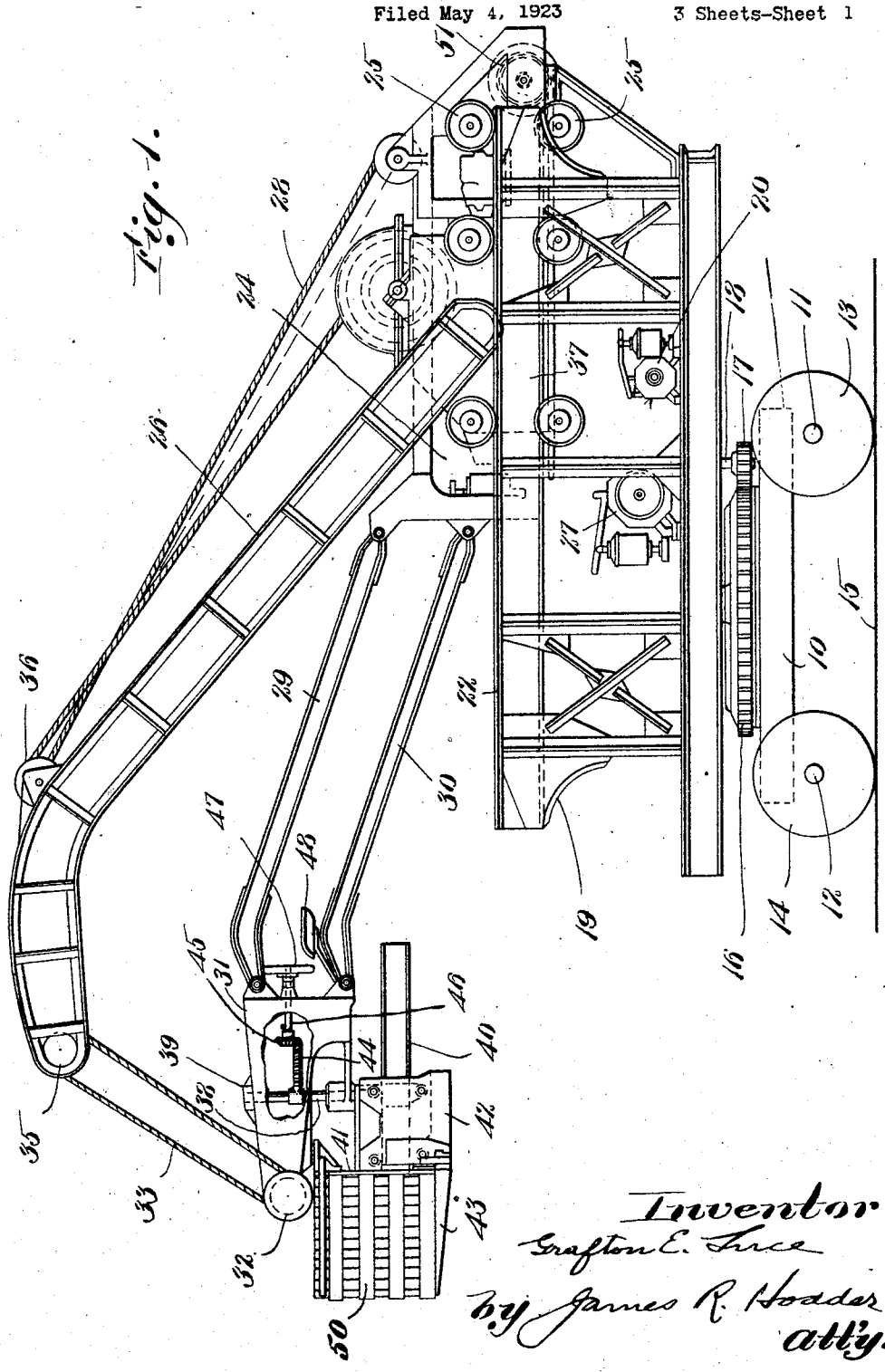
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G. E. LUCE

GOOSENECK BOOM FOR BRICKSETTERS

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Fig. 2.

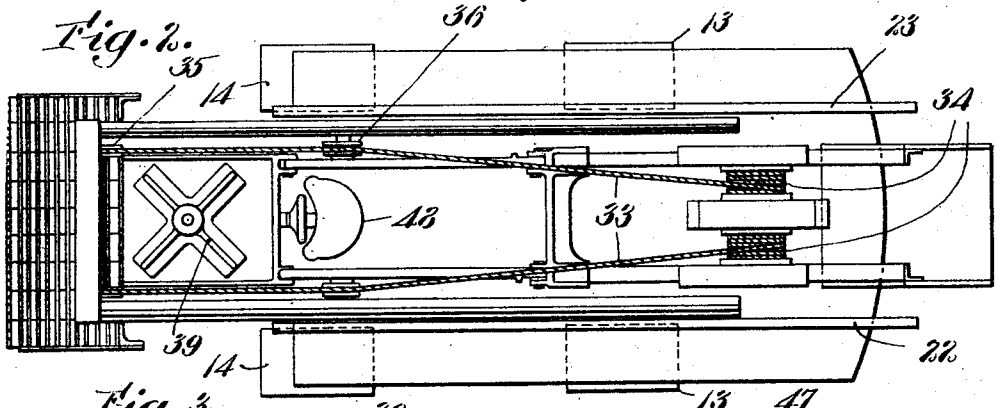
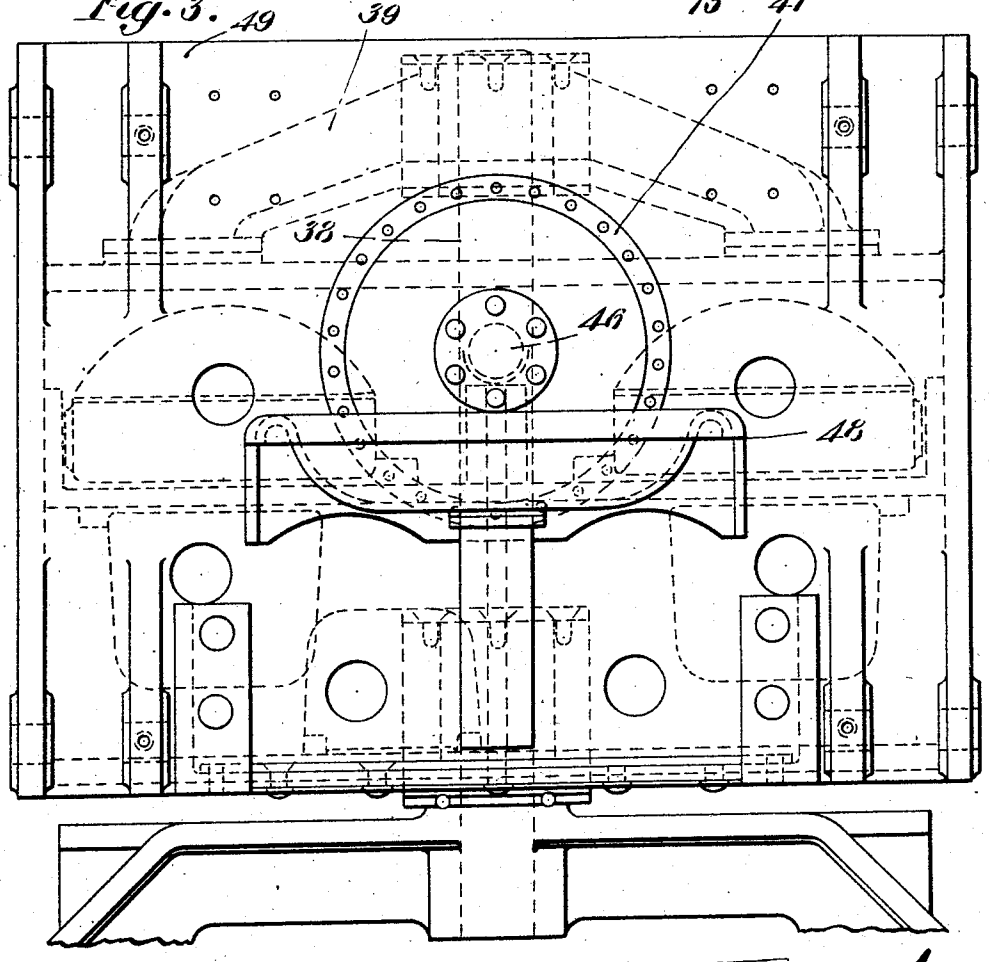


Fig. 3.



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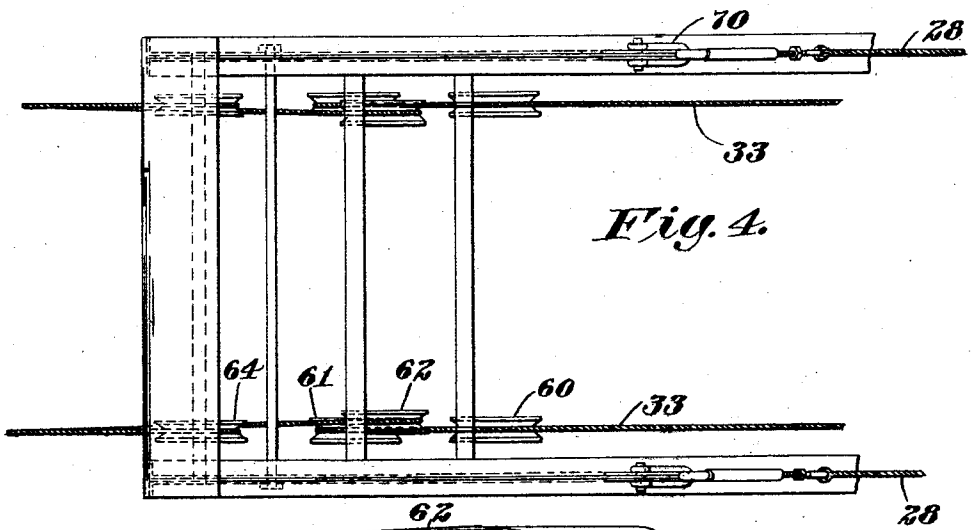


Fig. 4.

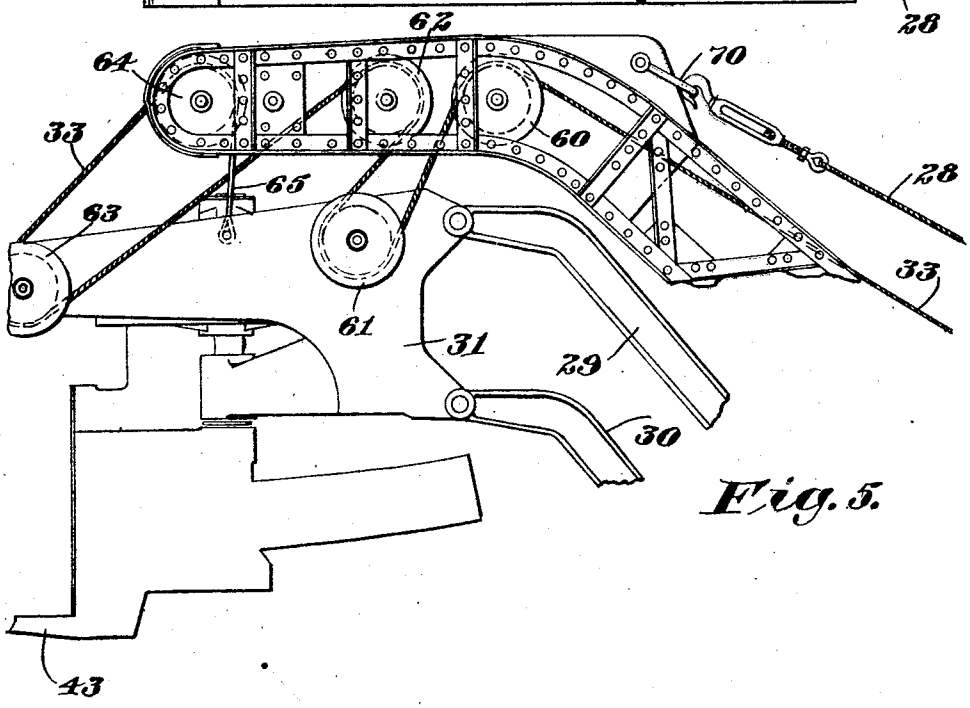


Fig. 5.

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UNITED STATES PATENT OFFICE.

GRAFTON E. LUCE, OF CHICAGO, ILLINOIS.

GOOSENECK BOOM FOR BRICKSETTERS.

Application filed May 4, 1923. Serial No. 636,675.

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 Gooseneck Booms for Bricksetters, 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 automatic brick setting machines, and more particularly to brick setting machines of the type described and claimed in my copending application Ser. No. 259,770, filed Oct. 26, 1918.

In automatic brick setting machines of the type referred to, the operator of the machine is stationed on the platform of the machine, from which he operated the various mechanisms controlling the longitudinal movement of the entire machine, the rotary movement of the platform and parts carried thereby, the raising and lowering of the crane boom and the loading and unloading of the piles of bricks from the carrier mechanism. An attendant passed word to the operator to bring the pile or load of bricks into proper position with respect to the wall of the kiln, swung the brick carrier on its pivot into position to unload and then instructed the operator to unload the pile of bricks. Such a method of procedure is unavoidable as the operator is located so far from the brick carrier that he cannot accurately position the same, and cannot rotate the carrier on its pivot. It is important in my present invention to provide an apparatus which will insure the speedy and correct operation of the brick carrier, making in effect a one man machine control.

An object of my invention therefore, is the provision of means for controlling the various movements of the machine, such means being located on the brick carrier frame and in such position relative to the brick carrier that the operator can supervise and control all movements of the machine.

Another object of the invention is the provision of means on the carrier frame and within convenient reach of the operator, for rotating the brick carrier into any desired position on its axis.

In stacking piles of bricks in kilns by means of automatic brick setting machines, considerable difficulty has been experienced in stacking the bricks to the capacity of the machine, as it has been necessary to allow ample room for the machine to operate. In other words, machines of this class required so much room in the kiln in which to successfully operate, that a large percentage of the bricks in the kiln had to be stacked by hand. In my present invention I obviate this difficulty by so proportioning the various parts and balancing all parts on the transporting platform, that I am enabled to withdraw the setter from the kiln, after the bricks have been discharged therefrom, within two units in width or one unit in length of the size unit or pile of bricks used.

A further and extremely important object of my present invention is to provide means for permitting the operation of my novel setter in a smaller vertical height than has heretofore been possible. This is made feasible by what I call a "gooseneck" boom arrangement, whereby the carrier with the bricks thereon is enabled to be raised or crowded to a position nearer the outer end of the boom than has heretofore been possible of achievement. I accomplish this by forming the outer end of the boom in such a manner that the carrier with the bricks therein may be swung to a point directly thereunder, thereby permitting the bricks to be stacked at the highest point desired in a kiln, stack or the like, thus obviating the necessity of completing the pile by hand stacking.

A still further important object of my invention is to provide a novel four-point suspension for the carrier, so that the same will be held at all times in a constantly level position, without any danger of tilting or the like, thus maintaining the bricks in even formation therein. This is an important feature of my invention and of great advantage in the apparatus herein described, and I wish to claim the same broadly.

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

Fig. 1 is a side elevation;

Fig. 2 is a plan view;

Fig. 3 is a front elevation of the operator's controlling board;

Fig. 4 is a top plan view of the outer end

of the boom, showing the arrangement of cable and pulleys for my novel four-point suspension; and

Fig. 5 is a fragmentary side view of the boom end and carrier, illustrating my improved gooseneck form of boom.

Referring to the drawings, 10 designates a platform mounted on axles 11 and 12 carrying wheels 13 and 14 respectively adapted to run on a track 15 located, for example, in a kiln. Mounted on and attached to the platform 10 is the circular rack 16 with which meshes the pinion 17 on the lower end of a shaft 18. This shaft 18 is rotatably mounted in the frame 19 and is connected by suitable mechanism, not shown, to the motor 20, also mounted on the frame 19. The wheels 13 and 14 are connected through suitable mechanism, to the traveling motor 27.

The frame 19 is rotatably mounted on a platform 10 by means of the bearing 21, the details of construction of which it is not necessary to show or describe. The top of the frame 19 consists of two parallelly arranged beams 22 and 23 defining a runway for the crowding frame 24 provided on either side with wheels 25 engaging the upper and lower surfaces of the beams 22 and 23, this construction allowing free longitudinal movement of the frame 24 on the beams 22 and 23 and preventing tilting of the frame when heavy loads are carried by the crane. The boom 26 carried by the crane is pivoted at its lower end to the frame 24. Means, not shown, are provided for raising and lowering the free end of the boom 26 by the cable 28.

Pivotally mounted on the front of the crowding frame 24 are stabilizing arms 29 and 30, which extend outwardly or forwardly from said frame and are pivotally attached to the rear of the carrier frame 31. The distance between the mounting points on the carrier frame 31 is equal to the distance between the mounting points on the frame 24, and provides for maintaining the carrier frame 31 and associated parts horizontal regardless of the vertical position of the carrier frame. At the forward end of the carrier frame, and at either side thereof, are pulleys 32, over which pass the cables 33, fastened, one end to the free end of the boom 26, and the other end to the drum 34, which drum is located on the crowding frame 24. In passing from the pulleys 32 to the drum 34, the cables 33 pass over pulleys 35 at the free end of the boom 26 and over pulleys 36, located, as shown in Fig. 1, on the upper side of the boom. The drum 34 is rotated, to raise and lower the carrier frame 31 and associated mechanism, by the motor 37, to which it is connected by suitable mechanism, not shown.

Pivotally mounted for rotation in a horizontal plane on the frame 31 is a brick carrier comprising a vertical shaft 38 having attached to its upper end a bearing plate 39 cooperating with a bearing member (not shown) in the frame 31, and having attached to its lower end the members 40, carrying at their forward end the plate 41. Mounted for movement longitudinally of the members 40 is the carriage 42 having forwardly extending fingers 43 attached to its lower front end.

Attached to the shaft 38, intermediate the ends thereof and below the bearing plate 39 is a curved rack or quadrant 44 with which meshes the bevel pinion 45 attached to the forward end of the shaft 46, mounted for rotation in suitable bearings, not shown, in the frame 31. The rear end of the shaft 46 is provided with a wheel 47 and by means of which the shaft 46, and therefore, the shaft 38 and associated parts, may be rotated. The wheel 47 is located within convenient reach of the operator's seat 48, which is attached to the frame 31 in any suitable manner.

The rear wall of the frame 31 constitutes an instrument board, on which is located, within convenient reach of the operator, the controlling mechanism for the various operating motors 20, 27, 37, etc. This instrument board 49 is clearly shown in Fig. 3, but the various controlling mechanisms have been omitted from said figure for the sake of clearness of illustration, and also because the details of construction of such instruments, and the character of their arrangement on the board forms no part of the present invention.

The frame 24 has been referred to as a crowding frame, in that if we assume the carrier in Fig. 1 is maintaining the pile of bricks 50 thereon in proper position to be inserted in place in the kiln, the frame 24 and all parts carried thereby are moved forward, or to the left, as viewed in Fig. 1, to force or crowd the pile of bricks into place. This movement of the frame 24 is accomplished by the motor 51 through suitable gearing, not shown, the motor being controlled by devices on the instrument board 49, as above referred to.

Referring now to Figs. 4 and 5, illustrating the novel gooseneck and four-point suspension features of my invention on an enlarged scale, the cable 28 for raising and lowering the free end of the boom is shown secured to the shackle 70 in any desired manner, here illustrated as by a hook and turnbuckle. The outer or free end of the boom 26 is so curved or formed that the carrier frame 31 and its component parts may be raised to a point directly underneath the boom, and extending substantially parallel therewith, in order to utilize to the greatest possible extent the apparatus of my invention in completing the piling of a stack of

bricks, by enabling the carrier to be raised upwardly to approximately the height of the boom end, which was not feasible or possible in prior straight booms heretofore utilized.

This construction enables my present machine to be operated in a smaller vertical height than heretofore, and to be swung freely within a shed, kiln or the like, or to be withdrawn from the same after completing the stack, and eliminating the necessity of completing the building of the top courses of brick by hand.

I will now describe the construction and operation of my novel four-point suspension means for maintaining the carrier and bricks thereon in a level position throughout the operation and functioning of my machine. As the means employed are the same on each side of the free end of the boom and carrier, but one side of same will be described. The cable 33, secured at one end to the drum 34, extends upwardly along the boom 26, over the pulley 60, down around the pulley 61, back up over the pulley 62, down and around the pulley 63, back up over the pulley 64, and downwardly to the carrier 31, where it is made fast or secured in any desirable manner, as by a shackle 65, as illustrated.

It will be appreciated that the pulleys 60, 61, 62, 63 and 64 are all freely rotatable, thus permitting easy operation of the device.

The four-point suspension feature includes the two sets of pulleys 61 and 63 on each side of the carrier.

As there is but a single cable 33, on each side of the boom end, and each of the same length, each secured at equi-distant points, it will be appreciated that the pull of the cable will be at all times equally distributed along the length of same, and that the lifting force on the pulleys 61 and 63 and hence the carrier 31, will be the same, so that the carrier frame 31 will be raised from four points at an absolutely equal rate of speed and with the assistance of the parallelly arranged stabilizing bearings 29 and 30 such frame 31 will be automatically maintained in the same level, horizontal position throughout.

The construction herein shown enables me to dispense with the services of attendants heretofore necessary to position the carrier, and enables the operator of the apparatus to operate the same much more quickly, cheaply and accurately than has been heretofore possible. It also provides a perfectly balanced structure at all times, and facilitates the work of building a stack of brick, as well as enabling the same to be done with the highest possible mechanical efficiency.

A further important advantage incident to the gooseneck construction is that in brickyards throughout the country as now constructed the sheds are built approximately of the same height as the topmost courses of the brick in a kiln to be constructed therein. The result of this present condition in brickyards is that prior to my development of this "gooseneck type" of boom, it was so impractical to use a setting crane of this type in brick sheds, as to entirely prevent the use of same, since only a part of the kiln could be set by the ordinary type of boom. This gooseneck feature which I have discovered, enabling the carrier to be lifted to substantially the same height of the boom itself—excepting only the diameter of pulleys and framework required, together with the parallel link feature, balanced four-point suspension, and one man control, and other advantages, enable this type of crane to be used in existing kiln sheds and consequently at once enlarges its field of usefulness.

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

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

1. In a device of the class described, the combination of a platform mounted for longitudinal movement, a frame rotatably mounted on the platform for movement in a horizontal plane, a crowding frame longitudinally movable with respect to said frame, a boom and parallelly arranged arms pivotally mounted on said crowding frame, a frame suspended from the boom and pivotally mounted on said parallelly arranged arms, a rotatably mounted brick carrier on said last named frame, an operator's seat on said suspended frame, and means on said suspended frame within convenient reach of the operator for rotating said brick carrier.

2. In a device of the class described, the combination of a platform, a frame, a crowding frame, a boom and parallelly arranged arms pivotally mounted on said crowding frame, a frame suspended from the boom and pivotally mounted on said parallelly arranged arms, a rotatably mounted brick carrier on said last named frame, means located on said frame and crowding frame for operating said mechanisms, an operator's seat on said suspended frame, and controlling devices on said suspended frame within convenient reach of the operator for rotating said brick carrier.

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

GRAFTON E. LUCE.