

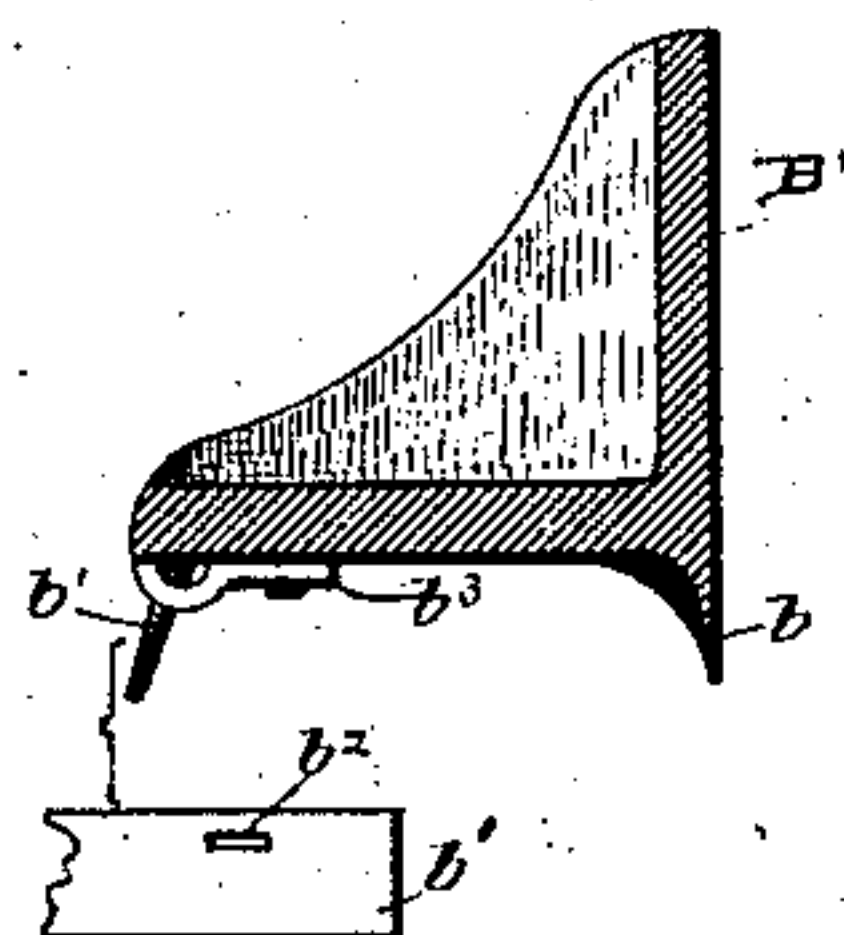
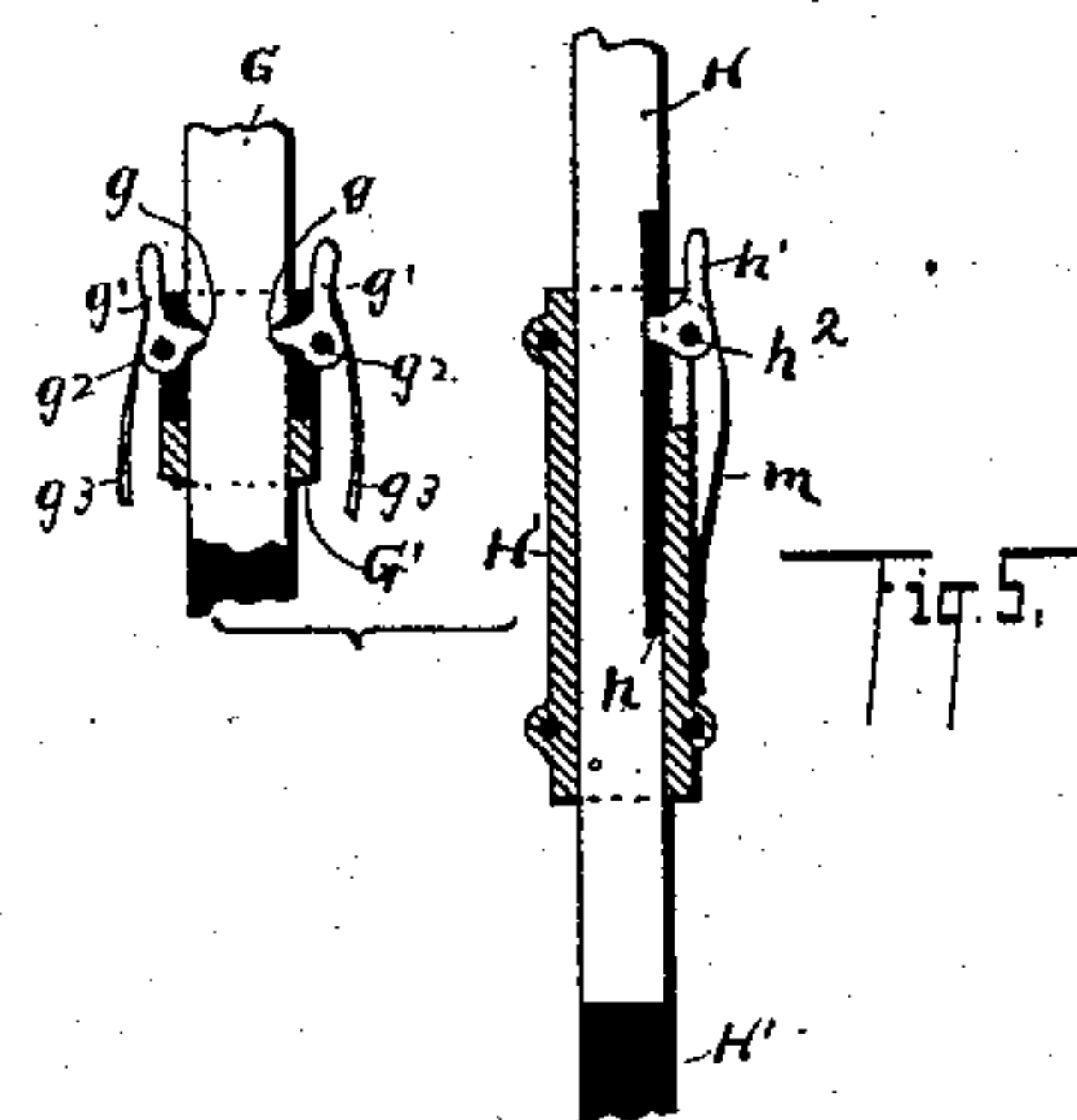
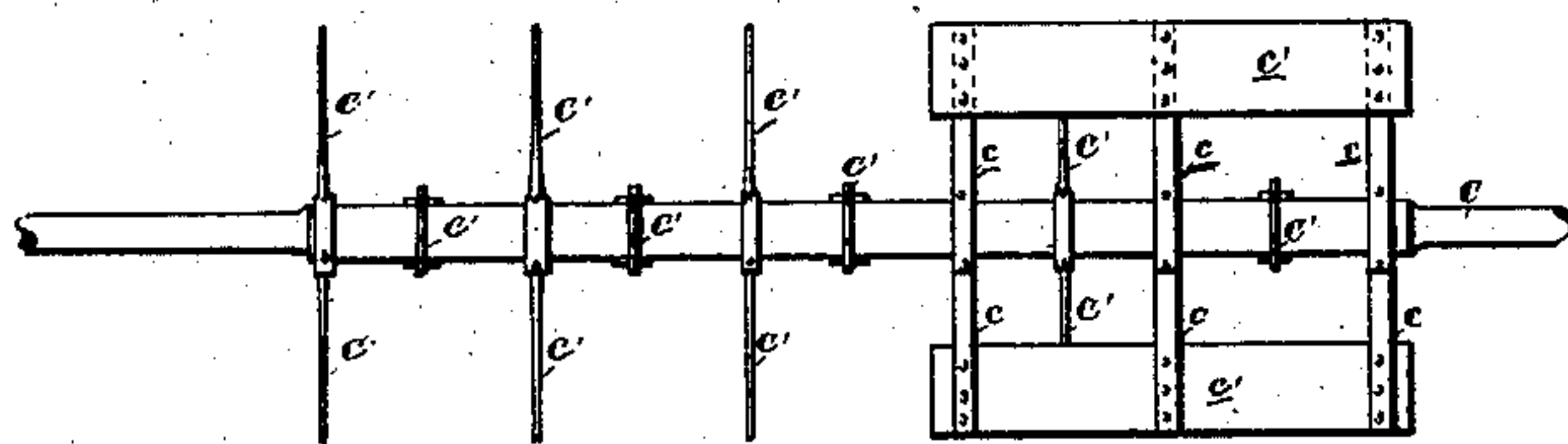
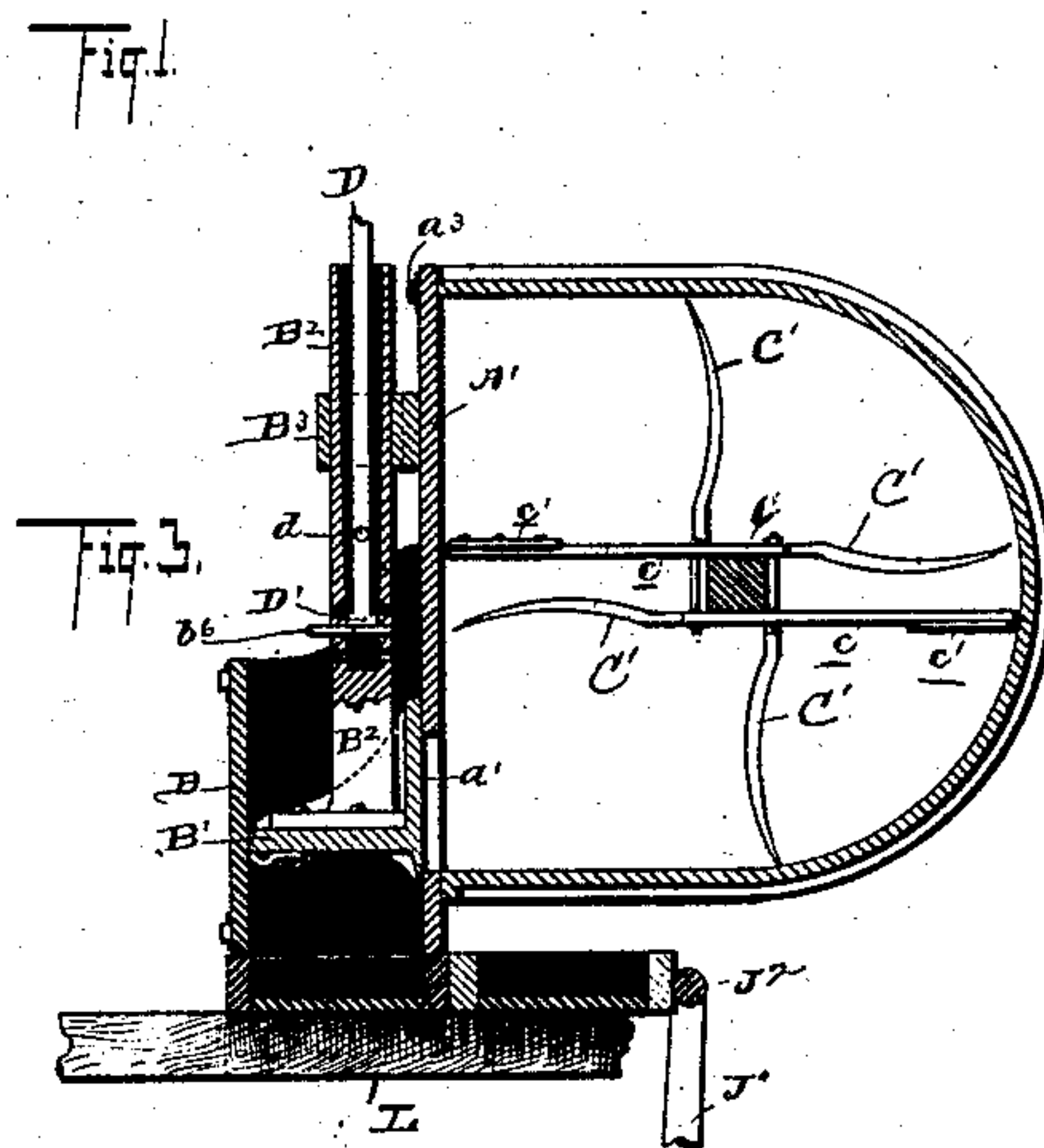
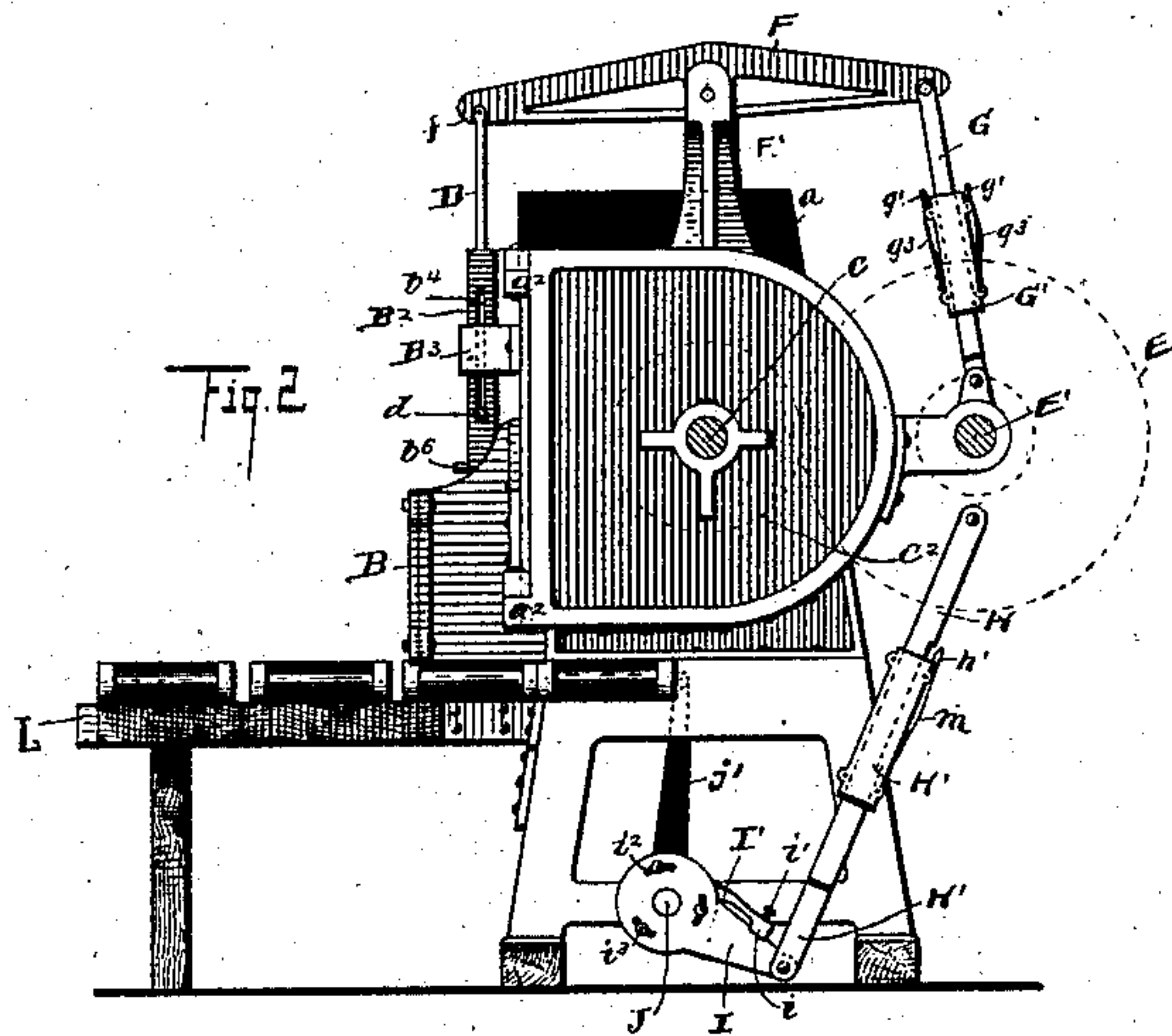
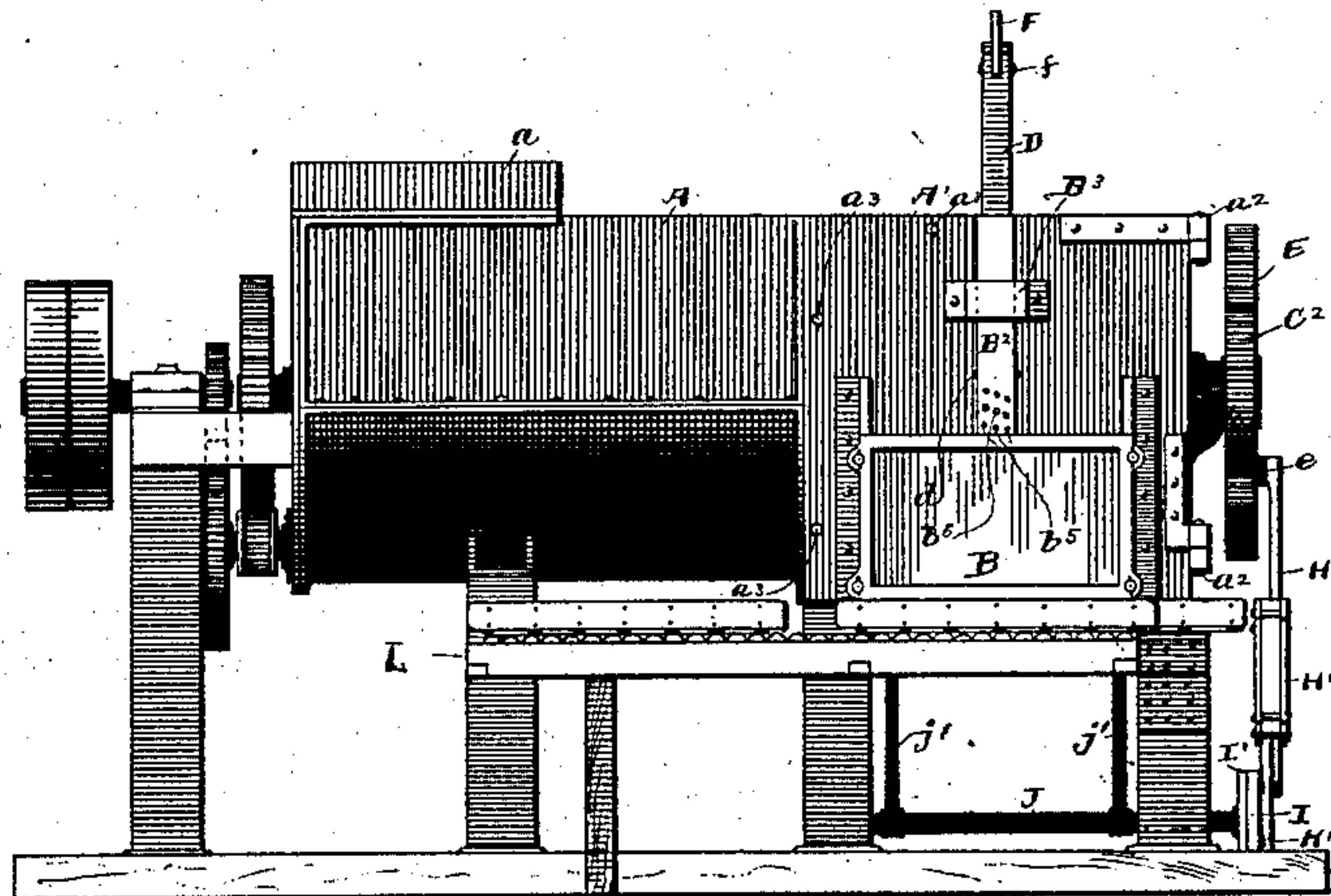
(No Model.)

J. W. & R. C. PENFIELD.

BRICK MACHINE.

No. 365,627.

Patented June 28, 1887.



WITNESSES
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JAMES W. PENFIELD AND RAYMOND C. PENFIELD, OF WILLOUGHBY, OHIO.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 365,627, dated June 28, 1887.

Application filed December 6, 1886. Serial No. 220,809. (No model.)

To all whom it may concern:

Be it known that we, JAMES W. PENFIELD and RAYMOND C. PENFIELD, of Willoughby, in the county of Lake and State of Ohio, have
5 invented certain new and useful Improvements in Brick-Machines; and we do hereby 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
10 it pertains to make and use the same.

Our invention relates to improvements in brick-machines of the variety for making what is known as "sand-molded or soft-mud brick," in which machine a horizontal pugging-shaft
15 is employed, together with other necessary appliances, to the end that a great pugging capacity may be had with a machine made low and convenient for feeding. The side of the machine next adjacent the molding apparatus,
20 and to which the latter is attached, is hung preferably on hinges, and made to swing open to give easy access to the inside of the machine for cleaning, repairs, &c.

Our invention also relates to the details of
25 construction, hereinafter described and claimed.

Heretofore brick-machines for manufacturing of the variety aforesaid have usually been made upright with a pugging-surface length-
30 wise of the shaft of perhaps three or four feet, which length, together with the necessary space at the bottom of the machine to accommodate the molding apparatus, and with the addition of a hopper on top, made the machine
35 so high that the elevation of several tons of material per day in feeding the machine was a serious objection; also, with the limited pugging-surface these machines could only be made to turn out a comparatively small amount
40 of work; otherwise extra labor must be expended in partially mixing the material before it entered the machine. To overcome the aforesaid difficulties, we have devised a horizontal pugging-mill in which any desired
45 pugging capacity is had without increasing the height of the machine, the top whereof is low down and convenient to feed. We make these machines usually with three or four times the pugging capacity of the ordinary
50 upright machine heretofore in use, by reason of which any ordinary material, as it comes from the clay-banks and in large quantities,

is thoroughly tempered in passing through the machine.

Now, while it is not broadly new to make a
55 horizontal pugging-shaft, such device having been used in so-called "auger-mills" for working stiff clay, the latter being pressed through a die and afterward severed into bricks, it is found necessary to introduce several novel
60 features in order to render our new machine practicable as a soft-mud machine.

In the accompanying drawings, Figure 1 is a side elevation of a pugging-mill or brick-machine embodying our invention. Fig. 2 is
65 a front end elevation. Fig. 3 is a transverse section through Fig. 1. Fig. 4 is a plan view of the pugging-shaft and attachment. Figs. 5 and 6 are details, hereinafter described, the former showing the safety attachment of the
70 respective pitmen, the latter showing more clearly the manner of attaching the packing-plate to the plunger.

A represents the pugging-box, the same having a feed-hopper, *a*, and an opening, *a'*,
75 for discharging the tempered material to the compression-box B. Through the center of the pugging-box operates the horizontal pugging-shaft C, the same having suitable gearing attached at the rear end to operate the de-
80 vice. This shaft is provided in the usual manner with a series of tempering-blades, C', and opposite the opening *a'* has arms *c*, usually three in number, on the ends of which are mounted the scrapers *c'*, the latter being flat
85 metal plates secured flatwise to the arms for discharging the tempered material to the compression-box. Rearward of these scrapers is a series of heavy rods or bars passing through the pugging-box from side to side, passing of
90 course between the tracks of the respective tempering-blades, and passing near the pugging-shaft, either just above or just below the latter. These rods prevent the material from revolving with the shaft and blades. A heavy
95 metal plate, A', forms the one side of the pugging-box from the front end thereof rearward as far as the box B extends, the latter being attached to this plate, and the aforesaid opening *a'* being made through the plate and lo-
100 cated substantially as shown. The plate is hinged at *a²* and locked by studs *a³*, the latter being attached to the body of the pugging-box and passing through holes in the said

plate, and having nuts or keys at the outer ends of the studs, by means of which the plate is held in its closed position. By removing such nuts or keys and disconnecting a pitman, hereinafter described, the plate may be swung open, giving free access to the inside of the machine, such opening or closing of the machine requiring but a few minutes' time.

Unless more time than is desirable is spent in assorting material, stones and other foreign substances will find their way into any brick-machine, rendering it necessary to stop from time to time to remove such obstructions. This is more especially the case when the machine is of large capacity and receiving material direct from the clay-banks. Therefore the mechanism for quickly opening and closing the machine and giving such free access to the inside thereof is a very valuable feature. The box B is rectangular in plan, the one shown being of suitable size to correspond with a mold for six bricks made flatwise and arranged side by side. Inside the box B operates a plunger, B', the latter having an upwardly-projecting hollow arm, B², that passes through a guide-box, B³. On the side next the pugging-box the plunger has a depending flange or rib, b, for closing the aperture a' on the downstroke of the plunger to prevent the material in the box B being forced back into the pugging-box. In such devices it is hardly practicable, or is at least expensive, to operate a tight-fitting plunger, owing to the sand and other sharp substances had in the material used. We have therefore provided packing-plates b', arranged as follows: These plates are usually of sheet metal, rectangular in form, and of suitable length to fit inside the box, respectively, on the three sides. These plates have slots b², made near the one edge thereof. Fingers b³, the ends of which are curved to fit into the slots of the plates, are secured by screws to the under side of the plunger and along the edges of the latter, forming a rude hinge for the plates, and leaving the latter depending and located, respectively, near the sides of the box B. While the plunger is descending the pressure of material on the flange b keeps the plunger pressed close to this side of the box, and the pressure of the material on the packing-plates b' keeps them out against their respective sides of the box. During the upstroke of the plunger the plates b' draw away a trifle from the sides of the box, so that they are only worn during the downstroke. The plunger does not come down to the molds by several inches, and the plates b' may therefore be made three or four inches (more or less) in width, and will continue to operate well until worn to less than half their original width, and may then be replaced with new ones at a trifling cost. With this arrangement of packing-plates little fitting is required on the plunger or box B, and tight joints are insured during the downstroke of the plunger, so that no material escapes upward by the side of the plunger.

The plunger is operated by means of a connecting-rod, D, and a walking-beam, F, the latter being mounted on the standard F', that is secured on top the pugging-box. A pivotal pin, f, connects the upper end of the connecting-rod with the walking-beam, this pin being withdrawn when it is desired to disconnect the parts so that the plate A' may be opened, in which latter case the box B and its attachments all remain in place and swing outward with the plate. The connecting-rod at the lower end has a foot, D', that fits easily in the chamber of the hollow arm B², and above the foot the connecting-rod is so reduced in thickness that it may vibrate inside the hollow arm the limited distance necessary to accommodate the sweep of the walking-beam. The connecting-rod is provided with a lateral pin, d, the projecting ends of which operate in slots b⁴ of the arm B², by reason of which the plunger is only elevated when the pin d reaches the upper end of the slot, thereby giving the plunger an intermittent movement. A series of holes, b⁵, are made at different elevations through the arm B², and a pin, b⁶, is inserted in one of these holes for the foot of the connecting-rod to rest upon in depressing the plunger. The pin b⁶ is adjusted in the respective hole to bring the plunger the desired distance from the mold on its downstroke, more or less, according to the density of the material that is being compressed into the mold.

The pugging-shaft C is made to extend through the front head of the machine, and has mounted thereon the gear C², the latter engaging a gear, E, these gears in Fig. 2 being shown only in dotted lines. The gear E is mounted on a crank-shaft, E', the latter being mounted in suitable boxes connected with the pugging-box. The wrist of this crank is connected by a pitman with the walking-beam F, for operating the latter. The pitman consists of two parts, G and G', the upper end of the latter being hollow and adapted to receive the part G, which may slide endwise. The part G has notches g, that engage with the dog g'. These dogs are of the bell-crank lever variety, and are pivoted at g² and are held in contact with the section G by springs g³, which engage the long arm of the dog-levers to hold the dogs in place in the notches, thereby causing the two parts G and G' to move together. The dogs are pivoted to the parts G', to which latter are also attached the spring. The shoulders of the notches are slightly beveled, as are also the engaging-points of the dogs, by means of which a heavy strain on the pitman will cause the dogs to be snubbed back against the action of the spring. On the return stroke of the pitman the dogs are forced back into the notches by the recoil of the spring. This arrangement of parts forms a safety attachment, whereby the plunger D is relieved from undue pressure—as, for instance, in case of stiff material, or too much material being forced into the box B. As an undue pressure could only be had after the molds are well packed with ma-

terial, the operation of the safety attachment does not interfere with the working of the machine, but only prevents break-downs. If it is found that the dogs g' are being forced back with nearly every stroke of the machine, the pin b^6 should be placed in a hole, b^5 , farther down. The gear E has a crank-wrist, e , which latter is connected with the pitman H, the lower end of the pitman being connected with a rock-arm of the shaft J. The latter has upwardly-projecting arms j' , with a roller, j^2 , journaled near the ends of the arm and extending from arm to arm. The molds K, while being filled, are of course directly under the box B and rest on a table, L. The empty mold is placed on the table just back of the mold being filled. As the arms j' are moved forward by the oscillation of the shaft J the roller j^2 strikes the side of the empty mold, and pushes the mold under the box B, thereby displacing the mold that has been filled, shoving the latter forward onto the table.

As it is necessary that the empty mold should be brought into position to register accurately with the box B, a nice adjustment of parts is necessary, and this is had at the lateral rock-arm I. This arm is mounted loose on the shaft, with an arm, I', rigidly secured to the shaft, the two arms lying flatwise side by side. The arm I' has a lug, i , that overhangs the arm I. The lug has a set-screw, i' , that abuts the upper edge of the arm I, by means of which the parts are adjusted accurately. The arm I has holes i^2 , elongated circumferentially, through which the securing-bolts i^3 pass. The set-screw having been properly adjusted, the bolts i^3 are tightened to hold the two parts of the arm firmly together. The mold that has been filled is struck off by the forward edge of the box B as the mold is pushed out by the empty mold aforesaid.

To avoid injuring the molds (that are usually of wood) in case a stone should be partly embedded in the material in the mold, and so as to collide with the box B, a safety attachment is connected with the pitman for operating this part of the device. The pitman consists of two parts, H and H', the latter being hollow and the part H being made to slide endwise therein. The part H has a shoulder, h , that is engaged by a dog, h' , the latter being pivoted at h^2 to the part H'. This dog is of the bell-crank variety, and the long arm thereof is engaged by a spring, m . The spring is secured to the part H', and holds the dog to its engagement with the shoulder h of the part H. In case an obstruction is met with in striking off the mold, or from any cause excessive pressure is brought to bear on this pitman, the dog is tripped back against the action of the spring, thereby relieving the shoulder h and allowing the slip-joints to elongate. On the return stroke of the pitman the dog is made to return to its normal position and engage the shoulder by means of the recoil of the spring. On the downstroke of the pitman the part H

slides in the part H', the gravity of the arm I being sufficient to retrograde the rock-shaft, by which arrangement an intermittent movement is imparted to the rock-arm and roller that move the mold, these latter parts remaining in their rearward position during the greater part of the stroke of the pitman, thus giving ample time to place the empty mold in position on the table in advance of these arms and roller.

For convenience in casting the arms G' and H' of the respective pitmen are usually made in two parts, the division being longitudinal and the parts being bolted together; but such construction is not essential, as these arms may be cast whole and cored. Of course the different parts of the machine are timed to co-operate, the only manual labor required being to feed the machine and to place in position and remove the molds.

We do not wish to limit ourselves to hinges employed for holding the plate A', as rollers or a crane might be employed for handling this plate; but we prefer the construction shown on account of its simplicity and cheapness.

What we claim is—

1. In a brick-machine, the combination, with a pugging-box having a removable plate forming a part thereof, the said plate having a discharge-orifice therein, and a compression-box secured to the plate, of a plunger adapted to reciprocate within the compression-box, and packing-plates secured to the plunger and projecting below the lower face thereof, substantially as set forth.

2. In a brick-machine, the combination, with a pugging-box having suitable discharging-aperture, and a compression-box located in front of said aperture, of a pugging-shaft, the same having suitable tempering-blades attached thereto, and plates or so-called "scrapers" mounted on arms that are attached to the pugging-shaft for discharging material to the compression-box, substantially as set forth.

3. In a brick-machine, the combination, with a pugging-box and compression-box, of a plunger adapted to reciprocate within the compression-box, and packing-plates pivotally secured to the plunger and projecting below the lower face thereof.

4. In a brick-machine, the combination, with compression-box, plunger, walking-beam, and connection, of a crank and pitman for operating the plunger, the pitman being made with a slip-joint, notches made in one member thereof, and spring-dogs mounted on the other member for engaging the said notches, the device forming a safety attachment as against excessive pressure on the parts, substantially as set forth.

5. In a brick-machine, the combination, with compression-box and plunger and a table for supporting the molds in position under the compression-box, of a crank-shaft, a rock-shaft, and arms for entering the molds under the compression-box, said arms having a roller

mounted thereon for engaging the molds, and yielding devices connecting the rock-shaft with the crank-shaft, substantially as set forth.

6. In a brick-machine, the combination, with the rock-shaft, arms and rollers for shifting the molds, and a pitman for operating the rock-shaft, of a safety attachment connected with the pitman, and consisting, essentially, of a slip-joint, a shoulder or suitable abutment made on one member thereof, and a spring-dog mounted on the other member and made to engage the said abutment, the arrangement being substantially as indicated, whereby the dog is tilted and the slip-joint released under undue pressure, substantially as set forth.

7. In a brick-machine, the combination, with a rock-shaft and arms for shifting the mold,

of an arm and pitman for operating the rock-shaft, the latter arm being made double, the one member thereof being secured rigidly to the shaft and the other member mounted loosely on the shaft, with suitable securing-bolts, and an overhanging lug and set-screw connected with the one member for engaging the other member to adjust the parts accurately, substantially as set forth.

In testimony whereof we sign this specification, in the presence of two witnesses, this 17th day of November, 1886.

JAMES W. PENFIELD.

RAYMOND C. PENFIELD.

Witnesses:

J. E. EASTES,

W. W. WALLACE.