June 9, 1925. 1,541,766

G. E. LUCE

TRAVELING CRANE

Filed Nov. 23, 1923 4 Sheets-Sheet 1

Fig. 1.

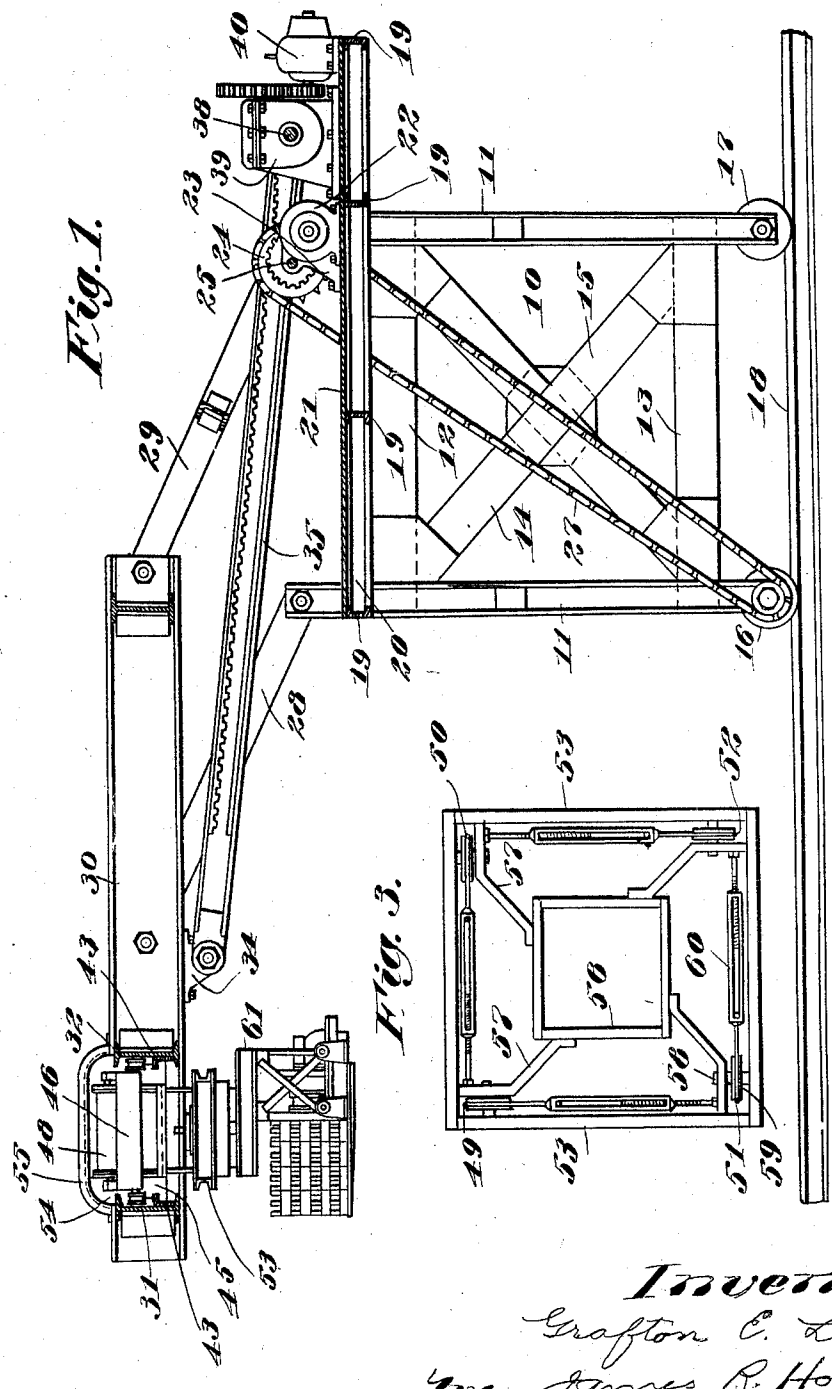


Fig. 3.

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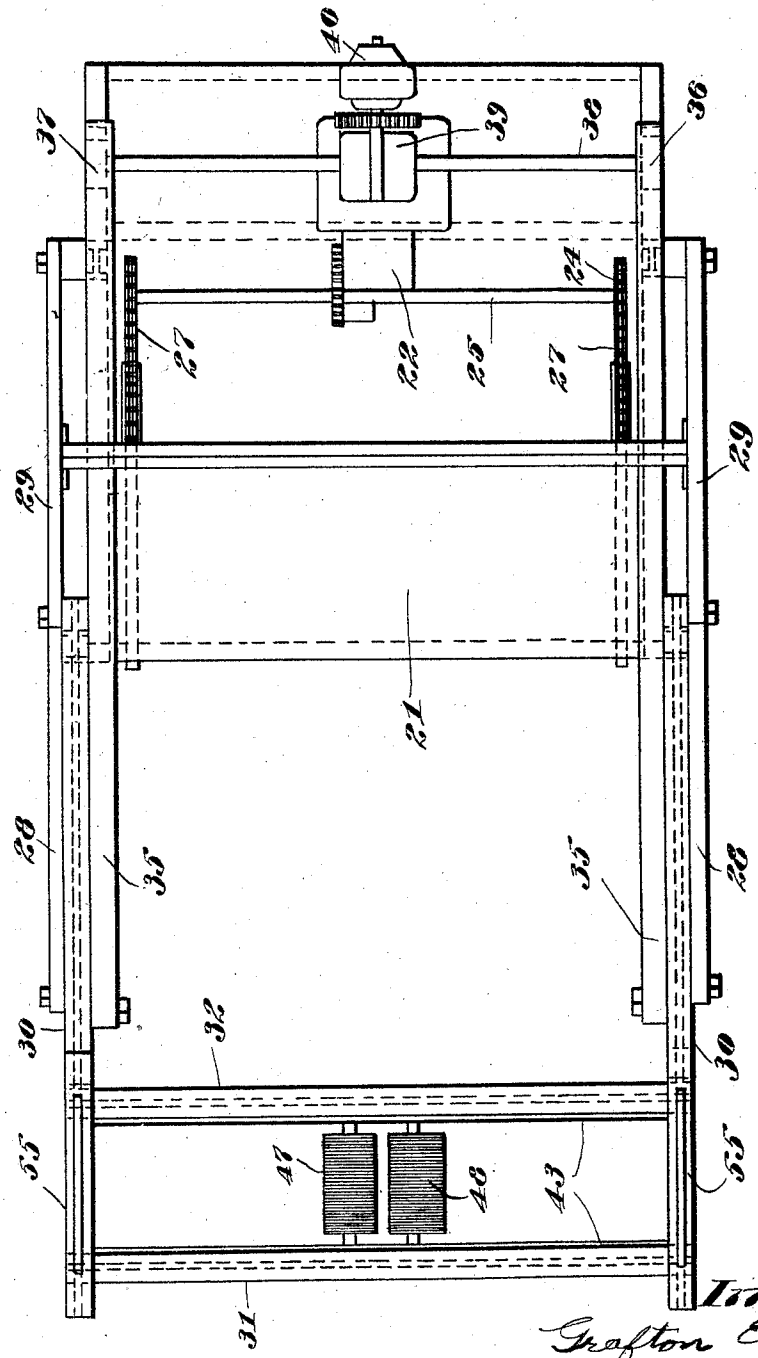


Fig. 2.

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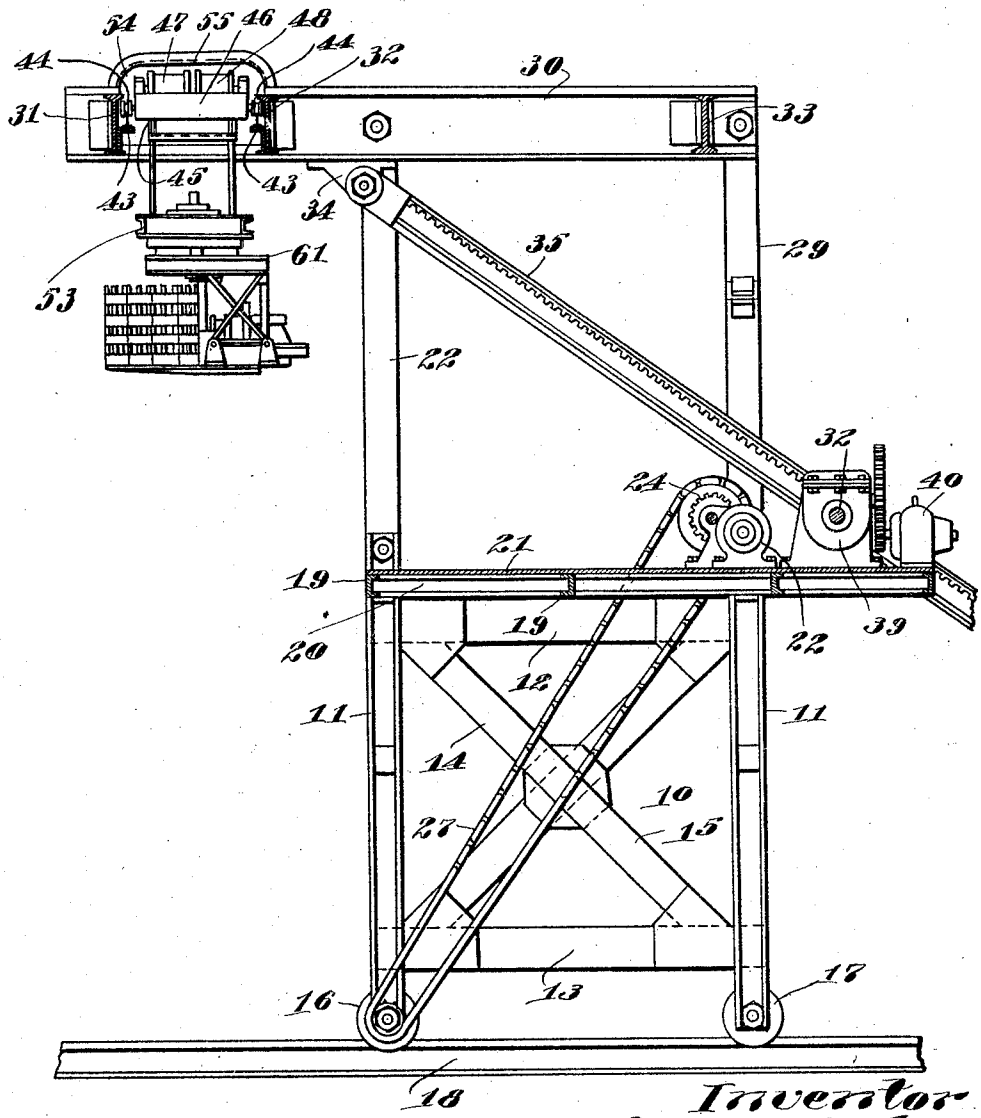
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Fig. 4.



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TRAVELING CRANE

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Fig. 6.

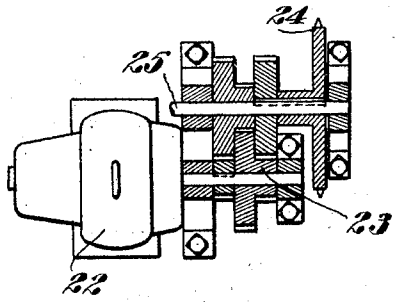


Fig. 5.

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Patented June 9, 1925. 1,541,766

UNITED STATES PATENT OFFICE.

GRAFTON E. LUCE, OF CHICAGO, ILLINOIS.

TRAVELING CRANE.

Application filed November 23, 1923. Serial No. 676,556.

To all whom it may concern:

Be it known that I, GRAFTON E. LUCE, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented an Improvement in Traveling Cranes, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My present invention relates to brick handling and setting machines, and more particularly to brick handling and setting machines of the crane type such as are described and illustrated in my prior pending application, Ser. No. 259,770, filed October 26, 1918.

In piling or stacking unit piles of bricks in kilns in which the distance between the floor and roof is small or in which low ceiled bays are employed, it is advantageous to employ a traveling crane that will economically pile or stack the brick units therein. A crane that will economically perform this function should, in addition to being able to deposit a pile of brick units in any position in the kiln or kiln bay, regardless of the height of the ceiling thereof, be of such rigid construction that the crane arm or mechanical device may be extended to its outward limit without imposing undue strain on the remainder of the construction. Also the various mechanism, such as movement of the crane as a whole, raising and lowering of the crane arm, transverse movement of the brick carrier proper, and the crowding mechanism, should be capable of being operated simultaneously or singly. My present invention is provided with suitable means to accomplish or perform the last named functions, but, as I have already described and claimed means for doing this in my copending application, Ser. No. 262,664, filed Nov. 15, 1918, they will not be shown or disclosed herein, and reference is here made to said application for a full disclosure of said means.

In carrying out my invention, I find it advantageous to employ a rigid platform of sufficient height to allow movement of the operating means for the crane arm or mechanical device within its extreme outward and inward movement, such platform being mounted on the usual wheels to allow it to move on the usual tracks running longitudinally of the kiln. On this platform is mounted the crane arm or mechanism having a movement in a vertical plane to the front, rear, or above said platform. The operating mechanism for moving said crane arm, the means for causing movement of the platform along the tracks in the kiln, as well as the means for controlling the various mechanism enumerated above, are placed on said platform within convenient reach of the operator.

To provide for moving the brick setter proper to any position laterally of the crane arms, within the limits of the machine, I provide a frame extending between the crane arms and rigidly attached thereto. On this frame is mounted a windlass capable of movement along said frame from end to end thereof, the mechanism for moving and operating said windlass being carried by the windlass frame and controlled by means united on the platform. The brick setter proper is suspended from cables on the windlass, the crowding means on the brick setter being controlled from the platform.

The principal object of my invention is the provision of a rigid or semi-rigid crane structure for piling or stacking bricks in units in a low ceiled kiln or bay thereof.

Another object of my invention is the provision of a crane, pivotally mounted, for movement in a vertical plane, at a plurality of pairs of points, to a platform. Still another object is the provision of means combined with a crane arm, as above described, for positioning a windlass laterally and in any position of said crane arm. Other and further objects will appear as the description of the invention progresses.

Referring to the drawings illustrating a preferred embodiment of my invention,

Fig. 1 is a side elevation, partly in section, showing the crane arms in their extreme forward and lowermost position;

Fig. 2 is a plan view;

Fig. 3 is a plan view showing the method of suspending the brick setter proper from the crane;

Fig. 4 is a side elevation, partly in sec-

tion, showing the crane arms in their extreme upward position;

Fig. 5 is a side elevation, partly in section, showing the crane arms in their extreme rearward and lowermost position, the extreme upward position being indicated by dotted lines; and

Fig. 6 is a detail of the reduction gearing from the platform driving motor to the driving chain therefor.

Referring to the drawings, 10 designates a platform constructed of two sets of uprights 11, upper and lower braces 12 and 13 and diagonal braces 14 and 15 securely riveted together as shown, one set being located at each side of the platform. At the bottom of the uprights 11 are wheels 16 and 17 adapted to run on tracks 18, located at either side of the kiln. Beams 19 extend from one set of uprights to the other, as shown in Fig. 4, and also beams 20 connect corresponding uprights in each set to stiffen the structure. A flooring 21 of sheet metal or wood provides a suitable top for the platform and on which is mounted the various operating mechanisms.

On the flooring 21 is mounted a motor 22 (see Fig. 6), connected through a reduction gearing 23 to sprockets 24 (only one of which is shown) on each end of a shaft 25 running crosswise of the platform. The shafts of the wheels 16 and 17 may extend from one set of uprights 11 to the other, or each shaft may be a stub shaft as shown. In either event, there is adjacent the wheels 16 and on the shaft thereof, a sprocket 26 in alinement with the sprockets 24 on the shaft 25, and connecting corresponding sprockets 24 and 26 is a sprocket chain 27 and through which power is transmitted to move the platform 10 and parts carried thereby along the rails.

The upright 11 extends above the flooring 21 as shown and pivotally connected thereto are the lower ends of links 28 and 29, the links being movable in a vertical plane on such pivot points. The links 28 and 29 are equal in length, and the upper ends thereof are pivotally connected to the channel beams 30, one at each side of the platform 10. I-beams 31, 32 and 33 are riveted to each beam 30, and form therewith an extremely rigid structure capable of moving in the arc of a circle of which the lower pivotal point of the links 28 or 29 is the centre and the upper pivotal points thereof, the radius. As the links 28 and 29 are equal in length and as the distance between the lower pivotal points thereof is equal to the distance between the upper pivotal points, the frame or crane arms 30 are always maintained in horizontal position. On the under face of each beam 30 is fastened a bracket 34, to which is pivotally attached the end of a rack bar 35, these rack bars meshing with a pinion 36 and 37, securely fastened at the ends of a shaft 38, rotated through a reduction gearing contained in the casing 39, from the motor 40 and by means of which the beams 30 and parts carried thereby are raised and lowered.

The I-beams 31 and 32 are provided on their inner faces with tracks 43, on which run the wheels 44 carrying the windlass 45. This windlass comprises a frame 46, having rotatably mounted therein a pair of drums 47 and 48, together with suitable mechanism for rotating said drums in either direction and for transmitting power to the wheels 44 to move the windlass along the tracks 43. As such mechanism, however, forms no part of the present invention, it will not be described in detail.

Each I-beam 30 is cut away as shown at 54 to allow the frame 46 and drums 47 and 48 to move to the extreme ends of the tracks 43, a brace 55 being employed to bridge the open space 54.

To each of the drums 47 and 48 is attached the ends of two cables, as for example, one end of each of the cables 49 and 50 is attached to the drum 47 and one end of the cables 51 and 52 to the drum 48. To the lower or free end of these cables is attached the frame 53; and referring to Fig. 3, it will be seen that I provide attaching means that enable me to adjust said frame and maintain the same horizontal. In the center of the frame 53 is a supplemental frame 56, attached to the frame 53 by braces 57. Between the end of each brace 57 and the sides of the frame 53 is mounted a shaft 58 carrying a pulley 59. Each of the cables 49, 50, 51 and 52 pass downwardly around the pulleys 59 and the ends attached to the turnbuckles 60. The screw of each turnbuckle is attached to the end of the braces 57. Assuming that the frame 53 is hung on the cables 49, 50, 51 and 52, and that the cables are unequal in length and that therefore the frame 53 is not horizontal, it will be apparent that by adjusting the length of the cables by the turnbuckles 60. I may bring the frame 53 to a horizontal position.

Pivotally mounted on and depending from the frames 53 and 56 is a rotatable frame or setting apparatus, designated generally by the numeral 61. This setting apparatus is similar in construction, arrangement and operation to the setting apparatus shown and described in my copending application, Serial No. 259,770, above referred to and as such apparatus forms no part of the present invention, it will not be described in detail herein.

It is to be understood that the various

mechanisms for operating the parts above described are controlled from devices located on the flooring 21 and within convenient reach of the operator.

The operation of the invention is as follows:

The motor 22 is operated to bring the entire structure to a convenient position with respect to the piles or units of brick it is desired to stack, the beams 30 being in any of the positions shown in the drawings. We will assume that the beams 30 are in the position shown in Fig. 4. The drums 47 and 48 are now rotated to lower the setting frame 61 to bring the same into position to engage with a pile of bricks, and the motor 22 is again operated to move the fingers 62 under the pile. The drums 47 and 48 are now rotated to lift the pile or unit of bricks clear of the ground or car, as the case may be, the motor 22 operated to lower the beams 30 sufficiently to clear the ceiling or top of the kiln. The pile or unit of bricks may be positioned on the floor of the kiln, or on other piles or units of bricks already in position on the floor of the kiln by either raising or lowering the beams 30, operating the drums 47 and 48 to raise or lower the setting frame, or by simultaneously operating the drums 47 and 48 and the beams 30. As the tracks 43 extend the width of the kiln and as the frame 61 may therefore be moved from one side of the kiln to the other, while the entire structure may be moved the length of the kiln, it will be seen that it is possible to deposit a pile or unit of bricks in any desired position within the limits defined by the kiln.

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

My improved crane, while designed primarily for use in piling or stacking unit piles of bricks in kilns and the like is not limited to such use and may be used in any situation in which it is desired to transport and pile or stack goods of a general nature in a low studded building. Further it may be used in storage yards or dumps, such as railroad yards where a plurality of culverts renders the employment of a low hung crane essential.

My invention is further described and defined in the form of claims as follows:

1. In a brick setting machine, the combination of a platform, a pair of beams spaced apart from each other and located above said platform, tracks extending between said beams near one end thereof, a parallel link connection between the beams and the platform, a pair of rack beams and means for operating the same to cause movement of said pair of beams with respect to the platform, a windlass mounted on said tracks for movement transversely of said beams and a brick setting platform suspended from said windlass.

2. In a brick setting machine, the combination of a platform, a pair of beams spaced apart from each other located above said platform, a parallel link connection between the beams and the platform and a pair of rack beams one for each of a pair of beams pivotally attached to said pair of beams and extending downwardly and rearwardly toward the platform, a shaft mounted on the platform and extending transversely thereof, pinions mounted at either end of said shaft and meshing with the racks, and means mounted on the platform for rotating said shaft to move the beams into any one of their positions.

3. In a brick setting machine, the combination of a platform, a pair of beams spaced apart from each other and located above said platform, tracks extending between said beams near one end thereof, a parallel link connection between the beams and the platform and a pair of beams permitting movement of said pair of beams with respect to the platform, a pair of rack beams one for each of the pair of beams pivotally attached to said beams and extending downwardly and rearwardly toward the platform, a shaft mounted on the platform and extending transversely thereof, pinions mounted at either end of said shaft and meshing with the racks, means mounted on the platform, for rotating the said shaft to move the beams into any one of their positions, and a windlass mounted on said tracks for movement transversely of said beams and a brick setting platform suspended from said windlass.

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

GRAFTON E. LUCE.