(No Model.)

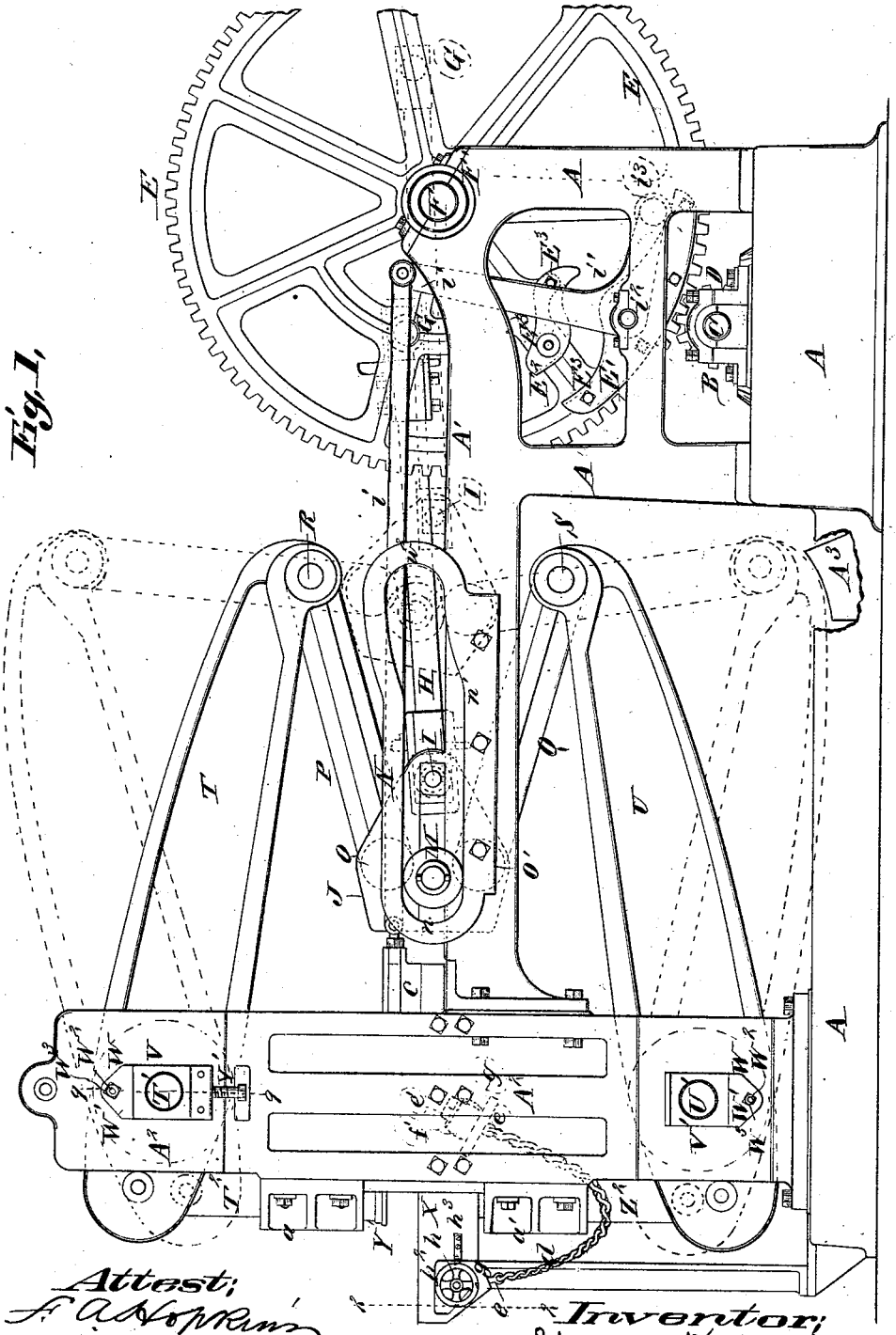
4 Sheets—Sheet 1.

H. KRUTZSCH.

BRICK MACHINE.

No. 345,513. Patented July 13, 1886.

Fig. 1.



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N. PETERS. Photo-Lithographer, Washington, D. C.

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Fig. 2.

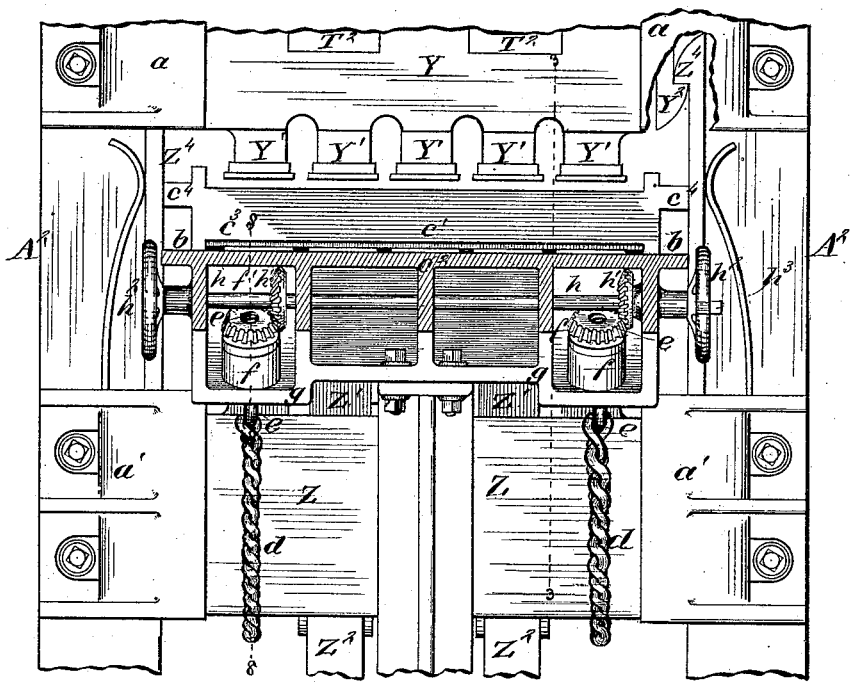


Fig. 3.

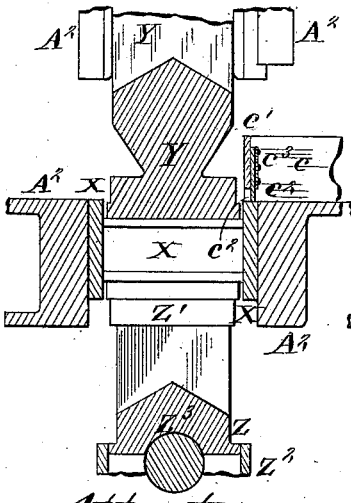


Fig. 4.

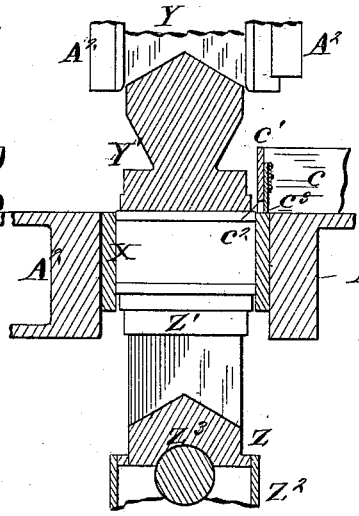
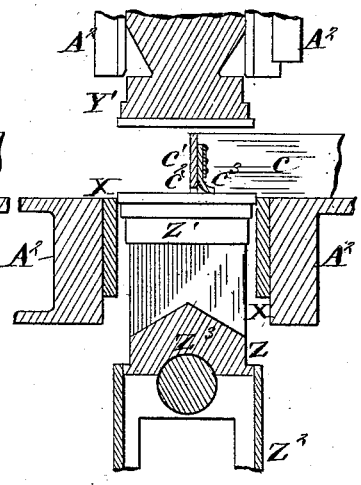


Fig. 5.



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H. KRUTZSCH.

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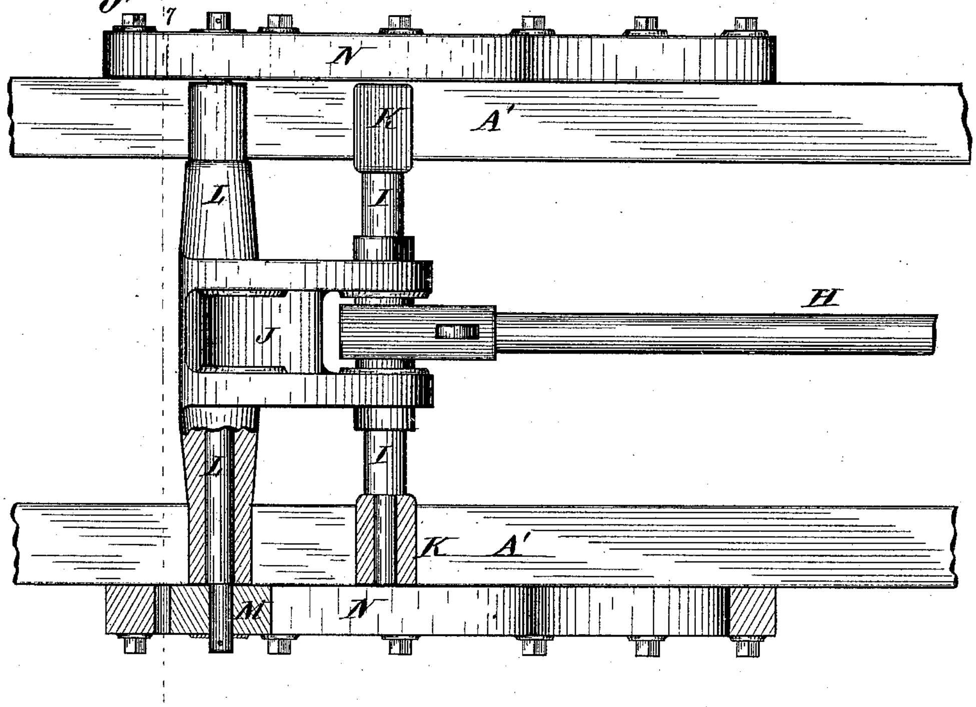
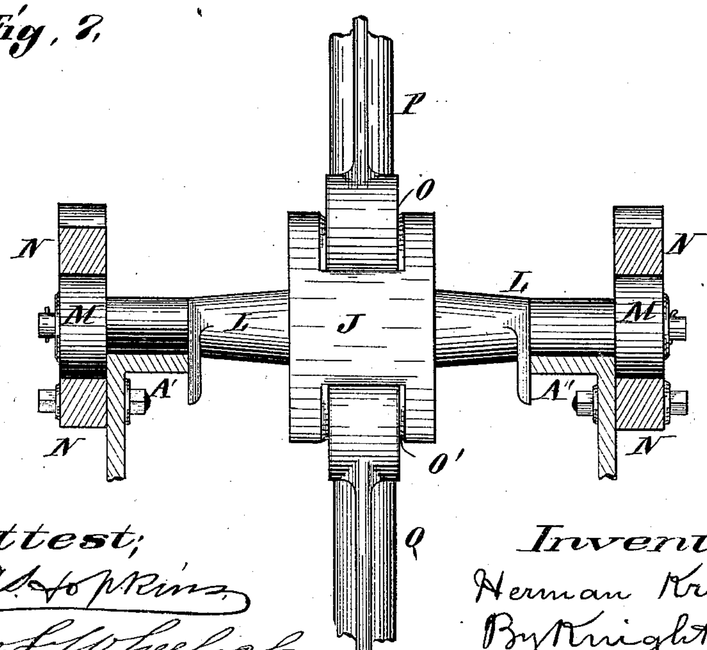
Fig, 6,



Fig, 7,



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(No Model.)

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H. KRUTZSCH.

BRICK MACHINE.

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Fig. 8.

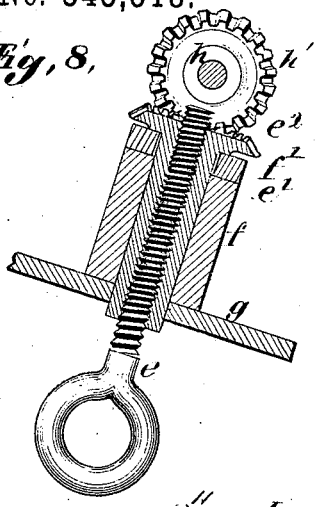


Fig. 9.

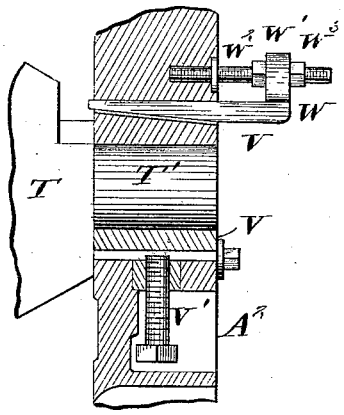


Fig. 10.

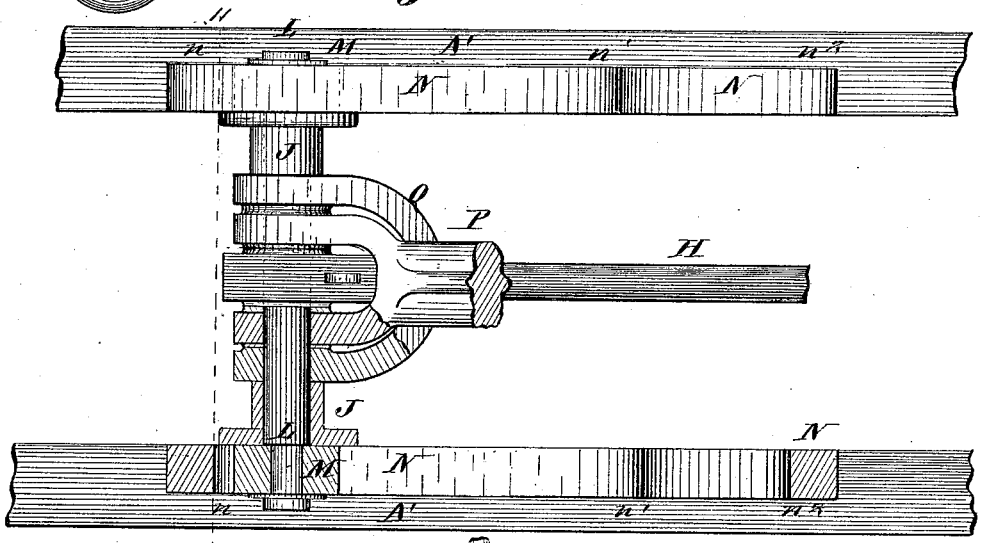
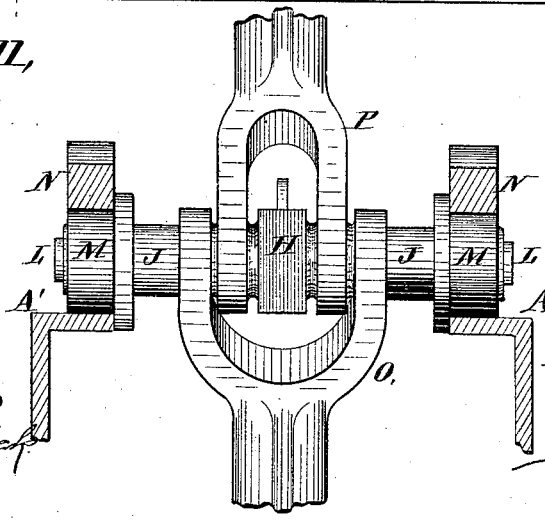


Fig. 11.



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UNITED STATES PATENT OFFICE.

HERMAN KRUTZSCH, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO THE ST. LOUIS IRON AND MACHINE WORKS, OF SAME PLACE.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 345,513, dated July 13, 1886.

Application filed January 14, 1886. Serial No. 188,592. (No model.)

To all whom it may concern:

Be it known that I, HERMAN KRUTZSCH, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Brick-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a side view of the machine, showing the parts in the position they occupy when the charger is just beginning its forward movement. Fig. 2 is a detail transverse section at 2 2, Fig. 1, showing parts in front elevation. Figs. 3, 4, and 5 are detail longitudinal sections at 3 3, Fig. 2, showing the charger and the mold-plungers in various positions. Fig. 6 is a top view of the cross-head and guides, parts being in horizontal section. Fig. 7 is a transverse section at 7 7, Fig. 6. Fig. 8 is an enlarged vertical detail section at 8 8, Fig. 2. Fig. 9 is an enlarged detail transverse section at 9 9, Fig. 1. Fig. 10 is a top view of a cross-head somewhat modified in construction from that shown in Figs. 1, 6, and 7. Fig. 11 is a transverse section at 11 11, Fig. 10.

This is in some respects an improvement on the brick-machine patented to J. J. Kulage, December 23, 1884.

The improvement consists partly in a construction and arrangement of parts by which the lower plunger is carried above the level of the mold-top, and the charger passes over it while in this position.

The improvement consists partly in a construction and arrangement by which the upper plungers continue to descend after the lower plungers have come to the upper position they attain in the pressure of the brick.

The improvement consists partly in an equalizing device applied to the mechanism, by which the descent of the lower plungers is arrested.

Other minor details of the improvement will be set forth in the claims.

The frame A may have any suitable construction to give bearing to the working parts.

B are pillow-blocks, in which the main shaft C has bearing. This shaft has a spur-pinion, D, which engages the spur-wheel E on the shaft F, having bearing in the oblique boxes F′. The construction is such that the strain on the shaft when the bricks are being pressed comes directly on the solid metal of the main frame.

G is a wrist-pin on the wheel E, connected by a connecting-rod, H, with a bar, I, upon the cross-head J. The ends of the bar I carry guide-wheels K, which travel on the horizontal part of the bars A′, which thus act as guides for this part of the cross-head. (See Figs. 1 and 6.)

At L are the main guide-arms of the cross-head, said arms carrying anti-friction wheels M, which work in the guides N. These guides N limit the arms to a horizontal movement between n and n', but from n' to n^2 the guides are inclined, so as to increase the movement of the upper plunger relatively to the lower plunger, or to cause the upper plunger to continue its descent after the lower plunger has come to rest. This latter would be the case where the guides N have the construction shown in Fig. 1, where the parts n' n^2 are concentric with the lower wrist of the lower toggle-bar, so that while the wheels M are passing between n' and n^2 this wrist has no motion.

O O′ are respectively wrists upon the cross-head, to which are connected the upper and lower toggle-bars, P and Q. The other ends of the toggle-bars are connected, respectively, by wrists R and S, to the upper and lower plunger-levers, T and U. The fulcrum-shaft T′ of the upper plunger-lever has bearing in boxes V, which have capacity for vertical adjustment in standards A^2 of the frame. (See Figs. 1 and 9.) The boxes V rest on the ends of screws V′, and the top of each box bears against a wedge, W, having a lug, W′, through which passes a screw-stud, W^2, with nuts W^3 upon it, which bear against the sides of the lug and hold the wedge in place. It will be seen that the severe strain in pressing the bricks comes upon the wedges, and that the screws V′ have merely to sustain the weight of the parts at other times. The fulcrum-shaft U′ of the lower plunger has bearing in similar boxes, V, the wedges W in this case being below the boxes, and the screws V′ may be dispensed with, as the pressure upon these boxes is always downward.

The molds are shown at X, and are open at bottom and top, except when closed by the plungers, (as usual in this class of machines.) The head Y of the upper plunger, Y′, works in guides *a* of the uprights A^2, and is connected to the end of the lever T by strong connecting rods or links T^2, so that the upper plungers, Y′, move upward and downward with the front end of the lever T. The lower plunger-head, Z, on the other hand, is not connected to the end of the lever U, but is capable of some independent movement, being carried upward, after the pressure of the bricks, by connection with the upper plunger-head, and dropping to its lower position by gravity when the connection is released. The lower plungers are shown at Z′.

Z^2 are lifting-bars, which are connected to the fore end of the lever U, and whose upper end is fitted to bear in recesses Z^3 at the bottom of the plunger-head Z. The lower plunger-head works in guides *a*′ on the uprights A^2, the molds also serving as guides to the plungers Z′, and consequently to the plunger-head.

Y^2 are catches depending from the ends of the upper plunger-head, Y, and Z^4 are spring-catches, which extend upward from the lower plunger-head, Z, in such a manner that the catches engage when the upper plunger-head is moving upward, so that the lower plungers are carried upward and lift the bricks from the molds.

The position of the parts when the tops of the lower plungers are level with the tops of the molds is shown in Fig. 1. It will be seen that the wrist G has not yet reached the dead-center, so that the molds will continue to rise a little distance from this point. On the other hand, it will be seen that the movement of the cross-head is very slow at this time, so that the wheel E turns a considerable distance while the lower plungers are rising a little distance above the molds and descending again to this level. While this is taking place the charger has been moved forward and discharged the bricks from the top of the molds onto the table *b*. To allow the front part, *c*′, of the charger *c* to pass over the lower plungers when they extend above the level of the mold, this bar is cut away at c^2 and the gap closed by a flexible cleaner, c^3, composed of leather, rubber, or other suitable substance, which will accommodate itself to the upper face of the molds and serve to brush away any matter that may be left thereon. As the charger attains its forward position side projections, c^4, thereon force the spring-catches Z^4 outward and disengage them from the catches Y^2, so that the lower plungers are released from the upper plunger-head and drop to their lower position, as seen in Fig. 4. The descent of the lower plungers is limited by chains *d*, fixed at their inner ends to eyebolts *e*, whose position is shown by dotted lines, Fig. 1. The eyebolts extend through a bracket or plate, *g*, and through a rubber or other spring, *f*, above the bracket, and have bearing upon the spring by means of washer and nut *e*′. The outer ends of the chains *d* are connected to eyebolts *e*, having upon their screw-threads round nuts *e*′, which carry at the upper ends bevel-wheels e^2. The bevel-wheels bear upon washers *f*′, and the washers in turn bear upon rubber or other springs, *f*, which springs bear upon the bracket or plate *g*, through which the nuts *e*′ pass. It will be seen that the round nuts *e*′ may be turned in their bearing in the bracket *g*, and will move vertically therein as the plunger falls on the chains *d*.

The bevel-wheels e^2 engage bevel-wheels *h*′ on the transverse hand-shaft *h*. This shaft is turned by hand-wheels h^2, one of which is notched and engaged by the spring-detent h^3, to prevent the accidental turning of the shaft *h*. It will be seen that when the shaft *h* is turned the two chains *d* are equally let out or taken up, for the purpose set forth. (See Figs. 1, 2, and 8.)

The charger *c* is actuated by the following means, (see Fig. 1:) *i* is a rod connected at the front end to the charger, and at the rear end to the upright arm of a bell-crank lever, *i*′, which is fulcrumed to the frame A at i^2. The horizontal arm of the bell-crank lever carries an anti-friction roller, i^3, which works between two cams, E′ and E^2, on the wheel E.

The adjustments of the machine are as follows: The cams E′ and E^2 are connected to the wheel E by bolts E^3, so that they can be adjusted as occasion may require. (See Fig. 1.) The amount of clay entering the mold at each time is regulated by the place to which the lower plungers descend, and this is regulated by the chains *d*, as before described. (See Figs. 1, 2, and 8.) The thickness of the bricks is regulated by the positions of the wedges W, as before described. (See Figs. 1 and 9.)

The operation of the machine is as follows: The plungers being in the position shown in Fig. 5, the charger moves forward, pushing the bricks from between the plungers, releasing the lower plungers, so that they drop to the position shown in Fig. 4, filling the molds with clay, striking the superfluous clay from the tops of the molds, and carrying it back. During this movement of the charger the wheel has passed the dead-center, so that although the upper plungers have had continuous movement, and also the lower plungers until released, yet this movement has been small, and not such as to interfere in any degree with the proper operation of the other parts. The upper plungers continue to descend, and when the lifting-bar Z^2 comes to its bearing beneath the lower plunger-head the lower plungers begin to ascend. When the guide-rollers M reach the point *n*′, the lower plungers cease to rise, while the upper plungers continue their descent. The purpose in this is to prevent the formation of a dead-line in the brick intermediate between the two plungers.

I have found that where the two plungers approach each other during the completion of

the pressing process the part of the brick intermediate between the plungers, and which is at rest in the mold, adheres to the side of the mold and forms a defect extending all around the brick. I have perfectly overcome this defect in the way described.

The action might even be carried further by causing one of the plungers to retreat slightly during the completion of the pressing. I have described the lower plunger as the one brought to rest; but the upper plunger may be the one at rest during the completion of the pressing. This may be accomplished by changing the guide-grooves between n' and n^2.

I have shown a block, A^3, against which the rear end of the lower plunger-lever impinges on reaching its lower position. This is not essential.

When the pressure of the brick has been completed, the upper plungers rise, and when they have ascended a certain distance the lower plungers are drawn up by the catches Y^2 Z^4, and the bricks are raised from the molds to be discharged by the charger, as before described.

In the modification shown in Figs. 10 and 11 the bar I, with its wheels K, and the part of the cross-head to which it is attached, are dispensed with, and the connecting-rod H and the two toggle-bars P and Q are all strapped or otherwise connected to a single cross bar or head, J, whose ends L carry the guide-rollers M, working in the guides N, as before described. In order to balance the strain upon the cross bar or head J the connecting-rod is strapped to the middle of the same and the ends of the toggle-bars forked for connection therewith, as shown in Figs. 10 and 11.

I claim as my invention—

1. The combination, with the toggle-bars, in connection, respectively, with upper and lower plungers of the brick-molds and the cross-head, of guides N, constructed to give the described variable movement to the plungers, substantially as and for the purpose set forth.

2. The combination of the upper and lower plungers of a brick-machine, operating-levers and toggle-bars in connection therewith, a cross bar or head, J, connecting said toggle-bars with a reciprocating pitman, and guides N, having substantially the form shown and described, for the purpose set forth.

3. The combination, with the bottom mold-plunger of a brick-press, of chains d, eye-bolts e, nuts f, bevel-wheels f', and hand-shaft h, with bevel-wheels h', substantially as and for the purpose set forth.

4. The mold-charger of a brick-machine, made with a recess or gap, e^2, at the bottom of its front side or bar c', substantially as and for the purpose set forth.

5. The combination of the bar or side c', having recess c^2, and the flexible lip c^3, for the purpose set forth.

6. The combination of a brick-mold with a lower plunger or movable bottom made to rise above the level of the mold when the crank-wheel is passing one of its dead-centers, substantially as and for the purpose set forth.

7. The combination of a brick-machine mold, with its lower plunger or movable bottom arranged to rise above the top of the mold, and a charger having its front bar cut out or recessed at bottom, substantially as and for the purpose set forth.

HERMAN KRUTZSCH.

In presence of—
SAML. KNIGHT,
BENJN. A. KNIGHT.