

J. A. GUSTAFSON & J. M. FLICKINGER.

BRICK AND BLOCK MACHINE.

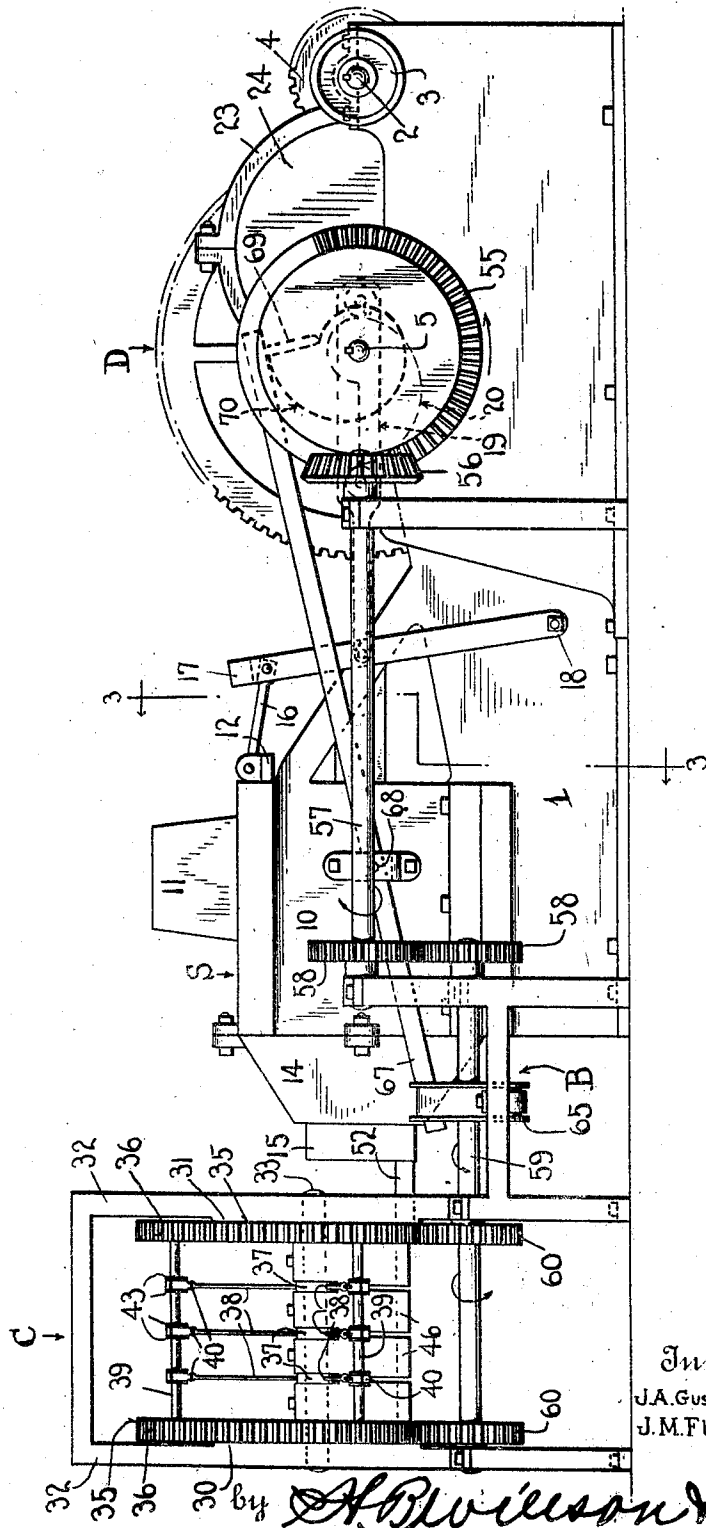
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Patented Sept. 17, 1912.

4 SHEETS—SHEET 1.

Fig. 1.



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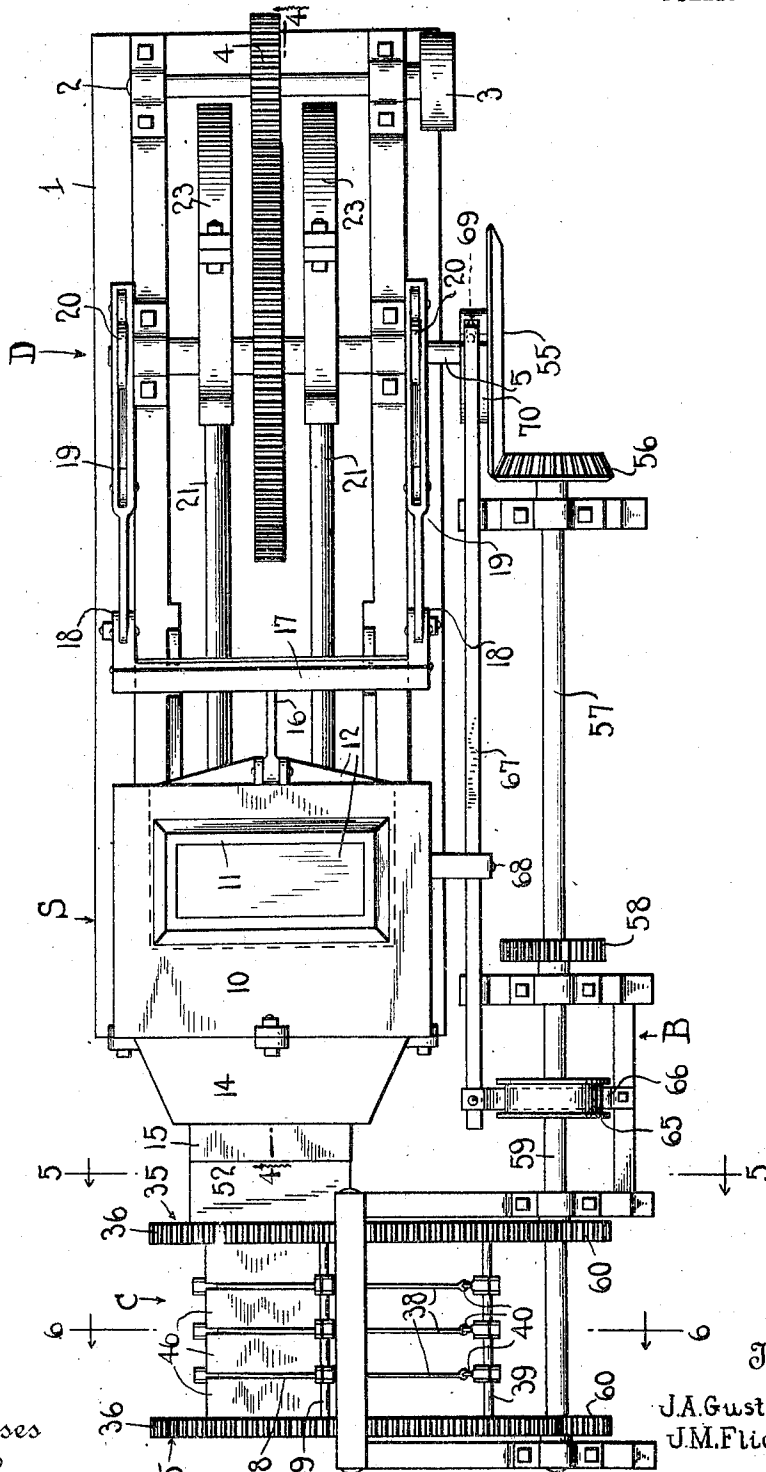
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Fig. 2



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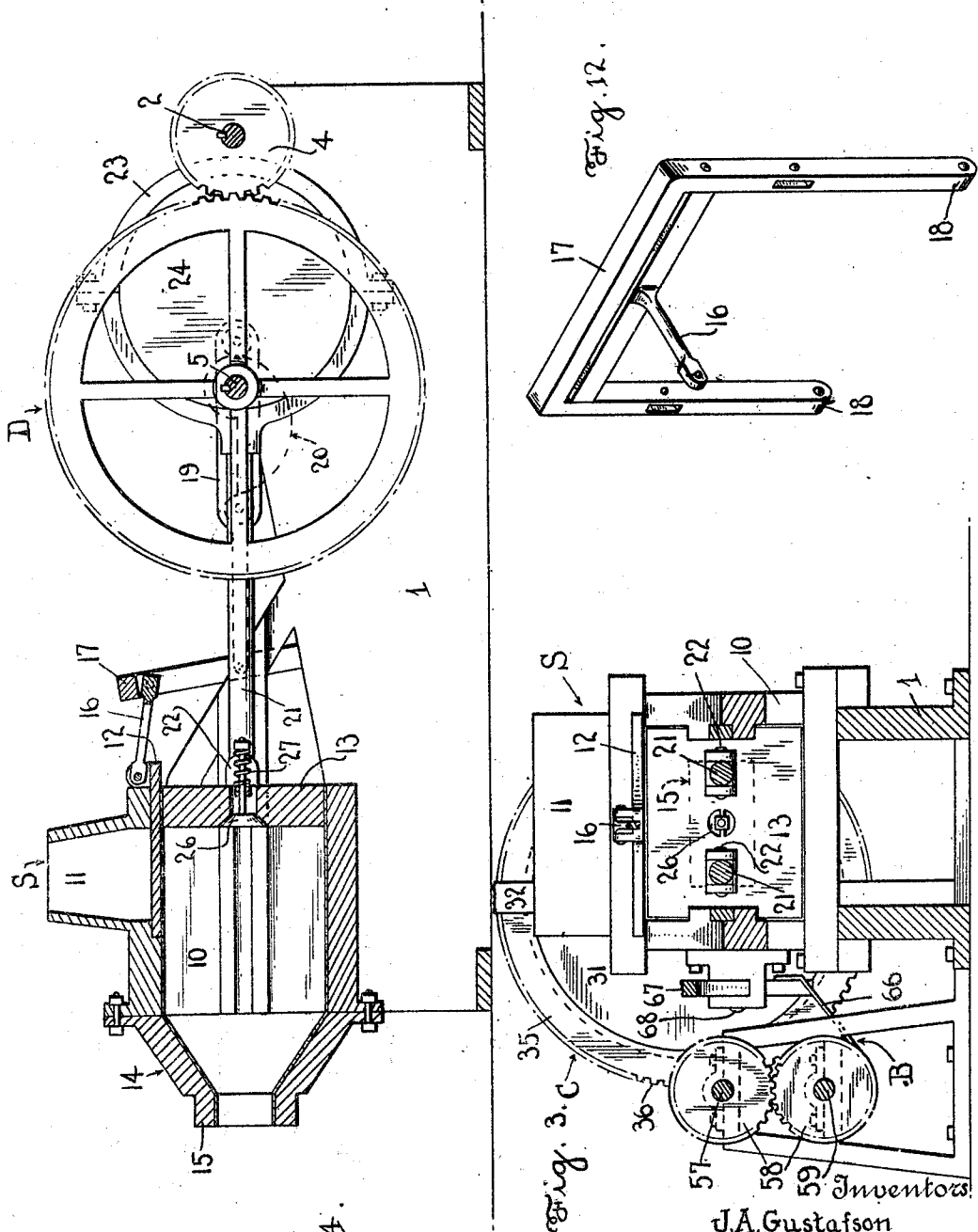
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Fig. 4.

Fig. 3.C

Fig. 12.

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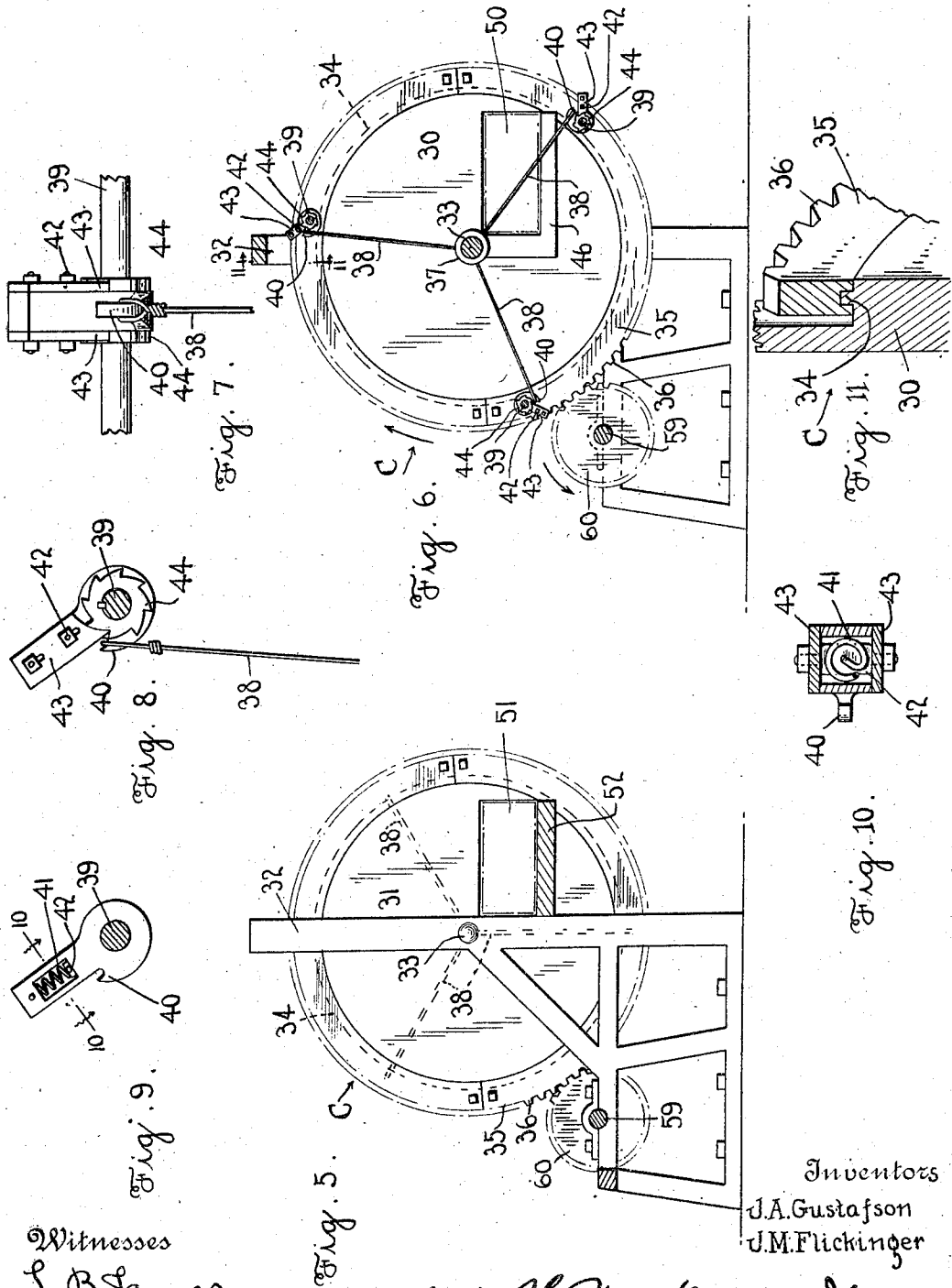
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4 SHEETS—SHEET 4.

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UNITED STATES PATENT OFFICE.

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BRICK AND BLOCK MACHINE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JOHN A. GUSTAFSON and JOSEPH M. FLICKINGER, citizens of the United States, residing at Kushequa, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Brick and Block Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to plastic block apparatus, and more especially to such as have a single mold with a cam-operated plunger and a cutter rotating on the longitudinal axis of the machine; and the object of the same is to produce improvements in a machine of this character. This and other objects are accomplished by the construction hereinafter more fully described and claimed and as shown in the drawings wherein—

Figure 1 is a side elevation and Fig. 2 a plan view of the machine complete; Fig. 3 is a cross section on the line 3—3 of Fig. 1, and Figs. 4, 5 and 6 are sections on the lines 4—4, 5—5 and 6—6 of Fig. 2; Fig. 7 is a front elevation and Fig. 8 a side view of the wire tightener on an enlarged scale, Fig. 9 is a side view thereof with the nearer pawl removed, and Fig. 10 is a section on the line 10—10 of Fig. 9; Fig. 11 is an enlarged perspective section of the gear ring and the outer end wall of the cutting mechanism, being taken about on the line 11—11 of Fig. 6 and on a larger scale; Fig. 12 is a perspective detail of the yoke for reciprocating the cut-off plate.

In the drawings the numeral 1 designates the base of this improved machine which at one end has bearings for the driving shaft 2 whose pulley 3 is connected with any suitable source of power not shown. This shaft is connected as by gearing 4 with the main shaft 5 also mounted on the base and which, with its cams and eccentrics, constitute the driving mechanism D of this machine. The latter consists broadly of the shaping mechanism S including a press box, a plunger therein operated from the main shaft, a hopper, and a die; the cutting mechanism C to which the die delivers in a manner hereinafter described; and a brake B interposed in the connections between the cutting mechanism and the driving mechanism so that the former is checked in its rotation at

proper times as will appear below. The details of the driving mechanism further than those that have been mentioned will be amplified below in conjunction with the description of the other parts with which they coact.

The shaping mechanism S includes a press box 10 (see Fig. 4) having a hopper 11 at its top, a cut-off plate 12 movable below the lower end of the hopper, a longitudinally movable plunger 13 reciprocating within the box beneath said cut-off plate, a tapering extension or outlet 14 at the forward end of the box 10, and a die or mouth 15 at the outlet end of said extension. The cut-off plate is connected by a link 16 with a yoke 17 which is pivoted at its lower end at 18 within the base 1, and whose side arms carry loops 19 which are engaged by cams 20 on the main shaft 5. The plunger in the present embodiment of my invention is actuated by two rods 21 whose forward ends are pivoted to the plunger at 22 and whose rearward ends are connected with eccentric rings 23 mounted on eccentrics 24 which are fast on the main shaft 5.

The numeral 26 designates a valve located within an air inlet port through the plunger 13 and drawn normally to its seat by means of a spring 27, the valve opening when the plunger is retracted by said eccentrics so as to admit air at a proper time to prevent the retraction of the plunger from drawing the molded plug of clay backward through the die 15.

It will be well understood by those familiar with this art that the clay is fed through the hopper 11 when the cut-off plate is retracted, and after a sufficient charge has been fed into the box 10 the cams project the plate 12 and check the feed; and the parts are properly timed so that next the eccentrics come into play and the plunger 13 is moved forward to compress the charge of clay within the box 10, force it toward and into the tapered extension 14, and finally eject it through the mouth or die 15 in the shape of a plug which has a cross section corresponding with that of the bricks or blocks to be produced and needs only to be cut into proper lengths to turn out the finished articles.

The cutting mechanism C which operates in conjunction with the parts above described is best shown in detail on Sheet 4 of the drawings and in connection with the

other parts on the remaining sheets. It comprises outer and inner walls 30 and 31 respectively, supported by suitable uprights 32 and rigidly connected by a round rod 33. The walls are circular as seen in Figs. 5 and 6, and the rod stands at their axis; and around their peripheries are tracks 34 on which move two rings 35 having radial gear teeth 36 by means of which the rings are driven in a manner yet to be described. On said rod 33 are loosely mounted collars 37—three in number in the present instance although of course there might be more or less—and these collars are connected by radial wires 38 with rods 39—also three in number in the present instance—which connect said gear rings 35 so that the latter are forced to revolve in unison around the circular end walls and the several wires 38 and collars 37 revolve with the rings. The outer end of each wire is by preference connected with a wire tightener best shown in detail in Figs. 7 to 10 inclusive, and comprising a hook member 40 mounted loosely on the rod 39 and having a spring 41 within its body pressing radially inward against a bolt 42 which connects two dogs or pawls 43 whose teeth are thereby normally engaged with those of ratchet wheels 44 that are fast on the rod 39. The inner end of each wire 38 is carried by its collar 37 while the outer end is secured to the hook of said member 40, and when the wire becomes slack or stretched the tightener is manipulated to take up the looseness thereof. Carried by said axial rod 33 are L-shaped teeth 46, four in number in the present instance, properly spaced to permit the three wires 38 to pass between them as the gear rings 35 revolve, and the inner faces of the teeth are alined with the inner and lower edges of two rectangular openings 50 and 51 made through the walls 30 and 31 in line with the outlet end of the die 15. If the latter sits close to the inner wall 31, the plug formed by the shaping mechanism may pass therefrom into the cutting mechanism without any intervening means; but by preference a table or chute 52 is interposed to prevent the possibility of the plug of clay getting out of shape between the time when it leaves the die and the time when it passes to the cutting mechanism C.

The brake B is herein shown as part of the driving mechanism for the cutter. Mounted on the main shaft 5 is a mutilated gear wheel 55 which meshes with a gear pinion 56 mounted on a shaft 57, the latter in the present case being connected by gears 58 with a counter shaft 59 which in turn is connected by gears 60 with the teeth 36 of the rings 35. The parts are so timed that the toothed portion of the mutilated gear 55 engages the pinion 56 so as to actuate the cutting mechanism while the driving mech-

anism is retracting the plunger for a second stroke, whereas the blank portion of said mutilated gear 55 passes the pinion 56 and permits the cutting mechanism to remain idle during the forward movement of the plunger and when the plug of clay is being forced through the die into the cutting mechanism. But in order that the latter shall not under any circumstances rotate by momentum or even be turned by accident until the freshly formed plug has been passed into proper position to be cut by the wires, I make use of a brake B interposed in the connections between the main shaft and the cutting mechanism and herein shown as composed of a band wheel 65 mounted on the counter shaft 59 and partly surrounded by a band 66 which constitutes the shoe, the same being connected to one end of a lever 67 pivoted at 68 in the main frame and having a pin or finger 69 in its other end. On the main shaft 5 adjacent the mutilated gear is a cam 70 (shown in dotted lines in Fig. 1) with which the tip of said pin engages; and all these parts are properly proportioned and timed so that the pin 69 drops into the low portion of the cam 70 and applies the brake just as the teeth of the mutilated gear 55 pass off the pinion 56 and its blank portion comes opposite to said pinion. The application of the brake at this moment instantly checks the rotation of the cutting mechanism C just at a time when the eccentrics are about to project the rod and move the plunger forward to eject the plug of cement.

We have not considered it necessary to go into details further than as above nor to give the proportions and materials of parts, because considerable latitude in these matters will be permitted to the manufacturer and may be embraced without losing sight of the principle of our invention.

In operation the clay is fed through the hopper in a manner forming no part of the present invention, and compressed within the box 10 and ejected therefrom by the plunger as described above. Passing over the table 52 in the form of a plug, it is driven through the opening 51 in the inner wall 31 of the cutting mechanism and across the teeth 46, meanwhile pushing out the bricks or blocks which have been cut at the previous operation, and these pass out the opening 50 in the outer wall 30 onto a suitable table whence they are conveyed to the proper point for burning. As soon as the plunger ceases its forward movement and begins to recede, the cam 70 releases the brake B and the teeth of the mutilated gear 55 come into engagement with the pinion 56 so that the cutting mechanism C is rotated one step and the projected plug of clay is again cut into bricks. When there are three wires 39 around the periphery of the gear

rings 35 as shown, one step will be one third of a revolution; but it is clear that there might be a greater or lesser number than three such wires although there should not be so many but what during the idle moments of the cutting mechanism the plug of clay can be projected between two of the sets of wires 38. Fig. 6 shows the cutting mechanism with one set of the wires passing across the line of the clay plug and between the teeth 46, but in Fig. 5 the wires 38 are shown in dotted lines in the position they would assume while the plunger is being projected forward. As the latter is retracted its valve 26 opens to admit air to the interior of the press box 10 whose cut-off plate 12 is then closed, and this valve we find useful for otherwise a partial vacuum might be created therein or the plug of clay sucked back a trifle through the die 15. Just as the plunger has reached its rearmost movement, the cams 20 actuate the cut off plate 12 so that it also is retracted and the parts stand in position to permit clay to be fed into the box 10. Said cams are so shaped that next the cut-off plate is actuated or projected forward over the lower end of the hopper 11, and then the plunger is moved forward (the valve 26 being then automatically closed) to forcibly compress the clay within the box, to yet further compress it as it is driven through the tapered extension 14, and finally to eject it through the die 15 and pass it to the cutting mechanism where it is treated as above described.

What is claimed as new is:

1. In a brick machine, the combination with the plug forming and ejecting mechanism, the cutting mechanism to which said plug forming mechanism delivers, and the driving mechanism including a mutilated gear; of a shaft geared to the cutting mechanism and having a pinion adapted to engage

said mutilated gear, a brake for this shaft, and mechanism carried by the driving mechanism for applying the brake while the blank portion of said mutilated gear is opposite said pinion.

2. In a brick machine, the combination with the plug forming and ejecting mechanism, the cutting mechanism to which said plug forming mechanism delivers, and the driving mechanism including a mutilated gear; of a shaft geared to the cutting mechanism and having a pinion adapted to engage said mutilated gear, a brake for this shaft, a pivoted lever connected at one end with the brake and having a pin at its other end, and a cam fast on the shaft of the mutilated gear and so shaped and disposed as to engage said pin and apply the brake while the clear space on the mutilated gear is opposite said pinion.

3. A rotary plug cutting mechanism for brick machines and the like comprising two upright spaced parallel walls having alined openings and connected rigidly by a central rod, circular tracks around said walls concentric with said rod, rings movable on said track and connected by a series of equidistant rods, a series of fingers rigidly connected with the central rod, said end walls having alined openings properly disposed for the passage through them and over said fingers of the plug being treated, collars revolubly mounted on the axial rod between said fingers, and wires connecting said collars with the rods which connect said rings.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

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JOSEPH M. FLICKINGER.

Witnesses:

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G. C. BURCH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."