(No Model.)

4 Sheets—Sheet 1.

C. W. RAYMOND.

BRICK PRESSING MACHINE.

No. 417,837. Patented Dec. 24, 1889.

Fig. 1.

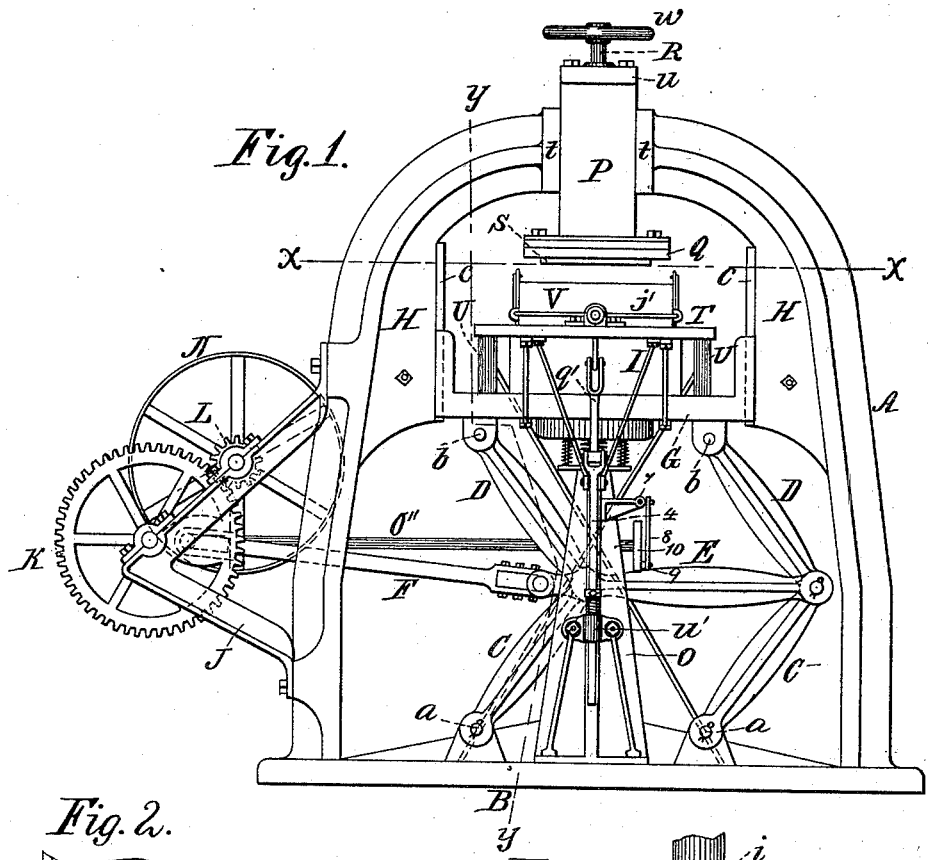


Fig. 2.

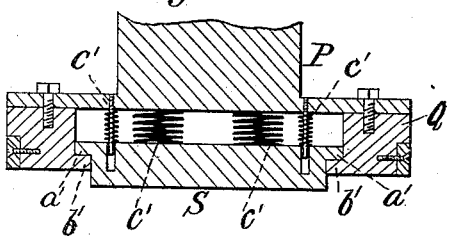


Fig. 3.

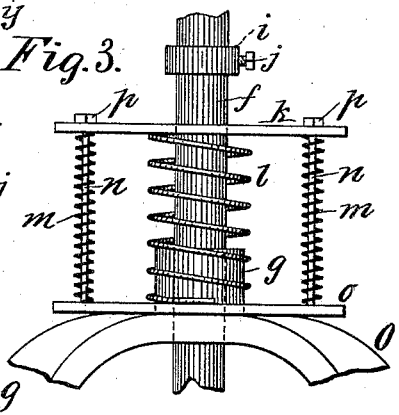
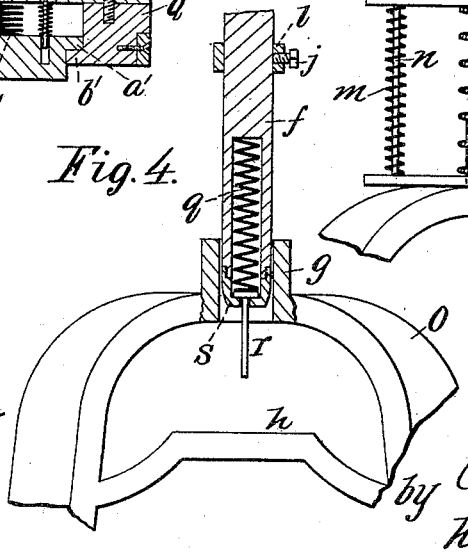


Fig. 4.



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(No Model.) 4 Sheets—Sheet 2.

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Fig. 5.

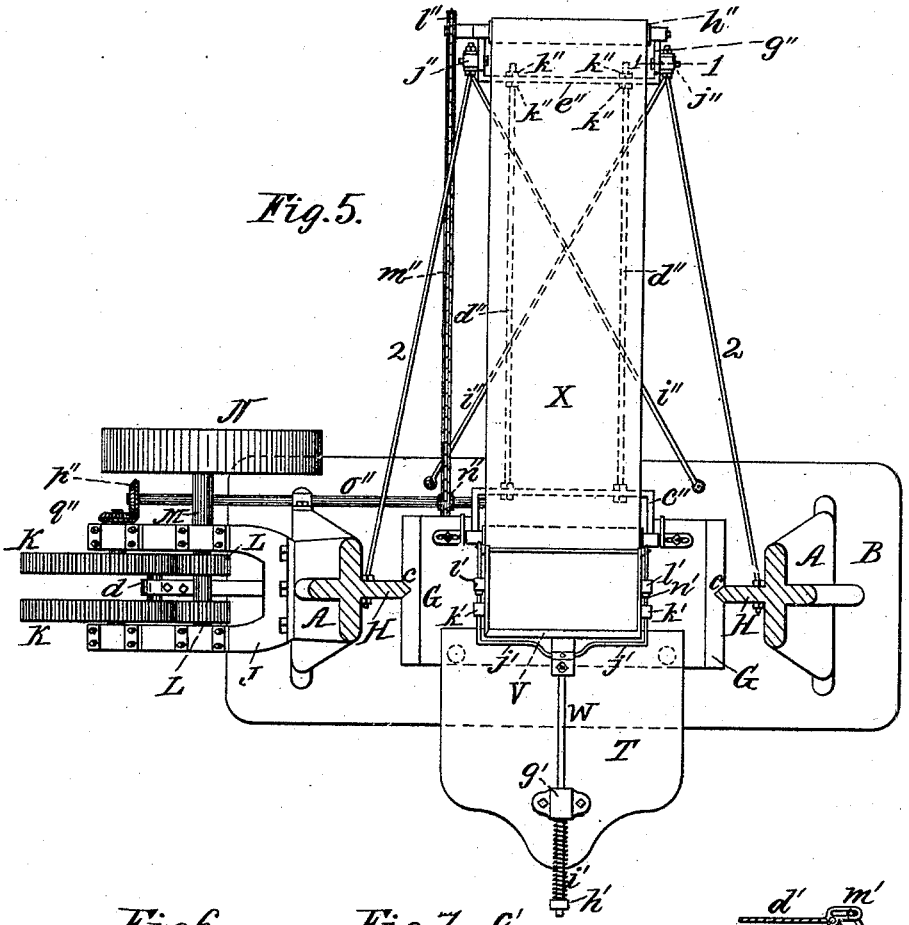


Fig. 6.

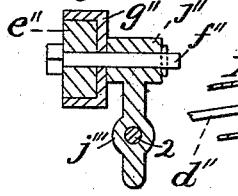


Fig. 7.

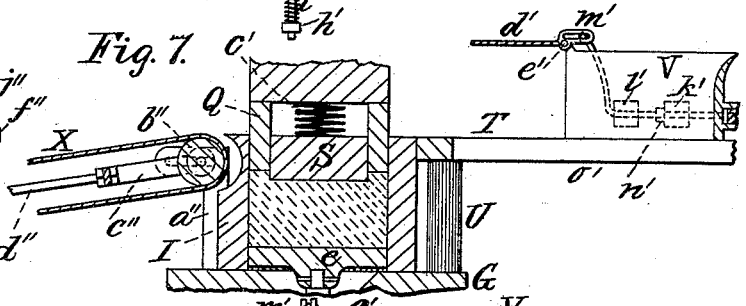
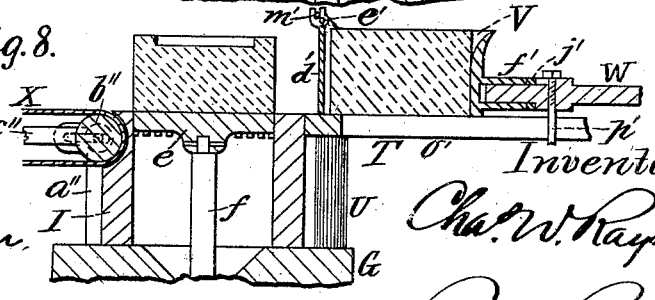


Fig. 8.



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BRICK PRESSING MACHINE.

No. 417,837. Patented Dec. 24, 1889.

Fig. 9.

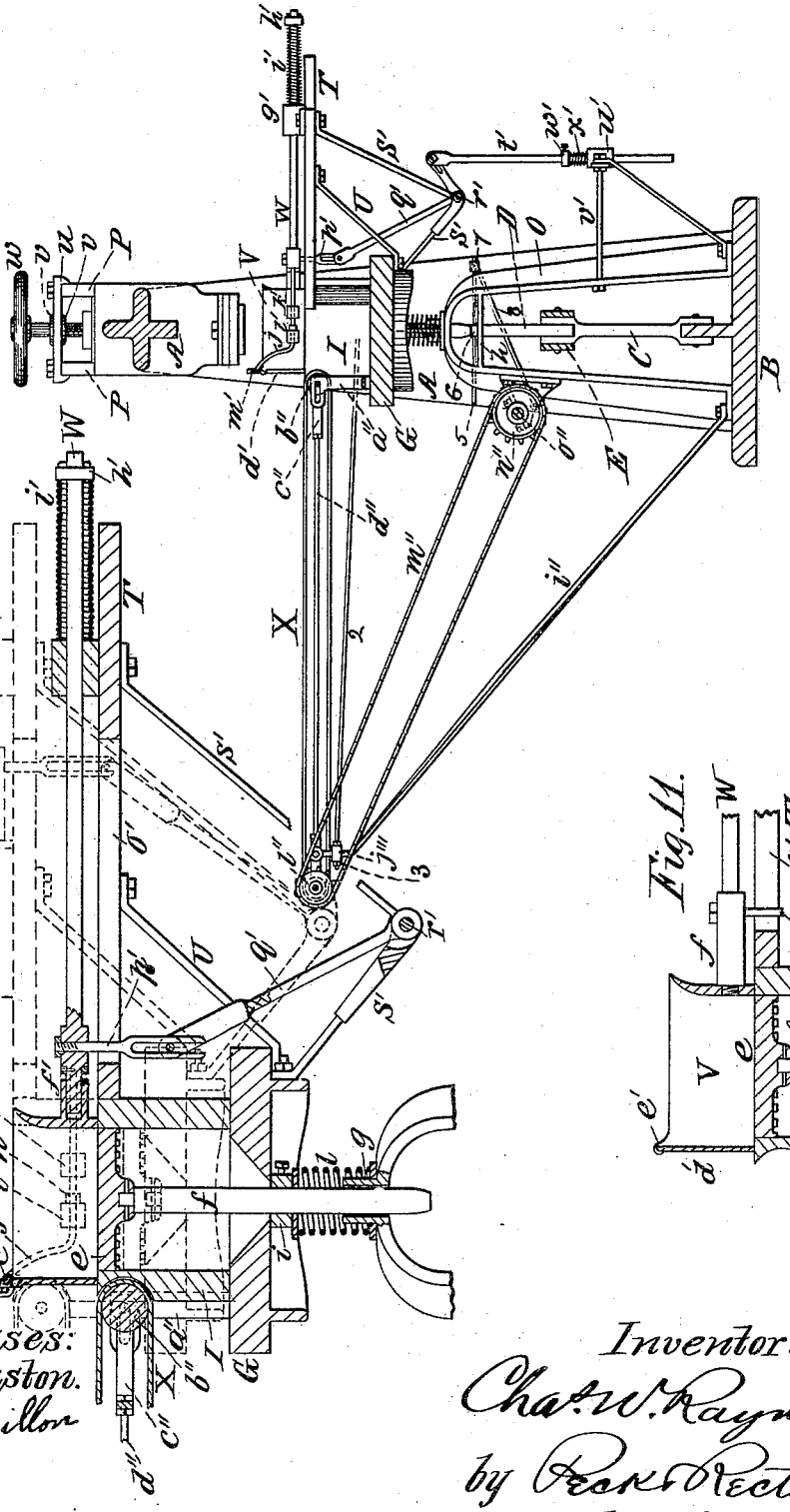

Fig. 10.

Fig. 11.

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BRICK PRESSING MACHINE.

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Fig. 13.

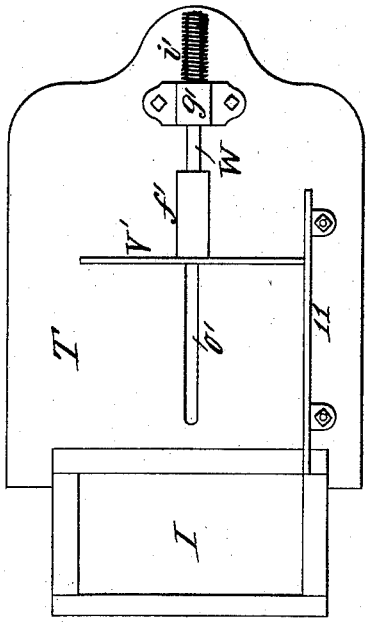

Fig. 12.

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UNITED STATES PATENT OFFICE.

CHARLES W. RAYMOND, OF DAYTON, OHIO.

BRICK-PRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 417,837, dated December 24, 1889.

Application filed June 10, 1889. Serial No. 313,720. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. RAYMOND, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Brick-Pressing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of brick-machines known as "re-pressing machines," wherein it is desirable, after the bricks have been formed in the mold or machine, to give them a second and final pressure by which any excess of moisture is removed, the air pressed out, and the bricks given their final set and shape ready to be burned or baked in the kiln.

My invention is designed as an improvement upon the press described and claimed in my prior patent, No. 354,226, of December 14, 1886, or upon presses of a similar character; and it has for its object the provision of means for the automatic delivery to and removal from the mold or compress box of the bricks, whereby the capacity of the machine is largely increased, as well as improvements in the construction of the parts.

The novelty of my invention will be herein set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is an enlarged sectional elevation of the platen. Fig. 3 is an enlarged detail elevation of the spring-buffers and connected parts. Fig. 4 is a corresponding view to Fig. 3, representing a modification in the construction. Fig. 5 is a plan view of the machine through the dotted line *x x* of Fig. 1. Fig. 6 is an enlarged sectional detail through the dotted line *l l* of Fig. 5. Fig. 7 is a sectional elevation of the compress-box and associated parts, showing their position at the time of pressing. Fig. 8 is a corresponding view showing the position of the parts after the pressing has been done and the compress-box partially lowered. Fig. 9 is an end elevation of the machine through the dotted line *y y* of Fig. 1, looking to the right. Fig. 10 is such an enlarged sectional side elevation of the compress-box and its associated operating mechanism as is necessary to show the position of the parts at the two extremes of movement. Fig. 11 is a detail, partly in section, showing a modification in the automatic feeder and remover. Fig. 12 is a sectional elevation of the compress-box and associated parts, showing their position when the press is at or near its complete upstroke. Fig. 13 is a plan view of the compress-box and table, representing a modification in the feeding mechanism.

The same letters of reference are used to indicate identical parts in all the figures.

The main frame-work of the machine is preferably composed of a single casting consisting of a vertical arch A and base or platform B, or it may be of any other suitable construction. Pivoted, as at *a*, to lugs upon the upper side of the platform are two levers C, to the upper ends of which are pivoted two similar levers D, said levers being connected at their central pivots by a pivoted cross-tie bar E, to which is pivoted the inner end of a pitman F.

The upper ends of the levers D are pivoted, as at *b*, to lugs upon the under side of a carrier or platform G, whose sides, extended upwardly, are vertically planed to fit ways *c* upon guide-ribs H, extending from the inner sides of the arch, as shown. Upon the carrier G is firmly but removably secured the mold or compress box I, open at its top, of the usual or any suitable construction, and in which the bricks are pressed. While in operation the carrier and compress-box are given a constant vertically-reciprocating motion through the medium of the toggle-levers C D, tie-bar E, and pitman F by the following means, referring to Figs. 1 and 5.

In a supplemental frame J, secured to the outer side of the arch A, are journaled two gear-wheels K, connected together by a wrist-pin *d*, upon which the outer end of the pitman F is pivoted. Meshing with the gears K are two smaller gears L, secured upon a shaft M, journaled in the frame J, and having upon its outer end a driving-pulley N. Any other suitable power mechanism for giving a constant vertical reciprocation to the carrier and compress-box may be substituted in the place of that illustrated and described.

Within the compress-box I is fitted a movable bottom *e*, Figs. 7, 8, 10, and 11, to the lower side of which at the center is secured

a rod or leg *f*, which extends down through the cut-out platform or carrier G and is guided vertically through a perforated lug *g* in the top of a supplemental arch O, secured upon the platform B. Between the uprights of the arch O is a plate *h*, with which or with other mechanism, to be hereinafter described, on the downstroke of the carrier and compress-box the lower end of the leg *f* comes in contact and is arrested, and so avoid jar and shock in the sudden lowering of the carrier and compress-box, as well as to operate the bottom *e*. The leg *f*, Fig. 3, is provided with a collar *i*, preferably adjustable by a set-screw *j* or any projection, such as a key, which comes in contact with a sliding buffer-plate *k*, surrounding the leg *f* and held up by a central coiled spring *l*, surrounding the lug *g* and leg *f*, and two outer springs *m*, surrounding vertical guide-rods *n*, secured to a bottom plate *o* and extending up through perforations in the buffer-plate, and provided on their upper threaded ends with nuts *p*, for adjusting the tensions of the springs. As a substitute for this buffer construction that shown in Fig. 4 may be employed, where the lower end of the leg *f* is bored out to receive a spring *q*, whose lower end bears against a button upon the top of a rod *r*, inserted through a cap *s*, screwed or fitted upon the lower end of the leg, as will be readily understood.

Just over the open top of the compress-box is an adjustable platen P, which fits around the top of the arch, is guided between ways *t*, and is provided on its under side with a removable plate Q, shaped to fit snugly in the top of the compress-box I. A set-screw R, engaging with a threaded perforation in the top of the arch, has its upper end passed through a cross-piece *u*, bolted to the uprights of the platen, and is locked thereto, but not prevented from rotation, by the collars *v*, Fig. 9, and is operated to raise or lower the platen by a hand-wheel *w*.

So much of the press and its mode of operation are substantially that of my prior patent before referred to, with the exception of the special means for operating the toggle-levers and the special buffer mechanism, which will form the subject of some of the claims.

The first novel feature of my invention applicable to presses of this character and illustrated in Figs. 1, 2, and 7 consists in applying a self-adjusting die S to the platen-plate Q, which is recessed to receive it and from the under surface of which it projects. This die is held from falling out by end flanges *a'* engaging shoulders *b'*, and is held projected by springs *c'*, suitably secured in the recess and bearing upon the upper side of the die. The purpose of this die is to render the bricks of uniform thickness and finish, as follows: It will be borne in mind that the press has a defined unvarying limit of stroke, and it sometimes happens that the bricks before re-pressing are of varying thickness. Now, in case of a brick of less thickness than the average, the die S in re-pressing will enter the top surface of the brick and spread it out in all directions, thus giving the required and uniform thickness to the brick, while in bricks of the average thickness the die will be pressed up into its recess and will very slightly, if at all, enter the top surface of the brick, owing to the yielding of the springs above the die and the thickness and density of the brick. In all cases the bricks will be of an exact size, the only difference being in the depth of the depressions caused by the die. This die may be provided on its under side with letters or other identifying or ornamental marks, as desired.

The next feature of my invention (illustrated more particularly in Figs. 5, 6, 7, 8, 9, and 10) relates to automatic mechanism for feeding and removing the bricks to and from the compress-box. Extending from one side of the compress-box and flush with its upper edge is a table T, supported on posts U, Figs. 1 and 9, secured to the carrier G. Upon this table is the automatic feeder and remover, which in one form consists of a box V, open at the top and preferably flaring and open at the bottom. This box has one side *d'* hinged, as at *e'*, to the upper corners of the ends, and has projecting from its opposite side a tubular lug *f'*, into the outer open end of which is slipped the inner end of a horizontal bar W, whose outer end is passed through one or more guide-lugs *g'* upon the table, and has surrounding it, between the lug *g'* and a pin or collar *h'* upon its outer end, a coiled spring *i'*. Attached to the bar W, just outside of the lug *f'*, is a yoke bar or rod *j'*, Fig. 5, which extends outward from the bar W, and then forward along the ends of the box V, through stop and guide lugs *k' l'* upon the ends of the box, and then has its forward ends bent up and provided with pins engaging the upwardly-extended and slotted pieces *m'*, secured to or integral with the swinging side *d'*. Upon the yoke-bar *j'*, between the lugs *k' l'*, on each side, is a pin or collar *n'*. Secured to the bar W, and extending down through a slot *o'* in the table T, is an arm *p'*, whose lower slotted end is engaged by a pin in the upper end of a bell-crank *q'*, pivoted, as at *r'*, to the lower end of a bracket *s'*, secured to the carrier G and table T. The lower member of the bell-crank is loosely pivoted to the upper end of a vertical rod *t'*, passed through a bearing *u'* upon a supplemental bracket *v'*, extending from the arch O, and said rod *t'* is provided with an adjustable collar *w'* above the bearing *u'*, and between which and said collar is a coiled spring or other elastic buffer *x'*, surrounding the rod *t'*.

The next feature of my invention consists in the mechanism for carrying off the bricks after they have been removed from the compress-box. It is in substance an endless belt supported and operated in the following manner: In the horizontal slots of two uprights

a'', secured to the carrier G, is journaled the spindle of a horizontal roller b'', which preferably occupies a recess in the upper side of the compress-box opposite the feed-box V, and with its upper side flush with the top edge of the box. Hung upon the spindle of the roll b'' is a stretcher-yoke c'', from which two stretcher-rods d'' extend outward and are connected to an opposite stretcher-yoke e'', Figs. 5 and 6, whose side arms are adjustably secured by bolts f'' to short journal-arms g'', in which is journaled the spindle of the outer roll h''. Secured to the base B, and extending outwardly and upwardly, are two crossed brace rods or arms i'', whose upper ends have eyes or perforations j'', through which the bolts f'' pass, and other perforations j''', through which the outer ends of horizontal brace-rods 2 are passed and held by nuts 3, Figs. 5 and 9, and then extend back and are secured to the ribs H. The endless apron or belt X is passed around the rollers b'' h'', and is made taut by the nuts k'', Fig. 5, on the threaded ends of the rods d'' on each side of the yoke e''. The spindle of the roll h'' has upon one end a sprocket-wheel l'', from which a drive-chain m'' extends around a second sprocket-wheel n'', fast upon a suitably-journaled shaft o'', having upon its end a bevel-pinion p'', meshing with a corresponding pinion q'' upon the shaft of the adjacent gear K. Thus the operation of the power mechanism transmits revolution to the roller h'' and causes the belt X to travel with its upper surface constantly moving away from the compress-box, as will be readily understood. At the commencement of the operation, when the carrier G is down to its lowest point of stroke and the movable bottom e is flush with the top of the compress-box, the box V is directly over and registers with the mouth of the compress-box, and the spring i' is under tension. (Shown by the solid lines of Fig. 10.) Now, as the carrier G moves up the bracket s' goes with it, thus carrying the pivot of the bell-crank q' with it, whereupon, by such shifting of the pivot of the bell-crank, the spring i' is released at once, and with a quick stroke draws the box V back upon the table T, out of the way of the platen P, whose plate enters the mouth of the compress-box. The parts are now in the position shown by Fig. 12, by the dotted lines of Fig. 10, and by Fig. 7. The box V remains back upon the table T, and the attendant places therein a brick which has been molded or partially pressed, and then the carrier and compress-box descend. In descending, and when about one-quarter of the way down, the leg f, with the movable bottom e, is first arrested by the contact of the collar i and plate K, Fig. 3, or by the contact of the rod r and plate h, Fig. 4, and further descent of the carrier and box causes the top of the movable bottom e to come flush with the top edge of the box. The adjustment is such that just at this moment the bottom of the carrier comes in contact with the top of the collar i, (solid lines, Fig. 10,) and further descent continues, the bottom e and leg f now going down together. As soon as the contact is made between the bottom of the carrier and the collar i the pivot of the bell-crank q' and the rod t' have been sufficiently lowered to put the spring x' under such tension that the further descent of the carrier trips the bell-crank q', throws the box V, with its contained brick, quickly over the mouth of the compress-box, and puts the spring i' again under tension. At this point the carrier has reached its lowest limit of stroke and starts up again. As it goes up, the pivot of the bell-crank is again shifted to release the tension of the spring i', as before described, and the first backward movement of the rod W draws back the yoke-rod j' and lifts the side d' to a horizontal position without moving the box V. Just at this point the stops n' on the rod j' come in contact with the lugs k', and the box V is drawn back on the table T, the raised side d' clearing the brick that was in the box and leaving it upon the movable bottom e. The further upward movement of the carrier and compress-box continues, and the bottom e, with its brick, settles within the compress-box, and just as the bottom e is arrested upon the top of the carrier and the brick is completely enveloped by the compress-box the platen-plate enters the top of the box and the pressing is done, as seen in Fig. 7. Another brick has been placed by the attendant in the drawn back box V, which still has its side d' raised in a horizontal position, and the downstroke is repeated as before. When the box V is again pushed forward to deposit the next brick, the just-pressed brick has been raised out of the compress-box, as seen in Fig. 8, and the lowered side d', which has been lowered by the first forward movement of the yoke-bar j', pushes the pressed brick off upon the traveling apron, which carries it away with such rapidity that it is out of the way before the side d' is again raised at the back stroke of box V, as will be readily understood. So the operation of feeding the bricks to the compress-box and removing them goes on continuously and automatically. From the belt X the bricks are removed and taken to the drying-room, and finally to the kiln.

In Fig. 11 the yoke-rod j' is dispensed with and the rod W is made fast to the box V without lost motion. In such case the side d' would be raised by the brick within the box V as the latter was drawn back, and the side d' would drop back to close the box by gravity. By reason of the horizontal slots in the uprights a'', in which the spindle of the roller b'' rests, the apron X vibrates as the compress-box moves up and down, the roller b'' approaching to and receding from the side of the compress-box, (see Figs. 7 and 8,) but at all times in position to receive a brick from the compress-box, and the belt X always has

the same tautness, as will be readily understood.

As a further means for starting the expulsion of a pressed brick from the compress-box, the following mechanism is employed, referring to Figs. 1, 9, and 12. In guide-boxes 4, secured to the yoke O, is fitted a sliding rod 5, having secured to it a stop-block 6, extending in and resting upon the plate *h*. The outer end of the rod 5 has pivoted to it at 7 the outer end of a pitman 8, whose inner end is connected to a wrist-pin 9 upon a disk 10 upon the inner end of the shaft *o''* or to the wrist-pin of a crank on said shaft. The adjustment of the parts is such that just after the spring *l* has been put under tension the block 6 will be directly under the leg *f* and will engage it, thereby starting to expel the compressed brick and loosening it in the compress-box, whereupon the spring *l* finishes the expulsion, and the block 6 slips from under the leg *f* and passes to the opposite side of the yoke, and then, at the complete revolution of the shaft *o''*, returns to the position shown in Fig. 12. This mechanism will be found particularly useful in giving an initial start to the bottom *e* in cases where the bricks are subjected to very heavy pressure and adhere tightly to the compress-box.

The advantage of the box form of feeder and remover with a hinged side is to prevent an unpressed brick coming in direct contact with a pressed and highly-finished brick. In many cases this would spoil the finish of one side of the pressed brick, owing to the adherence thereto of loose particles from the unpressed brick. Again, in other classes of work all the advantage of the automatic feeding and removing of the bricks might be accomplished by the construction shown in Fig. 13, where the box V is dispensed with as such, and an upright flat pusher-plate V' is substituted therefor. In this case the bricks would be fed upon the table T against a gage plate or rib 11, secured to the table, and the fed-in brick would by direct contact remove the pressed brick from the bottom *e*. The mechanism for operating the plate V' is just the same as that for operating the box V. Again, where the box V is used, the swinging side *d'* may be any flexible apron—as leather or oil-cloth, for instance—secured at its upper edge to the box, the only purpose of this swinging side being to prevent the direct contact of the pressed and unpressed bricks.

Having thus fully described my invention, I claim—

1. In a brick-pressing machine, the combination, with a carrier having vertical reciprocal motion and a compress-box carried thereon and provided with a movable bottom for expelling a pressed brick, of a feeding-pusher actuated by a reciprocating part of the pressing device to deposit a brick in position to enter the compress-box, substantially as and for the purpose described.

2. In a brick-pressing machine, the combination, with a carrier having vertical reciprocal motion and a compress-box carried thereon and provided with a movable bottom for expelling a pressed brick, of a feeding-box actuated by a reciprocating part of the pressing device to deposit a brick in position to enter the compress-box, substantially as described.

3. In a brick-pressing machine, the combination, with a carrier having vertical reciprocal motion and a compress-box carried thereon and provided with a movable bottom for expelling a pressed brick, of a feeding-pusher actuated by the press to deposit a brick in position to enter the compress-box and to remove the previously-pressed brick, and a vibrating endless traveling apron to receive the removed pressed brick, substantially as described.

4. In a brick-pressing machine, the combination, with a carrier having vertical reciprocal motion and a compress-box carried thereon and provided with a movable bottom, of a horizontally-sliding feed-pusher, a fixed support for the same traveling with the compress-box, an actuating-rod for the pusher, a bell-crank connected at one end to said rod and at the other to a yielding support and pivoted to the carrier or an extension therefrom, and a spring for retracting the pusher, substantially as and for the purpose described.

5. In a brick-pressing machine, the combination, with the feeding-box V, provided with the hinged side *d'* and guide-lugs *k' l'*, of the actuating-rod W, provided with the yoke-rod *j'*, pivoted to upper slotted extensions of the side *d'*, passed through the lugs *k' l'*, and provided with collars *n'* between said lugs, substantially as and for the purpose described.

6. In a brick-pressing machine, the combination of the horizontally-slotted uprights *a''*, carrying the roller *b''*, the yokes *c'' e''*, the connecting stretcher-rods *d''*, the journal-arms *g''*, the roller *h''*, journaled therein, brace-rods for said journal-arms, a sprocket-wheel on the spindle of the roller *h''*, and the drive-chain *m''*, driven by the power that actuates the press, substantially as and for the purpose described.

7. In a brick-pressing machine, the combination, with the vertically-reciprocating compress-box, its movable bottom *e*, provided with the leg *f*, having a projection *i*, the guide-arch O, buffer *k*, loose upon the leg *f*, the spring *l*, interposed between said arch and buffer *k*, and the support *h*, of the sliding block 6, carried upon the rod 5, and the actuating-pitman 8, pivoted to said rod and to a revolving part of the press, substantially as and for the purpose described.

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