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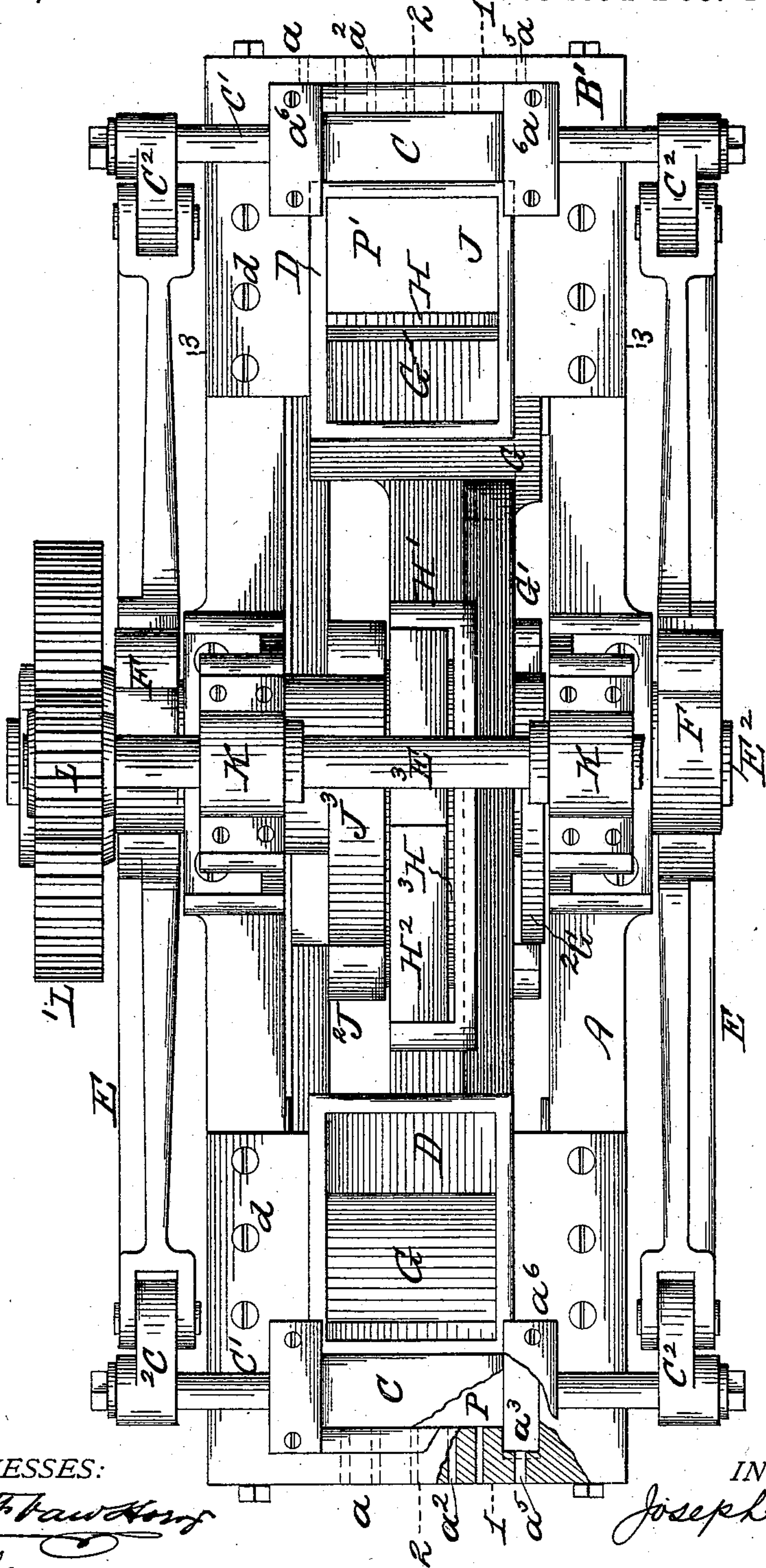
5 Sheets—Sheet 1.

J. BENNOR.

BLOCK OR BRICK PRESSING MACHINE.

No. 289,882.

Patented Dec. 11, 1883.



WITNESSES:

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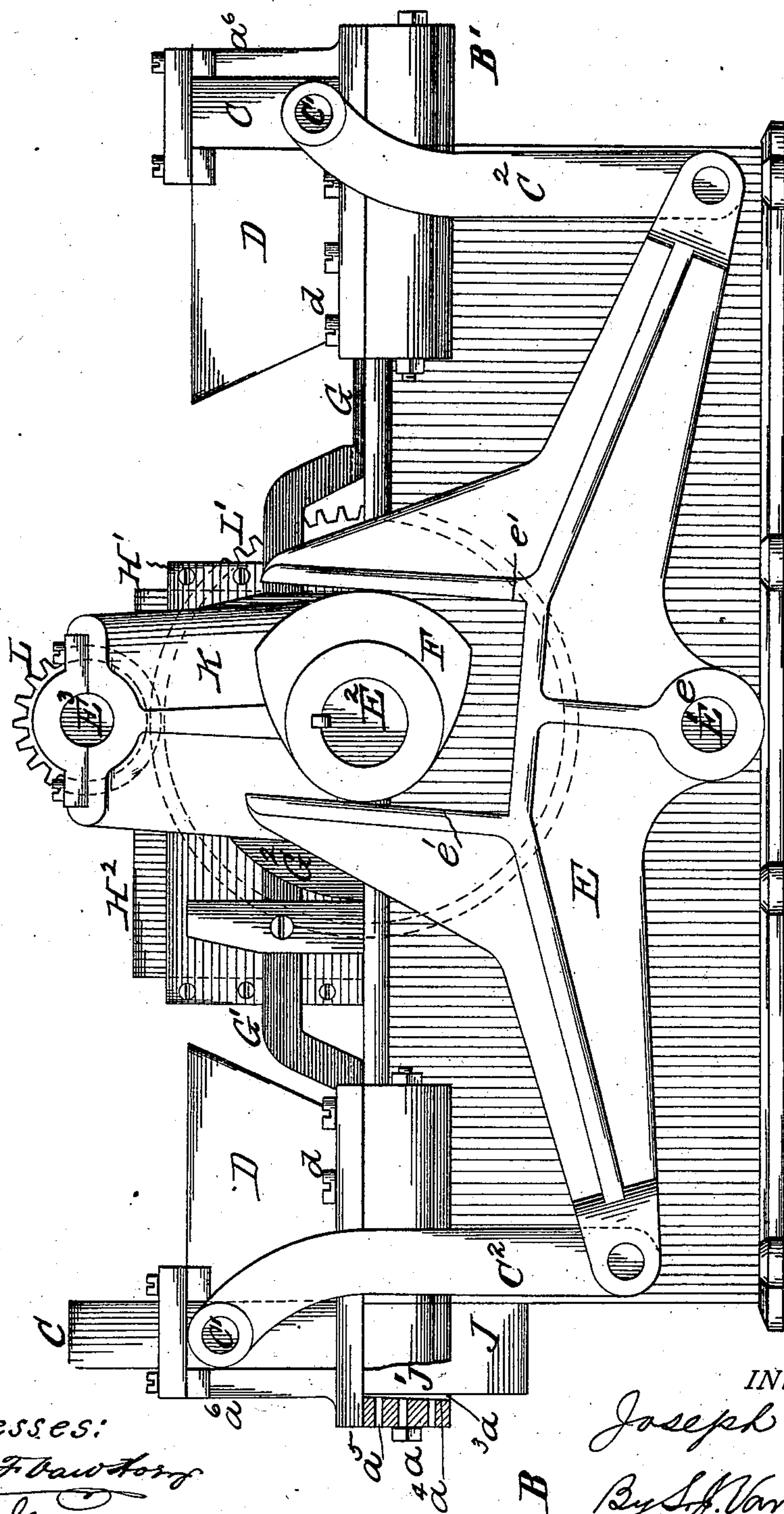


Fig. 2.

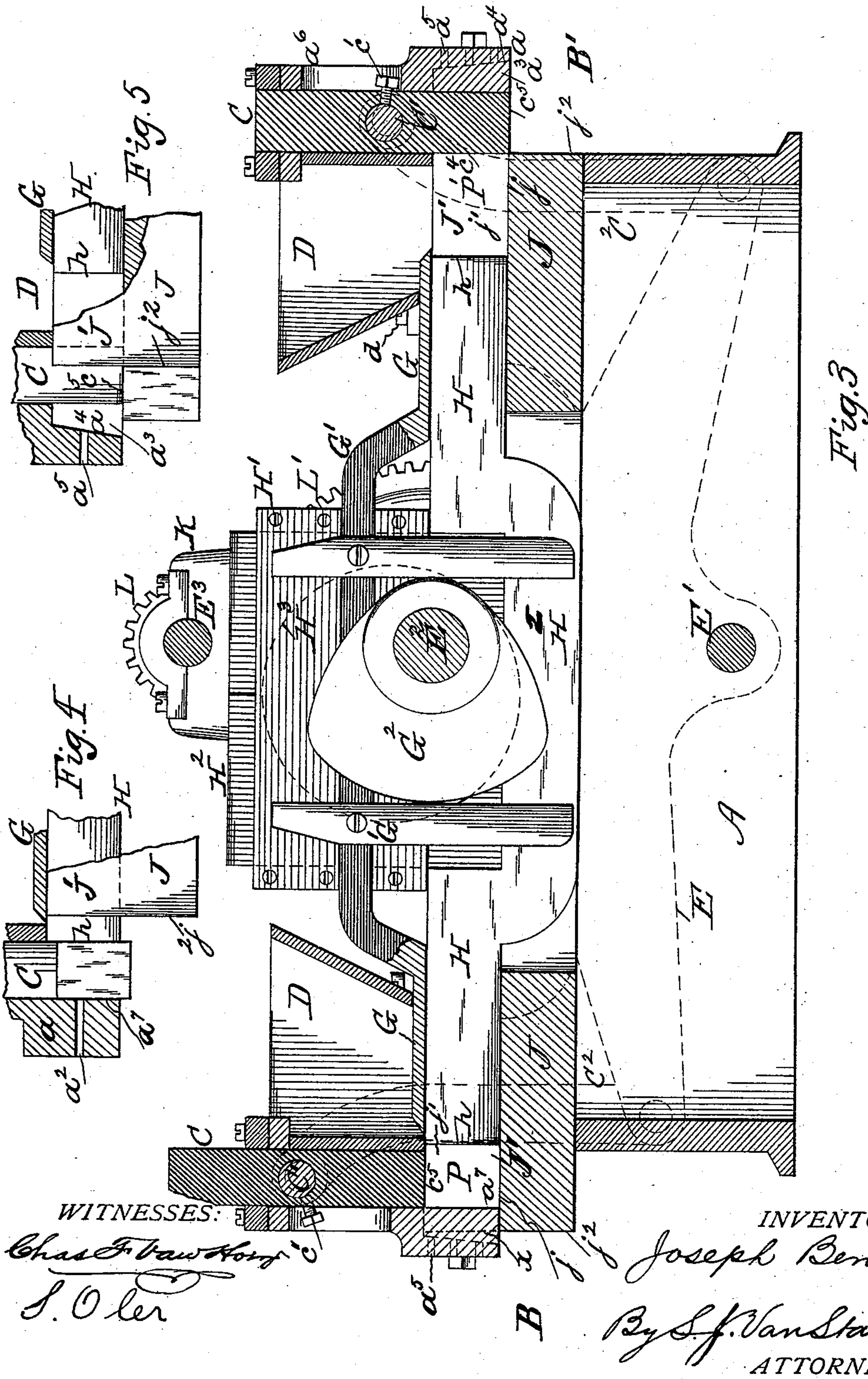
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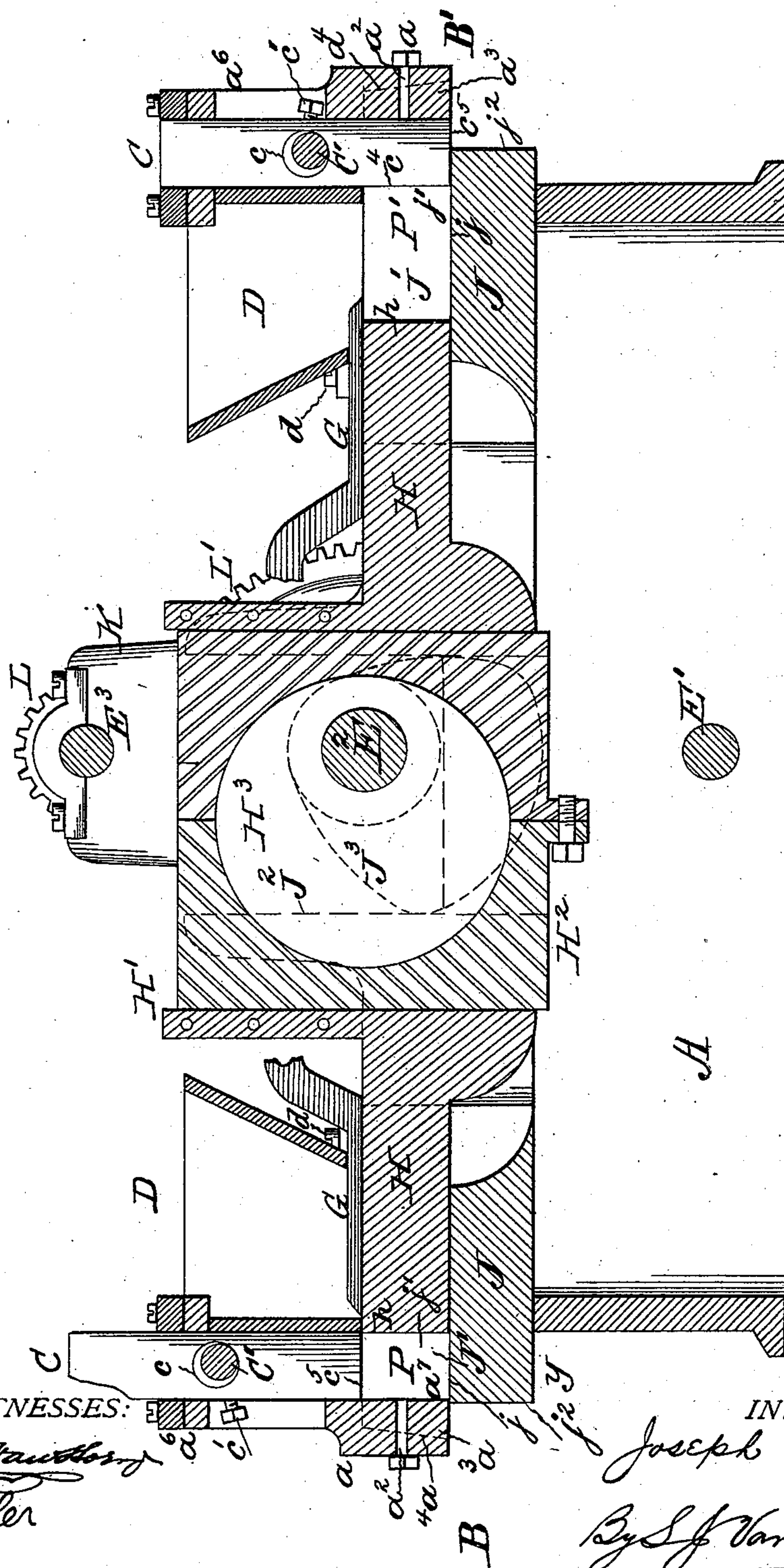


Fig. 6

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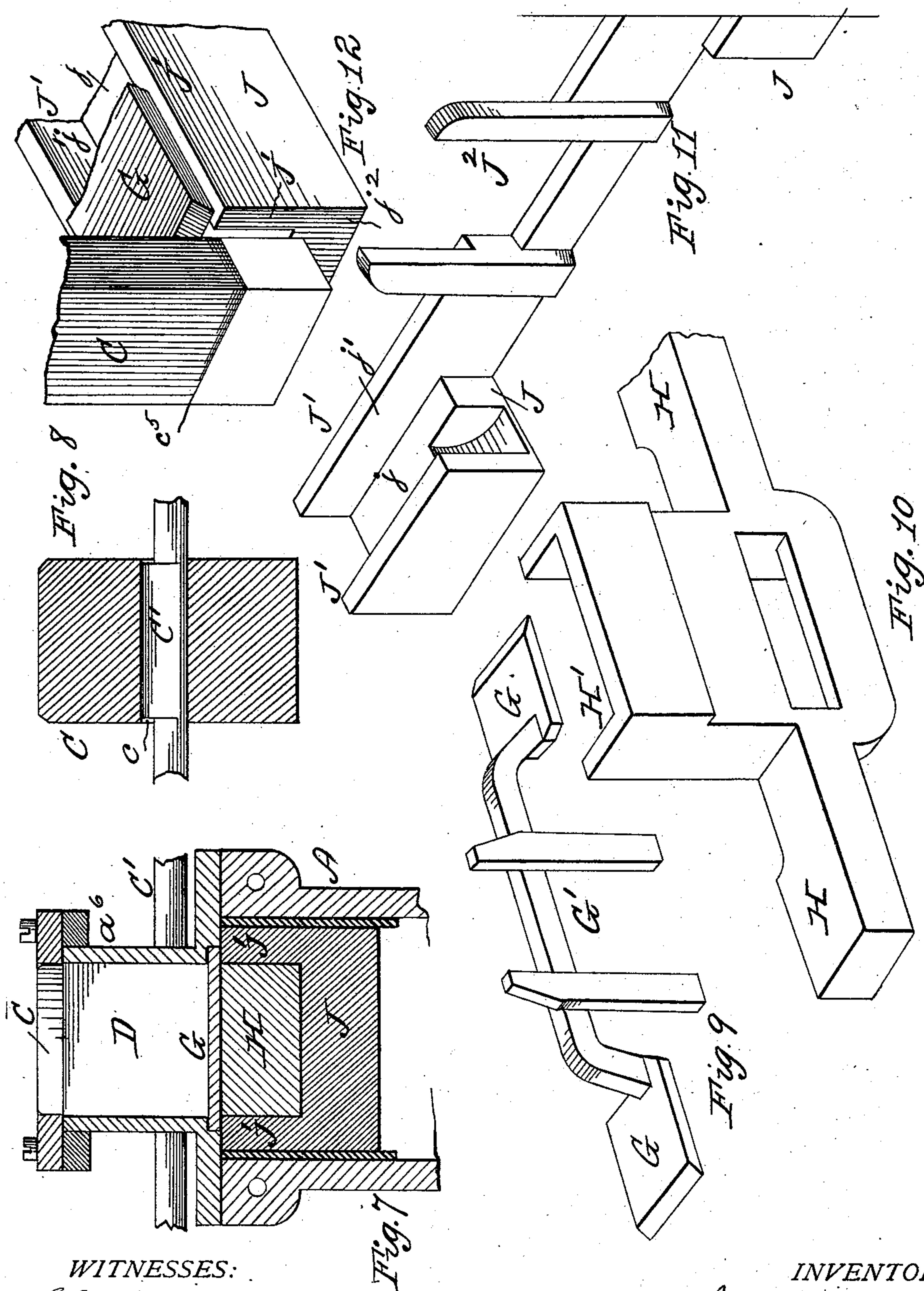
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UNITED STATES PATENT OFFICE.

JOSEPH BENNOR, OF PHILADELPHIA, PA., ASSIGNOR OF TWO-THIRDS TO
WILLIAM H. STAAKE AND WILLIAM E. KNOWLES, OF SAME PLACE.

BLOCK OR BRICK PRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 289,882, dated December 11, 1883.

Application filed January 22, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BENNOR, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Block or Brick Pressing Machines, of which the following is a specification, reference being had therein to the accompanying drawings, wherein—

Figure 1 is a plan of an artificial block or a brick pressing machine embodying my improvements, one end of the same being partly sectional. Fig. 2 is a side elevation, partly sectional, of the same. Fig. 3 is a longitudinal vertical section through the line 1 1, Fig. 1. Figs. 4 and 5 are detail broken sectional elevations, illustrating the sliding movement of the plungers or the parts between which the block or brick is formed. Fig. 6 is a longitudinal vertical section through the line 2 2, Fig. 1. Fig. 7 is a broken transverse vertical section through the line 3 3, Fig. 1. Fig. 8 is a detail section of the discharging-plunger. Fig. 9 is a perspective of the knives or cut-offs and connecting-yoke. Fig. 10 is a like view of the presser-plungers. Fig. 11 is a similar view of plungers for forming the bottom and ends of the block or brick; and Fig. 12 is a detail broken perspective of the movable plungers, cut-off, and a block or brick, illustrating their relative positions when the discharging-plunger is descending to eject the block from the press.

My invention has relation to machines for molding and compressing artificial blocks or bricks, and has for its object to provide a machine which forms a block or brick having all its surfaces smooth or finished, producing a block or brick better adapted for building or paving purposes and with less expenditure of power than has heretofore been the case.

Block or brick pressing machines as at present constructed are provided with a mold or box, in which the block is formed and ejected therefrom by means of a plunger or other compressing mechanism. The pressure of the plunger upon the block expels the air from the faces or from all those parts of the block upon which it is pressed; hence, when the plunger recedes, a suction is produced be-

tween the pressed or impinging faces or parts, which causes particles of the block to adhere to the faces of the compressing devices. Consequently the block so made has one or more roughened or pitted sides or surfaces. A like result is also produced even when a separate plunger is employed to effect the removal of the block from a sliding or traveling mold-box, for the reason that the pressure required to eject the block is such that it expels the air from the pressed faces, thereby causing the suction and effecting a separation of particles from the block, as described. Another disadvantage resulting from such suction is that it provides a force which acts reversely or is opposed to that employed to move the plungers backwardly; and hence more power is then required to effect its retrograde movement. It is evident, therefore, that if all the parts of the mold and the compressing devices of a block or brick making machine be so formed and arranged relatively to one another that they may be operated to slide off from all the faces or sides of the block, then all its surfaces will be smooth or finished, and all suction between the pressed faces is avoided.

My invention is designed to accomplish such results; and it consists in the novel combination, construction, and arrangement of parts, having especial reference to the provision of a series of plungers or block-compressing devices, forming a separable mold; the parts of which are combined with mechanism by means of which they are operated to successively or otherwise provide a chamber for the charge, a box in which the charge is compressed into a block, and are then separately moved or slid from the pressed block to smooth or finish all its surfaces and eject it from the press or machine.

Referring to the accompanying drawings, which show my improvements applied to a double-end or duplex pressing-machine, A represents the frame-work or base, which may be of any suitable or desirable form and construction, having bulk-heads *a a* at its ends B and B'. Said bulk-heads are provided with a series of perforations, *a²*, which serve as outlets for surplus in the charge when compressed into a block or brick, as hereinafter set forth. *a³ a³*

represent recesses in the bulk-heads, having inclined sides a^4 and perforations a^5 leading therefrom, for purposes to be hereinafter explained. Projecting from the bulk-heads are
 5 uprights a^6 , which form guides for the discharging-plungers C C to move up and down in. Adjacent to said plungers are the hoppers D D, screwed or otherwise suitably fastened to the frame A, as shown at d . The plungers C
 10 C provided with openings or sockets $c c$ for the reception of eccentrically-formed shafts C' C', (more plainly shown in Fig. 8,) and are connected to the said plungers by set or adjusting screws $c' c'$. The opposite ends of shafts C' C'
 15 are pivoted or loosely connected to links C² C², which in turn are similarly secured to beams E E, mounted at $e e$ on shaft E', on opposite sides of the machine, as plainly shown in Fig. 1. Said beams are formed with guides or slots $e' e'$,
 20 e' , in which work cams F F, secured to shaft E². As the cams F F rotate, the beams E E are oscillated, the shaft E' forming the fulcrum for such oscillation, and the plungers C C are moved up and down in their guides $a^6 a^6$.
 25 G G represent the knives or cut-offs for the hoppers D D, and are connected by a yoke, G', in which operates a cam, G², secured to shaft E². As the cam G² revolves, it reciprocates the cut-offs, to alternately open and close the bot-
 30 toms of the hoppers. Said cut-offs and yoke are more plainly indicated in Fig. 9.
 H H represent the compressing-plungers proper, and H' a connecting-yoke therefor, as illustrated in Fig. 10, for receiving a band or
 35 strap, H², for an eccentric, H³, secured to shaft E². As the eccentric H³ revolves, its strap H² moves vertically in the yoke H', and the plungers H reciprocate to and from the discharging-plungers C C.
 40 J J represent other plungers, having projecting sides or flanges J' J', which embrace the plungers H H, and extend upwardly and are flush with the top surface of plungers H, as
 45 J J have a connecting-yoke, J², in which works a cam, J³, attached to shaft E², whereby they are moved to and fro. The plungers H and the sides J' of plungers J are located in the plane of the bulk-heads $a a$, while the body of plungers J
 50 are below the bulk-heads, so as to move or slide below the same. When in such position or so moving, their flanges J' enter the recesses a^3 in the bulk-heads, as plainly shown at x , Fig. 3.
 55 E³ represents the driving-shaft, having bearings in uprights K K; and L L' are, respectively, a pinion and gear-wheel for communicating the motion of shaft E³ to shaft E², said parts being in the position shown in Figs. 3
 60 and 6. The hopper at end B' is opened to feed a charge in chamber P', formed below said hopper, while at the end B the charge previously fed from the hopper D at such end is being formed into a block or brick within the
 65 box P, the plungers C C being respectively at the highest and lowest points of their vertical movement. As the plungers H and J at

each end of the machine are reciprocated, they successively provide or form, in conjunction with the discharging-plungers C C and the
 70 bulk-heads $a a$, a charging-chamber, P', and a box or mold, P. The chamber P', it will be noted, is bounded by the end h of plunger H, upper surface, j , of plunger J, the inner faces,
 75 j' , of the sides J', and the face c' of discharging-plunger C, and the chamber or box P is bounded by end h of plunger H, top j of plunger J, faces j' of the sides J', and side a' of bulk-head a , and bottom side, c^5 , of plunger C. The movements of said various plungers
 80 for forming the chambers P' and boxes P to receive the charge and compress it being the same at both ends of the machine, I will, for the sake of clearness, confine the description thereof to the end B', premising that while the
 85 chamber P' at said end is being charged and the material compressed a block has been formed and is being ejected from the machine at the end B, or vice versa. The chamber P' having been charged, the plungers H and J
 90 are advanced toward the discharging-plunger C, and the latter begins to rise and provide for the box P. When plunger C has traveled upwardly to its highest point, the box P is fully formed, and the plungers H and J have
 95 assumed the position represented at y , Fig. 6. During such movement the plunger H has pushed the charge before it, moving the same from chamber P', and compressing it in box or mold P. As soon as the block is formed,
 100 the plunger J begins to recede, its top j and faces j' of its sides J' slide off of the respective sides or surfaces of the block in contact therewith. Said plunger J so recedes until it passes clear of the bottom of the block and
 105 assumes the position shown in Fig. 4. Meanwhile the plungers H and C have a slight dwell. When such clearance is effected, the plunger C begins to descend and slides the block across the surfaces a' and h of the bulk-
 110 head a and plunger H, respectively, as indicated in Fig. 4. As soon as the block moves downwardly, the plunger H recedes, its face or end h leaves the block without causing particles to adhere thereto, for the reason that as
 115 the plunger H recedes the block is moving downwardly and has been thereby loosened from the end h of said plunger, allowing air to enter between the pressed faces of said parts. When the block is moved by the
 120 plunger C to the line of the under side of the bulk-head, the plunger J again advances, the face j^2 thereof meets the block and slides it off the bottom c^5 of plunger C, as represented in Fig. 5, whereupon the last-named plunger rises
 125 to form box P for the fresh charge now ready to be compressed by the plunger H. It will be seen, therefore, that all sides or surfaces of the block are slid off the pressing-surfaces. Consequently a block so formed has all its sur-
 130 faces smooth or finished. All suction in the box P is avoided. Another advantage of such sliding movement of the block or the pressing-faces between which it is formed is that

said pressing-faces are kept clean or are polished, and such result is effected without using wipers or other special mechanism. The cams located on shaft E^2 are secured thereto, and so timed in their rotation that the above-described movements of the plungers follow each other, as set forth. Any surplus fed to the boxes P passes or is forced out thereof through the perforations a^2 by the plungers H , and all clay or other substances advanced into the recesses a^3 by the ends of the sides $J' J'$ of plungers J are forced out therefrom through the perforations a^2 , or loosened and separated from said ends by the inclined sides a^4 of such recesses, and drops out from the latter when the plunger J recedes.

I have shown and described the bulk-heads as being stationary; but, if desired, they may be connected to mechanism and so operated that they will descend to help form the chambers P , and rise or slide upwardly off the block when the latter is formed. In such case the plungers H may be used to eject the block from the machine, the plungers C not descending until such ejection has been effected. So, too, while I have shown and described the chamber P' and box P being formed successively, I do not confine myself thereto, for, if the machine be changed from a horizontal to a vertically-acting one, the charging-chambers and boxes will be formed simultaneously, or be one chamber or box.

Again, while I have shown special mechanism for effecting the different sliding movements of the various plungers, I do not limit myself thereto, as such mechanism may be changed in divers ways for accomplishing such results without departing from the spirit of my improvements. So, too, I do not confine my improvements to a double-end or duplex machine, as they may be applied to a single-end press. Again, the sides $J' J'$ on the plunger J may be dispensed with, in which case the bulk-heads will be formed the length of the block and have projecting sides to form the ends of the block.

What I claim is—

1. In an organized block or brick pressing machine, the combination, with a series of independent plungers or parts, of mechanism for operating said plungers to form a separable mold, substantially as shown and described.

2. In a block or brick pressing machine, the combination of plungers or movable parts forming a separable mold, and means for moving said parts to form a separable charging-chamber in advance of the mold, substantially as shown and described.

3. In a block or brick pressing machine, a separable mold the parts of which are combined with operating mechanism, substantially as shown and described, whereby said parts are moved to successively form a charging-chamber, a mold-box, and are slid off of the surfaces of the block or brick as it is ejected from the mold, substantially as set forth.

4. In a block or brick pressing machine, a separable mold and charging-chamber composed of a compressing-plunger, and two or more discharging-plungers, one of the latter forming the bottom and sides or ends of the mold and charging-chamber, and combined with operating mechanism, substantially as shown and described.

5. In a block or brick pressing machine, a separable mold composed of a compressing-plunger, sliding bottom, ends or sides, one or more discharging-plungers, and operating mechanism therefor, combined with a bulk-head, substantially as shown and described.

6. In a block or brick pressing machine, the combination of a separable mold, operating mechanism for the parts composing the mold, a hopper, and cut-off mechanism therefor, substantially as shown and described.

7. In a block or brick pressing machine, the combination of a separable mold, operating mechanism for the parts of the mold, and a perforated bulk-head, substantially as shown and described.

8. In a block or brick pressing machine, the combination of a separable mold, a separable charging-chamber, operating mechanism therefor, and a bulk-head having perforations a^2 a^5 and recesses a^3 , with inclined sides a^4 , substantially as shown and described.

9. The combination of vertically-moving plunger C , forming the top of a separable mold, the eccentric shaft C' , with adjusting mechanism c' , the plungers $H J$, bulk-head a , and operating mechanism, substantially as shown and described.

10. The combination of plunger H , the plunger J , having sides $J' J'$, and operating mechanism therefor, substantially as shown and described.

11. The combination of plungers $C C$, shafts C' , links C^2 , beams E , shaft or fulcrum E' , shaft E^2 , and cam F , working in ways e' in said beams, substantially as shown and described.

12. The combination of hoppers D , cut-offs G , yoke G' , cam G^2 , and shaft E^2 , substantially as shown and described.

13. The combination, with bulk-heads a , of the plungers H , yoke H' , eccentric H^3 , strap H^2 , and shaft E^2 , substantially as shown and described.

14. The combination of plungers $J J$, having sides $J' J'$, yoke J^2 , cam J^3 , and shaft E^2 , substantially as shown and described.

15. The combination of moving plunger C , compressing-plunger H , sliding plunger J , having sides $J' J'$, embracing plunger H , and operating mechanism therefor, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH BENNOR.

Witnesses:

S. J. VAN STAVOREN,
WM. E. KNOWLES.