

(No Model.)

4 Sheets—Sheet 1.

S. DALY.
BRICK MACHINE.

No. 330,002.

Patented Nov. 10, 1885.

Fig. 2.

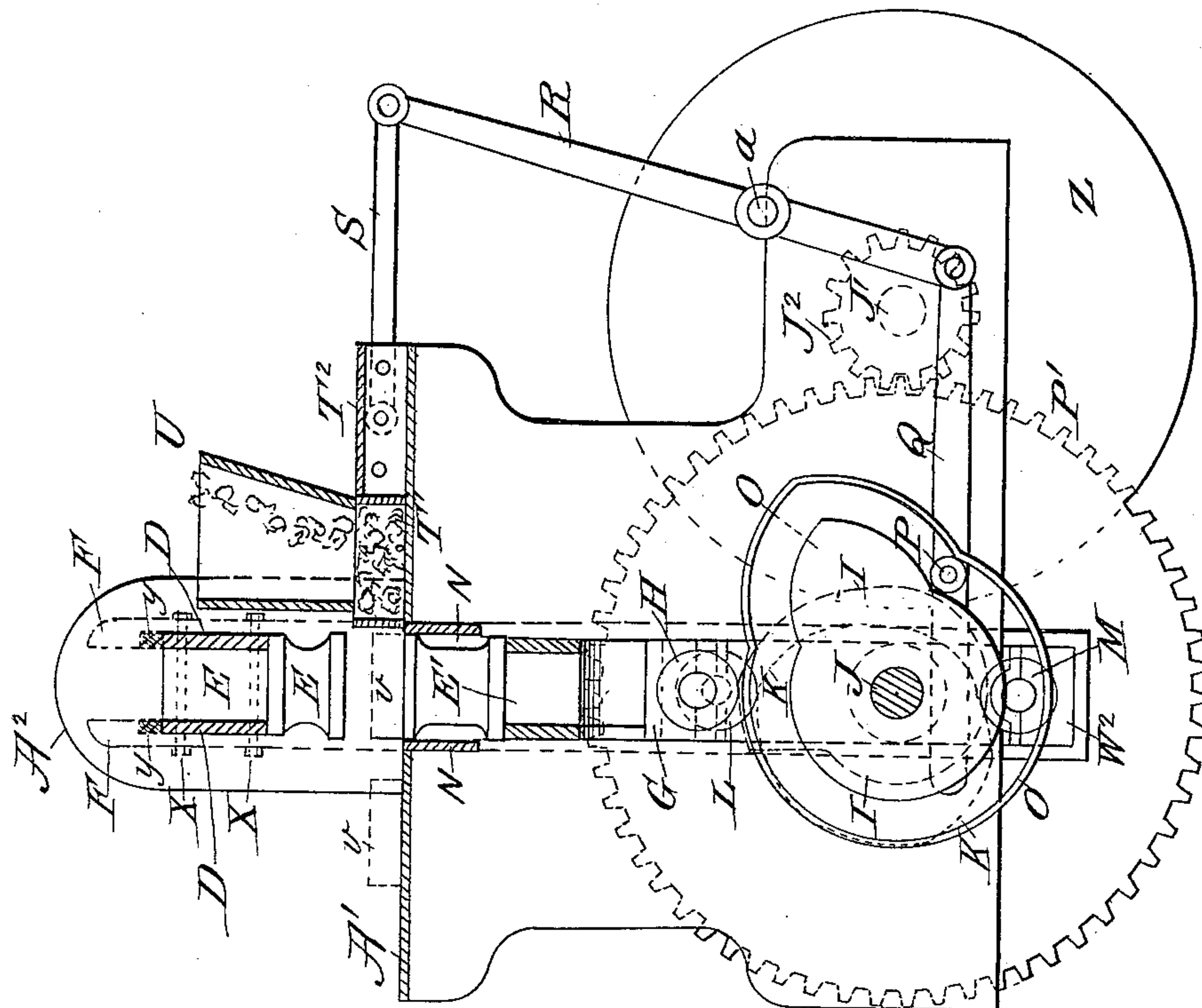
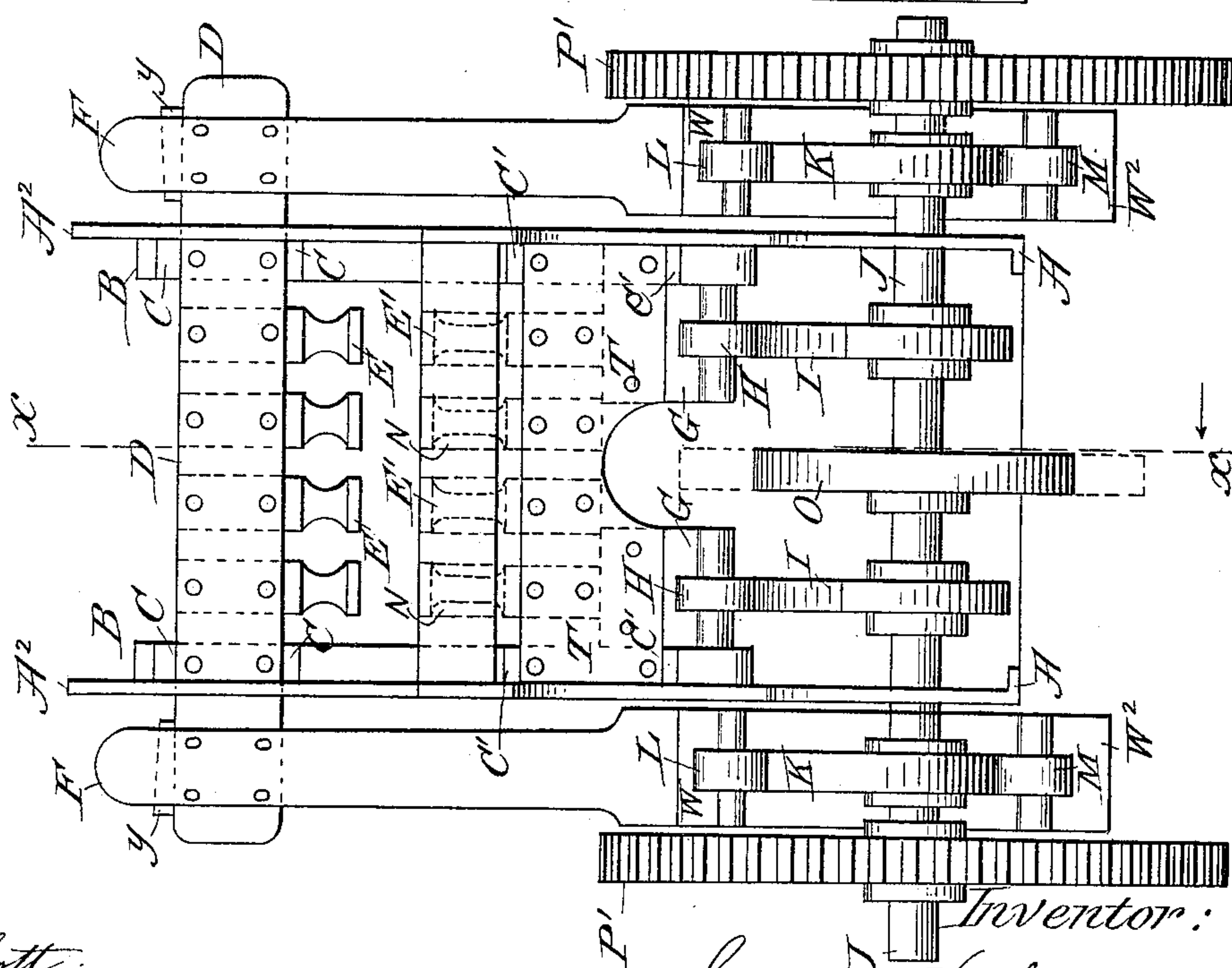


Fig. 1.



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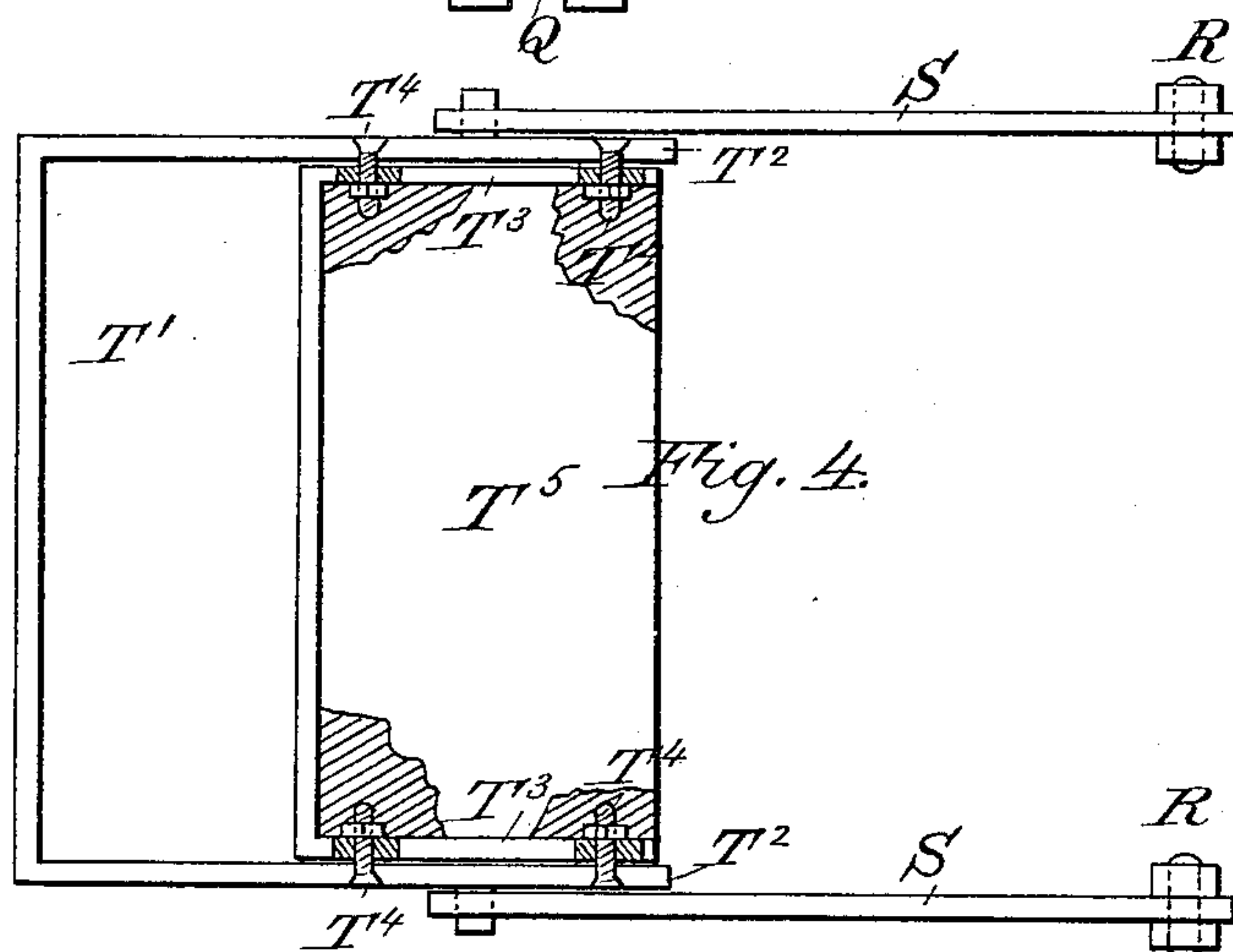
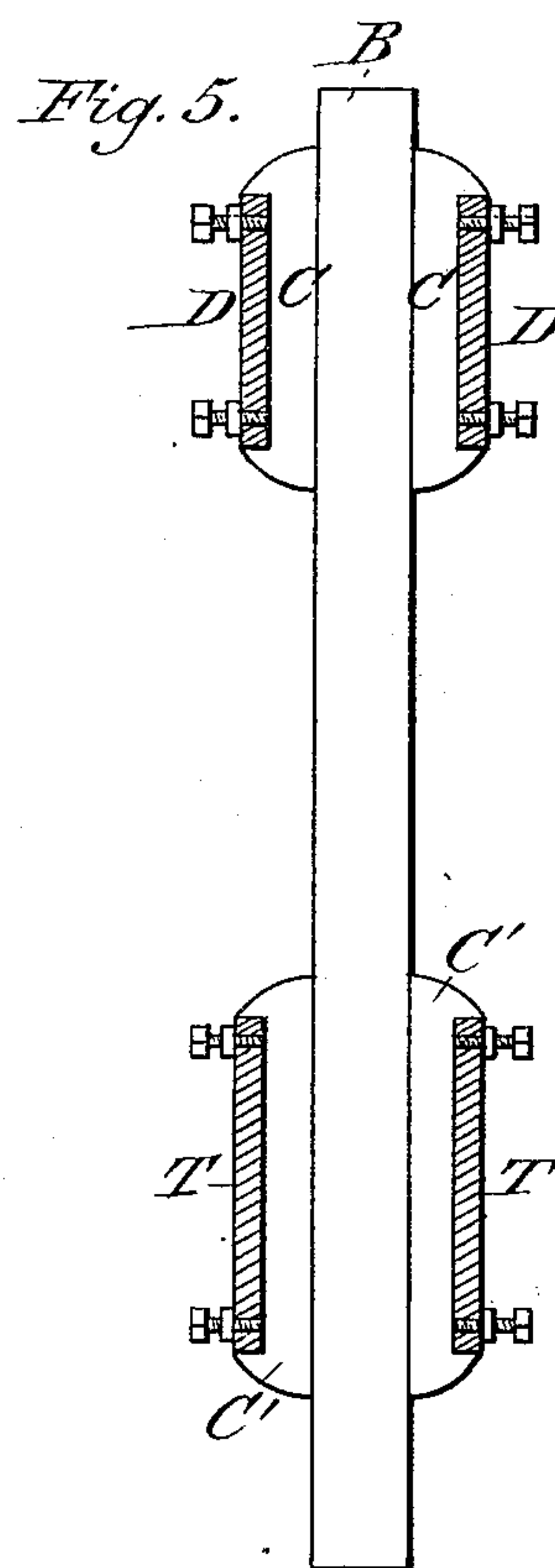
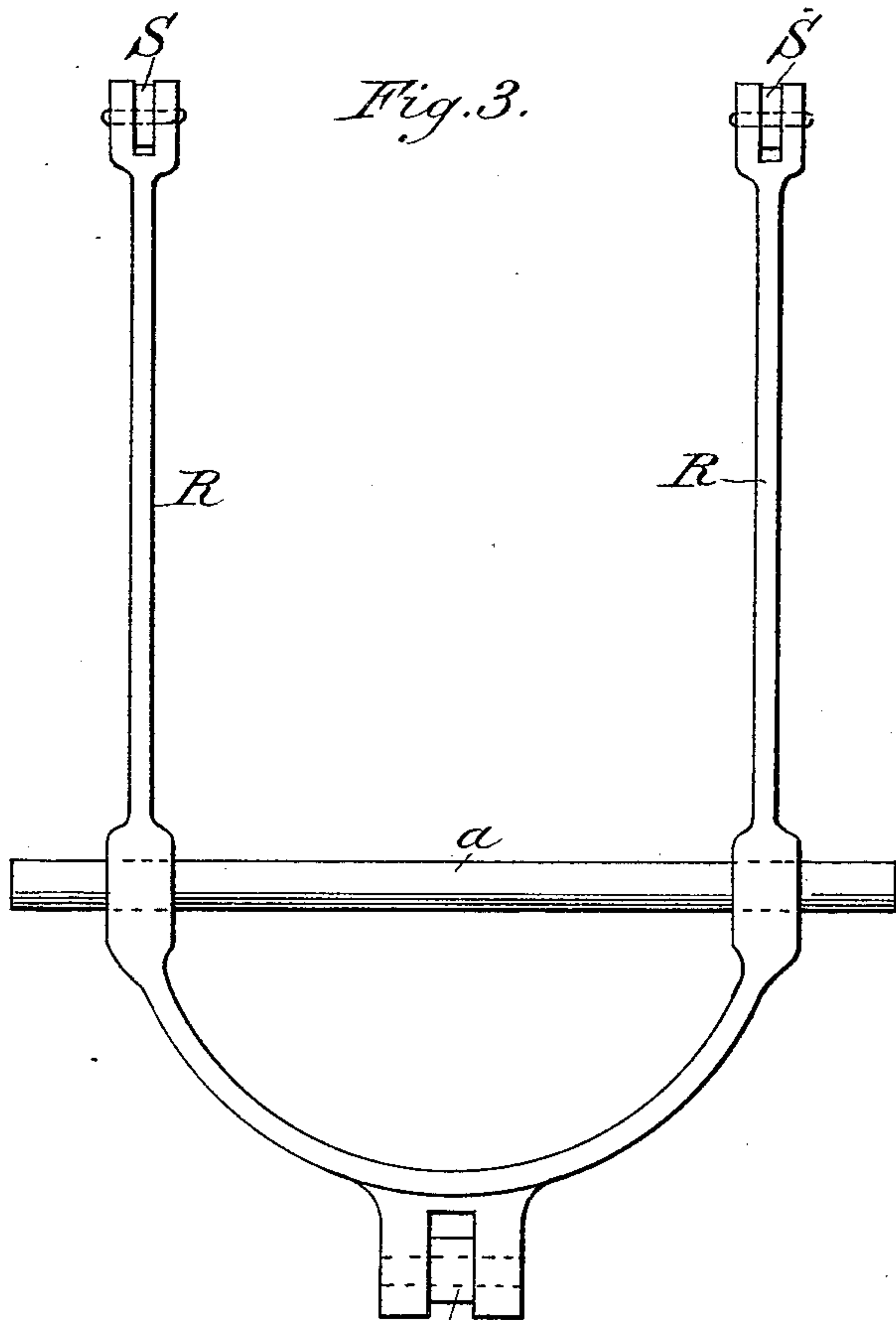
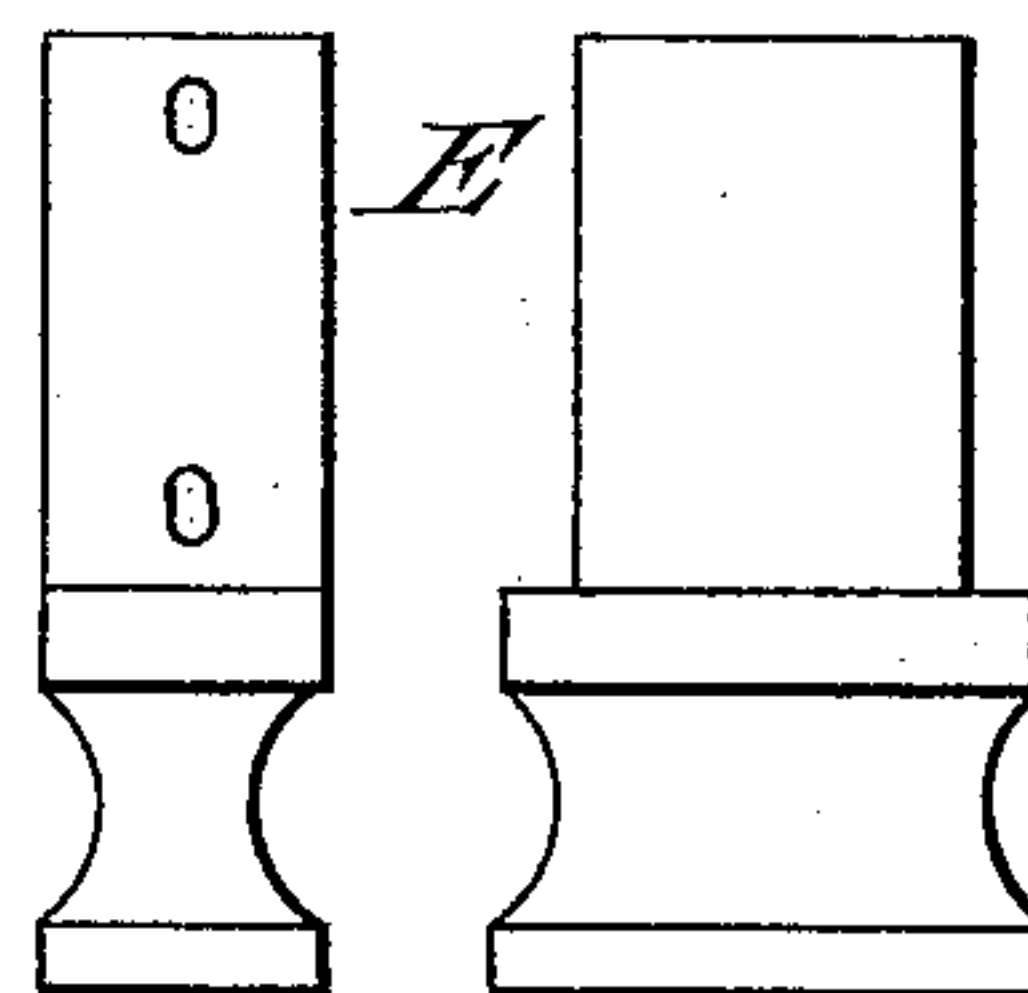


Fig. 6.



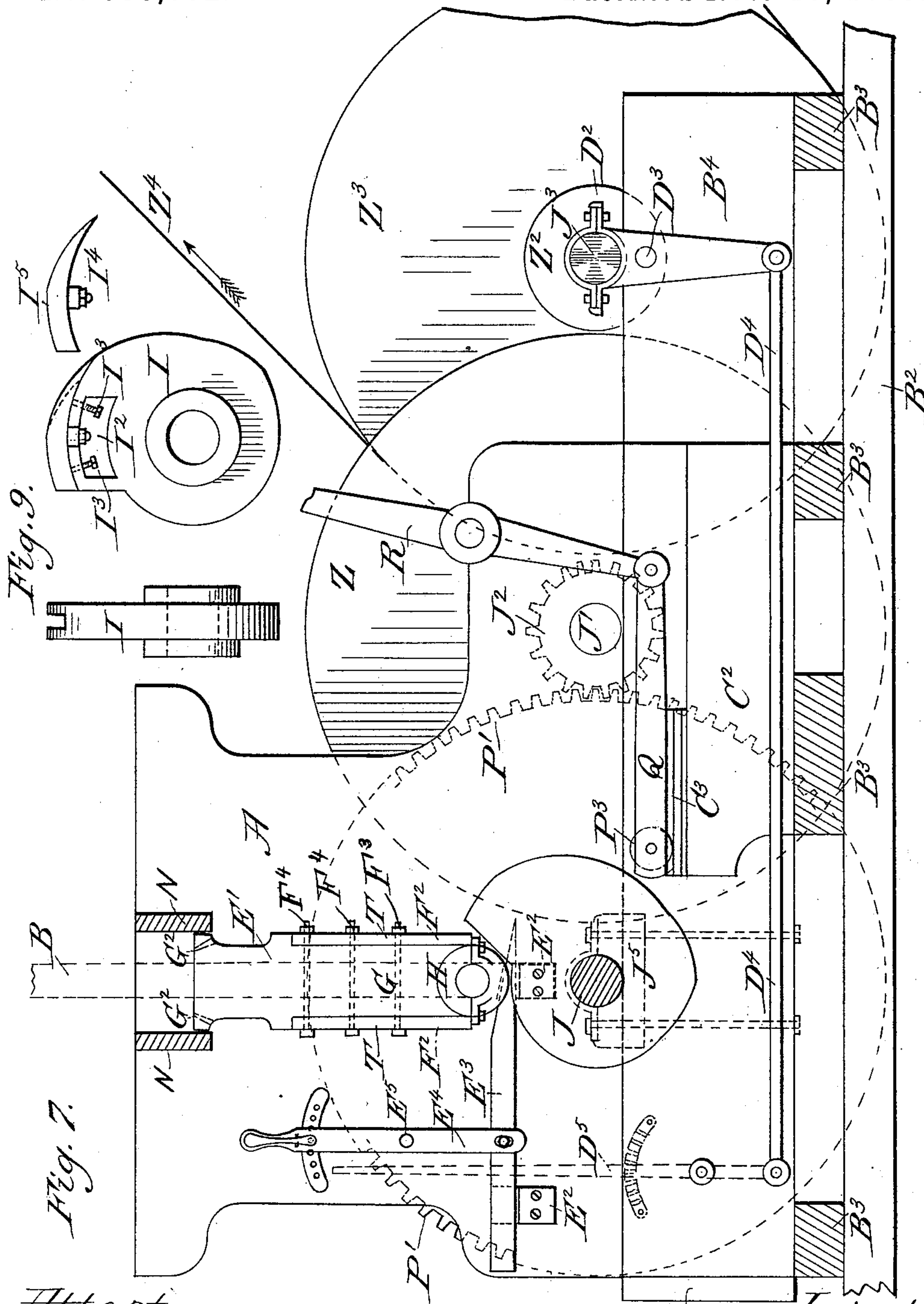
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4 Sheets—Sheet 3.

No. 330,002.

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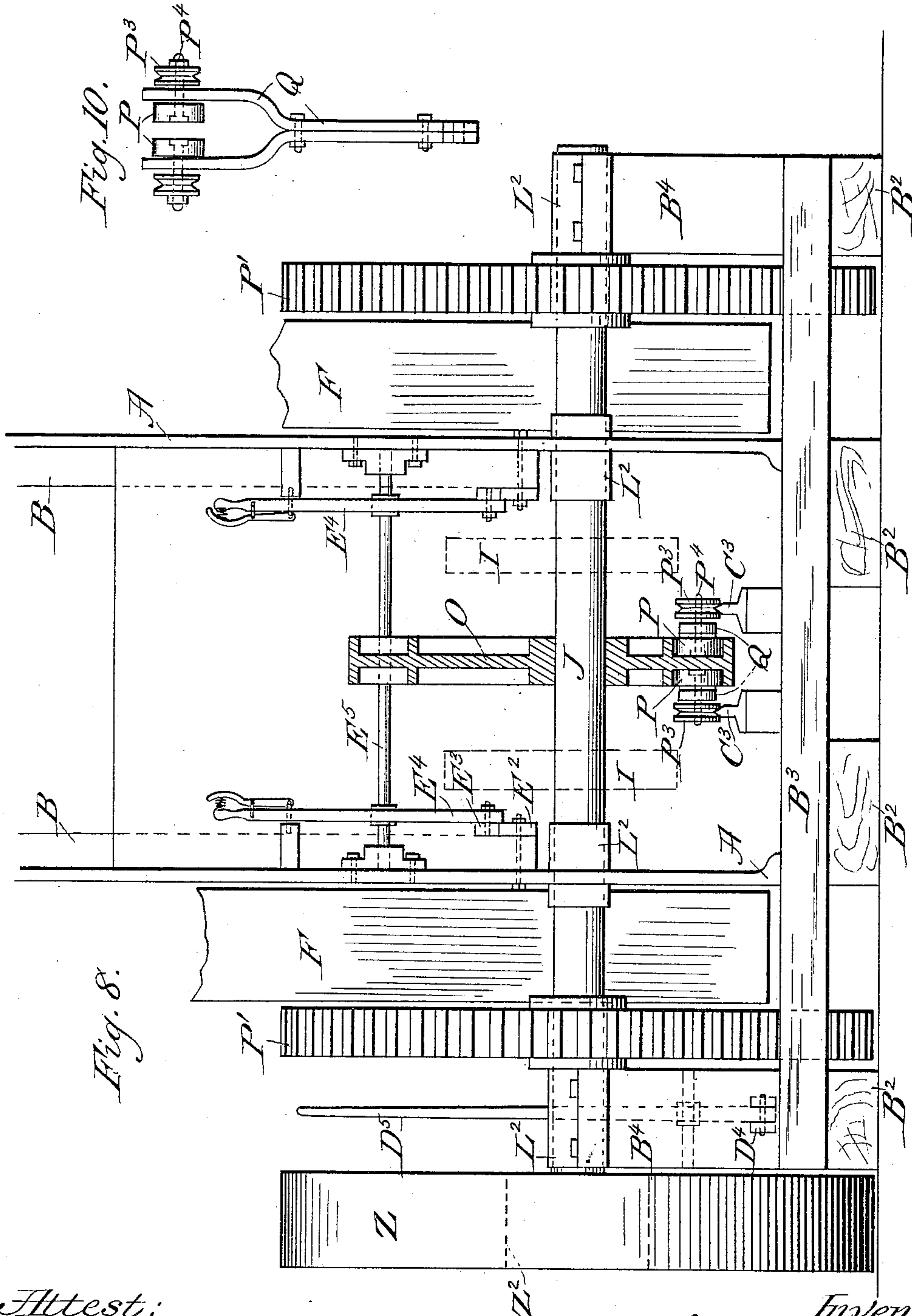
(No Model.)

4 Sheets—Sheet 4.

S. DALY.
BRICK MACHINE.

No. 330,002.

Patented Nov. 10, 1885.



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UNITED STATES PATENT OFFICE.

SAMUEL DALY, OF METROPOLIS CITY, ILLINOIS, ASSIGNOR OF ONE-HALF
TO WILLIAM OWEN TOWLE, OF SAME PLACE.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 330,002, dated November 10, 1885.

Application filed June 4, 1885. Serial No. 167,603. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL DALY, a citizen of the United States, residing at Metropolis City, in the county of Massac and State of Illinois, have invented certain new and useful Improvements in Brick-Machines; and I do 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 it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in that class of brick-machines in which bricks are made from nearly dry pulverized clay by pressing the same in suitable molds by means of an upper and lower series of reciprocating plungers.

The machine consists of a frame supporting an upper and a lower adjustable cross-head, in each of which are adjustably arranged a series of steel-faced plungers that act in conjunction with a series of steel-lined molds to which the clay is delivered by means of an adjustable feed-box, which also serves to push the finished bricks from between the plungers after they have been raised out of the molds by the lower set of plungers.

In the annexed drawings, illustrating the invention, Figure 1 is an end view of my improved brick-making machine. Fig. 2 is a section of the same on the line $x x$ of Fig. 1. Fig. 3 is a rear view of the levers for actuating the combined feed-box and pusher. Fig. 4 is a top view of the adjustable feed-box and brick-pusher combined. Fig. 5 is an inside elevation of one of the vertical guides with adjustable slides, cross-heads, and connections. Fig. 6 represents views of the plungers. Fig. 7 is a side view of my brick-machine, illustrating modifications in certain details. Fig. 8 is a partial front or end elevation of the same. Fig. 9 represents a side and edge view of a cam provided with adjustable point. Fig. 10 is a detail view of the arm Q and the rollers P and P^3 .

Like letters of reference designate like parts in the several views.

The frame of the machine embraces the side pieces, A A, which support a suitable table, A', above which project the uprights or standards $A^2 A^2$. To the inner sides of the frame A and standards A^2 are bolted the vertical guides B B, on which move the slides C C', to which are attached the cross-heads D and T, respectively. These cross-heads are each made of steel, wrought-iron, or other suitable material, and are of sufficient size and strength to support and resist the strain on the upper plungers, E E, and lower plungers, E' E', the form of which is shown in Fig. 6. To each end of the upper cross-head, D, is adjustably secured a pitman-strap, F, by means of screw-bolts X and key y , as shown in Fig. 2. Each pitman-strap F is made of steel or wrought-iron, and carries an upper journal-box, W, for an anti-friction roller, L, and a lower journal-box, W^2 , for an anti-friction roller, M. Between these journal-boxes each strap F is slotted for the passage of a cam, K, that is mounted on the main shaft J, so as to bear on the rollers L M and reciprocate the straps F, upper cross-head, D, and upper plungers, E E, at proper intervals.

The lower cross-head, T, carries adjustable boxes G G, in which are journaled anti-friction rollers H H, that are acted on by cams I I, carried by the shaft J, thereby reciprocating the lower cross-head and its plungers. In Fig. 7, F^3 represents the bolts that connect the lower cross-head and boxes. Besides the cams K K and I I, the shaft J also carries a cam, O, that is grooved or slotted to engage an anti-friction roller, P, on an arm, Q, Figs. 2, 7, and 8, having other rollers, $P^3 P^3$, Fig. 8, that are grooved to move on beveled guides C^3 , Fig. 7. The arm Q extends horizontally backward beneath the central part of the machine, and is pivoted at its rear end to the lower end of a bifurcated lever or yoke, R, that is mounted on a rock-shaft, a , at the end of the machine. To the upper ends of the lever-arms R R are attached connecting-rods S S, that actuate a combined feed-box and brick-pusher, T', the forward ends of the connecting-rods being pivoted to arms $T^2 T^2$ on the side of said box or pusher, as shown in Figs. 2 and 4. The rear portion of the feed-box T' is covered, and

is made adjustable by means of side pieces, T^3 T^3 , that are adjustably connected to the inner sides of the arms T^2 T^2 by screw-bolts and nuts T^4 , or other suitable fastenings. The forward side or front of the box T' acts as a pusher for removing the finished bricks from the molds N N , Figs. 1 and 2, after they have been pressed between the upper and lower plungers.

The combined feed-box and pusher T' is arranged to reciprocate on the table A' beneath a clay-hopper, U , Fig. 2, that is supported between the standards A^2 A^2 . When the feed-box T' is passed beneath the hopper U , the forward portion of said box, which is open at top and bottom, receives clay from the hopper. The forward or open portion of the box T' at this time rests on the table A' , which thus supports the clay within the box. As the box is moved forward, the clay contained therein is emptied into the molds, and the rear portion of the box, with its solid top T^5 , passes closely beneath the hopper, and serves as a slide or valve to prevent the further escape of clay from said hopper until the box T' is drawn back.

The machine may be actuated by power applied directly to the cam-shaft J , or to a wheel or pulley, Z , on a shaft, J' , that carries at each end a pinion, J^2 , which meshes with a gear, P' , on the cam-shaft, as shown in Fig. 2; or power may be applied to the wheel Z by means of a friction-head, Z^2 , on a shaft, J^3 , said shaft being run by a wheel, Z^3 , and belt Z^4 , as shown in Fig. 7.

The molds N N are open at top and bottom to allow the entrance and exit of the plungers E E' , and are lined with steel or other hard material.

The plungers E E' are preferably made in the form shown in Fig. 6, which represents a front and side view, and are either solid or hollow, the hollow form, with perforations G^2 , being preferred as affording an exit for air. These perforations are preferably made as shown in Fig. 7—that is, larger at the bottom than at the top, so as to prevent their becoming clogged with clay. The hollow form of the plungers enables them to be filled with steam to prevent clay from sticking to them. These plungers are steel-faced to correspond with the steel-lined molds N , and each plunger is adjustably supported in its adjustable cross-head, so that they can be adjusted separately or together, as desired.

In Fig. 7, F^4 represents the bolts for holding the plungers.

The material for brick-making, preferably dry or nearly dry clay in a finely-pulverized condition, is fed into the hopper U , from which it passes into the open portion of the reciprocating feed-box T' , that passes over the molds N N as the plungers E E' recede from each other. The clay is thus dropped into the molds N N and falls on the lower plungers, E' E' , whose downward movement is arrested at the lower edges of said molds, owing to the ad-

justment of the lower cross-head, T , and its accompanying mechanism. When the molds are filled, the box T' is withdrawn by the continued movements of the cam O and intermediate connections. The revolution of the cams K K against the rollers M M now draws down the cross-head D and upper plungers, E E , and just as said upper plungers are about to enter the upper ends of the molds N N the lower plungers, E' E' , and cross-head T are carried upward by the action of the cams I I , thereby pressing the bricks into shape within the molds. The cams K and I are so formed and adjusted as to cause the plungers to remain at rest during one-eighth of a revolution of the shaft J , so as to afford time for the air to escape and enable the clay to set. The continued movement of the cams K and I carries both sets of plungers E and E' upward, together with the bricks that rest between them, and which are thus removed from the molds. When the lower plungers, E' E' , have reached the top of the molds N , they are caused to again remain at rest during about one-sixteenth of a revolution of the cam-shaft, while the upper plungers, E E , before coming to a rest recede sufficiently to permit the passage of the combined pusher and feed-box T' , as shown in Fig. 2. The front of the box T' pushes the finished or pressed bricks v off from the tops of the lower plungers, E' E' , and onto the table A' , and as the lower plungers move downward through the molds N N the clay in the box T' falls onto said plungers and again fills the molds for further operation, as before.

The lower plungers, E E' , carried by the cross-head T , in their downward movement follow the cams I I , on which the rollers H H rest, until the cross-head is brought to a rest by adjustable stops, to be hereinafter explained, from which moment the cams I I are freed from the lower cross-head and plungers until in the course of their revolution they again come in contact with the rollers H H , and so raise the cross-head and plungers.

The adjustable stops for arresting the downward movement of the lower plungers are shown in Figs. 7 and 8. These stops are constructed and operated as follows: To the inner sides of the side pieces, A A , and guides B B are secured lugs or brackets E^2 E^2 for supporting the horizontal slip-wedges E^3 E^3 , that are pivotally connected to lever-arms E^4 E^4 , mounted on a rock-shaft, E^5 , one of said levers being extended above the rock-shaft, and provided with a pawl-and-ratchet connection or other suitable spring-fastening, by which the adjustable stops or slip-wedges E^3 E^3 can be locked in the position to which they may have been moved by their levers. By moving the beveled ends of the wedges or stops E^3 E^3 beneath the boxes of the lower cross-head to a greater or less extent the downward movement of the lower plungers will be arrested at the proper point for regulating the quantity of clay required to be admitted to the molds.

In Fig. 7 the cam I is shown as moved around one-eighth of a revolution beyond its position in Fig. 2, thus allowing the plungers E', cross-head T, and boxes G to come down onto the slip-wedges or adjustable stops.

I prefer to support the machine on timbers B² B³, as shown in Figs. 7 and 8, the foundation-pieces B² being placed in lines beneath the four journals L² of the main shaft J. The upper timbers or cross-pieces, B³ B³, support two timbers, B⁴ B⁴, for the purpose of holding journal-boxes, as J⁵, for the ends of the shafts J, J', and J³. One end of the shaft J³ is run into a swinging box, D², having a downward-extending arm that is pivoted at D³, and connected by a rod, D⁴, to a lever, D⁵, by means of which the operator can start or stop the machine at will.

It will be seen that by moving the lever forward the friction-head Z² will be moved against the wheel Z, so that the rotation of the wheel Z³, shaft J³, and friction-head Z² will rotate the shaft J' and pinion J², which in turn actuate the gear P, shaft J, and cams mounted thereon, thereby operating the various parts of the machine, as above described.

In Fig. 7, C² represents the side of a support for one of the beveled guide-tracks on which run the grooved rollers P³ P³, that are attached to the feed-arm Q. The supports C² are placed on either side of the cam O, and are bolted to the cross-pieces B³. The feed-arm Q and its rollers P and P³ are clearly shown in Fig. 8, which also shows the engagement of the rollers P P in the grooved sides of the cam O, by which said feed-shaft and the connected feed-box are actuated. The cam O is made with a roller-groove on each side of a central web. The form of these grooves is shown in Fig. 2. The feed-arm Q is made in two halves, bolted together to form a bifurcated end for receiving the cam-rollers P P, which run on bolts P⁴, that also support the guide-rollers P³ P³.

In Fig. 9 is shown a special construction of cam I, having an adjustable point, I⁵, that can be raised or lowered according to the range of movement required by the lower cross-head and plungers in making brick of unusual thickness. This adjustable point is secured to the cam-body by a shank and nut, I⁴, at any elevation to be determined by set-screws I³ I³, said nut and set-screws being manipulated through an opening, I², in the body of the cam.

The thickness of the brick to be made will ordinarily be regulated by means of the bolts X and keys y—that is, if in pressing the bricks they are found to be one-sixteenth, one-eighth, or even one-fourth of an inch too thick or thin, they can be made the right thickness by adjusting the upper cross-head and plungers by

means of said bolts and keys; but if other than the regular-size bricks are wanted the necessary adjustments can be made by taking out the two pieces of half-inch backing F² and raising the adjustable points I⁵ of the cams I half an inch and then adjusting the feed-box T' to hold more clay. Thus the machine can be readily changed from making the regular-sized bricks two and a half inches thick to making brick three inches in thickness.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a brick-machine, the combination, with the open-ended molds N N, of a series of upper plungers, E E, supported by an adjustable cross-head, D, connected with pitmen F F, and a series of lower plungers, E' E', supported in an adjustable cross-head, T, said cross-head being actuated by cams arranged and operating in the manner and for the purpose substantially as shown and described.

2. In a brick-machine, the combination, with the frame A A², guides B B, molds N N, and lower plungers, E' E', of the upper plungers, E E, adjustable cross-head D, sides C C, pitman-straps F F, having rollers L M, shaft J, and cams K K, substantially as described.

3. In a brick-machine, the combination, with the frame A A², guides B B, molds N N, and upper plungers, E E, of the lower plungers, E' E', adjustable cross-head T, having rollers H H, the slides C' C', shaft J, and cams I I, substantially as described.

4. In a brick-machine, the combination, with the frame A, table A', plungers E E', and molds N N, of the box or pusher T', connecting-rods S S, bifurcated lever R, rock-shaft a, arm Q, having roller P, shaft J, and cam O, substantially as described.

5. In a brick-machine, the combination, with the molds N N, lower plungers, E' E', cross-head T, and roller-boxes G, of the adjustable stops or slide-wedges E³ E³, levers E⁴ E⁴, and rock-shaft E⁵, substantially as described.

6. In a brick-machine, the combination, with a reciprocating feed-box having connecting-rods S S and bifurcated lever R, of the feed-arm Q, carrying rollers P P³, the guide-track C³ for the rollers P³, and the grooved cam O, for engaging the rollers P, whereby the feed-box is actuated, substantially as described.

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

SAMUEL DALY.

Witnesses:

WILLIAM R. BROWN,
WM. McCAWLEY.