No. 855,222. PATENTED MAY 28, 1907.

G. W. BALKWILL.

BRICK PRESS.

APPLICATION FILED MAR. 10, 1906.

5 SHEETS—SHEET 1.

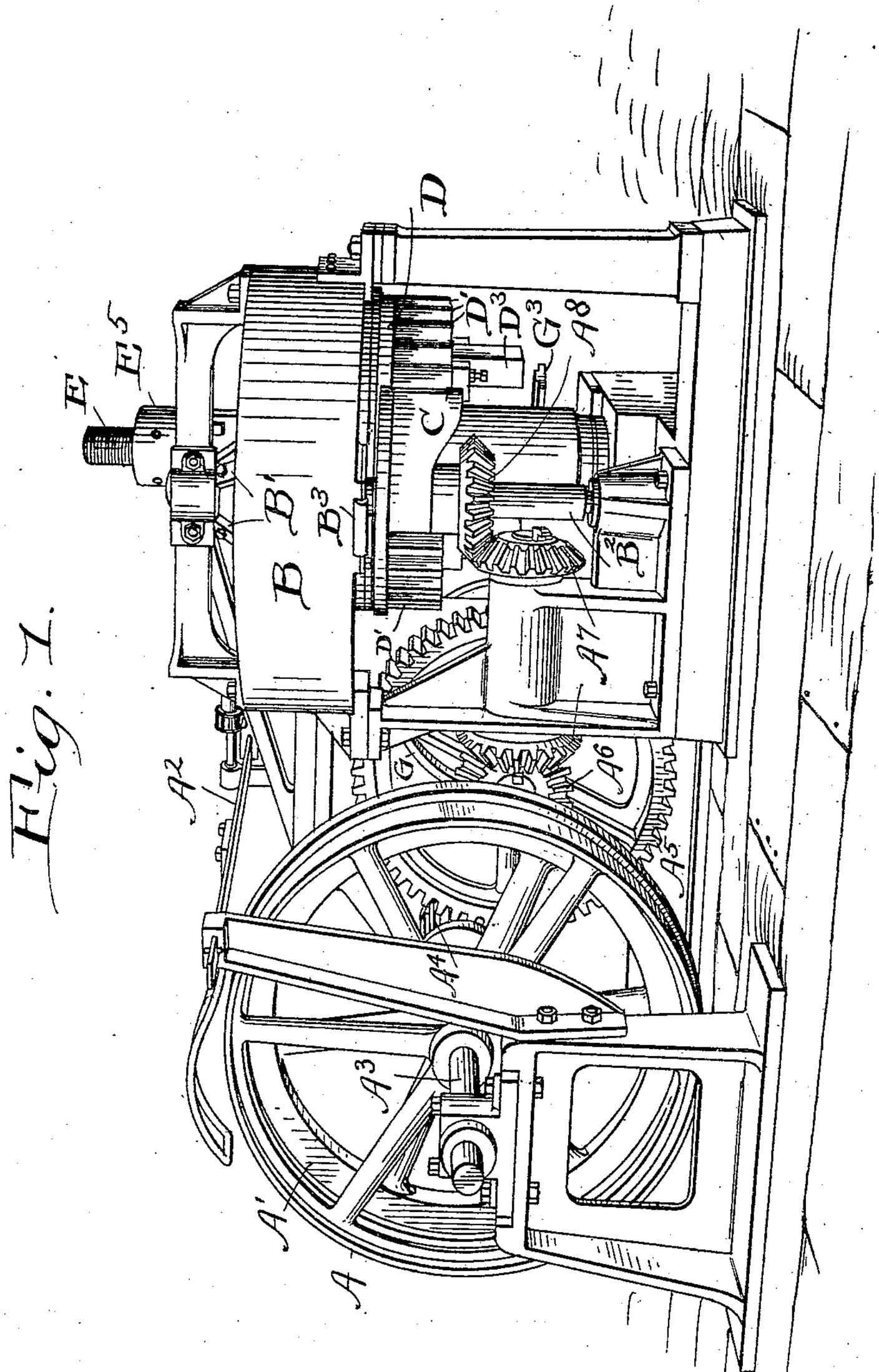

Fig. 1.

Witnesses.
E. B. Gilchrist
H. C. Sullivan

Inventor:
George W. Balkwill
by
Thurston Woodward
Attys.

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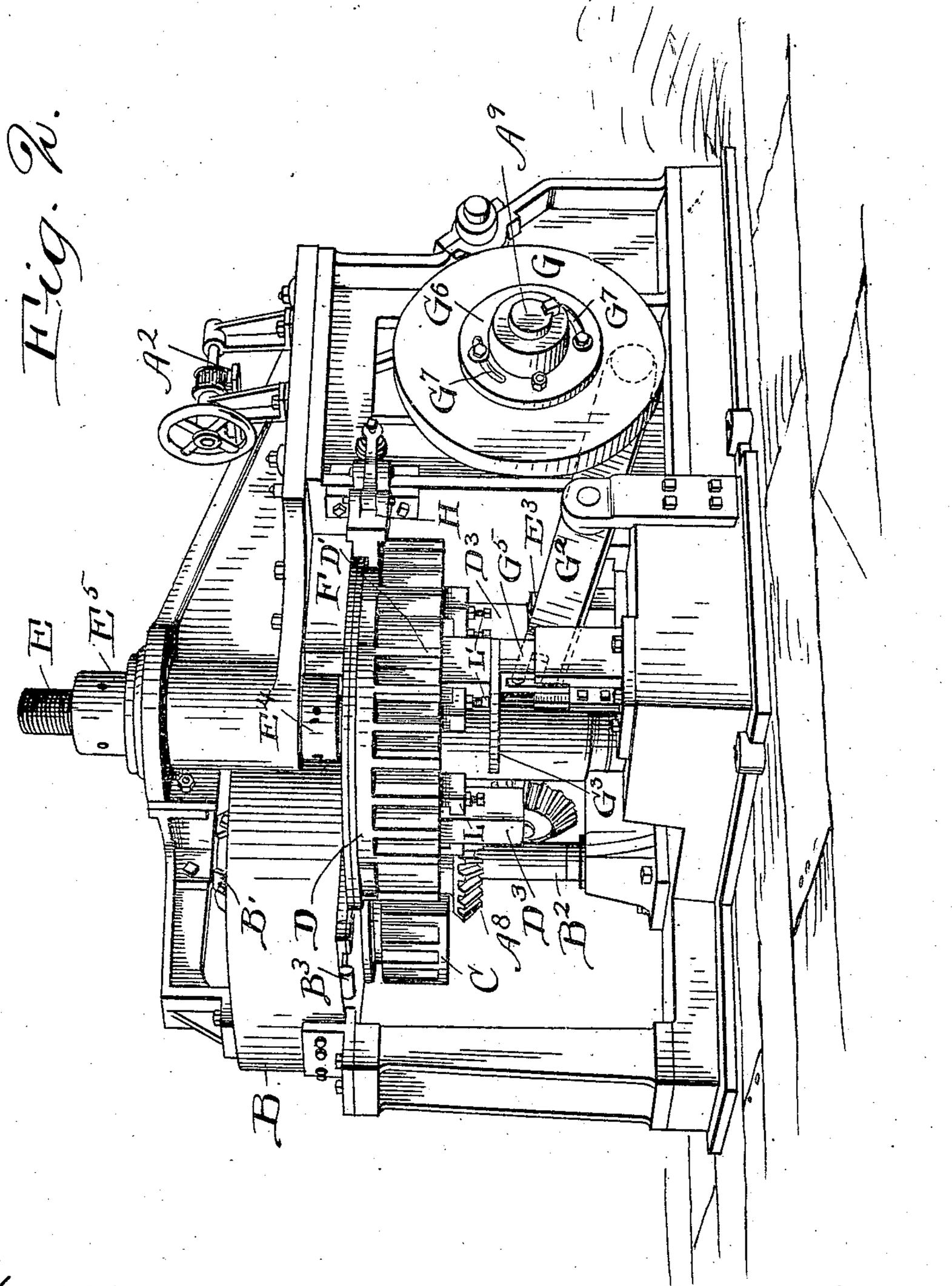
5 SHEETS—SHEET 2.

Fig. 2.



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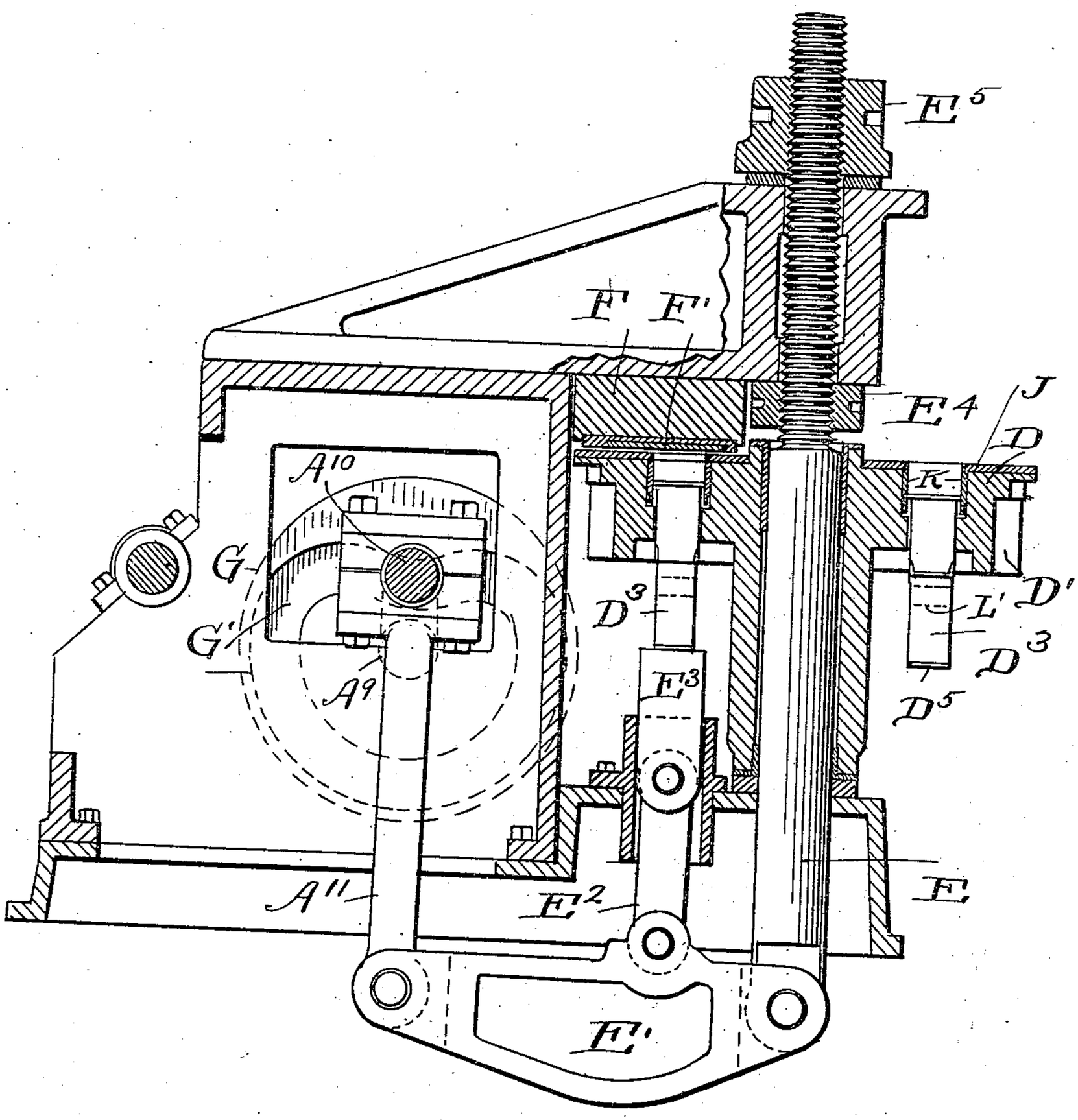

Fig. 3.

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E. B. Gilchrist
H. B. Sullivan

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George S. Balkwill
by
Thurston Woodward
Attys.

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5 SHEETS—SHEET 4.

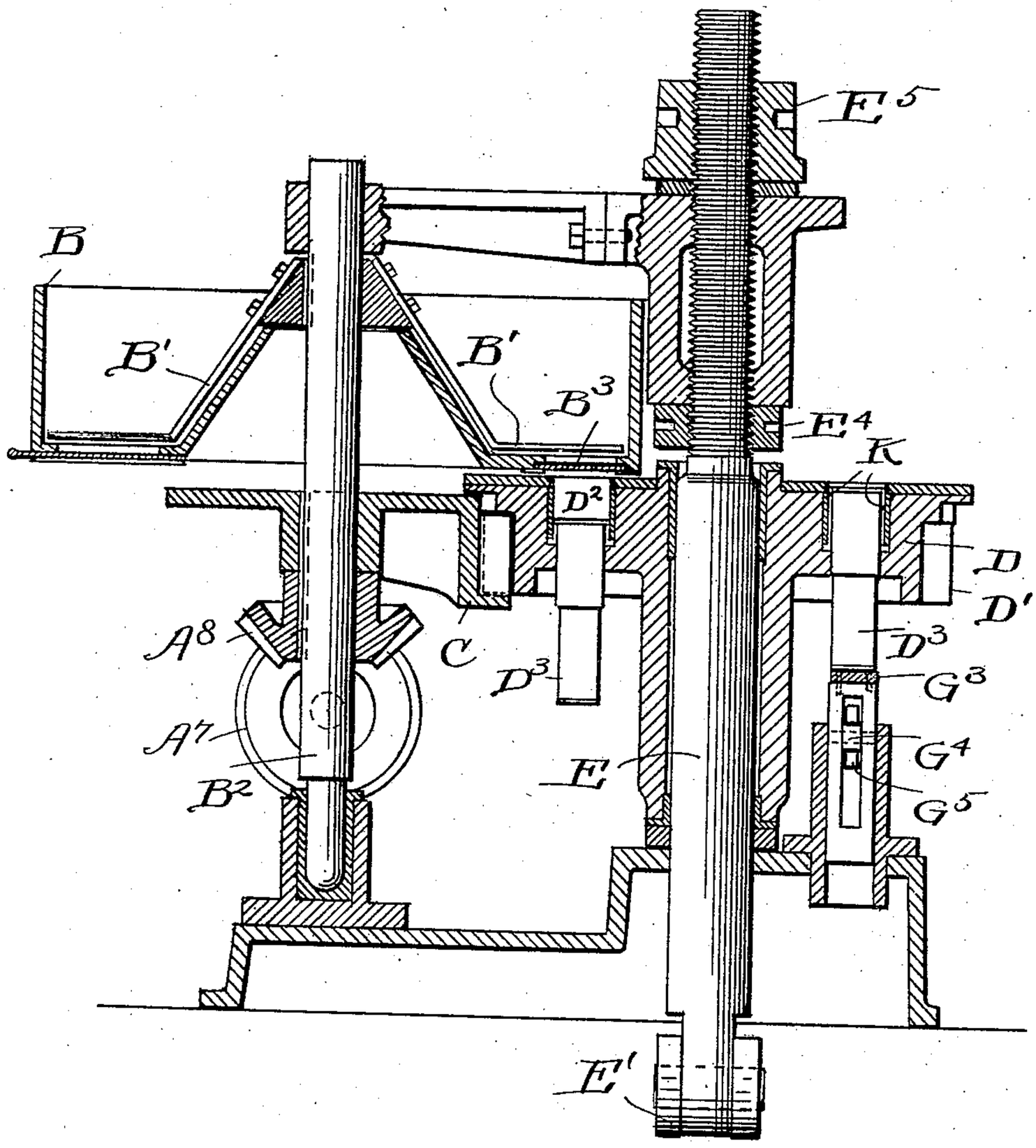

Fig. 4.

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E. B. Gilchrist
H. R. Sullivan

Inventor:
George W. Balkwill
by
Thurston Woodward
Attys.

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5 SHEETS—SHEET 5.

Fig. 5.

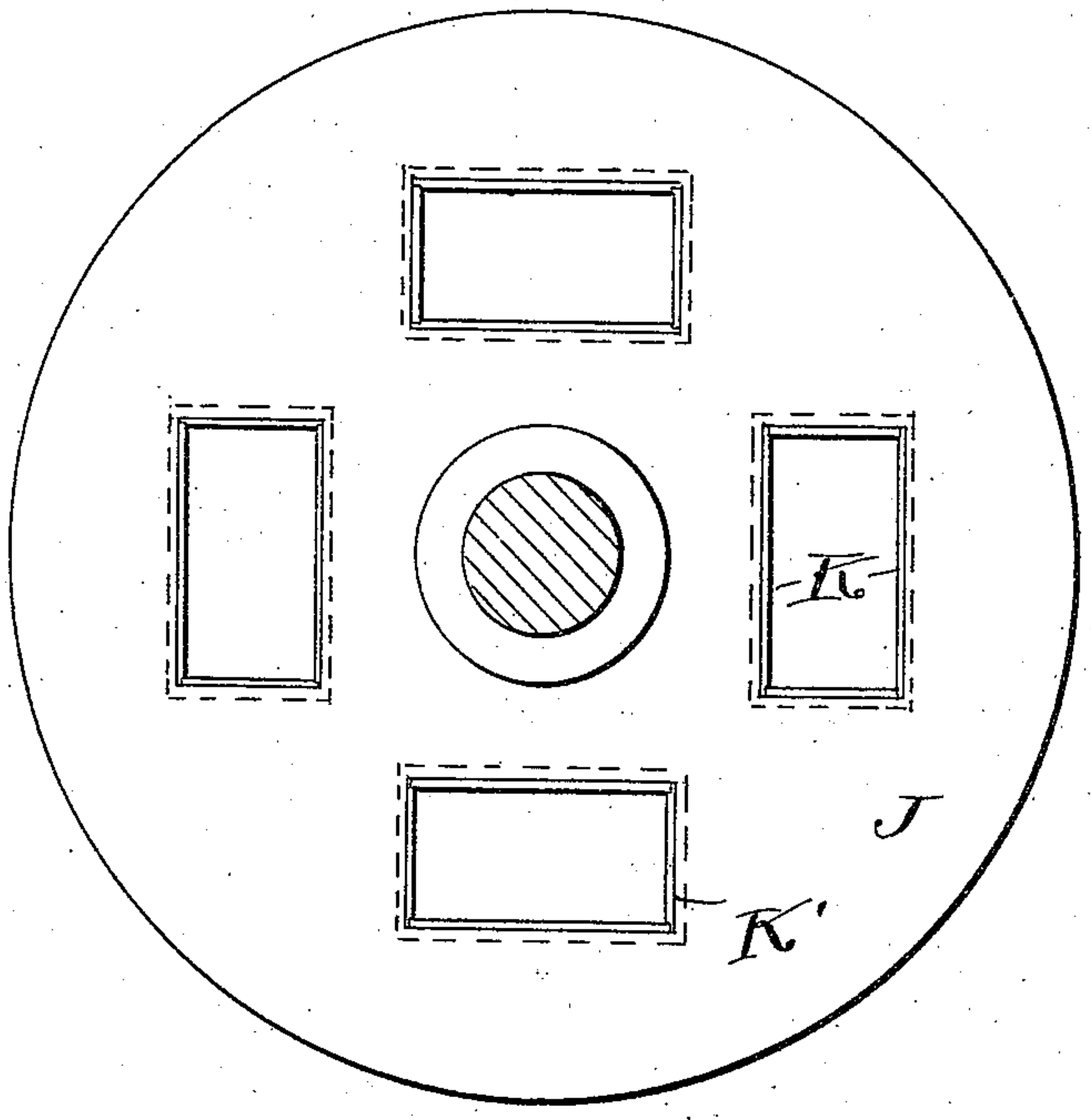
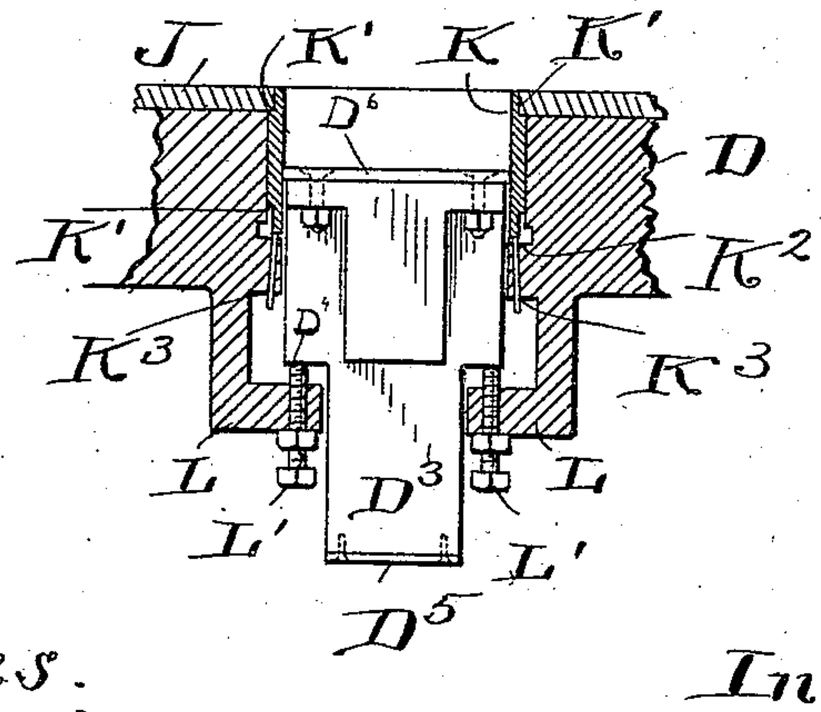


Fig. 6.



Witnesses.
E B Gilchrist
H. R Sullivan

Inventor
George W. Balkwill
by
Thurston & Woodward
Attys.

UNITED STATES PATENT OFFICE.

GEORGE W. BALKWILL, OF CLEVELAND, OHIO, ASSIGNOR TO THE SEMISTEEL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

BRICK-PRESS.

No. 855,222. Specification of Letters Patent. Patented May 28, 1907.

Application filed March 10, 1906. Serial No. 305,208.

To all whom it may concern:

Be it known that I, GEORGE W. BALKWILL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Brick-Presses, of which the following is a full, clear, and exact description.

The object of the present invention is to produce a power operated brick press capable of applying the great pressure necessary in the production of sand and lime bricks.

As is well known to those familiar with the process of producing bricks which are made from sand and lime, it is necessary to apply a great compressing force to the bricks in the mold, and the machines heretofore constructed for this purpose have not been uniformly satisfactory as to certain of their details of structure and operation. The machine which I have constructed is especially designed to withstand the great strains and wear consequent upon the operation of the machine and is provided with certain improvements in details which enable the operator to more finely adjust the working parts and to produce articles of uniform quality.

Referring to the accompanying drawings, Figure 1 is a perspective view of my press looking from the side on which the driving wheel and mixing pan are located. Fig. 2 is a perspective view taken from the side of the machine opposite to that shown in Fig. 1. Fig. 3 is a vertical longitudinal section through the center of the machine. Fig. 4 is a transverse vertical section through the end of the machine showing the structure of the mixing pan and mold cylinder. Fig. 5 is a top plan view of the mold cylinder. Fig. 6 is a detail section of a mold cavity in the cylinder.

The machine is provided with belt driving mechanism comprising fast and loose power wheels A A′ and a belt shifter A^2 for changing the belt from one wheel to the other.

Referring to Figs. 1 and 2, it will be seen that the belt shifting means A^2 is so located as to be operable from that side of the machine where its control will be in the hands of the person engaged in attending to the bricks as they come from the mold. The fast wheel A′ drives a shaft A^3 having on one end a pinion A^4 meshing with a large gear A^5 journaled in the frame of the machine. This large gear wheel has on one end of its shaft A^9 a bevel gear A^6 which through an intermediate shaft and other bevel gears A^7 A^8 rotates the mixing shoes or blades B′ located within the mixing pan B. This connection is positive, and from its nature, it is evident that the mixers will rotate constantly so long as the machine is in operation.

Splined to the vertical shaft B^2 to which the mixing blades are attached, and rotating constantly therewith, is a mutilated gear C adapted to mesh with an intermittent gear D′ on the periphery of the mold cylinder D. The mold cylinder is rotatable about a vertical shaft E so positioned in the frame body that the mold cavities D^2 upon the rotation of the cylinder, pass beneath a gate B^3 of the mixing pan in suitable position to receive material therefrom.

The mold cylinder is provided with any preferable number of equally spaced, vertical, rectangular mold cavities, the detail structure of which will be described below, each having therein a plunger, D^3, which is positioned and sustained in a manner subsequently to be described, forming the bottom of the mold cavity.

Carried by the top frame of the machine is a pressing plate F against which the material is pressed after having been received in the mold cavities. The presser plate F against which the wear of material is perhaps the greatest, is lined upon its face with a hardened steel plate F′.

For the purpose of transmitting pressure to the material, I have provided a crank A^{10} upon the shaft A^9, turned by the large gear A^5 above mentioned, and have mounted on this crank a connecting rod A^{11} pivoted to an oscillating beam E′. This beam is fulcrumed at one end to the lower part of the non-rotating vertical shaft E about which the mold cylinder rotates. Pivotallyconnected to the oscillating beam is a short link E^2 connected at the end to a presser-head E^3 guided in ver tical ways on the machine base. From this structure it will be evident that each revolution of the crank shaft will move the presser-head upward. The intermittent gear, by which the mold cylinder is rotated, is so constructed that a mold cavity is brought to rest over the presser-head as the latter is rising so that the presser-head will bear against the lower end of the plunger in the cavity and

compress the material therein between said plunger and the pressing plate thereover.

For the purpose of ejecting the pressed bricks from the mold cavities, I have mounted on the end of the crank shaft, A^9, and outside of the machine frame, a wheel G having an internally cammed groove G′ controlling a rocking arm G^2 which operates the ejecting platform G^3 in such manner and at such intervals as to raise the bricks out of the mold cavity after they have been pressed, thereby permitting the attendant to remove them before the cavity again passes under the mixing pan to receive a fresh charge.

The rotation of the mold cylinder is, in the present instance, so regulated by the mutilated and intermittent gears above mentioned that the cylinder will come to rest four times during each revolution, thus enabling the mold cavity to be filled, the brick to be pressed and ejection and removal to be effected.

In order that the momentum of the heavy cylinder shall not cause it to continue to rotate after the mutilated gear has passed out of mesh with the intermittent gear, I have applied thereto, an adjustable friction brake H which deadens the movement of the cylinder, see Fig. 2.

For the purpose of regulating the amount of compression of the bricks, I have threaded the vertical shaft E to which the oscillating beam E′ is fulcrumed, and provided it with locking and adjusting nuts E^4 E^5 whereby it may be raised or lowered, thereby raising and lowering the fulcrum point of said oscillating beam. When the position of this fulcrum is changed, it will plainly result in changing the limit of movement of the presser-head E^3 which forces the plungers D^3 in the mold cavities upward, thus regulating the amount of compression given the bricks.

The means which I have employed for ejecting the bricks, comprises the segmental platform G^3 sliding in vertical ways and having journaled thereon an anti-friction roller G^4 riding in the yoke G^5 of the rocking lever G^2 controlled by the internally cammed wheel G before mentioned. This wheel G is secured to a slotted disk G^6 on the end of the crank shaft A^9 by means of bolts passing through the slots G^7. By shifting the cammed wheel relatively to said disk, it is obvious that the relative time of raising the ejecting platform may be changed to suit the convenience of the operator. This platform is curved and of some length so that the plunger elevated thereby will be sustained in an elevated position throughout a short distance of its path, thus giving the operator ample time within which to remove the brick from the mold cylinder. Mounted upon the top of the mold cylinder and suitably apertured, is a machined face plate, J preferably applied in four quadrants.

In order to insure that the bricks shall be of uniform size, and to avoid all chance of breaking or roughing them, I have provided tightly fitted steel plates for lining the mold cavities, which cavities are of course cast rough, and which are impracticable to machine. These plates K are interchangeable and of any size preferred. They are fitted to each other and wedged into the mold cavity, see Figs. 5 and 6. It will be observed that at their upper and lower edges they are provided with shouldered recesses K′. These recesses are designed, as will appear from Fig. 6, to fit under the edges of the machined face plate J and are thus held in position against vertical upward movement. The recesses are made along both longitudinal edges in order that the plates may be reversible.

For the purpose of limiting the downward movement of the plates there is a projecting ledge K^2 around the lower part of the mold cavity, through which are driven friction pins K^3 whose purpose is to force the plates up to the proper position, where their upper edge will be exactly flush with the surface of the face plate J so that there will be no breaking or tearing of the bricks as they are taken from the mold.

In order to regulate the depth of the mold, I have provided underneath each mold cavity a couple of brackets L L having adjusting bolts L′ L′ upon which the plunger is supported. The lower part of the plunger is under-cut, thus providing shoulders D^4 which rest upon the adjusting bolts mounted in the brackets before mentioned. It will be plain that by running these bolts up or down as occasion requires, the thickness of the brick may be regulated as desired, and this independently of the amount of compression to be given.

I have provided on the lower face of the plunger a wearing plate D^5 secured thereto by countersunk screws, and having a lining plate D^6 similarly held upon its upper face, forming the bottom of the mold cavity.

By the above described arrangement of parts I am enabled to subject bricks to the enormous pressure necessary in the production of sand and lime bricks and to regulate the size of the bricks and the compression given so that each shall be independent of the other. Further, the detail parts are so arranged as to admit of certainty and uniformity in the character of the product with the least possible wear and tear on the large and more costly parts of the apparatus.

Having thus described my invention, I claim:

1. A mechanically operated brick press comprising a rotating mold cylinder having therein a plurality of mold cavities, a plunger in each cavity and vertically reciprocatable therein, a removable face plate fitted to the

top of the mold cylinder and having openings therein above the mold cavities, a projecting ledge around the lower part of each mold cavity below the lower limit of movement of the upper face of the plunger, lining plates fitted about the four side walls of the mold cavities, said lining plates being provided with shouldered recesses along the longitudinal edges and fitted in the mold cavity above said projecting ledge in such manner that the shoulders come underneath the edges of the face plate overhanging the mold cavity, and adjusting devices carried by said ledge whereby the lining plates may be held up in such position that their upper edges are flush with the surface of the face plate.

2. A mechanically operated brick press comprising a rotatable mold cylinder having therein a plurality of mold cavities, a vertically reciprocatable plunger in each cavity, lugs depending from the mold cylinder at the side of the mold cavities carrying adjusting screws for fixing the lowermost position of the plunger, a projecting ledge around the lower part of each mold cavity below the lower limit of movement of the upper face of the plunger, a removable face plate fitted to the top of mold cylinder and having openings therein above the mold cavities, lining plates removably fitted about the four side walls of the mold cavities, said lining plates being provided with shouldered recesses along the longitudinal edges and fitted in the mold cavity above said projecting ledge in such manner that the shoulders come underneath the edges of the face plate overhanging the mold cavity and adjusting pins in said ledge by which the lining plates may be held up in such position that their upper edges are flush with the surface of the face plate.

3. A mechanically operated brick press comprising a rotatable mold cylinder having therein a plurality of mold cavities, an intermittent gear rigid with said mold cylinder, a mutilated gear positioned to mesh with said intermittent gear, a constantly rotating shaft for transmitting motion to said mutilated gear, a crank on said shaft, a presser-head positioned beneath the path of the mold cavities in such location that the intermittent motion of the mold cylinder will bring each cavity in turn to rest over said presser-head, operating connection between said presser-head and said crank, a disk on said crank shaft, a cam wheel fixed to said disk in a manner to allow of circumferential adjustment, a rocking arm controlled by said cam wheel, a platform vertically reciprocatable in ways on the machine base, said platform being connected with the said rocking lever and provided with an arc-shaped extension lying beneath the path of the mold cavities.

4. A mechanically operated brick press comprising a rotatable mold cylinder having therein a plurality of mold cavities, a gear rigid with said mold cylinder, a second gear positioned to mesh with said gear, a constantly rotating shaft for transmitting motion to said second gear, a crank on said shaft, a presser-head positioned beneath the path of the mold cavities in such location that the intermittent motion of the mold cylinder will bring each cavity in turn to rest over said presser-head, operating connection between said presser-head and said crank, a disk on said crank shaft, a cam wheel fixed to said disk, a rocking arm controlled by said cam wheel, a platform vertically reciprocatable in ways on the machine base, said platform being connected with the said rocking lever and provided with an extension lying beneath the path of the mold cavities.

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

GEORGE W. BALKWILL.

Witnesses:

J. M. WOODWARD,

H. R. SULLIVAN.