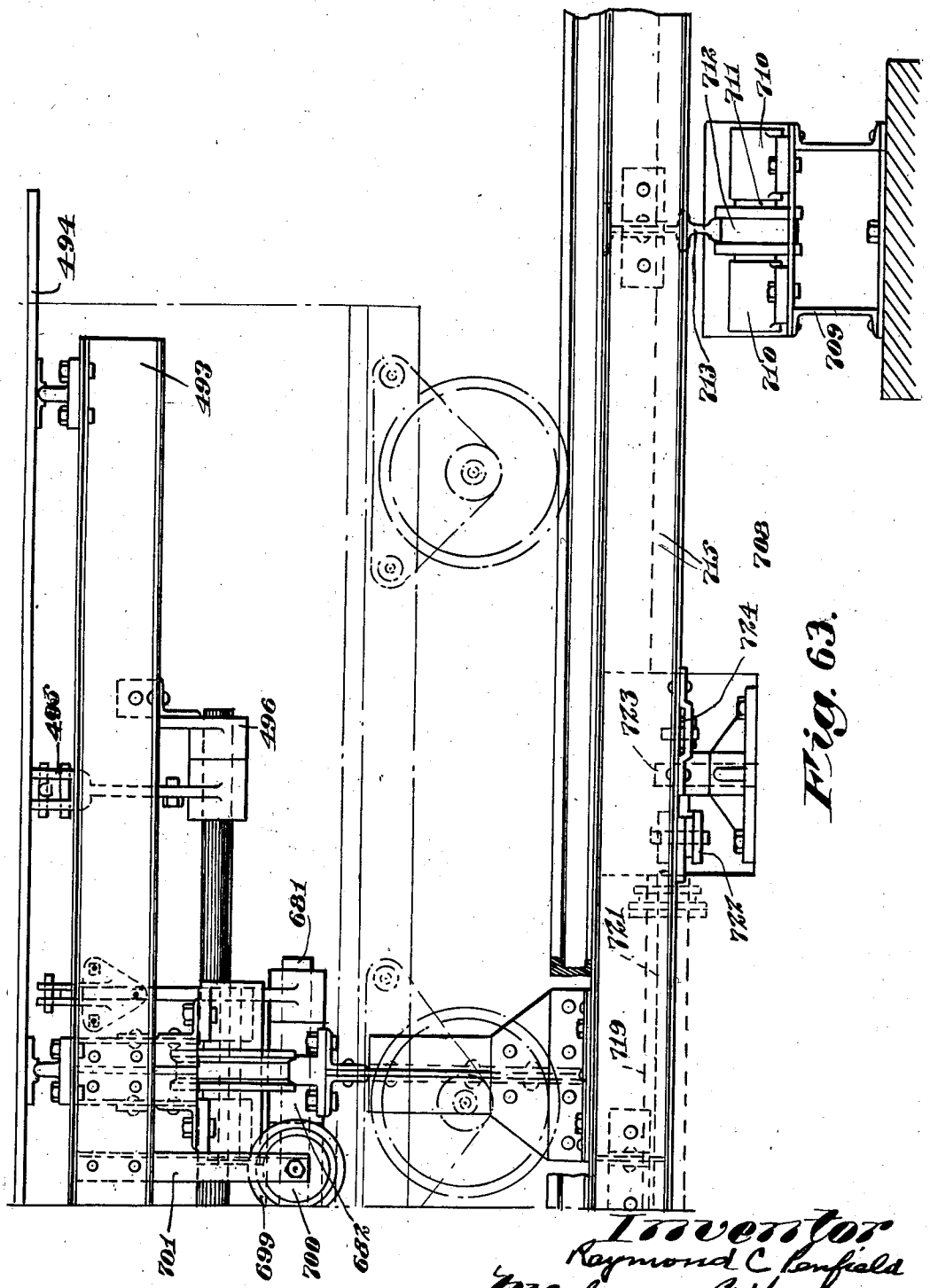


Fig. 63.

Inventor
Raymond C. Penfield
By James R. Hodder
Attorney

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 58

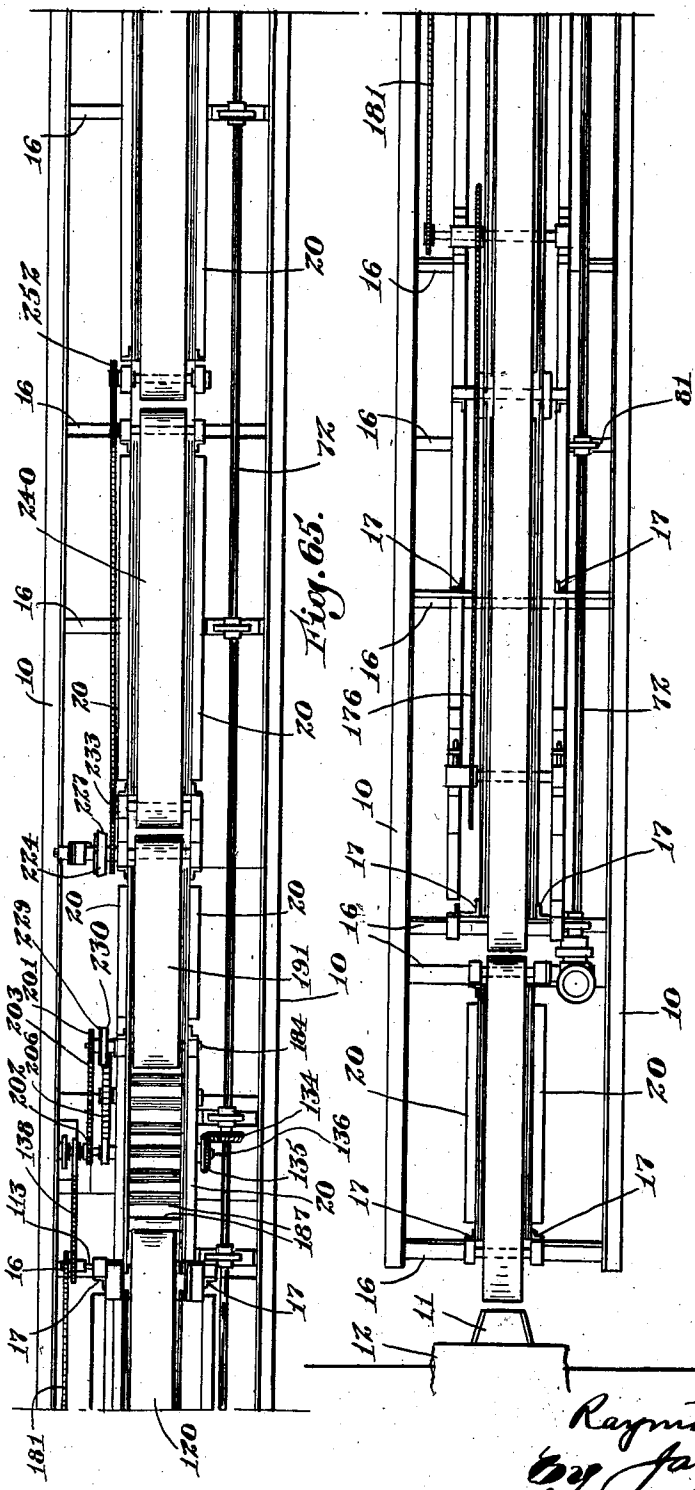


Fig. 65.

Fig. 64.

Inventor:
Raymond C. Penfield
By James R. Hodder
Attorney

June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 59

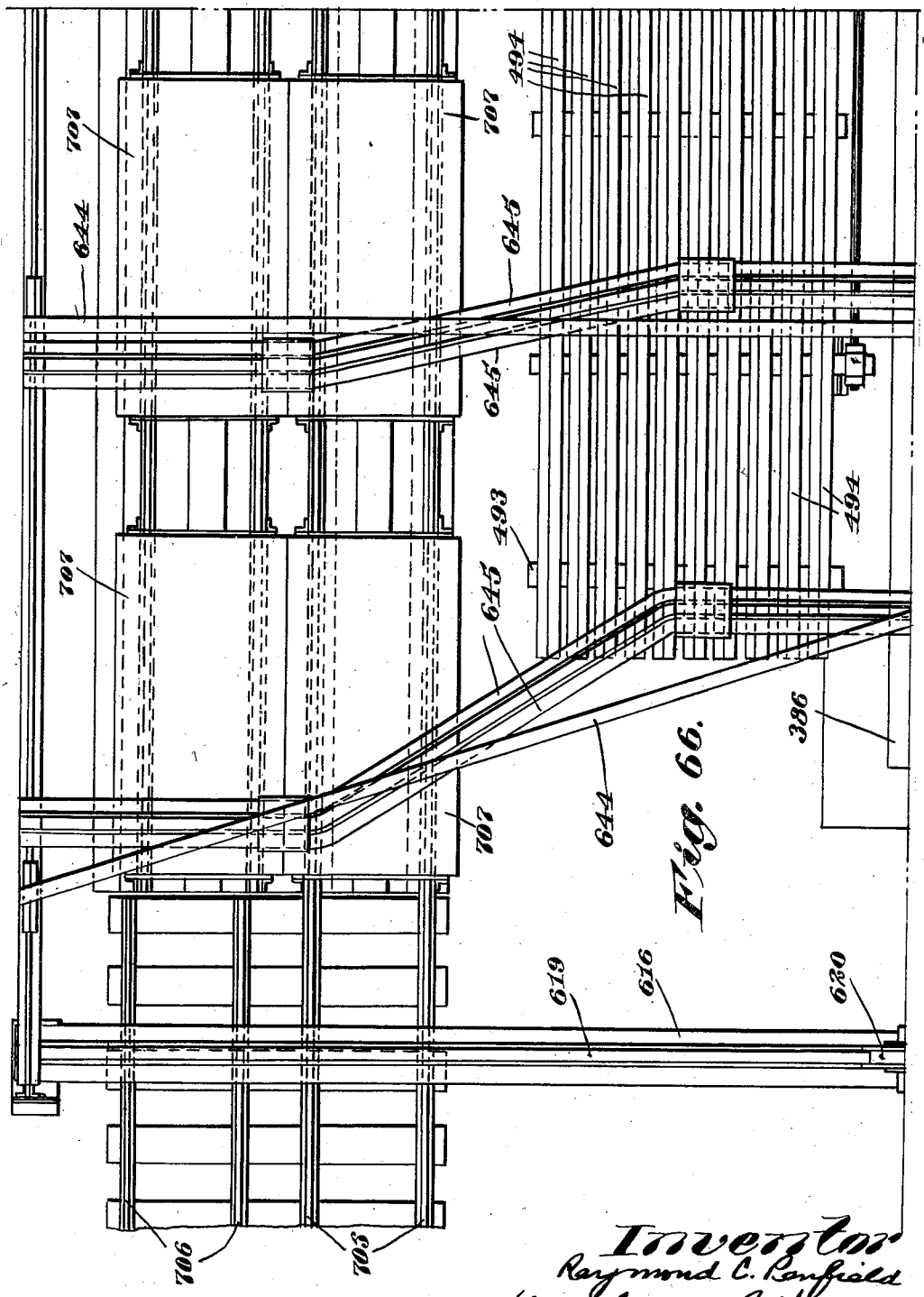


Fig. 66.

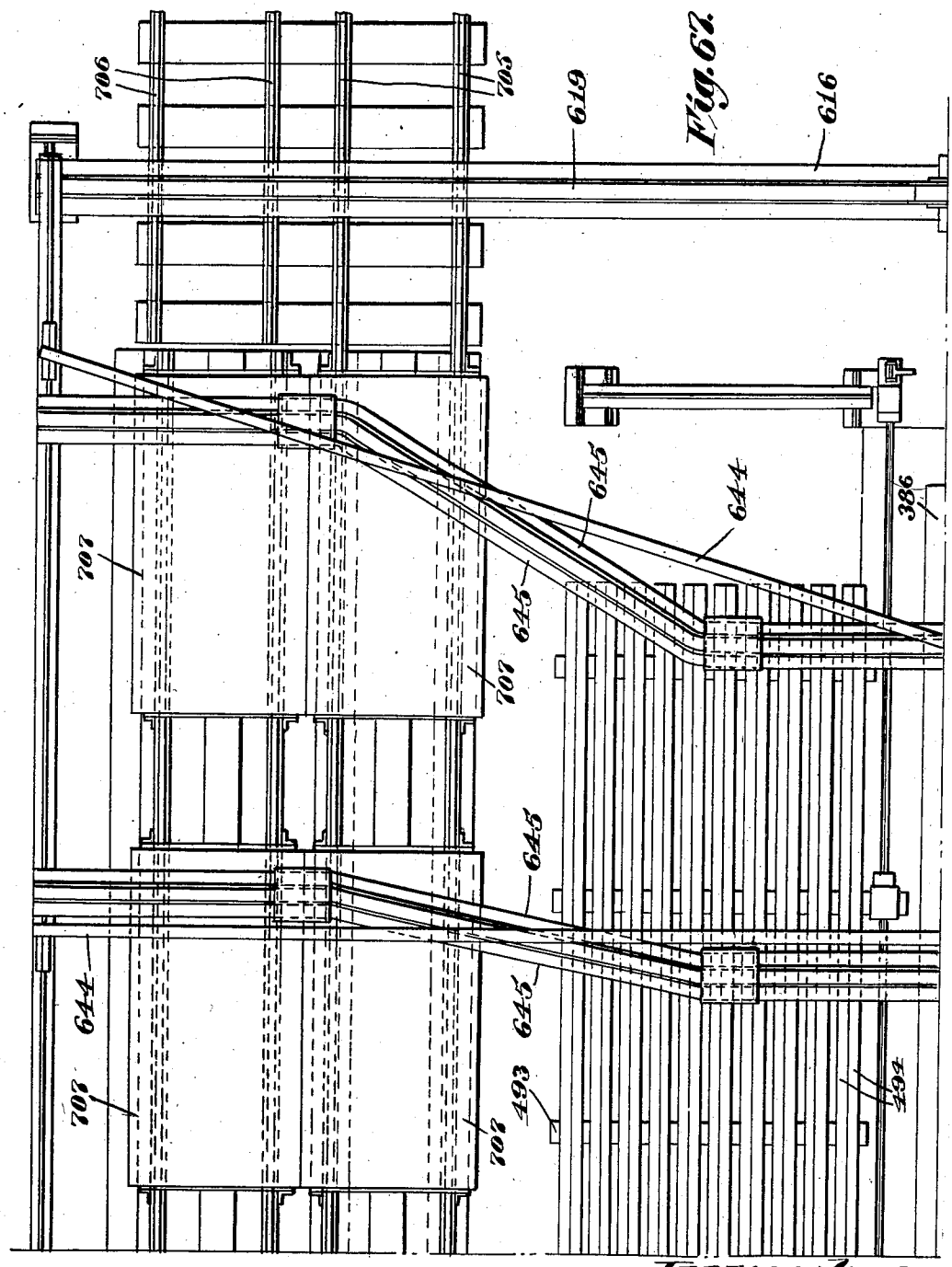
Inventor
Raymond C. Penfield
By James R. Hodder
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 60

Fig. 67.



Inventor
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 61

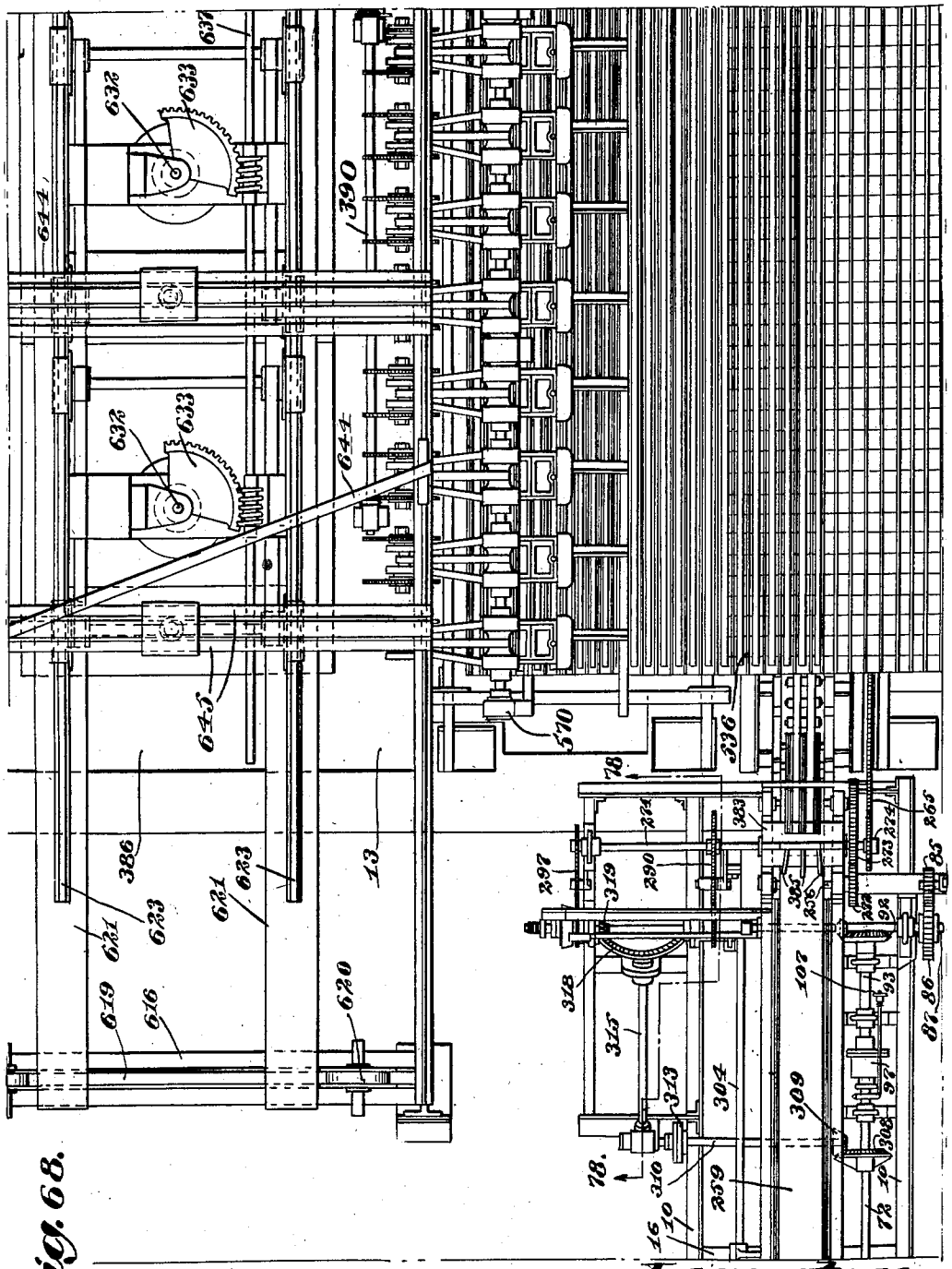


Fig. 68.

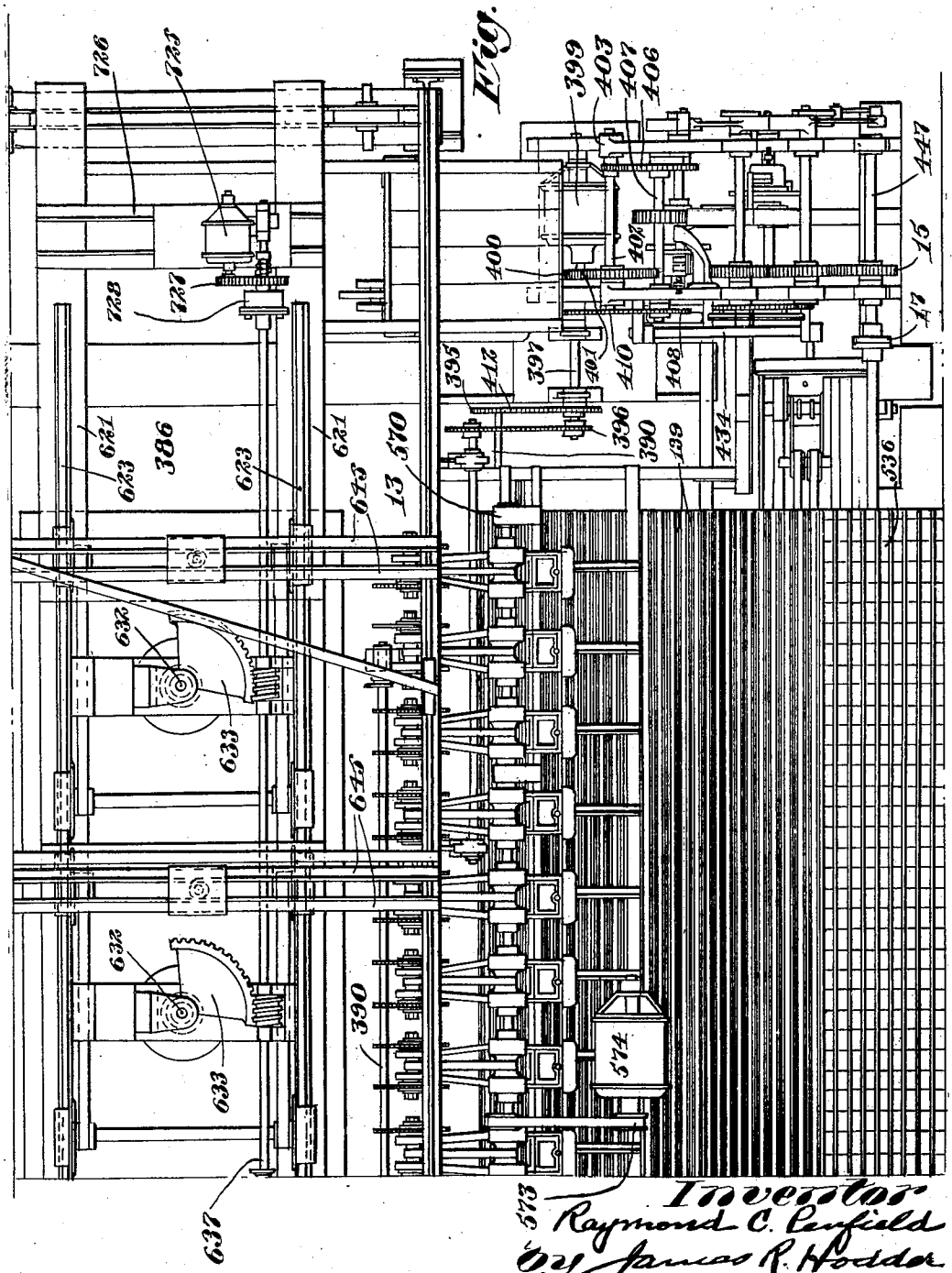
Inventor:
Raymond C. Penfield
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 62

Fig. 69.



Inventor
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 63

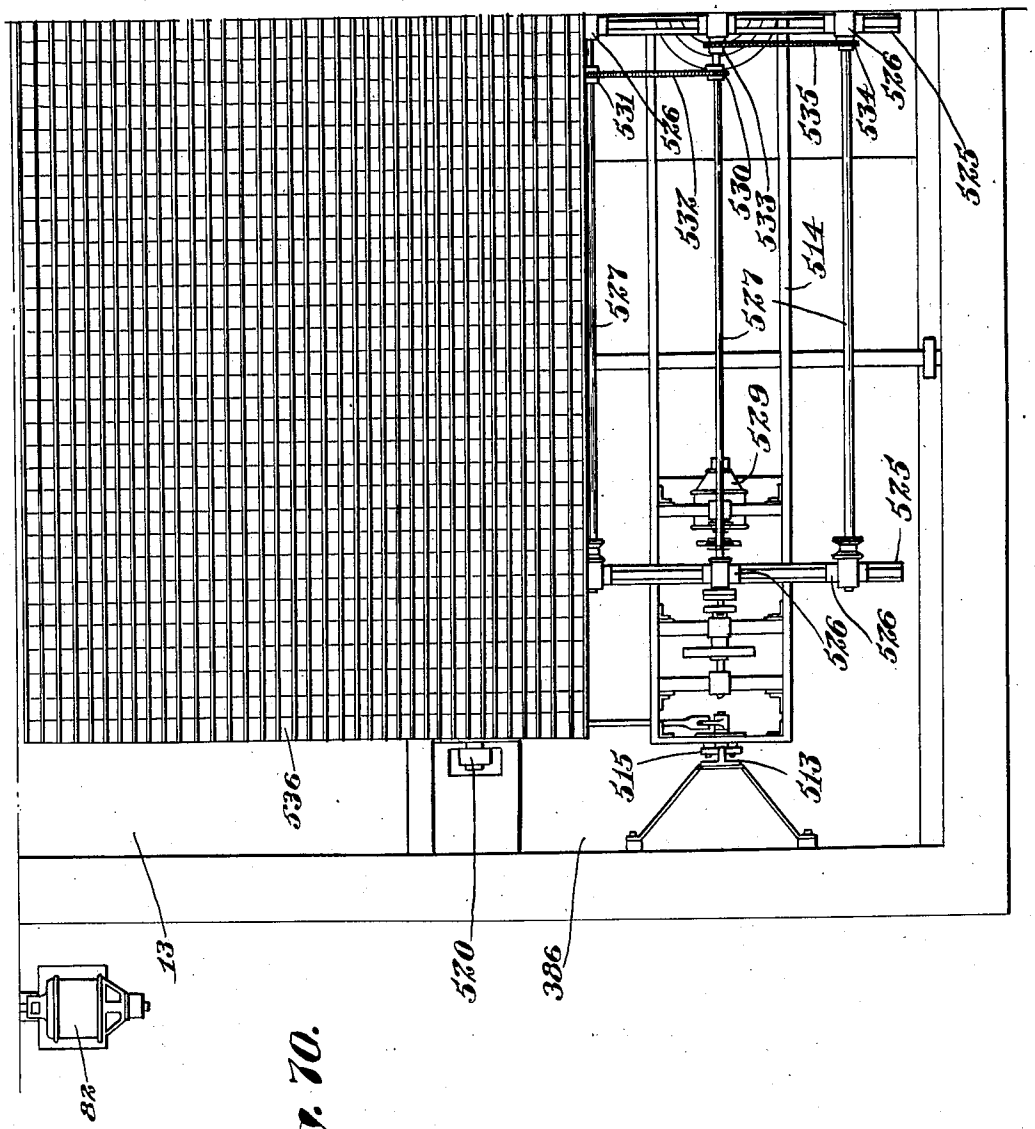


Fig. 70.

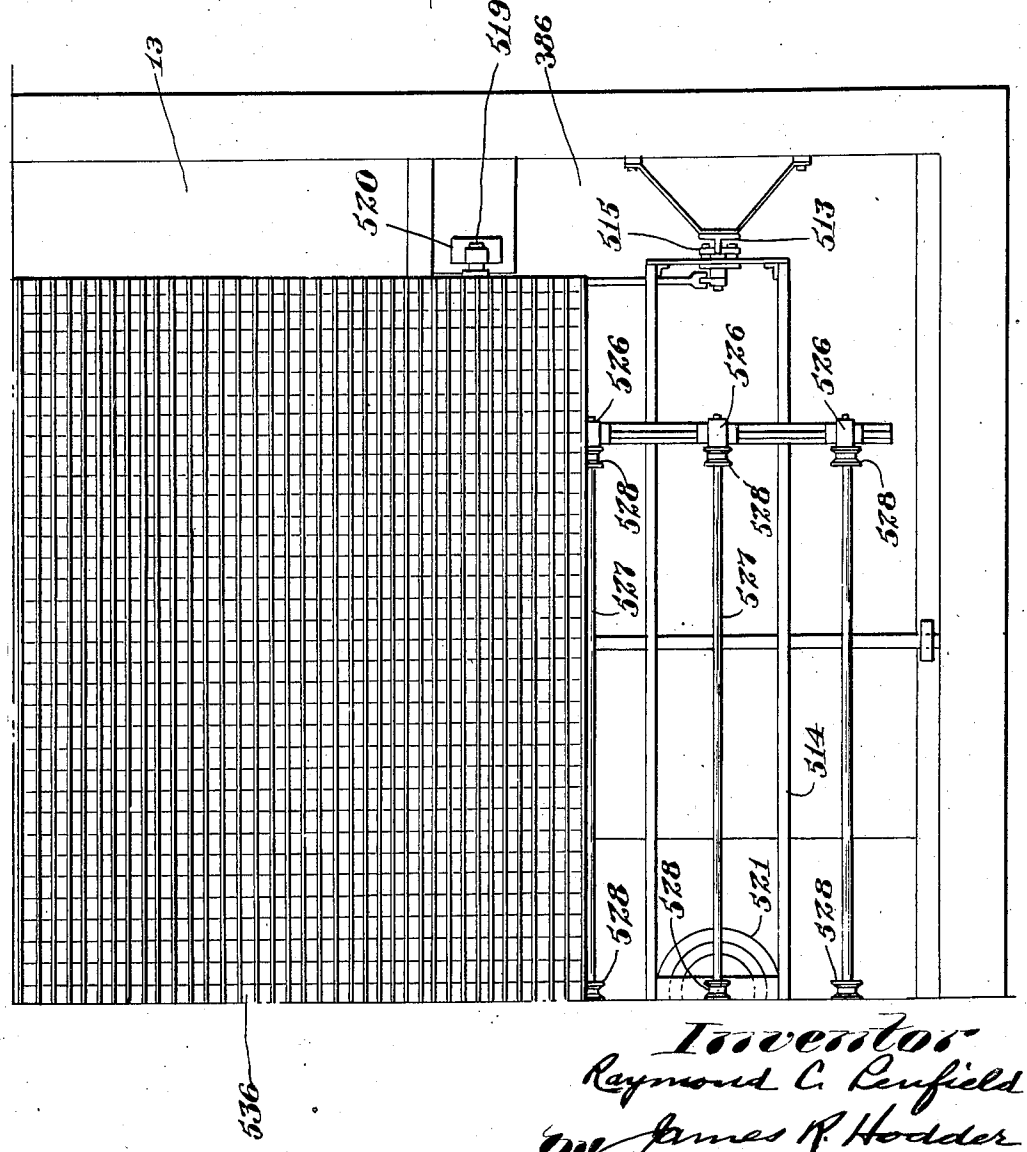
Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 64

Fig. 71.



Inventor
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June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 65

Fig. 73.

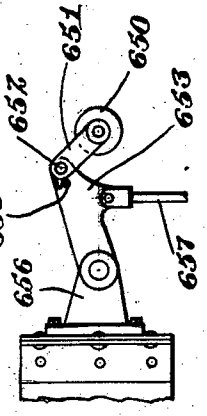
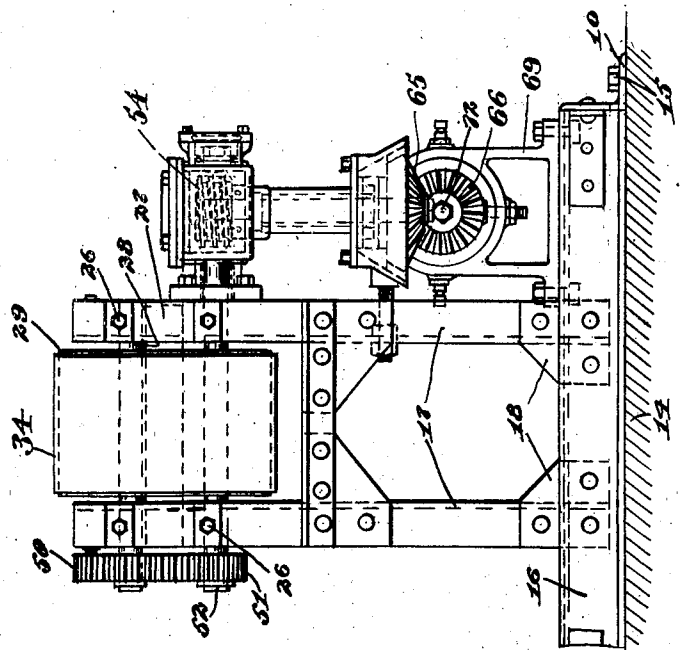


Fig. 72.



Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 66

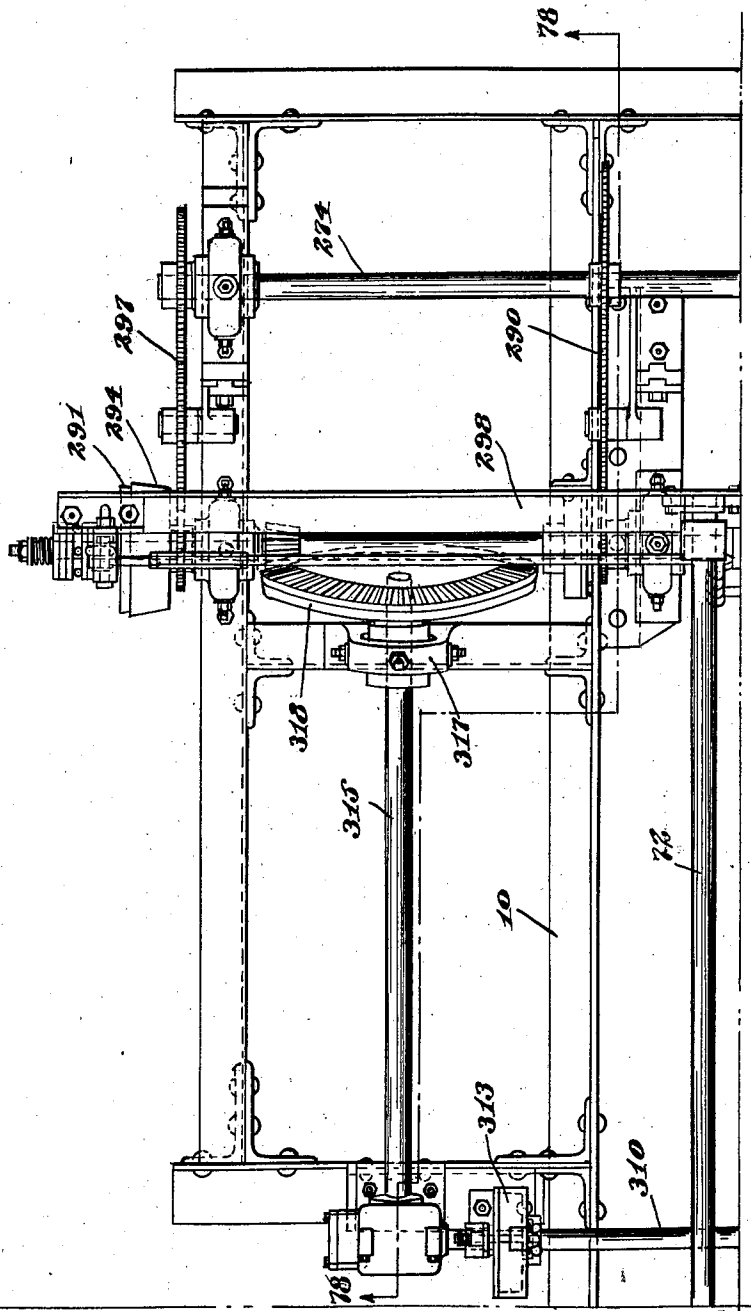


Fig. 76.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 67

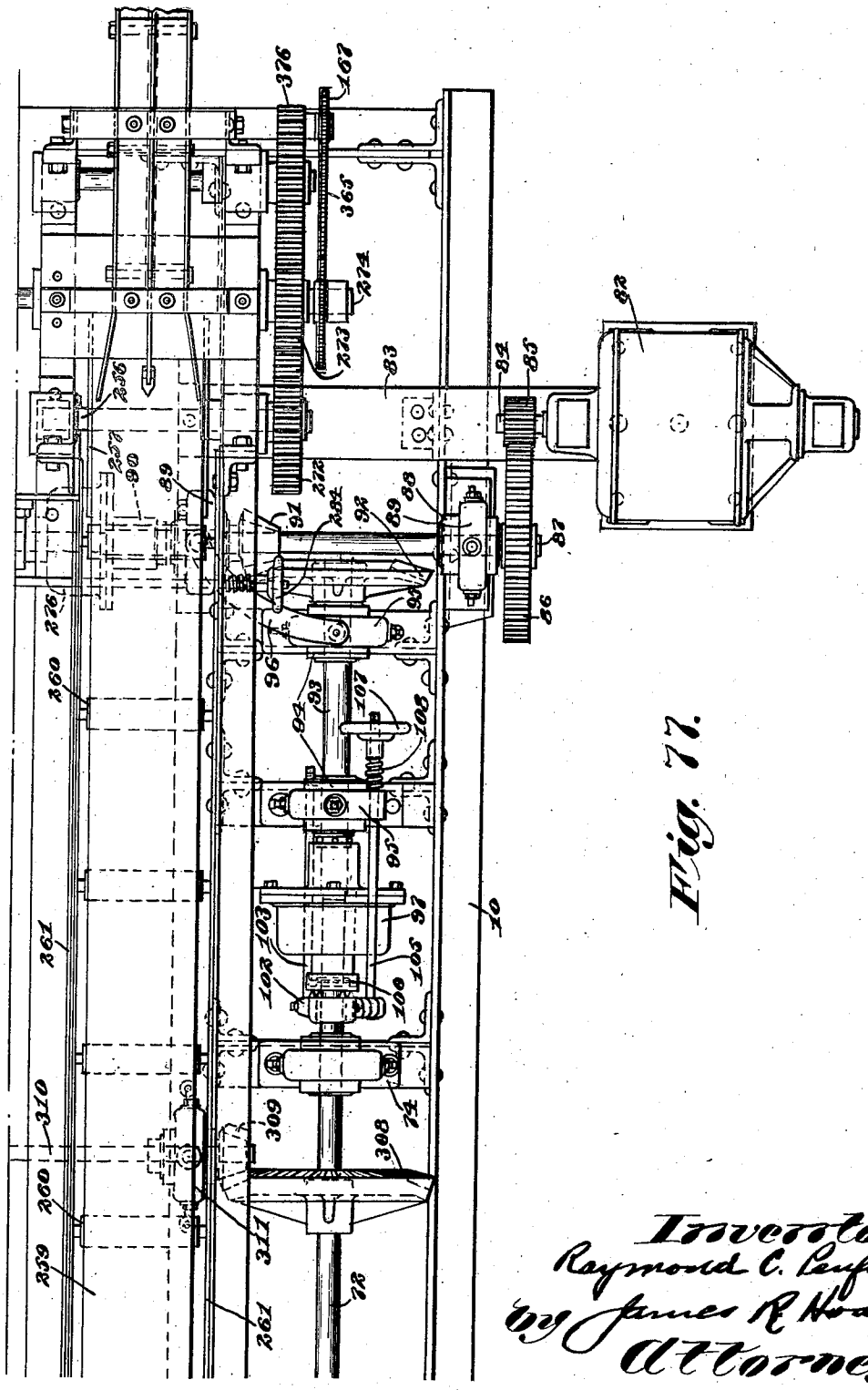


Fig. 77.

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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 68

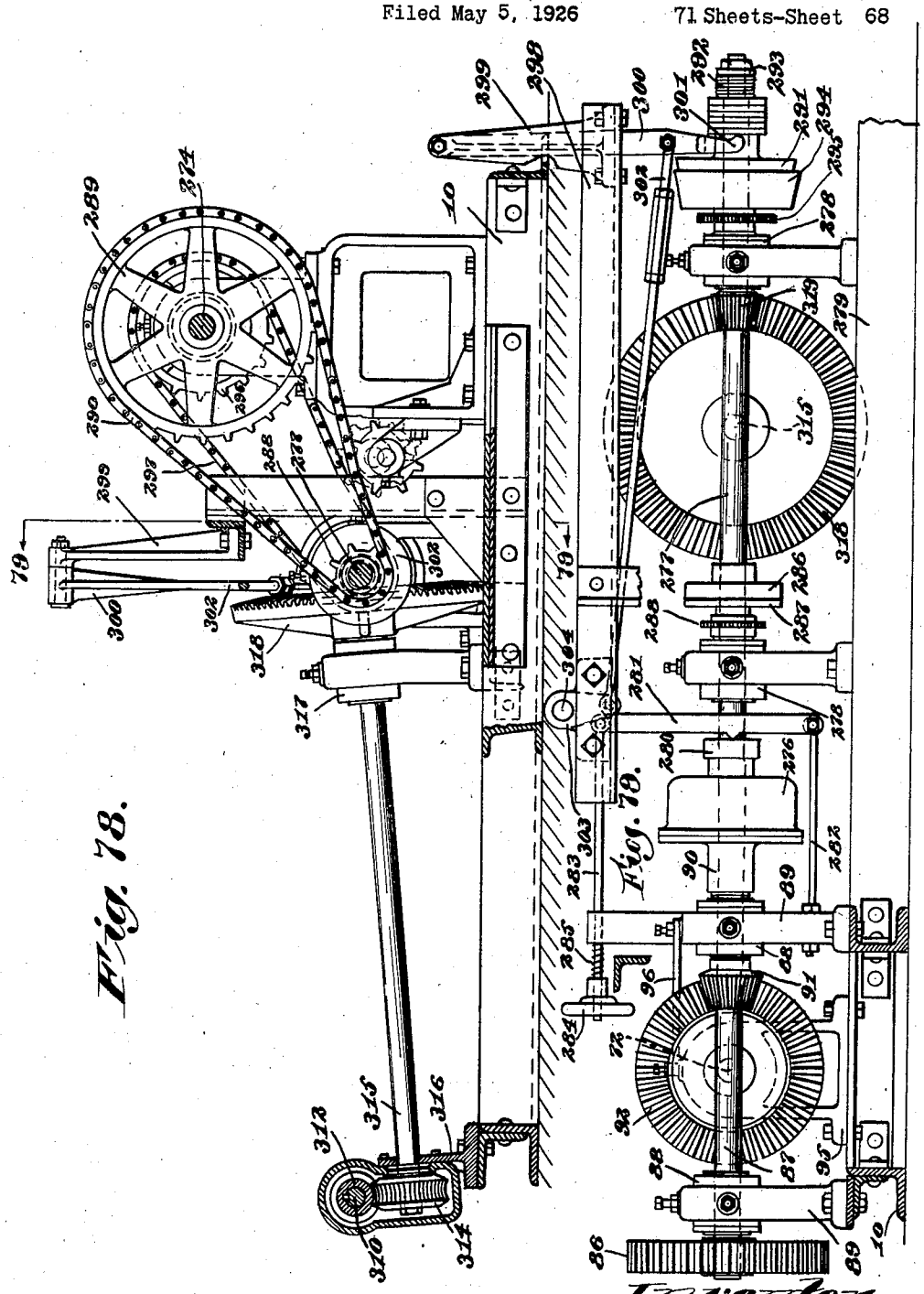


Fig. 78.

Fig. 79.

Inventor
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Attorney

June 3, 1930. R. C. PENFIELD 1,760,993

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 69

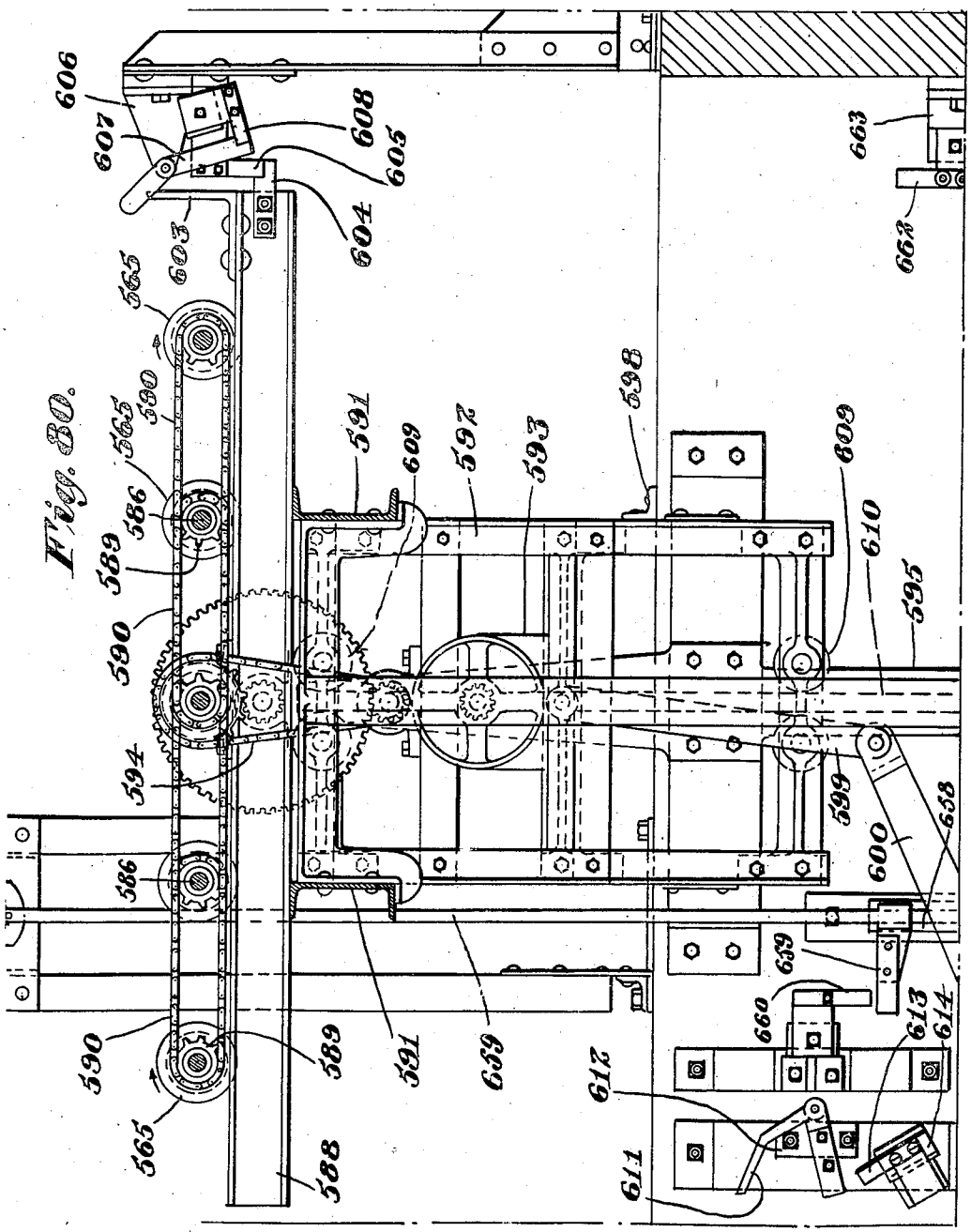


Fig. 80.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 70

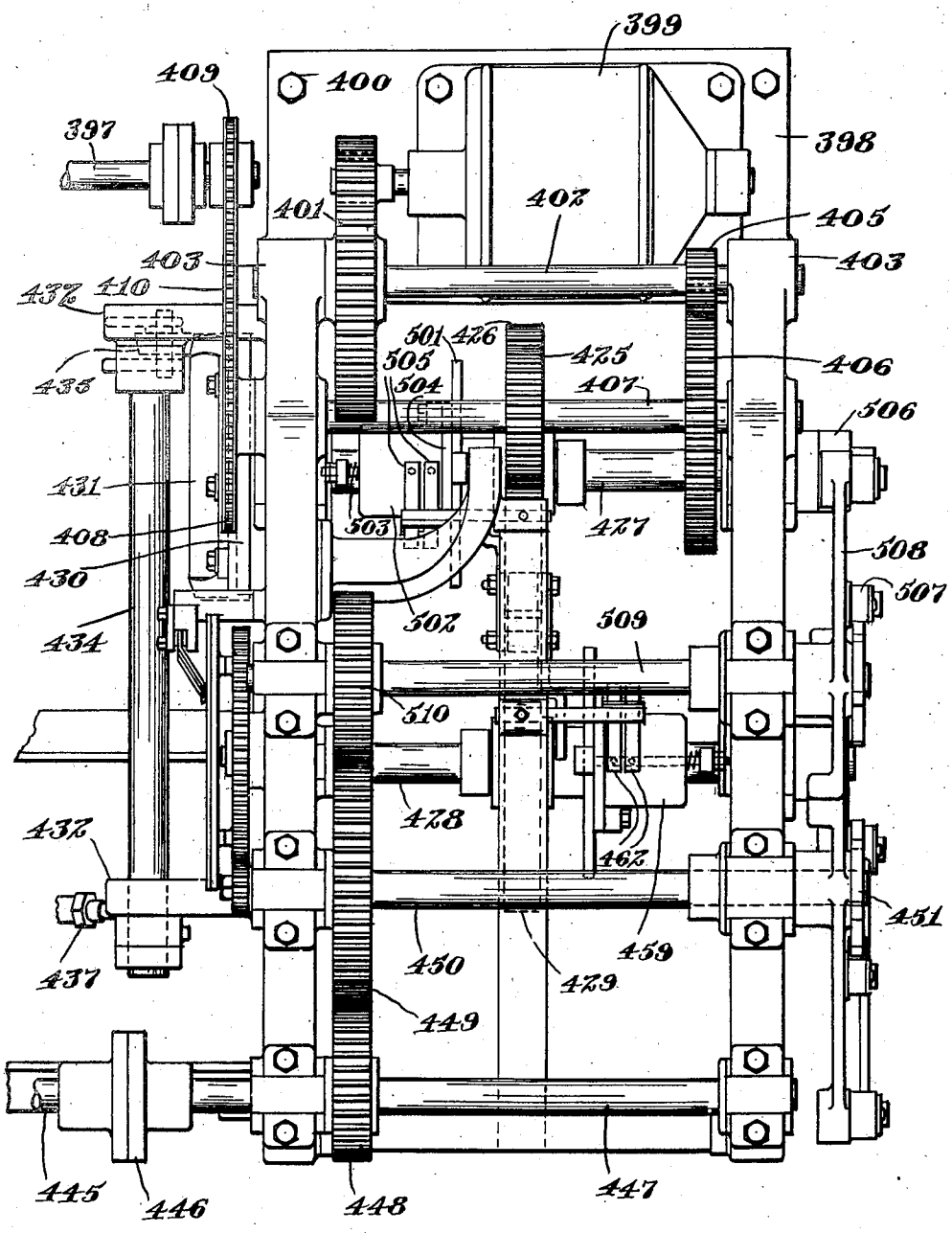


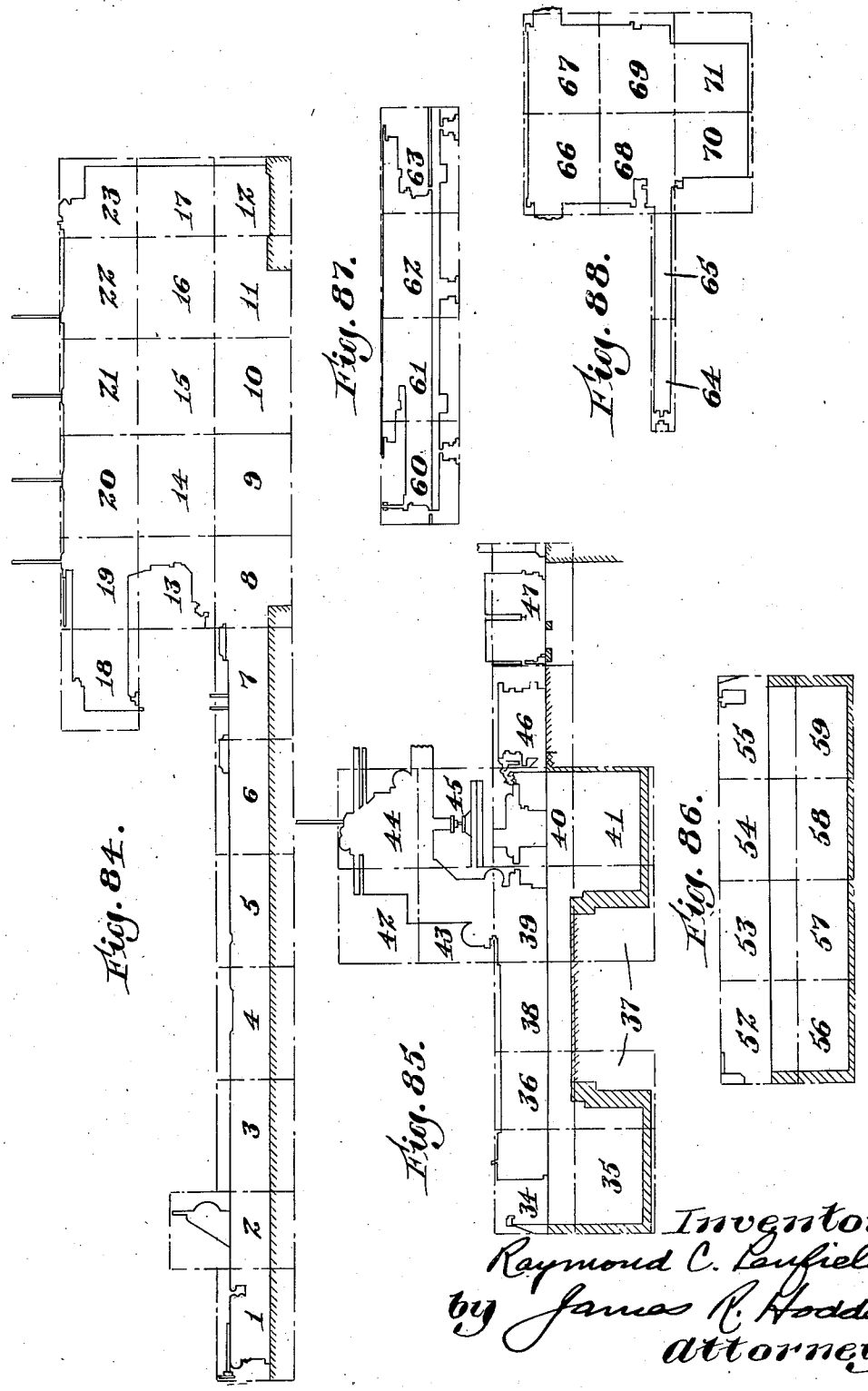
Fig. 83.

Inventor
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METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Filed May 5, 1926 71 Sheets-Sheet 71



Inventor
Raymond C. Penfield
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Attorney

Patented June 3, 1930 1,760,993

UNITED STATES PATENT OFFICE

RAYMOND C. PENFIELD, OF NEW YORK, N. Y.

METHOD OF AND AUTOMATIC MEANS FOR HACKING BRICK

Application filed May 5, 1926. Serial No. 106,875.

My present invention relates to brick making machines and more particularly to an improved brick forming and hacking machine.

At the present time, there are two principal and well-defined methods of manufacturing brick. One of these methods consists broadly in taking a brick mould, placing the same under a press and filling such mould with clay to form a plurality of bricks, passing such now-filled mould along toward a drying apparatus, and, before the moulds reach such drying apparatus, a pallet is placed thereon, the brick moulds turned over and lifted off the brick, which are thus left on the pallet. After the drying operation, the bricks are removed from the pallet, usually by hand, and are placed in stacked relation in a kiln.

The other of the principal methods is the extruding of a slug of clay having a cross sectional area equal to the cross sectional area of the brick which it is desired to make and as the slug is formed, pass the same under a cutter of any desired kind where the slug is cut into unit lengths to form bricks. These slugs as they issue from the brick machine, and cut into brick lengths, are deposited on what is known as an off-bearing belt and on each side of such belt, belt boys are positioned, the duty of such belt boys being to take the brick from the off-bearing belt and place them in trucks in stacked relation. When it is considered that the modern brick machine extrudes brick at the rate of approximately 300,000 per day of eight hours, it is obvious that a considerable number of belt boys must be employed and also that teamwork between the belt boys is essential if the brick are to be carefully and economically handled. The work is exacting and laborious and the absence of one or two of the belt boys from the crew seriously handicaps the output of the brickyard. Various plans have been suggested and various devices have been built in the attempt to eliminate, if possible, the use of belt boys and in case this latter was impossible, then to so reduce the necessity thereof as to make it possible that ordinary unskilled labor perform this function. None of these methods of procedure or devices have been successful.

In my present invention I have constructed an apparatus designed to obviate the difficulties heretofore experienced in this art and by the use of my apparatus, I am enabled to dispense entirely with the belt boys and am able to stack brick in unit formation as fast as they issue from the brick machine. In developing this structure, I have devised means whereby a slug of clay, equal in length to any predetermined number of brick, is extruded from a brick machine and passes this extruded slug along towards the hacking end of the device, gradually speeding up the rate of travel of such slug until it is placed in a carrier, which carrier may be moved laterally the proper distance before the arrival of the next succeeding slug. While I have spoken of a single slug, I find it advantageous in order to increase the capacity of the brick machine, to make the slugs in pairs and operate simultaneously on a pair of parallelly arranged slugs. After the slugs have been placed in position on the transversely movable carrier, the means by which the slugs are positioned therein is depressed a sufficient distance to deposit the slug or slugs on the carrier which is then moved laterally, and afterwards the slug-carrying means is raised into position to receive the next succeeding slug or slugs. The carriers are of predetermined size as regards length and width and when a carrier has been filled to its capacity or to any desired amount, means is provided for automatically passing the same under a plurality of parallelly arranged and equally spaced saws which saw the plurality of parallelly arranged slugs in the carrier into individual bricks. After passing through the saws, the carrier, with the now individual brick therein, is moved into position under a plurality of parallelly arranged and vertically movable lifting devices by means of which bricks are removed from the carrier. As the carrier moves laterally of the plurality of on-coming slugs, means is provided for automatically positioning from a source of supply, a succeeding carrier so that there is a continuous procession of carriers passing

laterally of the on-coming stream of slugs. When the individual bricks have been removed from the carriers by the lifting devices referred to, the now empty carrier is automatically lowered to a predetermined amount and moved into a storage apparatus in position to be moved into position with relation to the on-coming stream of slugs. For the better mechanical handling of brick, it has been found desirable to hack the brick in predetermined sized units, such units to be handled mechanically by means of a lifting fork. As it is necessary to place the lifting fork under the unit of brick, the first two courses of brick in a unit are what have been termed "finger courses." There is one of these brick hacking tables for each of the lifting devices and the first two carriers that are moved under the saws have the bricks thereon lifted therefrom and deposited temporarily on the hacking tables. When the bricks have been deposited on the hacking tables, means is provided to separate the rows of brick in a predetermined manner and the lifting forks are again brought into action to lift the layers of bricks from the hacking tables and deposit them on hacking cars. In order to handle economically and expeditiously such a large number of brick as 300,000 in a day or eight hours from one brick machine, I find it advisable to place a plurality of pairs of hacking cars in alignment with each other.

An important feature of my invention is an improved means for taking a slug or slugs of clay of any length as they issue from the brick machine and gradually increase the speed of travel thereof so as to be able to perform the necessary operations thereon prior to the arrival of the next succeeding slug or slugs. The mechanism for operating the slug carrier has a speed that bears a fixed relation to the speed of the brick machine and intermediate the carrier and brick machine are interposed mechanisms for taking the slug or slugs, speeding the same up gradually and injecting or feeding such slug or slugs into the carrier, the arrival of the slug in position in the carrier causing the operation of the mechanism for automatically moving the carrier laterally and bringing into position portions thereof for receiving the next succeeding slug or slugs. As the mechanisms referred to, including the mechanism operating the carrier, are all unconnected and must operate in synchronism with each other, I have provided means for operating the same from a single source of power.

Another important feature of construction of my apparatus is a mechanism for holding the carriers and for assuring a constant supply of such carriers during the operation of the machine. In carrying out this feature of my invention, I provide practically a rectangular track for such carriers and at each end thereof provide automatically operable elevators for carrying the freshly unloaded carriers from the upper to the lower level and at the other end thereof provide an elevator for moving the unloaded carrier from the lower to the upper level in position to be fed across the path of movement of the slug or slugs. In connection with the carrier operating means is a slug carrying means which is constantly operable and intermittently operable in a vertical direction, such means, when in its upper limit being in position to receive and transport a slug or slugs across the entire width of the carrier, and, as it is moved from the upper to the lower position, depositing such slug or slugs on the carrier, and when, in its lowermost position, being entirely free from the carrier and permitting a lateral movement of the carrier with respect thereto. This particular operation of my apparatus is broadly new and I am not to be limited in the claims other than as specified.

The principal object of my invention, therefore, is an improved brick hacking machine.

Another object of my invention is an improved means for collecting slugs of clay or other material into groups.

A further object of my invention is an improved means for collecting a plurality of slugs into groups in mechanically operated carriers.

A still further object of my invention is an improved means for moving a carrier laterally of an on-coming stream of clay or other material.

A further object of my invention is an improved means for moving a carrier laterally of an on-coming stream of clay by step-by-step movements.

A further object of my invention is an improved means for moving a carrier intermittently, movement of said means being initiated by the on-coming stream of clay.

A further object of my invention is an improved slug carrying means associated with an intermittently movable carrier.

A still further object of my invention is an improved means for subdividing a slug of clay into a plurality of bricks simultaneously.

A further object of my invention is an improved means for moving a carrier loaded with a plurality of parallelly arranged slugs past a plurality of parallelly arranged severing means.

A further object of my invention is an improved transferring mechanism for transferring a plurality of bricks from a carrier to a hacking device.

A further object of my invention is an improved means for positioning a plurality of carriers in succession in the path of movement of on-coming slugs of clay or other material.

Other objects and novel features of the construction and arrangement of parts comprising my invention will appear as the description of the invention progresses.

In the accompanying drawings illustrating the preferred embodiment of my invention,

Figs. 1–23 inclusive, when arranged in accordance with key sheet of drawings, show a side elevation. In such side elevation, Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12 are to be placed end to end, counting from left to right, Figs. 13, 14, 15, 16, and 17 are to be placed end to end, counting from left to right, Fig. 13 being placed above Fig. 8, Fig. 14 above Fig. 9, Fig. 15 above Fig. 10, Fig. 16 above Fig. 11, and Fig. 17 above Fig. 12. Figs. 18–23 are to be placed end to end, counting from left to right, with Fig. 19 placed above Fig. 13, Fig. 18 to the right of Fig 19, Fig. 20 above 14, Fig. 21 above Fig. 15, Fig. 22 above Fig. 16, and Fig. 23 above Fig. 17;

Fig. 24 is a sectional end elevation on the line 24—24 of Fig. 1 looking in the direction of the arrows;

Fig. 25 is a sectional elevation on the line 25—25 of Fig. 24 looking in the direction of the arrows;

Fig. 26 is a sectional end elevation on the line 26—26 of Fig. 2 looking in the direction of the arrows;

Fig. 27 is a sectional end elevation on the line 27—27 of Fig. 4 looking in the direction of the arrows;

Fig. 28 is a sectional end elevation on the line 28—28 of Fig. 5 looking in the direction of the arrows;

Fig. 29 is a sectional end elevation on the line 29—29 of Fig. 8 looking in the direction of the arrows;

Fig. 30 is a sectional end elevation on the line 30—30 of Fig. 8 looking in the direction of the arrows;

Fig. 31 is a sectional end elevation on the line 31—31 of Fig. 12 looking in the direction of the arrows;

Fig. 32 is a sectional end elevation on the line 32—32 of Fig. 12 looking in the direction of the arrows;

Fig. 33 is a side elevation of Fig. 12;

Figs. 34 to 47 inclusive, when arranged according to the diagram on the key sheet, show an end elevation of the machine. Figs. 34, 36, 38, 39, 40, 46 and 47 are to be placed end to end counting from the left, Fig. 35 to be placed under Fig. 34, the left half of Fig. 37 is to be placed to the right of Fig. 35 and under Fig. 36, the right hand half of Fig. 37 is to be placed under Fig. 39; Fig. 41 is to be placed to the right of Fig. 37 and under Fig. 40; Fig. 43 is to be placed above Fig. 39; Fig. 45 is to be placed above Fig. 40 and to the right of Fig. 43; Fig. 42 is to be placed above Fig. 43; Fig. 44 is to be placed to the right of Fig. 42 and above Fig. 45;

Fig. 48 is a plan view of one of the slotting saw units and driving mandrel;

Fig. 49 is an elevation of Fig. 48;

Fig. 50 is a partial plan view of the mechanism shown in Fig. 46;

Fig. 51 is a plan view of a portion of the mechanism shown in Fig. 46, but in extended position;

Figs. 52–59 inclusive, when assembled in accordance with the diagram on the key sheet, show a rear elevation of the machine. In this group, Figs. 52, 53, 54, and 55 are to be placed end to end, counting from left to right; Figs. 56, 57, 58 and 59 are to be placed end to end, counting from left to right, Fig. 56 below Fig. 52, Fig. 57 below Fig. 53, Fig. 58 below Fig. 54, and Fig. 59 below Fig. 55;

Figs. 60–63 inclusive, when arranged in accordance with the diagram shown on the key sheet, show a rear elevation of a portion of the machine. The figures in this group are arranged end to end, counting from left to right;

Figs. 64–71 inclusive, when arranged according to the diagram on the key sheet, show a plan view of the machine. In this group, Figs. 64, 65, 68 and 69 are to be placed end to end, counting from left to right, Fig. 66 to be placed above Fig. 68, Fig. 67 to the right of Fig. 66 and above Fig. 69, Fig. 70 below Fig. 68, and Fig. 71 to the right of Fig. 70 and below Fig. 69;

Fig. 72 is a left hand elevation of the mechanism shown in Fig. 1;

Fig. 73 is a view showing the details of construction of the slug cutter illustrated in Fig. 2;

Fig. 74 is a view shown on the same sheet as Fig. 16 and is an enlarged view of the mechanism shown on the upper right hand end of Fig. 11;

Fig. 75, shown on the sheet containing Fig. 13, is an end elevation of Fig. 74;

Figs. 76 and 77, when placed together with Fig. 77 below Fig. 76, represents on an enlarged scale the driving mechanism shown on the lower left hand corner of Fig. 68 and the upper left hand corner of Fig. 70;

Fig. 78 is a vertical section taken on the line 78—78 of Fig. 76;

Fig. 79 is a sectional elevation on the line 79—79 of Fig. 78;

Fig. 80 is a sectional elevation on the line 80—80 of Fig. 55;

Fig. 81 is a sectional elevation on the line 81—81 of Fig. 50;

Fig. 82 is a sectional elevation on the line 82—82 of Fig. 51;

Fig. 83 is a plan view of Fig. 12, and

Figs. 84 to 88 inclusive are diagrammatic views showing the manner in which certain drawings are to be assembled to make complete views of the machine.

Referring to the drawings, and particularly to the sheet of drawings constituting the

side elevation of the machine, 10 designates angle iron sills spaced apart from, and arranged parallel to, each other and extending from a point adjacent to the dies 11 of a brick making machine 12 to substantially the edge of a pit or other excavation 13 (see Figs. 8, 9, 10, and 11), these sills resting on a substantially level foundation 14, preferably of concrete. The sills 10 are secured in position on the base 14 by bolts 15 at intervals. The sills 10 are tied together by cross bars 16 secured at their ends to the sills in any suitable manner. The sills 10 and cross bars 16 constitute an elongated rectangular frame, and extending upwardly from such frame, while being secured to the cross bars 16, are pairs of uprights 17. These uprights are, for convenience, made of angle iron and are secured to the various cross bars by riveting and by the aid of gussets 18, as clearly shown in the drawings. For strengthening purposes, several of the pairs of uprights 17 along the length of the sill 10 are tied together intermediate their ends by cross bars 19. Secured to the uprights 17 parallel to each other and to the sills 10 are longitudinally extending angles 20, these angles being secured to the uprights 17 by means of gussets 21.

Secured to the upper ends of the first two pairs of uprights 17, measured from the left as viewed in Fig. 1, are plates 22 lying parallel to each other and to the angles 20. Secured to the outer face of each of the plates 22 is a plate 23 and in the plates 22 and 23 are formed bearings for shafts 24. Secured to the shafts 24 between the plates 22 are rollers 25, the upper edge of such rollers lying in a substantially horizontal plane. Secured to each of the left hand end uprights 17 by bolts 26 are pillow blocks 27 in which is rotatably mounted a shaft 28. Secured to the shaft 28 is a roller 29 and the upper edge of the roller lies in the same horizontal plane as lies the upper edge of the rollers 25 above referred to. Secured to the rear faces of the next adjacent pair of uprights 17 by bolts 30 are pillow blocks 31 and in these pillow blocks is rotatably mounted a shaft 32 that lies parallel to the shaft 28. Secured to the shaft 32 so as to be rotatable therewith is a roller 33 of less diameter than the roller 29, but the upper edge of this roller 33 lies in the same horizontal plane as does the roller 29 and rollers 25 above referred to. Over the rollers 29 and 33 runs an endless conveyor belt 34 and the upper reach of such conveyor belt rides over the rollers 25 and the upper reach of the conveyor belt 34 is therefore maintained substantially horizontal regardless of the load placed thereon. Secured to the outer face of each of the plates 22 by bolts 35 is a downwardly extending bearing plate 36 and in each of the plates 36 is provided an elongated bearing slot 37 in which is rotatably mounted a shaft 38. Secured to said shaft 38 adjacent to each end thereof is a forwardly and downwardly extending plate or bar 39. Each of the elongated bearing slots 37 is provided with an adjusting screw 40 at each end thereof and by means of which the relative position of the shaft 38 therein may be determined. The lower end of each of the bars 39 is provided with a slot 41 in which is rotatably mounted a shaft 42 that has secured thereto an idler roller 43, this idler roller, as will be seen from an inspection of Fig. 1, engaging with the under face of the lower reach of the conveyor belt 34. Pivotally attached to each of the bars 39 intermediate the ends thereof is a rearwardly and downwardly extending bar 44, such bars being connected adjacent to their lower end by a rod or shaft 45 on which may be placed counterbalancing weights 46. Formed integral with each of the bearing plates 36 is a downwardly extending member 47, each provided with an arcuate slot 48 in which may travel for purposes of adjustment a bearing bolt 49 attached to the rearwardly extending bars 44 and intermediate the ends thereof. The mechanism above described makes it possible to regulate the tension on the endless conveyor belt 34 as desired. Secured to one end of the shaft 32 is a gear 50, this gear meshing with, and being driven by, a gear 51 secured to the end of a shaft 52 rotatably mounted, parallel to the shaft 28, in suitable bearings on the uprights 17. Secured to the end of the shaft 52 remote from the gear 51 is a worm wheel 53 which meshes with, and is driven by, a worm 54 secured to, or formed integral with, the upper end of a shaft 55. The shaft 55 is mounted on an elongated bearing 56 which has secured thereto, or formed integral therewith, a casing 57, at its upper end, that encloses the worm wheel 53 and the worm 54. Numeral 58 designates a flange member formed integral with the casing 57 and the casing, and therefore the bearing 56 at its upper end, is secured to the uprights 17 by bolts 59. Numeral 60 designates a flange formed integral with the bearing 56 and at the lower end thereof, and secured to the lower face of such flange by bolts 61 is a cup-shaped member 62, this cup-shaped member being secured to the uprights 17 by bolt 63 and nut 64. The shaft 55 extends downward within the cup-shaped member 62 and has secured thereto at its lower end a bevel gear 65 that meshes with, and is driven by, a bevel pinion 66 formed on one end of a cylindrical member 67 that is rotatably mounted in a bearing 68. The bearing 68 is adjustably mounted in a bearing standard or block 69 that is secured to a suitable cross member extending between the sills 10. The end of the bearing member 67 remote from the pinion 66 is provided with a clutch slot or member 70 that cooperates with the clutch member 71. The clutch member 71

is slidable longitudinally of, but rotatable with, a shaft 72 that extends rearwardly of the machine, or to the right as viewed in the side elevation and plan views, and is mounted for rotation adjacent to its right hand or rear end in a bearing 73 that is adjustably mounted in a bearing bracket 74 secured to suitable cross members associated with the sills 10 (see Fig. 7). The left hand or forward end of the shaft 72 is rotatably mounted in the cylindrical bearing member 67 and such shaft 72 is prevented from longitudinal movement to the right, as viewed in side elevation, by a nut 75 threaded on its left hand end, as clearly shown in Fig. 25. Pivotally mounted at its lower end on a rod or shaft 76 secured to any convenient portion of the machine is a clutch lever 77 provided with means 78 for engaging the clutch member 71, and such clutch lever 77 is provided with an operating handle 79 and by means of which the same may be manipulated. By means of the lever 77 the clutch members 70 and 71 may be brought into and out of operative engagement with each other to thereby at will have power transmitted from the shaft 72 through the train of gearing to the shafts 32 and 28 to thereby operate the endless conveyor 34, and the rotation of the various mechanisms above described is such that the conveyor belt 34 moves in the direction of the arrow shown in Fig. 1 adjacent to its upper reach. The shaft 72 is provided, at various points along its length, with bearings 80 adjustably mounted in bearing brackets 81, these bearings and bearing brackets being similar to the bearing and bearing bracket respectively described as being shown in Fig. 7. Referring now to Figs. 7, 68, 77, and 79, there is shown a driving motor 82 mounted on a laterally extending bracket 83 on the sills 10 and secured to the driving shaft 84 of the motor 82 is a pinion 85. The pinion 85 meshes with, and drives, a gear 86 that is secured to one end of a shaft 87, and such shaft is rotatably mounted in bearings 88 adjustably secured in bearing brackets 89, as clearly shown in Fig. 79. The shaft 87 has secured at the end thereof remote from the gear 86 a slip clutch mechanism 90 to be hereinafter further described in detail. Secured to the shaft 87 adjacent to one of the bearings 88 is a bevel pinion 91 which meshes with, and drives, a bevel gear 92 that is secured to the extreme right hand end of a shaft 93. This shaft 93 is rotatably mounted in bearings 94, such bearings being adjustably mounted in bearing brackets 95 that are secured to the frame of the machine in any desired manner. Referring to Fig. 77, it will be noted that one of the bearing brackets 95 is connected with one of the bearing brackets 89 by means of an arm or connecting plate 96, this construction being employed for the sake of rigidity. Secured to the right hand end of the shaft 93 is one end of a slip clutch mechanism 97, the thrust bearing 98 being placed between the member 97 and the adjacent bearings 94. The extreme right hand end of the shaft 72 passes through a slip clutch member 97, and, by reference to Fig. 7, it will be noted that such member 97 is provided with a plurality of parallelly arranged discs 99, approximately one half of such discs being attached to the shaft 72 while the other approximate half of such discs are attached to the left hand end of the shaft 93. Extending outwardly from the left hand end of the member 97 and surrounding the shaft 72 is a slidable member 100. Engaging with the member 100 is a member 101, such member being secured to, or formed integral with, the lever 102 and intermediate the ends thereof. One end of the lever 102 has pivotally attached thereto one end of a rod 103, such rod being threaded at its free end and the free end passes through a perforation provided therefor in one of the bearing brackets 95, nuts 104 being provided for adjusting the rod 103, and therefore the lever 102. The upper end of the lever 102 has pivotally attached thereto one end of a rod 105, this rod passing through a perforation in the upper end of a standard 106 secured to, or formed integral with, one of the bearing brackets 95. The free end of the rod 105 is threaded, as clearly shown in Fig. 7, and screwing onto such threaded end is a hand nut 107. A coil spring 108 is provided and located between the standard 106 and hand nut 107. By means of the mechanism just described, the degree of friction between the parallelly arranged plates 99 may be varied as desired, and, therefore, the amount of slip between the shafts 93 and 72 may be regulated at will.

Secured to the adjacent pair of standards 17, or the next pair of standards to the right, as viewed in Fig. 1, adjacent to the upper ends thereof are pillow blocks 109 and in these pillow blocks is rotatably mounted a shaft 110 which lies parallel to the shafts 32 and 28. Secured to the shaft 110 between the pillow blocks 109 is a roll 111. Referring to Fig. 4, it will be seen that there are pillow blocks 112 secured to the right hand face of the uprights 17 shown therein, and rotatably mounted in such pillow blocks is a shaft 113 that lies parallel to the shaft 110. Secured to the shaft 113 between the pillow blocks 112 is a roller 114, this roller being considerably greater in diameter than the roller 111. Secured to the uprights 17, above referred to, or to any auxiliary uprights, as 115, that may be secured to the angles 20 are plates 116. Such plates are arranged parallel to each other and parallel to, but above, the angles 20. Secured to each of the plates 116 and in engagement with the outer face thereof are plates 117, such plates being provided at in-

tervals along their length with bearings in which are rotatably mounted parallelly arranged shafts 118. Secured to the shafts 118 are rollers 119. The arrangement of the rollers 111, 114, and 119 is such that a substantially horizontal plane lies parallel to all of them, and all such rollers are arranged parallel to each other. Over such rollers passes an endless conveyor belt 120, and, by reference to Figs. 1, 2, 3, and 4, it will be seen that the upper reach of such belt lies in substantially the horizontal plane above referred to. Secured to each of the plates 116 adjacent to the bearing blocks 112 are downwardly extending bearing plates 121, such bearing plates being provided with elongated bearings 122 in which is rotatably mounted a shaft 123. Each of the bearing slots 122 has associated therewith a plurality of adjusting screws 124 and by means of which the shaft 123 may be adjusted. Pivotally mounted on the shaft 123 and extending downwardly and to the right are arms 125, each arm being provided with a bearing slot or groove 126 in which is rotatably mounted a shaft 127. The shaft 127 carries an idler roller 128 which engages with the under face of the lower reach of the endless conveyor belt 120. Pivotally attached to the downwardly extending arm 125 and intermediate the ends thereof is one end of levers 129, these levers being provided with counterbalancing weights 130 at their other end. Intermediate the ends of the levers 129 is a device 131 for adjustably holding such levers in position with respect to the slot 132 formed in a downwardly extending member 133 on the bearing plates 121. By proper adjustment of the counterbalancing weights 130 and the lever 129 in the slot 132, the tension on the endless conveyor belt 120 may be varied at will.

Secured to the shaft 72 (see Fig. 4) is a bevel gear 134 which meshes with, and drives, a bevel gear 135 that is secured to the shaft 136. This shaft 136 is rotatably mounted in suitable bearings adjustably secured to bearing brackets 137. Secured to the shaft 136 is a sprocket in alignment with the similar sprocket secured to the shaft 113 and over such sprocket runs a chain 138 and by means of which power is transmitted to the shaft 113 from the shaft 136.

The speed of the endless conveyor belt 34 is determined by the speed of rotation of the shaft 72 and such speed of the shaft 72 is, in turn, determined by the speed with which the brick slug 139 (see Fig. 1) is extruded through the die 11 of the brick making machine 12; that is, the speed of the endless conveyor 34 is equal to the speed at which the brick slug 139 is formed. The connection between the shaft 72 and the shaft 113 is such that the surface speed of the upper reach of the endless conveyor belt 120 is slightly in excess of the surface speed of the endless conveyor 34, such conveyor belts, however, moving in the same direction, or in the direction of the arrow shown in the drawings. I have found that, for the proper working of the machine, the excess of speed of the endless conveyor belt 120 over that of the endless conveyor 34 is approximately one half of one percent. In the practical application of my machine, I preferably make the distance between the centers of the shafts 28 and 32 approximately four and a half feet, while the distance between the centers of the shafts 110 and 113 is approximately sixteen and a half feet. The length of the slug 139 is approximately eighteen times the length of a commercial size brick; that is, eighteen times eight inches, or one hundred and forty four inches, or the slug 139 is approximately twelve feet long. There is, due to the difference in speed of the endless conveyors 120 and 34, a slight drag exerted on the slug 139, but this drag is not detrimental in any way and allows me to speed up the machine to the desired extent. Associated with the endless conveyor 120 is a slug cutter (see Figs. 2 and 26). The uprights 17 at the point where the slug cutter is located are considerably longer than the other uprights, the length being sufficient to provide ample clearance for the rotating arm carrying the cutting wire, and the upper ends of said pair of uprights 17 tied together at their top by a cross bar or plate 140. Secured to the front faces of the members 17 and in alignment with each other are bearing blocks 141 in which is rotatably mounted a shaft 142. Secured to the shaft 142 between the uprights 17 is a pulley or fly wheel 143. Secured to the pulley 143 by bolt 144 is a radially extending arm 145 provided on its extreme outer end with a substantially U-shaped member 146. To one arm of the U-shaped member 146 is attached a laterally extending bar 147 and to the bar 147 is secured a hook 148 to receive one end of a severing wire 149. This wire passes across the open end of the U-shaped member 146 and passes over a pulley 150 rotatably mounted at the free end of the opposite arm. The end of the severing wire 149 is attached to a hook 151 formed on the end of a rod 152. This rod passes up through a lug 153 formed on the U-shaped member 146 and at its upper end is pivotally attached to one end of a lever 154. The other end of this lever is pivotally attached to the lug 155 formed on the U-shaped member 146 and such member 154 is provided with an operating handle 156. Between the lug 153 and the upper end of the rod 152 is provided a coil spring 157. The arm 156 cooperates with the laterally projecting stud 158 on the fly wheel 143 and by means of which the lever 154 is locked in position. The spring 157 insures a yielding tension on the severing wire

149. Secured to one end of the shaft 142 is a ratchet and pawl driving mechanism 182 and on such ratchet and pawl mechanism is a sprocket 159. This sprocket is in alignment with a sprocket 160 rotatably mounted on a shaft 161 rotatably mounted in a suitable bearing 162 that is adjustably secured to one of the uprights 17 and above the shaft 142. The sprockets 159 and 160 are in alignment with a sprocket 163 secured to one end of a shaft 164 that is rotatably mounted in suitable bearings 165 adjustably mounted on guideways 166[a] secured to the longitudinally extending members 20. Over the sprockets 160 and 163 runs a chain 166, the direction of rotation of the shaft 164 being such that the fly wheel 143 rotates in the direction of the arrow shown in Fig. 2. The chain 166 also runs over the sprocket 159, the sprocket 159 acting in this instance as an idler sprocket for the chain 166, although the primary object of the chain 166 is to rotate the fly wheel 143 and parts carried thereby in the direction of the arrow shown in Fig. 2. Secured to the arm 167 on one of the uprights 17 is a brake spring 168 having secured thereto at its outer end a brake shoe 169 that engages with the periphery of the fly wheel 143. The brake shoe 169 being yieldably held against the periphery of the fly wheel 143, an even motion of the fly wheel and therefore all parts carried thereon, is assured. Secured to the shaft 164 adjacent to the end to which is attached the sprocket 163 is a sprocket 170. This sprocket 170 is in alignment with a sprocket 171 secured to a shaft 172 (see Fig. 3) that is rotatably mounted in suitable bearings 173 adjustably mounted on blocks or ways 174 secured to the longitudinally extending members 20. Means 175 is provided for adjusting the bearings 173 in the blocks or ways 174. The sprockets 170 and 171 are equal in pitch and diameter and the diameter is such that the endless sprocket chain 176 has its upper reach parallel to, and slightly below, the upper reach of the endless conveyor belt 120. Secured to the endless sprocket chain 176 and extending outward therefrom, or radially outward from either the shafts 164 or 172 when it passes over the sprockets 170 or 171, is an arm 177, said arm having attached thereto at its outer end a supporting strut 178, the other end of which is secured to the endless sprocket chain 176. The arm 177 is of such length that it will engage with the laterally extending member 147 on the U-shaped frame 146 and will engage with such member 147 and rotate the shaft 142, and therefore the parts carried thereby, at a faster rate of speed than such shaft would ordinarily be driven by the sprocket chain 166. Ordinarily the surface speed of the severing wire 149 is equal to the surface speed of the conveyor belt 120 and the surface speed of the sprocket chain 176 is equal to the surface speed of the conveyor 120. The sprocket chain 176 will therefore be driven (as will be hereinafter described) at such a speed that these objects may be carried out. As, however, the surface speed of the severing wire 149 must be greater than the surface speed of the endless conveyor belt 120, except when the U-shaped member 146 is in a substantially vertical plane, in order that a vertical cut in a single plane may be made in the slug material 139, there is provided the ratchet and pawl or other slip mechanism 182 so that the shaft 142 may be driven faster than the means that ordinarily drives the same. This means is the arm 177 that engages with the member 147 and insures that the onward speed or the rate of speed, from the position where the severing wire 149 engages with the slug material 139 until the severing wire 149 passes down through the material and thence outward again, will be equal to the rate of speed of the endless conveyor 120. The distance between the shafts 164 and 172 and the diameters of the sprockets carried thereby is such that the length of the endless sprocket chain 176 is equal to the length of the slug to be cut from the slug material 139. Therefore, in the present instance, but one arm 177 is required. Should it be desired, however, to cut a slug of lesser length, two or more arms similar to 177 may be attached to the sprocket chain 176 and the gearing for rotating the shaft 142 altered accordingly. This, however, is a detail of construction and does not affect the patentability of my device. The shaft 172 has secured thereto a sprocket wheel 179, such sprocket wheel being in alignment with a sprocket wheel 180 secured to the shaft 113 and over such sprocket wheels runs an endless sprocket chain 181.

On the frame members 20 in the rear of the shaft 113 are spaced uprights 182 and on the forward faces of these uprights are secured bearing blocks 183. Rotatably mounted in the bearing blocks 183 parallel to the shaft 113 is a shaft 184. On the shaft 184 between the bearing blocks 183 is secured a roller 185. By reference to Fig. 4 it will be seen that extending between the uprights 17 and 182 and on either side of the framework are bars 186 to the upper edge of which and on each side of the framework are rotatably mounted a plurality of anti-friction rollers 187, the upper edge of these rollers lying in a plane substantially that in which lies the upper reach of the conveyor belt 120. On the framework and at the rear of the uprights 182 are other uprights 17 and on the rear faces of these uprights are secured pillow blocks 188. Rotatably mounted in the pillow blocks is a shaft 189 lying parallel to the shaft 184. Secured to the shaft 189 between the pillow blocks 188 is a roller 190 substantially equal in diameter to the diameter

of the roller 185. Over the rollers 185 and 190 runs an endless conveyor belt 191, the upper reach of this conveyor belt being supported on its under surface by a plurality of anti-friction rollers 192 rotatably mounted in longitudinally extending bars 193. Secured to the bars 193 and extending downwardly therefrom are bearing brackets 194 in the lower end of which is adjustably and rotatably mounted a shaft 195. Secured to each end of the shaft are lever bars 196, these bars being provided at one end with an enlargement 197, each provided with a radially extending slot 198, while the other end is provided with adjustable weights 199. On the shaft 198 between the levers 196 is a roller 200 which engages with the outer surface of the under reach of the endless conveyor belt 191, as clearly shown in Fig. 5, and which acts to maintain tension on such endless conveyor belt. Rotatably mounted on the shaft 184 is a sprocket 201 secured to, or formed on, a member 229 which engages, by a ratchet mechanism, to a member 230 secured to the shaft 184. The sprocket 201 is in alignment with a sprocket 202 adjacent to one end of the shaft 136 and over these sprockets 201 and 202 runs an endless sprocket chain 203 and by means of which power is transmitted from the shaft 136 to the shaft 184 for the purpose of driving the endless conveyor belt 191, which conveyor belt is movable in the direction of the arrow shown in Figs. 4 and 5.

Secured to the under side of the frame members 20 in front of the uprights 182 are bearing blocks 204 and in these bearing blocks is rotatably mounted a shaft 205. Secured to the shaft 205 is a gear 206 which meshes with, and is driven by, a pinion 207 secured to the shaft 136. Secured to the shaft 205 between the bearings 204 and spaced apart from each other are cam discs 208 and 209, these cams being provided on one face with adjustable cam plates 210 and 211 respectively, the construction of these cam plates being clearly seen from an inspection of Figs. 4 and 27. On a cross bar 212 secured to the lower front faces of the uprights 182 is a bearing 213 which is in alignment with a bearing 214 secured to a cross bar or plate 215 secured to the rear faces of the next adjacent rear uprights 17. Rotatably mounted in the bearings 213 and 214 is a shaft 216 to the forward end of which is secured a downwardly extending arm 217. To the lower end of this arm is rotatably mounted a cam roller 218 that is adapted to engage with the adjustable cam 210 on the cam disc 208. To the end of the shaft 216 adjacent to the bearing 214 is an upwardly extending arm 219 and to the upper end of this arm is pivotally attached one end of a link 220. This link is pivotally attached at its other end to a lever 221 that is pivotally mounted at its lower end to the extreme lower end of a bracket 222 secured to one end of the cross bar or plate 215. The upper end of the lever 221 is forked, as indicated at 223, such forked end fitting over a clutch element 224 that is rotatable with, but slidable on, one end of the shaft 189. Between the outer end of the clutch member 224 and an adjustable stop member 225 on the end of the shaft 189 is a coil spring 226 which tends to urge the clutch member 224 to the left, as shown in Fig. 28, or into engagement with an associated clutch element 227. This clutch element 227 is rotatably mounted on the shaft 189. It will be seen that, therefore, as the shaft 136 is rotated, and, therefore, the gear 206 is rotated, the clutch members 224 and 227 are alternately brought into and out of engagement with each other by means of the cam plates 210 and lever 207 on the cam disc 208 and therefore that the endless conveyor belt 191 will be intermittently operated were it to depend for its operation on such clutch members 224 and 227. As a matter of fact, however, the endless conveyor belt 191 is alternately driven through the clutch members 224 and 227 at a rate of speed determined by the rotation of the shaft 136 and is also driven, but at a much higher speed, through mechanism that will be hereinafter described, such mechanism acting to drive the conveyor 191 when the clutch members 224 and 227 are out of engagement with each other.

To the rear of the shaft 189 and secured to the frame members 20 are uprights 231. Secured to the front faces of these uprights 231 are pillow blocks 232 in which is rotatably mounted a shaft 233, which shaft is parallel to, and spaced apart from, the shaft 189. Secured to the shaft 233 between the pillow blocks 234 is a roller 236 substantially equal in width and diameter to the roller 190 on the shaft 189. Secured to the rear faces of the next rearward uprights 17 are pillow blocks 237 in which is rotatably mounted a shaft 238. Secured to the shaft 238 is a roller 239 substantially equal in width and diameter to the roller 236 on the shaft 233. Over the rollers 236 and 239 runs an endless conveyor belt 240, the upper reach of which has its under surface engaged by a plurality of rolls 241 rotatably mounted in plates 242 extending longitudinally of the framework, being secured to the uprights 231 and 17. Adjacent to the pillow blocks 239 and secured to the lower edges of the longitudinally extending plates 242 are downwardly extending brackets 243 in the lower ends of which is rotatably and adjustably mounted a shaft 244. Secured to the shaft 244 adjacent to each of the brackets 243 are parallelly arranged lever arms 245. These arms are provided with weights 246 adjustably attached to one end thereof, while at the other and upper end are provided radial slots in which is rotatably mounted a shaft 247 having se-

cured thereto an idler roller 248 which engages with the under surface of the lower reach of the conveyor belt 240. This belt 240 runs in the direction of the arrow shown, for example, in Fig. 5. It will be noted that the endless conveyor belt 240 is not positively driven and therefore this belt is an idler belt, the motion imparted thereto depending on the motion of the positively driven belt 191, such motion, of course, being imparted thereto by means of the slugs 139. Adjacent to, and in the rear of, the pillow blocks 239 on the frame members 20 are uprights 249 on the front faces of which are secured pillow blocks 250. Rotatably mounted in the pillow blocks 250 is a shaft 251 and to one end of this shaft 251 is secured a sprocket wheel 252, this sprocket wheel being in alignment with, and of substantially the same pitch and diameter as, the sprocket 228 on the reduced portion of the clutch member 227 on the shaft 189. Over the sprockets 228 and 252 runs an endless sprocket chain 253 and by means of which motion is imparted to the shaft 251 and the clutch member 227.

At the rear of the longitudinally extending framework and on the upper end of the frame members 20 thereof are upwardly extending frame members 254. On the rear face of these frame members 254 are secured pillow blocks 255 on which is rotatably mounted a shaft 256 arranged parallel to the shaft 251. Secured to the shaft 256 between the pillow blocks 255 is a roll 257 of suitable diameter and width. Secured to the shaft 251 between the pillow blocks 250 is secured a roll 258 substantially equal in width and diameter to the roll 239 on the shaft 238. Over the rolls 257 and 258 runs an endless conveyor belt 259 and the upper reach of this belt is maintained substantially horizontal and in the same horizontal plane as the upper reach of the belt 240 by a plurality of rolls 260, such rolls being rotatably mounted in longitudinally extending members 261. Adjacent to the roller 257 and secured to the under edge or face of the longitudinally extending members 261 are brackets 262. In these brackets and at the lower end thereof is rotatably and adjustably mounted a shaft 263 to which is secured rearwardly extending spaced arms 264. The outer and lower ends of these arms are provided with radial slots in which is mounted an idler roller 266 that engages with the under side of the lower reach of the endless conveyor belt 259. Secured to the brackets 262 and extending downwardly therefrom are members 267 provided with arcuate slots 268 in which is adjustably mounted pivot bolts 269. Pivotally mounted on such pivot bolts 269 intermediate their ends are levers 270, which levers are also pivotally mounted at their rearward ends to the rearwardly extending arms 264 and such members 270 are provided at their forward ends with counterweights 271, this mechanism providing for an adjustable tension to be transmitted to the endless conveyor 259 by the roll 266. Secured to one end of the shaft 256 is a gear 272 which meshes with, and is driven by, a gear 273 secured to a shaft 274 lying parallel to the shaft 256 and rotatably mounted in bearings 275 secured to the top surface of the longitudinally extending frame members 20. As above described, power is transmitted from the motor 82 to the shaft 72 through the shaft 87, and such shaft 87 has been described as having secured thereto a slip clutch member 90. Referring now to Fig. 79, it will be noted that the slip clutch mechanism 90 has associated therewith a slip clutch mechanism 276 slidable on, but rotatable with, a shaft 277, such shaft being rotatably mounted in bearings 278 secured to base members 279. Engaging with an element 280 of the slip clutch mechanism 276 is a lever 281 which is pivotally attached at its lower end to the rod 282 attached to the bearing member 89, while its upper end is pivotally attached to the rod 283, the free end of which passes through a perforation in the upper end of the bearing member 89 and has threaded thereon a hand nut 284. Between the inner end of the hand nut 284 and the bearing member 89 is a coil spring 285. It will be seen that, by properly adjusting the hand nut 284 on the rod 283, the tension exerted by the lever 281 on the slip clutch element 276 may be regulated at will. Secured to the shaft 277 adjacent to one of the bearings 278 is a coupling member 286. Cooperating with the coupling member 286 and rotatably mounted on the shaft 277 is a coupling member 287 The members 287 and 286 are geared together by a ratchet and pawl driving mechanism so that, while the member 286 is rotating in one direction, the member 287 will be driven at the same speed in the same direction, while the member 287 may be driven in the same direction, but faster than the member 286. Secured to the member 287 is a sprocket wheel 288 which is in alignment with a sprocket wheel 289 secured to the shaft 274. Over the sprockets 288 and 289 runs an endless sprocket chain 290 and the sprocket wheel 289 being greater in diameter than the sprocket wheel 288, the shaft 274 will rotate at a slower speed than the shaft 277. With this combination, therefore, the shaft 256 and the mechanism dependent for driving on the shaft 256 will be driven at a predetermined rate of speed, depending on the speed of the motor 82. Slidably mounted on the shaft 277, but rotatable therewith, is a clutch member 291 constantly urged to the left, as viewed in Fig. 79, by a coil spring 292 engaging the end thereof and abutting against a nut or washer 293 secured to the end of the shaft. Rotatably mounted on the

shaft 277 and abutting against one of the bearings 278 is a clutch member 294 which cooperates with the clutch member 291, and secured to the reduced portion of the clutch member 294 is a sprocket wheel 295. This sprocket wheel is in alignment with a sprocket wheel 296 secured to the shaft 274 and over these sprocket wheels runs an endless sprocket chain 297. The sprocket wheel 295 is greater in diameter than the sprocket wheel 288 and the sprocket wheel 296 is smaller in diameter than the sprocket 289. Therefore, if the clutch members 291 and 294 are brought into engagement with each other, the shaft 274 will be driven at a rate of speed greater than the rate of speed imparted to it by the sprockets 288, 289 and endless chain 290, assuming the speed of the motor 82 to be constant. Forming part of the frame structure is a transverse bar 298 and on the upper surface of this bar is an upright 299. Pivotally attached to the upper end of this upright is a downwardly extending clutch lever 300, the lower end of which is forked, as indicated at 301, and engages with the clutch member 291. Pivotally attached to the clutch member or lever 300 intermediate its ends is one end of a connecting rod 302, the other end of this connecting rod being pivotally attached to a crank arm 303 secured to the extreme rear end of a shaft 304. This shaft 304 extends longitudinally of the machine and in a forward direction, suitable intermediate bearings being provided, and at its front end is rotatably mounted in a bearing 305 secured to the front face of the cross bar 212. Secured to the forward end of the shaft 304 is a downwardly extending arm 306 provided at its lower end with a cam roller 307 adapted to engage with the adjustable cam plate 211 on the cam disc 209. The cam plates 210 and 211 are so arranged with respect to each other on their respective discs 208 and 209 that the downwardly extending arms 217 and 306, engaging with such cam plates respectively, will rotate the shafts 216 and 304 in proper order to bring either the clutch members 224 and 227 or the clutch members 291 and 294 into engagement whereby the conveyors 259, 191, and 210 will be driven from the shaft 277 either through the sprocket wheel 288 or the sprocket wheel 295 respectively. When driven from the sprocket wheel 288, the speed of the various conveyor belts maintains a certain relation to the speed of the driving motor 82, which is assumed to be constant, and if driven from the sprocket wheel 295, the speed of the conveyor belts will also bear a certain relation to the assumed constant speed of the driving motor, but this assumed constant speed of the conveyors will be greater than the speed of the conveyors when driven from the sprocket wheel 288. As a matter of fact, the speed of the conveyor belts when driven from the sprocket wheel 295 is twice that when driven from the sprocket wheel 288.

As heretofore pointed out, the shaft 72 is driven from the motor 82 through a slip clutch mechanism 97, this slip clutch mechanism being connected to the shaft 87 through the bevel pinion 91 and bevel gear 92. As the shaft 72 drives the conveyor 34 and as the speed of the conveyor 34 should bear a predetermined relation to the speed of the remaining conveyors, I have attached to the shaft 72 a bevel gear 308 which meshes with a bevel pinion 309 secured to one end of a shaft 310 that is rotatably mounted in bearings 311 arranged transversely of the machine. The shaft 310 is divided into two sections, the section remote from the bevel pinion 309 having keyed thereto a worm 312. Between the sections of the shaft 310 is a ratchet clutch 313 and by means of which the various sections of the shaft may be rotated in the same direction, but at different speeds. The worm 312 meshes with, and drives, a worm wheel 314 secured to the forward end of a shaft 315 rotatably mounted in bearings formed in the block 316 that is secured to the base of the machine. The upper rearward end of the shaft 315 is rotatably mounted in a bearing 317 secured to the base of the machine and at its extreme forward end such shaft 315 is provided with a bevel gear 318. The bevel gear 318 meshes with a bevel pinion 319 secured to the shaft 277. By means of the mechanism just described, the shaft 315 and a portion of the shaft 310 may be driven at varying speeds, but the varying speeds bear a constant relation to the varying speeds of the shaft 72, while the motor speed 82 is a constant.

As above stated, the sills 10 extend from a point adjacent to the brick machine 12 to a point adjacent to the pit 13. This pit is of any suitable dimensions as regards length, breadth and depth, and on the end of the pit remote from the sills 10 is built up a rectangular framework of ordinary structural steel, this framework being designated generally by the reference numeral 320. Extending between the sills 10 adjacent to the rear ends thereof is a base plate 321 to which is secured an upwardly extending rod 322. Slidably mounted on the rod 322 is a cap or buffer plate 323 mounted for reciprocation on the base plate 321 by bars 324. Between the upper surface of the base plate 321 and the under surface of the plate 323 is a compression spring 325. Secured to the ends of the sills 10 are bearings 326 in which is rotatably mounted a shaft 327. Secured to the shaft 327 adjacent to each end thereof are links 328, these links being arranged in pairs, as shown in Fig. 29, and pivotally attached in each pair of links on a shaft 329 is the lower end of a connecting link 330. The upper end of the connecting links 330 are rotatably mounted on a shaft 331 that is, in turn, ro-

tatably mounted in suitable bearings 332, riveted or otherwise suitably secured to the sides of an elongated rectangular frame designated generally by the reference numeral 333.

Secured to the lower end of the rectangular framework 333 by riveting, or in any other suitable manner, is a plate 334 provided with a perforation through which is slidably mounted the vertical rod or shaft 322. Secured to one end of the shaft 327 is a bell crank lever, the rearwardly extending arm 335 of which has secured thereto, a bar 336 and on such bar is adjustably mounted a counterweight 337. The counterweight 337 is sufficiently heavy to maintain the rectangular framework and parts carried thereby and attached thereto in a position with the plate 334 out of engagement with the buffer plate 323 or in the position indicated in Figs. 8, 29 and 30. The other end of the rectangular frame 333 (see Fig. 11) is provided with a plate 338 similar to the plate 334 above described. This plate 338 is perforated to be a sliding fit on the upwardly extending shaft 339 secured to the base of the rectangular member 320, and also slidably mounted on the shaft 339 is a buffer plate 340 maintained in the upward position by compression spring 341, the upward movement being limited by means similar to that described with respect to Figs. 8 and 29. Secured in the rear end of the rectangular frame 333 is a shaft 342 and on each end of the shaft is pivotally attached the upper end of a connecting link 343. The lower end of the links 343 are pivotally attached to a transversely arranged shaft 344. Numeral 345 designates one of a pair of bearings secured to the base of the rectangular framework 320, and rotatably mounted in such bearings is a shaft 346. Secured to the shaft 346 adjacent to each end thereof is a rearwardly extending crank arm 347, the free end of each of which is pivotally attached to the shaft 344. Also secured to the shaft 346 is a forwardly and downwardly extending member 348, this member having secured thereto a downwardly and forwardly extending bar 349 on which is adjustably mounted a counterweight 350. The counterweight 350 is ordinarily sufficient to maintain the plate 339 out of engagement with the buffer plate 334 to hold, therefore, the elongated rectangular framework 333 in its upward or normal position or in the position indicated in Fig. 11. As it is essential to maintain the rectangular framework 333 and all parts associated therewith in horizontal position and as it might be possible that more weight would be on one end of the rectangular framework 333 than on the other, I have provided means whereby a downward movement of one end will cause an equal and like movement transmitted to the other end. The bell crank lever described as being secured to the shaft 327 has an upwardly extending arm 351, the upper free end of which has pivotally attached thereto one end of a connecting link 352. This connecting link 352 extends rearwardly alongside of the rectangular framework 333 and is pivotally attached at its rear end to the upper end of a crank arm 354. The crank arm 354 is secured to a shaft 355. Also secured to the shaft 355 and extending forwardly therefrom are crank arms 356, these arms being pivotally attached to the shaft 344 associated with the crank arms 347. Pivotally attached to the shaft 355 is the upper end of a link 357, the lower end of this link being provided with a shaft 358. The mechanism just described provides an equalizing device for the rectangular framework 333 and all parts associated therewith and carried thereby and which device will maintain the rectangular framework substantially horizontal at all times. Spaced along the length of the elongated framework 333 and secured to the top surface thereof by bolts 359 and arranged in pairs are bearing members 360 and in each pair of bearings 360 is rotatably mounted a shaft 361, these shafts being, therefore, arranged parallel to each other. Secured to the shaft 361 and arranged parallel to, but spaced slightly apart from, each other are pulleys or rollers 362. By reference to Fig. 30, it will be noted that the second shaft 361 from the left of such figure, and comparing such figure with Fig. 8 it will be noted that the second shaft in Fig. 8 measured from the left of such figure, extends laterally outward beyond the limits of the rectangular framework 333, and on the left hand end, as viewed in Fig. 30, such shaft 361 has secured thereto a sprocket wheel 363. This sprocket wheel is in alignment with a sprocket wheel 364 secured to one end of the shaft 274 (see Fig. 7). Over the sprockets 363 and 364 runs an endless sprocket chain 365 and by means of which power is transmitted from the shaft 274 to the shaft 361. Secured to the right hand upright 17, shown in Fig. 7, is a bracket 366 to the top end of which is rotatably mounted a sprocket wheel 367 which engages with the lower reach of the endless sprocket chain 365 and which bracket and sprocket wheels 366 and 367 respectively are utilized as tension devices for such endless sprocket chain. Referring to Figs. 8, 9, 10, and 11, it will be noted that, beginning with the second shaft 361 from the left of Fig. 8, every fourth shaft 361 to the right of such figures is provided on one end with a bevel gear, these gears being designated generally by the reference numeral 367 and of equal pitch and diameter. Rotatably mounted in suitable bearings secured to the rectangular framework 333 and on the opposite side thereof from the chain 365 is a longitudinally extending shaft 368. Secured to such shaft at intervals are bevel gears 369 which engage with the bevel gears 367[a]. The bevel gear 367[a] on the end of the second shaft

361 shown in Fig. 8 drives the bevel gear 369 and, therefore, the shaft 368, while the other bevel gears 369 on the shaft 368 drive the bevel gears 367ª and, therefore, the shaft 361 to which they are attached. Secured to the upper surface of the bearings 358 and spanning each pair of bearings 368, measured from the right in Figs. 8, 9, 10, and 11, are bearing plates 370, the plates on either side of the rectangular frame being arranged in pairs, and in each pair of bearing plates 370 are rotatably mounted shafts 371, each shaft having secured thereto a roller 372. The extreme forward end of the rectangular framework 333 is provided with extension bars 373 on which are arranged pairs of bearing plates 370 similar to those described as being mounted on the bearing members 358. Referring now to Fig. 7, it will be seen that to the left hand face of the extreme right hand uprights 17 are secured bearings 374 and in these bearings is rotatably mounted a shaft 375. Secured to one end of the shaft 375 is a gear 376 which meshes with, and is driven by, a gear 273 on the shaft 274. Secured to the shaft 375 between the bearings 374 is a roller 377, the upper portion of which is in substantially the same horizontal plane as lies the top edge of all of the rollers 372 in the bearing plates 370. Referring now to Fig. 11, it will be noted that the shaft 342 has secured thereto connecting arms 378, these arms being each provided with an elongated slot 379 on their top ends, and adjustably mounted in such elongated slots is a shaft 380. Rotatably mounted on the shaft 380 is a roller 381. Over the roller 377, the roller 381, all of the rolls 372, and under all of the rolls 362 runs an endless conveyor belt 382. The function of the plurality of pairs of bevel gears 367ª and 369 will now be apparent as it is obvious that friction will be reduced by positively driving the train of rollers over which the endless conveyor belts 382 pass if a plurality of the same are positively driven. Also, it will be apparent that the speed of the travel of the endless conveyor belt 382 bears a direct relation to the speed of travel of the conveyor belt 259. Between the rollers 257 and the roller 377 is arranged a transversely extending plate 383, this plate being secured to uprights 384 secured to the upper surface of the rear ends of each of the members 20. Secured to the top plate 383 are guide plates 385 and through which the slugs of brick 139 are guided onto the endless conveyor belts 382.

As above stated, the framework 333 extends across the entire width of the pit 13 and this pit is of any desired length, the length being assumed to extend transversely of the length of the framework 333. At each end of the pit 13 are located wells 386 in which are located lift mechanism to be hereinafter described. In the well 13 spaced apart from each other and extending longitudinally of such well with each end thereof extending over the pits 386 are a plurality of parallelly arranged I beams 387, such I beams being each composed of a pair of channel irons placed back to back, as clearly shown in Figs. 8, 9, and 11. Secured to each of the I beams 387 by bolts 388 are bearing blocks 389, and in these pillow blocks are rotatably mounted a plurality of parallelly arranged shafts 390 which extend transversely of the length of the pit 13. Secured to each of these shafts at intervals along their length are grooved pulleys 391. In the structure shown in the drawings, each of the shafts 390 has thereon three of the grooved pulleys 391 and such pulleys on all of the shafts are arranged in groups, the pulleys of each group being in alignment with each other and constituting a rolling track for receiving track members 392 and which will be later described in detail. Each of the shafts 390 has attached thereto, adjacent to one of the bearings 389, a sprocket 393, these sprockets 393 being arranged in pairs and over the pairs of sprockets run endless sprocket chains 394. The sprockets 393 are equal to each other in pitch and diameter and the shafts 390, therefore, are positively driven in the same direction and at the same speed simultaneously. Secured to one end of one of the shafts 390 is a sprocket wheel 395 which is in alignment with a sprocket wheel 396 secured to a shaft 397.

Mounted on a base adjacent to the delivery end of the conveying belts 382 is a base 398, and secured to said base, one end thereof, is a driving motor 399. The driving pinion 400 of the motor 399 meshes with and drives a gear 401 secured to a shaft 402, rotatably mounted in bearings 403 on the base 398. Also secured to the shaft 402, is a pinion 405 which meshes with and drives a gear 406, secured to the shaft 407, rotatably mounted in suitable bearings in the base 398 and lying parallel to the shaft 402. Secured to one end of the shaft 407 is a sprocket wheel 408 in alignment with a sprocket wheel 409 on the shaft 397. Over the sprockets 408 and 409 runs a sprocket chain 410 and by means of which power is transmitted to the shaft 397. As above described, the sprocket wheel 396 secured to the shaft 397 is in alignment with the sprocket wheel 395 on one of the shafts 390. This particular shaft 390 is made in two portions connected together by means of a clutch mechanism 411, the function and operation of which will be hereinafter described. Over the sprockets 395 and 396 runs a sprocket chain 412.

On each side of the pit 13, resting on the foundation 14, are brackets 413, such brackets being arranged in pairs and on each pair extending across the pit 13 are channel members 414. Secured to the top of the channel members 414 and extending parallel to, but above the I beams 387 are I beams 415. By refer-

ence to Figs. 36, 38 and 39, it will be noted that the pairs of brackets 413 are again arranged in pairs extending longitudinally of the pit 13 and that there are two lengths of channel members 414, the lengths being separated from each other to form a passage for the bridge structure disclosed in side elevation in Figs. 8, 9, 10, 11 and 12 and end sectional elevation in Fig. 38. On the members 415, shown in side elevation in Figs. 36 and 38, are secured bearing blocks 416. It should be understood that Figs. 36, 38 and 39, for example, represent a side elevation of the mechanism shown in plan view in Figs. 68, 69, 70 and 71 and that while only one I beam 415 has been shown or described, that necessarily there are a plurality of such I beams extending longitudinally of the pit 13 and, therefore, that the plurality of bearing members 416 are mounted on the plurality of I beams 415. Extending transversely of the pit 13, therefore, these bearing members 416 are arranged in groups, the bearings of the members of each group being in alignment with each other and in such groups are rotatably mounted shafts 417. On such shafts are secured grooved wheels 418, being similar in number and position to the grooved wheels 391 described as being secured to the shafts 390. Also, on some of the shafts 417, though not necessarily on all of such shafts, are secured sprocket wheels, such sprocket wheels being arranged in pairs with relation to adjacent shafts 417 and over such pairs of sprockets run sprocket chains 419. Such sprocket chains 419 are positively driven and, therefore, this construction allows the shafts 417 to be positively driven in the same direction at the same speed. The I beams 415, shown in side elevation in Fig. 39 and resting on the original beams 414, are similar in number and arrangement to the I beams 415 shown in Figs. 36 and 38, and on top of the I beams 415 shown in Fig. 39 are secured bearing members 420, these bearing members being arranged in groups, and each group being in alignment with each other, there is rotatably mounted therein a plurality of parallelly arranged shafts 421 provided with grooved pulleys 422.

Secured to the shaft 407, intermediate the ends thereof, is a pinion 425 which meshes with and drives a gear 426 rotatably mounted on a shaft 427 that lies parallel to the shaft 407 in suitable bearings on the base 398. Also on the base 398 in suitable bearings and parallel to the shaft 427 is a shaft 428 and rotatably mounted on this shaft and meshing with and driven by gear 426 is another gear 429 similar in pitch and diameter to such gear 426. Secured to one end of the shaft 427 is a circular plate 430 and to such plate is adjustably secured a cam race 431. Formed integral with and extending outward from the intermediate portion of the base 398 and spaced apart from each other are bearing members 432, these members being in alignment with each other and rotatably mounted in such bearings is a shaft 433. Secured to the shaft 433 adjacent to one end thereof is a downwardly extending arm 434, the lower end of this arm being forked. In the forked end of the arm 434 is a cam roller 435 which engages with the cam race 431. In the normal position of the cam race 431 and cam roller 435, such roller resting near the end of the cam race and as the shaft 427 rotates in the direction of the arrow shown in Fig. 32, for example, a relatively small angular rotation of such shaft will move the cam race 431 from engagement with the cam roller 435 and will allow the shaft 433 to rotate in the direction of the arrow shown, for example, in Fig. 12. Secured to the shaft 433 adjacent the end remote from the arm 434 is a downwardly extending arm 436. The lower end of this arm 436 is forked, as shown in Fig. 32, and pivotally mounted in such forked end is one end of a connecting rod 437. The other end of this connecting rod 437 is pivotally attached to the shaft 358 on the lower end of the crank arm or member 357. Referring now to that portion of the device illustrated in Figs. 8, 9, 10 and 11, it will be obvious that the framework swung on the shafts 327 and 346 is held in its uppermost position with the top surface of the endless conveyor belt 382 in its uppermost position by reason of the fact that the cam roller 435 engages with the cam race 431 and thus prevents movement to the right of the connecting rod 437, as viewed in Fig. 11, and, therefore, prevents the weights 337 and 350, as well as the load carried on the endless conveyor belt 382, from forcing the framework referred to downward. The object of permitting a downward movement of the framework and conveyor belt 382 is to permit a lateral movement of the slug carrier. There are a plurality of these carriers employed, each carrier consisting essentially of a plurality of equally spaced vertically arranged plates 438, the lower edges of which are serrated, as indicated at 439, and to the lower portions of the serrations 439 are riveted secured to floor plates 440. To certain of the floor plates 440 and on the under side thereof are secured the tracks 392, which engage with the plurality of rollers 418 on the shafts 417, with reference to Figs. 36 and 38, and with the rollers 422 secured to the shafts 421, with reference to Fig. 39, as well as engaging with the rollers 391 arranged below the rollers 418 and 422. The plates 438 of the carriers are equal in length to the length of the slug of clay 139 and by reference to the drawings, it will be noted that the side plates are provided with vertically arranged slots 442, the slots being arranged parallel to each other and the distance between slots

being equal substantially to the length of the brick it is desired to make. When the plates 438 are built into a carrier, the slots 442 are in alignment with each other, making it possible for a saw to pass through the slugs of brick contained between adjacent plates 438 without danger of dulling the saw or injuring the carrier. The plurality of saws by which this operation is performed will be hereinafter described. Also secured to the under surface of some of the floor plates 440 and extending transversely of the carrier or parallel to the track members 392, are racks 443. Preferably there are two of these racks and such racks mesh with gears 444 (but one of which is shown) secured on a shaft 445 rotatably mounted in suitable bearings on top of the I beams 415. This shaft is connected through coupling 446 to a shaft 447 rotatably mounted in suitable bearings on the base 398. Secured to the shaft 447 is a pinion 448 which meshes with and is driven by a gear 449 secured to a shaft 450 rotatably mounted in suitable bearings on the frame 398 and parallel to the shaft 447. Secured to one end of the shaft 450 is a ratchet 451. Secured to one end of the shaft 428 is a balanced crank arm 452 and pivotally mounted at the free end of such crank arm 452 is one end of a connecting rod 453. The other end of this connecting rod 453 is pivotally connected to the free end of a lever 454, that is rotatably mounted on the shaft 450 adjacent to the ratchet 451. Pivotally mounted on the lever 454 is a spring pressed pawl 455 which engages with the teeth in the ratchet 451 and on oscillation of the lever 454 causes an intermittent rotary movement of the shaft 450 and all parts attached thereto in the direction of the arrow shown in Fig. 33, this rotation in turn causing an intermittent rotary movement of the shaft 447 and, therefore, an intermittent rotary movement of the shaft 445 and all parts carried thereby and thereon. The ratio existing between the gears 429, 449, 448 and gear 444 on the shaft 445 is such that one revolution of the shaft 428 will cause the crank arm 452 to move, by means of the connecting rod 453, the lever 454 through one-sixth of a revolution and this will cause the shaft 447 to rotate through one-half a revolution and will cause the gear 444 to move the slug carrier to the right, as viewed in Fig. 38, a distance equal to four of the slugs 139, or so as to bring the second succeeding pair of spaces between adjacent parallel plates 438 into position relative to the parallelly arranged endless conveyor belts 382.

This is the abnormal operation and double spacing of the slug carrier and is only necessary when certain desired structures such as finger courses are being formed and only at the end of the carrier. To provide for the ordinary or normal operation of the carrier, that is, a step-by-step movement, two spaces at a time, I associate with the gear 426 a clutch member 501, this member being secured to and rotatable with said gear 426. Secured to the shaft 427 is a solenoid 502, this solenoid being provided with a spring-pressed plunger 503 controlling the association of the clutch member 501 and a clutch member 504 secured to and rotatable with the shaft 427. Break points for the controlling circuit of the solenoid 502 are indicated at 505. Secured to one end of the shaft 427 is a balanced crank arm 506, to the free end of which is pivotally attached one end of a connecting rod 507. The other end of this connecting rod 507 is pivotally attached to the free end of a lever 508 that is rotatably mounted on a shaft 509. The shaft 509 is rotatably mounted in suitable bearings in the base 398 and such shaft has secured thereto a pinion 510 that meshes with and drives the gear 449 above described. Pivotally mounted on the lever 508 is a spring-pressed pawl 511 adapted to engage with a ratchet 512, secured to the shaft 509. The gear 510 is equal in pitch and diameter to the gear 448 and such gears 510 and 448 are connected together by the gear 449. Therefore, rotation of the gear 510 will cause an equally angular rotation in the same direction of the gear 448. The ratio of the gears 426 and 510 is such that a rotation of the shaft 427 will cause through the connecting rod 507 and lever 508 an angular rotation of the gear 510 through one-sixth of a revolution and, therefore, an angular rotation of the gear 448 through one-sixth of a revolution and one-sixth of a revolution of the gear 448 is sufficient to cause through the medium of the shaft 445 and the gear 444 thereon a lateral movement of the slug carrier through two spaces or through the width of two of the slugs 139. By utilizing a proper commutating device, I am enabled to operate the shaft 427 to cause an intermittent movement of the shaft 445 to move the slug carrier through two spaces or to operate the shaft 428 to cause an intermittent movement of the shaft 445 and thus a movement of the slug carrier through four spaces. When the shaft 428 is operated to cause a rotation of the gear 449, it will be understood, of course, that there is a simultaneous movement of the ratchets 451 and 512 and their respective pawls, but as the angular movement of the gear 449 is less than the angular movement of the gear 510, the ratchet 512 will slip with relation to the pawl 511.

By reference to Fig. 33 it will be noted that the crank arm 452 is in the extreme limit of its travel with respect to the connecting rod 453 and that at this time the spring-pressed pawl 455 is slightly above one of the teeth of the ratchet 451. Under these circumstances no rotary movement of the shaft

450 will take place until the crank arm 452 has moved a predetermined angular distance about the shaft 428 as a center. This angular distance is approximately equal to or slightly greater than the angular distance between the contacting of the cam roller 435 and the cam race 431, shown in Fig. 32, so that immediately after the cam roller 435 has ridden off the cam race 431 and allowed the connecting rod 437 to move to the right, as shown in Fig. 11, and the frame 333 and all attached parts carried thereby dropped into its lowermost position with the upper face of the endless conveyor belts 382 below the level of the floors 440 of the carriers, the shaft 447 begins its rotation and transmitting power to the shaft 445 and gears 444 associated therewith, the slug carrier will be moved to the right, as shown in Fig. 38. This entire movement takes place during the first half of the revolution of the shaft 427 and on the second half of such revolution the cam roller 435 rides up on the cam race 431, the riding up movement causing a rotation of the shaft 434, forcing the connecting rod 437 to the left, as viewed in Fig. 11, to bring the frame 333 and all parts attached thereto and associated therewith back into the normal or initial position as shown in such figure.

The means by which the above sequence of operations just described is initiated consists essentially of the following. On the shaft 428 is rotatably mounted the gear 429, this gear being driven, as above described, directly from the gear 426. Associated with the hub of the gear 429 is a clutch plate 456. Secured to one face of the gear 429 is a cam 457 that normally engages with a spring-controlled plunger armature 458, this armature being associated with a soleniod 459 secured to a clutch member 460 attached to the shaft 428. On the member 460 is a weight 461 to counter-balance the weight of the solenoid 459. The solenoid is ordinarily energized and thus maintains the member 458 out of engagement with the clutch plate 456 and such clutch plate 456 will, therefore, rotate with the gear 429 and independently of the clutch member 460 and the shaft 428. While the circuit for the solenoid 459 is not shown and is not necessary to an understanding of the present invention, yet I have indicated break points in such circuit at 462 in Fig. 33 and another break point in such circuit at the point 463 in Fig. 11 and 74. In addition to the two break points mentioned, I have provided a still further means for maintaining the energizing circuit for the solenoid 459 closed except under predetermined conditions regardless of whether or not the break points 470, 469 are operated. Referring for a moment to Figs. 74 and 75, which are views on an enlarged scale of the structure shown in the upper right-hand portion of Fig. 11, 464 designates generally a portion of the framework of the machine and mounted on this portion is a base 465, adjacent one end of which is adjustably mounted a bracket 466. Secured or formed integral with the bracket 466 is a forwardly extending member 467, in which is secured a laterally extending shaft 468. On the member 467 is secured contactor points 469, and associated with these points is a switch blade 470 secured to arms 471 rotatably mounted on the shaft 468. Also formed integral with the member 467 and extending upwardly therefrom, is an arm 472 and slidably mounted in the upper end of this arm is a hook bolt 473, the rear end of this hook bolt being threaded, as shown in Fig. 74, and provided on either side of the arm 472 with adjusting nuts 474 and by means of which the position of the hook bolt 473 relative to the arm 472 may be adjusted. Secured to the forward end of the hook bolt 473 is one end of a coiled spring 475, the other end of this coiled spring being attached to the upper end of the pivotally mounted member 471. The lower portion of the arm 471 lies in the path of movement of the on-coming slugs of clay 139 and is adapted to be engaged thereby to rotate the member 471 and force the switch blade 470 out of engagement with the contact points 469 against the tension of the spring 475. Slidably mounted in the bracket 466 and the extension 467 thereof and on each side of such members are shafts 476, the forward ends of these shafts being adapted to be engaged by and acting as stops for the lower portion of the pivoted member 471. The rear portions of the shafts 476 are slidably mounted in bearings formed adjacent to the top of a bracket 477 that is slidably mounted on the upper portion of the base 465. The rear portion of the shafts 476 are enlarged, as indicated by a reference numeral 478, and such enlarged portions are each provided with a vertical slot 479, in which fits a laterally extending pin 480, secured to the outer faces of the lower ends of downwardly extending levers 481. These levers 481 are secured to a shaft 482 that is rotatably mounted in bearings formed in the upper end of a member 483 that is secured to the top of the bracket 477 by bolts 484. Secured to the shaft 482, between the downwardly extending levers 481, is a boss 485, this boss being separated from one of the bearings formed in the member 483. Surrounding the shaft 482 is a coiled spring 486, one end of which is secured to the boss 485 and the other end is secured to one of the bearings 483. The spring 486 is so wound and positioned as to constantly urge the shaft 482 to rotate in the direction of the arrow shown in Fig. 74 and thus move the shafts 476 to the left, as shown in such figure, toward the lower portion of the member 471. Secured to the outer end of the shaft 482 is a crank arm 487 and to the

outer end of this arm is pivotally attached one end of a spring member 488, the lower end of this spring member being attached to any convenient portion of the frame work 464. The tension of the spring member 488 is so arranged as to work in opposition to the tension of the spring 486 so that the shafts 476 are held against movement in either direction under spring tension. Secured to the rear end of the bracket 477 is one end of a bolt 489, the extreme rear or right-hand end of this bolt being reduced in diameter, as viewed in Fig. 74, and such reduced end is threaded and passes through a bearing member 490, that is secured to the right-hand end of the base 465. Mounted on the reduced threaded end of the member 489 is a hand wheel 491, and by means of which movement of the bracket 477 and all parts carried thereon or thereby to the right or left is accomplished to vary the distance normally existing between the rear face of the lower end of the member 471 and the left-hand end of the shaft 476. It will be obvious from the above that if a pair of slugs 139 are being moved to the right on the endless conveyor belts 382, as shown in Figs. 8, 9, 10 and 11, that when such slugs engage with the outer face of the lower end of the pivoted member 471, that such member will be rotated in an anti-clockwise direction to move the switch blade 470 out of engagement with the switch points 469, thus breaking the energizing circuit for the solenoid 459. The solenoid 459 being de-energized, the spring-pressed plunger armature thereof will be moved to the right, as viewed in Fig. 12, carrying the member 458 thereon into position to bring the clutch members 456 and 460 into association with each other and cause a rotation of the shaft 428. As above described, this will cause, first, a dropping of the frame 333 and parts carried thereby downward a sufficient distance to have the upper face of the endless conveyors 382 clear the lower surface of the slug carrier and afterwards a lateral movement of the slug carrier so as to bring the next two unoccupied spaces between adjacent plates 438 into alignment with the endless conveyor belts 382.

The above describes the normal and usual operation of moving slug carriers intermittently into position to have slugs of clay 139 placed therein. In the mechanical handling of brick in the process of manufacture, however, such brick are of necessity, and for convenience, placed in stacked relation in such a manner that the stacks may be handled by mechanical means, that is, lifted up by a lifting arrangement and placed in a kiln in stacked or hacked formation. To accomplish this the first two courses of brick are designated finger courses and such finger courses will contain a less number of rows of bricks made from slugs 139 than the succeeding courses. It, therefore, becomes necessary to devise means for skipping some of the spaces between adjacent plates 438, or, in other words, to place a less number of parallelly arranged slugs in the carriers for the finger courses than is required for the other courses. For the most economical operation of my device I have devised the carriers with 24 parallelly arranged spaces into which slugs are automatically placed by the machine and in order to arranged for the brick courses, I preferably skip the last third group of two spaces or grooves between adjacent plates, fill the next or second last pair of spaces or grooves and skip the last pair of spaces or grooves. This will be more clearly apparent from an inspection and study of Figs. 46, 50, 51, 81 and 82, wherein is shown a device for building the finger courses. This machine or finger course building table consists essentially of uprights 492, supporting at their upper ends a platform 493, on which is arranged a plurality of parallelly arranged and laterally movable slats 494. These slats are ordinarily arranged in the position shown in plan view in Fig. 50, or in elevation in Fig. 81, and it will be seen that while ordinarily there are twenty-four parallelly arranged spaces in a carrier, yet the number of slats 494 in the finger course building table has but twenty of such slats and there is at the extreme left-hand portion of Fig. 81, a space for two of such slats 494 and adjacent the next pair 494 is an open space large enough for two more of such slats. As stated above, the slats 494 are interconnected together and the linkage for interconnecting them together is pivotally attached to the upper end of a lever 495 rotatably mounted in bearings 496 on the uprights 492. The lower end of the lever 495 is slotted at 497 to receive a laterally extending pin 498 on a plunger 499 connected to an operating cylinder 500, the operating mechanism for this cylinder being either air, oil or water. Assuming that a carrier has been filled with slugs of clay 139, sufficient in number and arrangement so that slugs 139 of the unformed brick, into which such slugs may be subdivided, rest on the slats 494 shown in Figs. 50 and 81, by operating the cylinder control means 500, the plunger 499 is moved to the right, rotating the lever 495 on its shaft from the position shown in Figs. 50 and 81 and into the position shown in Figs. 46, 51 or 82 and from either of these figures it will be apparent that the parallelly arranged slugs of clay 139 or the brick into which such slugs may be cut, are arranged in pairs that occupy a space equivalent to twenty-four of the spaces in a carrier. This will be particularly apparent from an inspection of either Fig. 46 or Fig. 82.

The slug carriers are fed over the grooved pulleys 418 and into position to be engaged

by the gears 444 from a vertically movable lift, this lift and the means for operating the same comprises the following instrumentalities: At each end of the pit 13 is placed on a suitable framework a vertical track or guideway 513. These tracks are facing each other and also in alignment with each other and arranged for sliding movement thereon is a rectangular framework 514, the end members of which are provided with devices 515 that engage with the members 513. At each end of the rectangular frame 514 is pivotally attached the upper end of a connecting rod 516 and these connecting rods are permitted a limited oscillating movement about their pivot point by a limiting device 517. Pivotally secured to the lower end of each of the connecting rods 516 is the outer or free end of a lever 518, these levers being secured at their other ends to a shaft 519 that is rotatably mounted in pillow blocks 520 secured to the foundation of the machine. Secured to the foundation of the machine at the bottom of the pit 13 and extending upwardly therefrom is an air or hydraulic cylinder 521, in which is mounted for reciprocation in either direction a piston 522. This piston 522 is secured at its upper end to the rectangular frame 514, adjacent to its middle portion so that such rectangular frame 514 is practically balanced on the piston. The levers 518 being connected to the rectangular frame 514 and being connected and secured to the shaft 519, such levers will prevent a tipping movement of the rectangular frame about the connecting point of the piston 522 therewith as a center and, therefore, the rectangular frame is constrained to move in a vertical direction while being maintained horizontally or substantially so. Secured to the foundation of the machine at each side of the pit 13 and extending transversely of the length of the rectangular frame 514 and parallel to each other are I beams 523. Secured to the rectangular frame 514 on each side thereof are angle irons 524, which are adapted to engage with the I beams 523 and thus limit the downward vertical movement of the rectangular framework 514. Secured to the upper end of the rectangular framework 514 and spaced apart from each other, while extending transversely of such rectangular framework, are spaced I beams 525. Secured to the top surface of each of these I beams 525 at one end thereof are angle members 526, as clearly shown in Fig. 34. Secured to the upper surface or edge of the I beams 525 and spaced apart from each other are pillow blocks 526^a, there being, as will be seen from an inspection of Figs. 70 and 71, a plurality of groups of such pillow blocks and the blocks of each group being in alignment with each other, while in each group is rotatably mounted a shaft 527. Secured to each of the shafts 527, adjacent the pillow blocks 526^a, are grooved pulleys 528, such grooved pulleys being adapted and positioned to receive the track members 392 secured to the under side of the slug carriers. Secured in the rectangular framework 514 is a motor 529, which is connected through a train of gearing to one end of the center one of the shafts 527. Adjacent to the middle portion of such center shaft 527 is a sprocket 530 in alignment with a sprocket 531, and on the innermost shaft 527 and over such sprocket runs a sprocket chain 532. Also on the center shaft 527 is a sprocket 533 that is in alignment with a sprocket 534 on the outermost shaft 527 and over these two latter sprockets runs a sprocket chain 535. By this construction all of the shafts 527 are rotated simultaneously at the same speed and in the same direction and switching means is provided for causing this rotation to take place in either direction at will. The grooved pulleys 528 are designed to support and carry and to receive and remove therefrom one of the slug carriers designated generally by the reference numeral 536. In the upper limit of travel of the rectangular frame 514, the grooved pulleys 528 are in alignment and the top surface thereof lies in the same horizontal plane as does the top surface of the grooved pulleys 418 on the shafts 417, shown in Fig. 36. In the downward limit of this movement of the rectangular frame 514, the upper surface of the grooved pulleys 528 is in alignment with the top surface of the grooved pulleys 391 above described and with the top surface of grooved pulleys 537 clearly shown in Fig. 36. The pulleys 537 are secured to shafts similar in all respects to the shafts 390 shown in Fig. 38 and, therefore, the present shafts have been designated by the numeral 390 and all of the shafts 390 shown in Fig. 36, three in number, are positively driven in the same direction and at the same rate of speed by means of sprocket chains 538 passing over appropriate sprockets 539 on such shafts. The right-hand one of the shafts 390, shown in Fig. 36, has thereon a sprocket over which runs the sprocket chain 394 leading from the left-hand shaft 390, shown in Fig. 38, and the sprocket on the right-hand shaft 390 of Fig. 36 is rotatably mounted on such shaft but may be connected so as to rotate therewith by means of a clutch mechanism 540. The operating arm 541 of this clutch mechanism 540 is spring-pressed and has connected thereto at the end remote from the clutch mechanism a bell crank lever 542 rotatably mounted on a shaft 543. One arm of this bell crank lever lies in the path of movement of one of the I beams 525 carried by the rectangular frame 514 and serves, when the rectangular frame is in its lowermost position, to operate the clutch mechanism 541 and connect driving power to the shafts 390 shown in Fig. 36 and,

therefore, cause a rotation of the grooved pulleys 537 in the direction of the arrow shown in such figure. It will be obvious, therefore, that if at this time a slug carrier 536 is moving to the left, with reference to Fig. 8, on the grooved pulleys 391, that such slug carrier will have its march continued until the same is forced onto the grooved pulleys 528 on the I beams 525 carried by the rectangular frame 514, as shown in Fig. 4, and assuming that the motor 529 is operating to rotate the grooved pulleys 528 in an anti-clockwise direction, as viewed in Fig. 34, such march to the left of the slug carrier 536 will continue until the left-hand end of such slug carrier comes into engagement with a contact bar or switch 544, which bar is pivotally mounted on a bracket 545. Secured to said bracket 545 is a switch bar 546 that co-operates with the bar 544 and rotary movement of the bar 544 in an anti-clockwise direction will break the connection existing between the bars 544 and 546, and thus break the energizing circuit for the motor 529. Secured to the foundation of the machine is a bracket 547 on which is mounted contact blades 548 adapted to be engaged by a switch blade 549 carried on the I beam 525 and which members 548 and 549 close a circuit for enabling the armature of the motor 529 to rotate in such a direction as to cause a rotation of the grooved pulleys 528 in an anti-clockwise direction. Secured to the foundation of the machine at one end of the pit 13 is a panel board 550 and on this board are pivotally mounted control levers 551 and 552 respectively. These levers control the operation of the air cylinder 521, these levers being arranged with respect to the controlling valves so that when the lever 551 is in the position shown in Fig. 34, the air cylinder 521 will be controlled in such a manner as to allow the piston 522 to move downward therein and carry the rectangular frame 514 along with it. When both the levers 551 and 552 are in a downward position, the valves for the air cylinder 521 are so controlled as to cause the piston 522 to move upward and this upward movement will continue until both the levers 551 and 552 are in the same relative position with respect to each other as is the lever 552, shown in Fig. 34. Under these conditions the air cylinder 521 is placed out of operation. Assume that the slug carrier 536 shown in the upper right-hand end of Fig. 34 has moved gradually to the right until the end thereof moves out of engagement with the lever 552. This lever will immediately rotate in a clockwise direction and assume the same relative position with respect to this point as is shown with respect to the lever 551 and under these conditions the air cylinder 521 will cause the piston 522 to move upward carrying the rectangular frame 514 and the I beams 525 thereon upward until such I beams 525 reach the dash and dotted line position shown in Fig. 34. As the I beam 525 moves upward and clears the end of the switch bar 544, such switch bar will move into position to engage with the contact bar 546, thus again closing a break point in the operating circuit for the motor 529 and when the I beam 525 is in its uppermost position the switch blade 549 thereon will engage with a contact bar 553 secured to a bracket 554 mounted on a frame member 555 on the base of the machine and thus completes the energizing circuit for the motor 529 to cause the armature thereof to turn in such a direction as to rotate the grooved pulleys 528 in a clockwise direction and thus to feed the slug carrier 536 thereon to the right, as shown in Fig. 34. As the rectangular frame 514 approaches its uppermost position, the upper portion of the slug carrier 536 will engage with both of the levers 551 and 552 and will move them into their uppermost position or into the position illustrated by the lever 552, thus stopping the further upward movement of the rectangular frame 514.

As above described, the slug carrier 536 is moved step-by-step or intermittently to the right as shown in Figs. 38 and 39 until the left-hand end thereof moves past the belts 382. The racks 443 on the bottom of the slug carriers 536 are at this time brought into engagement with a plurality of gears 556. These gears 556 are secured at intervals to a shaft 557 rotatably mounted in bearings 558. The gear 556 meshes with and is driven by a pinion 559 secured to a counter shaft 560 that is suitably mounted in bearings 561 secured to the framework or base of the machine. On the shaft 560 is a sprocket wheel 562 that is in alignment with a sprocket wheel 563 on the shaft 397 and over the sprocket wheels 562 and 563 runs a sprocket chain 564 and by means of which power is transmitted from the motor 399. The loaded slug carrier 536 is thus moved forcibly to the right, as viewed in Figs. 39 and 40, onto a plurality of parallelly arranged grooved wheels 565, such wheels forming a part of a lift, the details of which will be hereinafter described.

Extending transversely of the pit 13 and above the lever of the intermittently movable slug carriers 536, are a plurality of parallelly arranged channel irons 566. Secured to the top of such parallelly arranged channel irons 566 and extending transversely thereof are a plurality of angle irons 567. Also secured to the top of the channel irons 566, transversely thereof and parallel to each other, are a plurality of channel irons 568, these channel irons, being arranged intermediate the ends of the channel irons 566 and such channel irons form a support or bed on which is secured a motor 569. Two of the channel irons 566 are arranged relatively close together and

secured to their top surface at intervals along the length thereof are bearing members 570, such bearings being in alignment with each other and rotatably mounted in said bearings is a shaft 571. Secured to such shaft adjacent to the channel irons 568 is a sprocket wheel 572, this sprocket wheel being in alignment with a sprocket wheel 573, secured to the driving axle 574 of the motor 569. Over the sprocket wheels 572 and 573 runs a silent chain 575 and by means of which power is transmitted from the motor 574 to the shaft 571. At intervals along the length of the shaft 571 are mounted saw frames 576, these frames, as will be seen from an inspection of Figs. 48 and 49, extending on either side of the shaft 571 and what might be termed the rear end of such frame 576 is provided with a counter-balancing weight 577. At the other or forward end of such frame is rotatably mounted in suitable bearings 578 an arbor 579 and secured to said arbor 579 in any suitable manner and adjacent to each end thereof are circular slitting saws 580, the distance between these saws on each of the frames 576 being substantially equal to the length of a brick. Also, the distance between either of the saws 580 on one of the frames 576 to the next adjacent saw on the next adjacent frame 576 is also equal to the distance between the saws on any of the frames 576 or equal to the length of a brick into which it is desired to cut the slug 139. Between the bearing members 578 on each of the frames 576 is a pulley 581 that is in alignment with a pulley 582 secured to the shaft 571 and over the pulleys 581 and 582 runs a belt 583 and by means of which power is transmitted from the shaft 571 to the saws 580. Each of the frames 576 is provided at the counter-weighted end thereof with an adjustably mounted screw eye 584, to the eye of which is secured one end of a chain 585 and the other end of this chain is secured to the intermediate portion of the angle irons 567. These chains 585 limit the downward pivotal movement of the saw-carrying end of such frame 576, and therefore limit the downward movement of said saws, it of course being desirable that said saws approach the bottom of the slats 442 in the plates 438 of the slug carriers 536 as a limit. The filled slug carrier 536 has been described above as being moved to the right because of the engagement of the gears 556 with the racks 443 on the under side of such slug carriers and as the same is moved to the right, the plurality of parallelly arranged saws 580 registering with the slats 442 in the parallelly arranged side plates 438 will sever the slugs 139 therein into a plurality of individual brick-size units.

The loaded slug carrier 536 in its passage under the saws 580 has been described as moving onto a plurality of parallelly arranged pulleys 565. These grooved pulleys are secured to shafts 586 that are arranged parallelly to each other and rotatably mounted in suitable bearings 587 on the top of a plurality of parallelly arranged channel irons 588. These shafts are interconnected together by means of suitable sprockets 589 and sprocket chains 590 so as to rotate in the same direction and at the same speed. The parallelly arranged beams 588 are secured to the top of a pair of channel irons 591 that extend transversely of the pit 13 and are secured to the top of a rectangular frame 592. Mounted on the rectangular frame 592 is a motor 593, which, through suitable gearing that includes a driving chain 594, causes the simultaneous operation of the shafts 586. The rectangular frame 592 is secured to, at approximately its middle point, the top of a piston plunger 595, that is arranged for vertical movement in an air or hydraulic hoist cylinder 596 that is secured to the foundation of the machine. Secured to the foundation of the machine and transversely with respect to the rectangular frame 592, are channel irons 597 that are adapted to be engaged by angle irons 598 secured to the sides of the rectangular frame 592 and thus to limit the downward movement of such rectangular frame. Pivotally mounted at each end of the rectangular frame 592, are downwardly extending connecting rods 599 and to the lower end of these connecting rods is pivotally attached the outer or free end of levers 600, both such levers being secured at their other end to a shaft 601, that is rotatably mounted in pillow blocks 602 secured to the foundation of the machine, as clearly shown in Fig. 37. The levers 600, being connected together by the shaft 601, and being connected together through the connecting rods 599 to the rectangular frame 592, insure that the rectangular frame 592 will be maintained horizontally during its up and down movement. At the end of the rectangular frame 592 are arranged rollers 609 that are adapted to engage with and are on either side of uprights 610 forming part of the framework of the machine. The rollers 609 and the uprights 610 prevent a rotary movement of the rectangular frame 592 about the piston plunger 595 as a center. When the rectangular frame 592 and parts carried thereby is in the position shown in Figs. 40 and 80, the motor 593 is turning its armature over in the direction to rotate the grooved pulleys 565 in a clockwise direction so that slug carrier 536 placed on such grooved wheels will move from left to right in such figures. Secured to the right-hand end of the channels 588 are angle members 603, which angle members will prevent too far a movement to the right of the loaded slug carriers 536. Carried on one of the channels 588 is a contact blade 604, which engages, when the rectangular frame 592 is in its uppermost position, with a contact 605,

that is secured to a bracket 606 attached to a frame member 607 mounted on the foundation of the machine. The contacts 604 and 605 control a break point in the circuit for the motor 593. Pivotally mounted on the bracket 606 is a switch lever 607, the lower end of which is adapted to engage with a switch contact 608 that is secured to the bracket 606. The switch plate 607 and switch contact 608 control other break points in the energizing circuit for the motor 593 and when the loaded slug carrier 536 moves to its limit of travel to the right, as shown in Figs. 40 and 80, the lever 607 will be rotated on its axis and becomes separated from the switch contact 608, thus breaking the energizing circuit for the motor 593, and stopping the rotation of the grooved wheels or pulleys 565.

After the loaded slug carrier 536 has been brought to rest on the grooved pulleys 565, mechanism, to be hereinafter described, is operated to control the hydraulic cylinder 596 to cause a lowering of the rectangular frame 592. When the rectangular frame 592 starts on its downward movement, the switch blade 604 will become disengaged from the switch contact 605 and the switch lever 607 will again be brought into engagement with the switch contact 608, these operations having no effect on the motor 593.

When the rectangular frame 592 reaches the lower limit of its travel and the angle iron 598 engages with the channel iron 597, the lower surface of the empty slug carrier 635 will come into engagement with a switch lever 611 pivotally mounted on a bracket 612 secured to the foundation of the machine and will force such switch lever into engagement with contact members 613 secured to a bracket 614 also attached to the foundation of the machine. The closing of the contacts 611 and 612 prepares for the subsequent operation of the cylinder 596. The arrival of the frame 558 into its lowermost position brings the contact 604 carried thereby into engagement with the contact 662 secured to a bracket 663 on the framework and completes the energizing circuit for the motor 593 to cause a rotation of the grooved pulleys 565 in an anti-clockwise direction, causing thereby the now-empty carriers 536 (as will be hereinafter explained) to be moved to the left off the grooved pulleys 565 and onto the plurality of grooved pulleys 391. The grooved pulleys 391 being connected together and positively driven from the shaft 397 will cause a movement to the left, as viewed in Figs. 39, 38 and onto the normal stationary grooved pulleys 537, shown in Fig. 36, where such empty slug carrier 536 will be brought to rest, preparatory to being moved onto the rectangular frame 514, as hereinbefore described.

At each end of the pit 13, and extending longitudinally thereof and rearwardly therefrom, are parallelly arranged structural iron frames constituting spaced uprights 616, these parallelly arranged members being tied together at their top ends by parallelly arranged trusses 617. Intermediate the ends of the members 616 and parallel to each other are secured I beams 618 and to the top of such I beams are secured T rails 619. Engaging with the T rails 619 are grooved wheels 620, forming part of an overhead crane structure, the main beams of which are designated by the numeral 621. Any suitable motive power may be arranged for rotating the grooved wheels 620 to move the crane structure along the rails 619 and such means is preferably an electric motor (although not shown). Secured to and extending downward from the parallelly arranged main beams 621, at one end thereof is a substantially rectangular frame 622, in or on which may be built an operator's cabin with the necessary control devices therein for controlling the operation of the motor just referred to. The main beams 621 are spaced apart from each other and secured to the top surface of such main beams and parallel to each other are T rails 623. Engaging with the T rails 623, are flanged wheels 624. The flanged wheels 624 are arranged in pairs, one pair to a shaft 625. The shafts 625 are also arranged in pairs and are secured parallel to each other at either end of substantially rectangular frames 626. Secured to the under side of the central portion of the rectangular frames 626, by bolts and tie rods 627 and 628 respectively is a downwardly depending hydraulic cylinder 629 in which is mounted for reciprocation a piston or plunger 630. Secured to the upper end of the rectangular frame 626, is a rectangular framework 631 that is in vertical alignment with respect to the hydraulic cylinder 629. Attached to the upper end of the piston or plunger 630, and extending upwardly through the rectangular frame 631, is a rod or shaft 632. Rotatably mounted in suitable bearings in the upper part of the rectangular framework 631 is a sector of a worm wheel 633, this worm wheel at its center of revolution being keyed to the vertical shaft 632 so as to be rotatable with said shaft but also slidable with respect thereto, this construction enabling the shaft 632 to be movable vertically without disturbing the relative relation therewith of the worm wheel sector 633. Secured to the lower end of the piston or plunger 630 is a base 634, to the lower surface of which is secured a brick lifting device 635.

There are four of the rectangular frames 626 and, therefore, four of the hydraulic cylinders 629 carrying on the piston 630 thereof four of the brick lifting devices 635 and these brick lifting devices, when placed end to end with the grooves therein in align-

ment with each other, the combined total length thereof is equal to the total length of the slug of clay or other matter 139, or equal to the total length of the individual bricks into which such slugs of clay may or have been cut. Mounted in suitable bearings 636 at the upper end of the rectangular frames 631 is a shaft 637. Associated with each bearing 636 and rotatable with, but slidable longitudinally of the shaft 637, is a worm 638, which meshes with and drives the worm wheel sector 632. Mounted on the main beams 621, adjacent one end thereof, is a subframe 639, to the top of which is secured a motor 640, operating control means for the same being located in the cabin built on the rectangular framework 622. The armature shaft of the motor 640 has secured thereto a pinion 641 which meshes with and drives a gear 642 connected to the shaft 637 through a spring clutch 643. Secured at either ends to the forward and rear truss members 617, so as to stiffen the construction are I beams 644. Also secured to the end truss member 617, are members 645. These members 645 are arranged in pairs, each pair constituting a track or cam race. There are four pairs of these tracks or cam races built of the members 645, one pair for each of the rectangular frames 626. Secured to the top and at one side of each of the rectangular frames 626 is a bracket 646. As a means for rigidly mounting the brackets 646 on the rectangular frame 626, I provide an adjustable bolt 647 extending between the brackets 646 and the rectangular frames 631. On the top of the brackets 646 is mounted a vertical shaft 648 and on such vertical shaft is rotatably mounted a roller 649, which roller is slightly less in diameter than the distance between the members 645 constituting the track. As the crane structure including the beams 621 and wheels 620 is moved along the tracks 619 by a motive power associated therewith, the rollers 649 will be constrained to move in the path defined by the spaced members 645 and, therefore, will cause a predetermined movement of the individual rectangular frames 626 along the tracks 623.

When the crane, including the main beams 621 and wheels 620, is in its extreme forward position, that is, in the position adjacent to the plurality of parallelly arranged saws 580, the center line of the parallelly arranged vertical shafts 632, attached to the upper end of the pistons or plungers 630 of the brick lifter 635, are in alignment with the central longitudinal axis of the lift frame 592. If, under these conditions, a filled carrier 536 is passed under the plurality of parallelly arranged saws 580 onto the grooved pulleys 565, it will, when it reaches the extreme right-hand position, as indicated in the drawings, come into engagement with the switch lever 607, moving the same out of engagement with the switch blade 608. This opens the energizing circuit for the motor 593 and rotation of the grooved wheels 565 ceases and the loaded slug carrier 536 is brought to rest in the position shown in Fig. 40. The crane structure above referred to, having been brought into position with the line of vertical shafts 632 directly over the longitudinal axis of the rectangular frame 593, the operator controls the hydraulic cylinders 629 (by appropriate mechanism not shown) in such a way as to lower the brick lifting devices 635 down onto the loaded slug or brick carrier 536 with the brick lifting elements of the brick lifters 635 in position to engage with the individual brick in such carrier. In this downward movement, one of the brick lifters 635 engages with a roller 650 rotatably mounted on a link 651. This link in turn is pivotally mounted on a shaft 652 on the end of a lever 653. A spring 654 is associated with the link 651 and tends to rotate the same about the shaft 652 in an anticlockwise direction. A projection on the link 651 is adapted to engage with a pin 655 secured to and extending laterally of the lever 653 and limits the anti-clockwise direction of such link 651. The lever 653 is pivotally mounted at the end remote from the shaft 652 in a bracket 656 secured to any suitable portion of the framework of the machine. Pivotally attached to the lever 653 intermediate its ends and extending downwardly therefrom is a rod 657, the lower end of this rod being slidably mounted in a bearing 658 secured to the framework of the machine. Secured to the rod 657 adjacent to the bearing 658 is a radially extending contact blade 659 that is adapted to engage with a contact blade 660, secured to a bracket 661 on the framework of the machine. In this downward movement, the brick lifter engages with the roller 650 and rotates the link 651 about the shaft 652 as a center in a clockwise direction against the tension of the spring 654 and when the brick lifter 635 has moved downward beyond the roller 650, the spring 654 will rotate the link 651 in an anticlockwise direction until the projection thereon engages with the pin 655. The operator controls the brick-engaging device of the brick lifter 635 so as to grasp and hold therebetween the individual bricks in the slug carrier 536 and then controls the hydraulic cylinders 629 to raise the brick lifters 635 upward. In this upward movement, the upper edge or corner of one of the brick lifters 635 engages with the roller 650 and because the projection on the links 651 engages with the pin 655, the levers 653 and 651 will be rotated about the pivot point of the lever 653 as a center lifting the rod 657 and bringing the contact 659 into engagement with the contact 660. These contacts are in a controlling circuit (not shown) for controlling devices that control the operation

of the hydraulic cylinder 596. The hydraulic cylinder 596 is controlled to lower the piston 595 therein and the frame 592 therefore moves downwardly with respect to Figs. 40 and 80, until one of the channels 591 comes into engagement with the contact 659 and forces the same out of engagement with the contact 660, thus breaking the energizing circuit above referred to and the rectangular frame comes to rest with the grooved wheels 565 in alignment with the grooved wheels 391. When the rectangular frame 592 starts downward, the contact 607 will rotate into engagement with the contact 608 but this has no effect at this time on the equalizing circuit for the motor 593 because simultaneous with the making of the circuit between the contact 607, the circuit between the contact 604 and 605 is broken. When the rectangular frame 592 reaches its lowermost position, the contact 604 moves into engagement with a contact 662 secured to a bracket 663 on the foundation of the machine, completing the energizing circuit for the motor 592 and causing it to rotate its armature in a direction to rotate the grooved wheels 565 in an anti-clockwise direction and moving the now-empty slug carrier 536 to the left, as viewed in Figs. 40 and 80 and onto the grooved wheels 391. When the empty slug carrier 536 has moved to the left a sufficient distance, the lever 611 is released and the contact carried thereby is separated from the contact 613. This causes a controlling movement of the hydraulic cylinder 596 to move the plunger 595 thereof upward and carrying the rectangular frame 592 therewith. When the contact 604 becomes separated from the contact 662, the motor 593 is de-energized and the grooved wheels 565 brought to rest. The upward movement of the plunger 595 ceases when the contact 604 engages with the contact 605. The plurality of brick lifting devices 635 are now transported rearwardly of the machine until the vertical shafts 632 are centrally located over the finger course building device shown in plan in Figs. 66 and 67, in end elevation in Fig. 46, and in normal and extended position in Figs. 51 and 52. The brick lifting devices 635 are lowered gradually and the crane operator, as the lifting devices approach the finger course making devices, is brought closer and closer to an upstanding arm 680 secured to one end of a shaft 681, that is rotatably mounted in a plurality of spaced bearings 682 secured to the framework 492 of the finger course making device. The upper end of this arm 680 is forked, as shown at 683, and across the forked end runs a rod or bar 684 that is adapted to be engaged by a tripping lever 685, pivotally mounted in the lower part of the framework 622 and in which framework is built the operator's cage. Secured to the shaft 681, intermediate its ends, is a grooved pulley 686 and passing over such pulley and engaging with the portion of the periphery thereof, is a flexible belt 687, one end of this belt being secured to a frame member 688 and the other end having secured thereto a weight 689. The weight 689 and the flexible belt 687 have a tendency to cause a rotation of the shaft 681 in an anti-clockwise direction or in the direction of the arrow shown in Fig. 46. This tendency of the shaft 681 to rotate in an anti-clockwise direction causes the parallelly arranged slats 494 to become equally spaced from each other, or in other words, to move in a normal position or in the position shown in Fig. 50, as will be hereinafter described. The frame member 688 is but one of a plurality of frame members that constitutes a substantially rectangular frame and on the under side of each of these frame members, front and rear, are secured bearing blocks 689^a and in each pair of aligned blocks 689^a is rotatably mounted a shaft 690. Secured to each of the shafts 690 adjacent to each of the bearings 689^a are grooved wheels 691, each of which wheels is adapted to engage with a short stretch of track 692, secured to the upper face of the top member of the frame 492. The rectangular frame composed of the members 688 is, therefore, capable of movement on the track 692 in either direction up to the limits of the track. Secured to the members 688, forming a rectangular frame and extending upwardly and downwardly therefrom, are frame members 693 and the lower extending portion has secured at its lower end, members 694 which constitute a rectangular supporting means for the air cylinder 500 that has been heretofore referred to. The upper extending portion of the members 693 has secured to their upper ends the parallelly arranged members 493 and slidably mounted on such members 493 are the parallelly arranged slats 494. Associated with the air cylinder 500, as above described, is the plunger 499, such plunger being provided with laterally extending and diametrically arranged pins 498, engaging with slots 497 on the lower end of downwardly depending arms 495^a that are secured at their upper ends to a shaft 695, this shaft being rotatably mounted in bearings 496, secured to the under side of the members forming the rectangular framework 688. Secured to the shaft 695 adjacent to each end thereof are arms 495, each arm 495 having pivotally attached thereto, one end of a connecting rod 696, the other end of each of the arms 696 being pivotally connected to a plurality or group of operating rods 697 for the parallelly arranged slats 494. Secured to the upper face of the framework 492, and spaced apart from each other, are dash pot members 699 and slidably mounted in said dash pot members are plungers 700 that are secured at the lower end of downwardly depending members 701

riveted to the members 493. The operator operating the lever 685 engages the lever 680 so as to bring the slats 494 into alignment with the downwardly moving parallelly arranged rows of bricks. When properly centered on the slats 494, the operator controls the brick lifting devices 635 on the parallelly arranged slats 494 and then controls the air cylinder 500 to move the plunger 499 thereof in such a manner that the slats 494 are arranged in a plurality of pairs, as shown in Figs. 46 and 51, where it will be noted that the individual bricks that formerly formed part of the slug 139 are arranged in pairs. This is the first finger course and at this point, the operator lowers the brick lifting devices 535 and picks up the plurality of pairs of parallelly arranged bricks and controls the crane including the crane beam 621 and wheels 619, moving the same upward as viewed in Figs. 66 and 67, and in this upward movement, the rollers 649 on the vertical shaft 648 that are in turn on the rectangular frame 626 will follow the respective tracks 645 with which they are associated and the respective brick lifting devices 635 will become gradually separated from each other and will ultimately move into the position shown in Figs. 66 and 67.

Referring to Figs. 66 and 67, and also to Fig. 47, there are shown two pair of tracks 705 and 706 respectively. The tracks 705 extend clear through Figs. 66 and 67 and form a storage space for a plurality of spaced trucks 707. The trucks 707 are spaced from each other a certain distance and their position bears a certain relation to the tracks 645 and to the brick carrying devices 635. That portion of the track 706 substantially equal to the space occupied by the trucks 707 is cut away and beneath such cutaway portion is a rectangular pit or well 708. At the bottom of such pit 708 and arranged parallel to each other and transversely of the pit are rectangular box structures 709 and on the top of such rectangular box structures are secured pillow blocks 710 arranged in pairs. In each pair of pillow blocks 710 is rotatably mounted a shaft 711, on which is secured a grooved wheel 712, on which rest and are adapted to move beams 713, the length of these beams being less than the length of the rectangular box structures 709. Secured to each end of the upper surface of the rectangular box structures are angle irons 714, these angle irons limiting the end movement of the beams 713. Secured to the upper surface of the beams 713 and parallel to each other, are I beams 715, these I beams being spaced a distance apart substantially equal to the distance apart of the rails 706. Secured to the upper surface of the I beams 715 parallel to each other and also in alignment with the rails 706 are rails 706ª. Secured to the I beams 715 are angles 716 which slide under plates 717 secured to each side of the pit 708 and such angles and plates 716 and 717 cooperate to form dust and dirt excluding means for the pit 708. Under the tracks 705 on angle irons 718, is mounted an air cylinder 719, in which is slidably mounted the usual plunger (not shown) and to each end of said plunger and extending axially from each end of the air cylinder 719 is a rod 721. Pivotally attached to the outer end of each of the rods 721 is one end of a bell crank lever 722. The bell crank levers 722 are rotatably mounted on vertical shafts 723 mounted between the air cylinder 719 and I beams 715. Pivotally attached to the other arm of the bell crank levers 722 is one end of a link 724 and the other end of these links 724 are pivotally attached to any convenient portion of the I beams 715. By properly controlling the air cylinder 719, the plunger contained within the same is movable in either direction to cause, through the bell crank levers 722 and connecting rods 724, a lateral movement of the I beams 715 and parts carried thereby, the lateral movement being limited by the members 713 engaging with one or the other of the angles 714. When the I beams 715 are in the position shown in Fig. 47, the truck 707 carried on the rails 706 will have the platform of such truck in engagement with the platform of the truck 707 on the tracks 705 and by reference to Figs. 66 and 67, it will be seen that the platforms of the two trucks 707 constitute a square platform. When the I beams 715 are moved to the right, as viewed in Figs. 47, to the extreme limit of their travel, the rails 706ª will be brought into registry or alignment with the tracks 706 and this action will, of course, separate the platform of such trucks with each other and this will divide the load of bricks into two parts, one part on each of the trucks 707. The layer of bricks picked up by each of the brick lifting devices 635 occupies an area that is substantially square and also substantially equal to the area of the square formed by the trucks 707. The arrangement of the bricks in the brick lifting devices 635 is such that one-half the bricks of the load will be deposited on one of the trucks 707 and the other half on the other truck 707, without danger of any of the bricks on either truck falling off. The crane operator, therefore, having brought the brick lifting devices 635 over the trucks 707, will gradually lower such brick lifting devices until the bricks carried thereby rest on the trucks. Having deposited the bricks on such trucks, the crane operator will lift such brick lifting devices upward by means of the air cylinders above referred to and by operating the crane structure will bring the brick lifting devices back to their initial position or the position shown for example in Figs. 68 and 69. It is understood

of course that during all the time that the operator has been working on the bricks that have been contained in the carrier above described, that the second carrier is being filled with slugs 139 and the apparatus is so designed that the operator will be able to pick up the load of bricks from the carriers, put the same onto the finger course making device, pick such bricks up again and deposit them on the trucks 707 and bring the crane and brick lifting devices back into normal position before the second carrier has been filled with the slugs. Assume now that the second brick carrier has been filled with brick slugs 139, and that the end of such carrier has the racks on its under surface brought into engagement with the driving means shown in Fig. 39 and above referred to, said loaded carrier will be passed through and under the gang of saws or cutters 580 and will ultimately be brought to rest on the framework 588, as shown in Figs. 40 and 80. The crane operator will move the brick lifters 635 into association with the now cut up slugs 139 and will repeat the operations above described of putting such loads of bricks on the finger course making devices and will deposit such parallelly arranged rows of bricks on top of the rows of bricks placed on the trucks 707. The finger courses for the unit stacks of bricks have now been placed in position on the trucks 707 and the operator for the third layer of bricks picks such third layer of brick up by means of the brick lifting devices 635 after the slugs 139 have passed under and through the gang of saws 580 and during the operation of moving the crane rearwardly of the device and into position over the trucks 707 as shown in Figs. 66 and 67, will control a motor 725 that is secured to beams 726 extending between the crane beams 621. This motor 725 is connected through a train of gearing 727 and a clutch 728 to the shaft 637 and, therefore, the motor 725 controls the rotation of the shafts 632 and, therefore, the rotation of the brick lifter 635. The operation of the motor 725 is continued until the shaft 632, and therefore the brick lifting devices 635, have been rotated through an angle of 80 degrees, when it will be obvious that the rows of brick on the brick lifter 635 will lie at right angles to the rows in the finger courses and deposit it on the trucks 707. Each successive row occupies a position on the truck 707 at right angles to the proceeding one and this sequence of operations continues until the desired size of unit stacks of brick is formed. When the unit stacks are finished, the air cylinder 719 is controlled to move the rod 721 in such manner as to cause a movement of the I beams 715 to the extreme right-hand position, as shown in Fig. 7, with the right-hand end of the members 713 in engagement with the right-hand angles 714. When this occurs and as above explained, the tracks 706[a] are in alignment with the tracks 706 and the trucks 707 may be moved off the position shown in Figs. 66 and 67 and into position in the kiln shed where the units may be removed from the trucks 707 by mechanical lifting means.

From the above it will be obvious that with my improved invention, I am enabled to form and hack brick as rapidly as the same issue from the brick-making machine and that with my machine, all belt boys heretofore employed are eliminated. The operations from the brick or slug extruding means to the point where bricks are arranged in a plurality of parallelly arranged rows is strictly automatic and the remaining portion of the machine, that is, the taking of the brick from the carriers, separating the rows of brick into finger courses and building up the unit stacks of bricks is done mechanically.

While I have necessarily described the preferred embodiment of my invention somewhat in detail, it is to be understood that I may vary the size, shape and arrangement of parts comprising the structure without departing from the spirit of the invention.

Having thus described my invention, what I claim as new is:

1. That improvement in the art of manufacturing bricks which consists in subdividing a slug of clay of indeterminate length into slugs of predetermined length, taking each slug of predetermined length as it is formed and gradually increasing the speed of travel thereof until it reaches a collecting point, forming said on-coming stream of slugs of predetermined length into a group of parallelly arranged slugs, then moving said group of slugs transversely of the length of said slugs while maintaining the same in a horizontal plane and simultaneously subdividing the plurality of slugs into bricks and then automatically and mechanically arranging said bricks in hacked relation to each other preparatory to forming a kiln.

2. In a brick hacking machine the combination of a plurality of conveyors arranged end to end, means for operating said conveyors simultaneously, a slug forming apparatus associated with said conveyors and feeding a continuous stream of clay thereto, cutting apparatus associated with said conveyors for severing said continuous stream of clay into slugs of predetermined length, means for collecting said slugs into groups of predetermined size, means for separating said slugs into unit size bricks, a hacking platform and a mechanical lifting and transporting device interposed between the hacking platform and the brick cutting devices.

3. In a brick hacking machine the combination of a conveyor, an extruding device for extruding a stream of material of predetermined cross-sectional area associated with

said conveyor, means for moving said conveyor at substantially the same surface speed as the speed of the extruding machine, a cutting device associated with said conveyor and operating to cut the stream of material into slugs of predetermined length, a plurality of other conveyors associated with said first conveyor, connecting means between said conveyors and the conveyor driving means for driving said plurality of conveyors at different rates of speed, a collecting device movable transversely of said conveyors, a plurality of parallelly arranged cutting devices above said collecting device, means for moving said collecting device after a predetermined number of slugs of material have been collected therein through the plurality of cutting devices, a hacking platform and a mechanical lifting and transporting means interposed between said hacking platform and the material cutting means.

4. In a brick hacking machine the combination of an endless conveyor, a material extruding machine, means for moving said conveyor at the same surface speed as the speed of the extruded material, a plurality of other conveyors arranged end to end, driving connections between said other conveyors and the first conveyor, operating means for moving said other conveyors at different rates of speed, and equalizing means associated with said driving means for maintaining the same relative rates of speed between the other conveyors and dependent on the speed of the extruding machine.

5. In a brick hacking machine the combination of a collecting device, means for inserting a plurality of parallelly arranged slugs of material therein, and for maintaining the same in a horizontal plane, a rotatably mounted shaft located above said collecting device, a plurality of independently driven conveyors, of cutting devices mounted on said shaft and means for moving the collecting device transversely of the shaft through the cutting devices whereby the parallelly arranged slugs of material are divided into units of any desired size.

6. In a brick hacking machine the combination of a collecting device, a plurality of grooves arranged in the top surface thereof, conveying means associated with said collecting device and extending throughout the extent of the length of the grooves, means for moving said collecting device transversely of the conveyor, a framework mounted above said collecting device, a shaft rotatably mounted on said frame, a plurality of arms pivotally mounted on said shaft, a pair of cutting devices rotatably mounted on the free end of said arms, driving connections between the shaft and the pairs of cutting devices and means operable on the completion of the filling operation of a collecting device for moving said collecting device transversely of the shaft under and through the cutting devices whereby the slugs of material therein are cut into units of predetermined size.

7. In a brick hacking machine the combination of a platform, aligned bearings thereon, a shaft rotatably mounted in said bearings, arms pivotally mounted on said shaft and provided on one end with rotatably mounted cutters and at the other end with counterbalancing weights, driving connections for said cutting devices extending from said shaft and means for driving said shaft.

8. In a brick hacking machine the combination with a rotatably mounted shaft, of a plurality of parallelly arranged frames rotatably mounted on said shaft and spaced apart from each other, a shaft rotatably mounted in the free end of each frame and lying parallel to the first said shaft, cutting devices secured adjacent to each end of each of the shafts in the frames and driving connections extending between the first said shaft and the remaining shafts.

9. In a brick hacking machine the combination with a rotatably mounted shaft, of a plurality of parallelly arranged frames rotatably mounted on said shaft and spaced apart from each other, a shaft rotatably mounted in the free end of each frame and lying parallel to the first said shaft, cutting devices secured adjacent to each end of each of the shafts in the frames, driving connections extending between the first said shaft and the remaining shafts, whereby said cutting devices are rotated in the same direction, and means for limiting the rotated movement of said frames on the first said shaft.

In testimony whereof I have signed my name to this specification.

RAYMOND C. PENFIELD.