

W. H. WARD.

Housing for Metal Rolling Mill.

No. 103,399.

Patented May 24, 1870.

Figure 1.

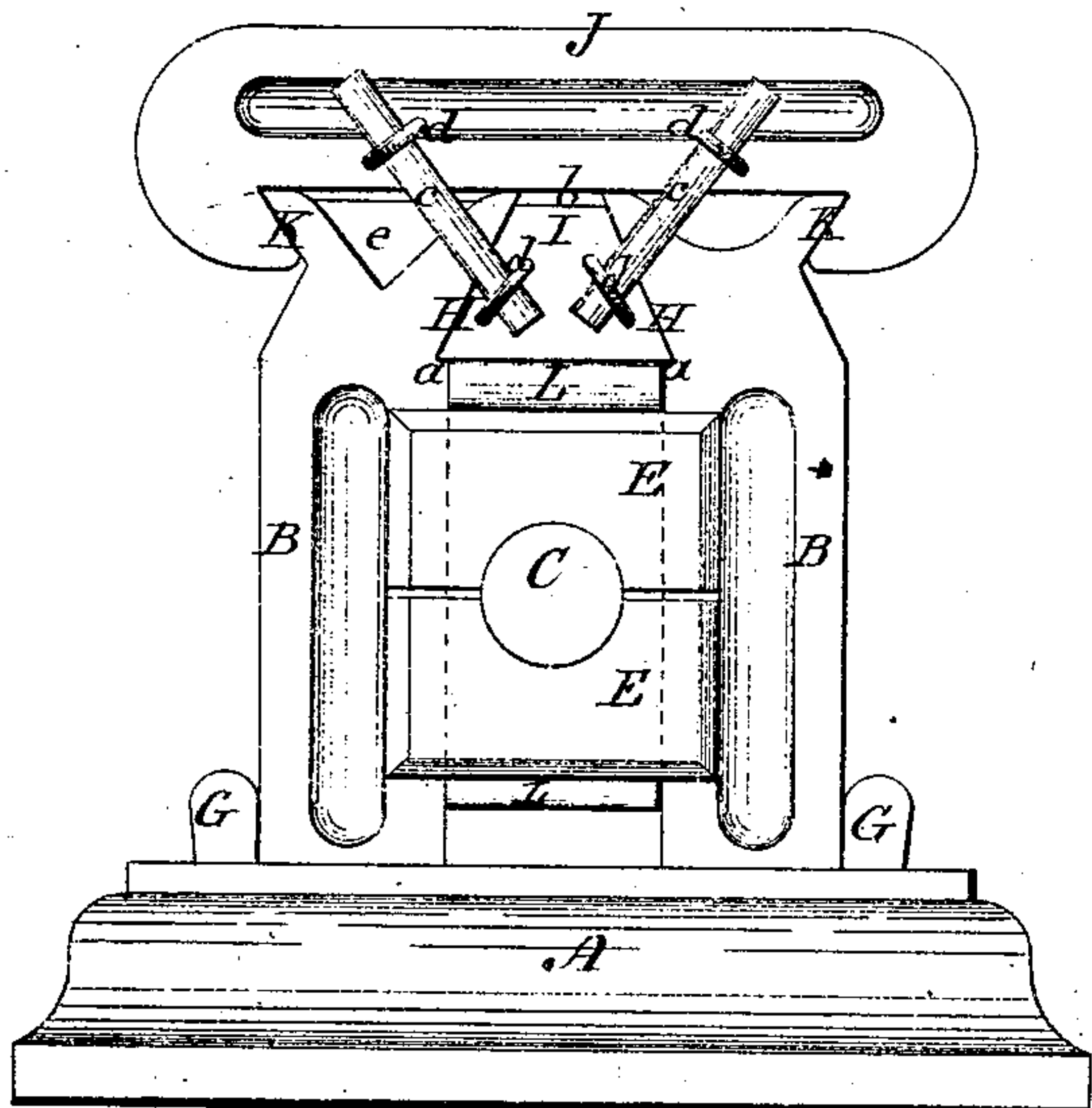


Figure 2.

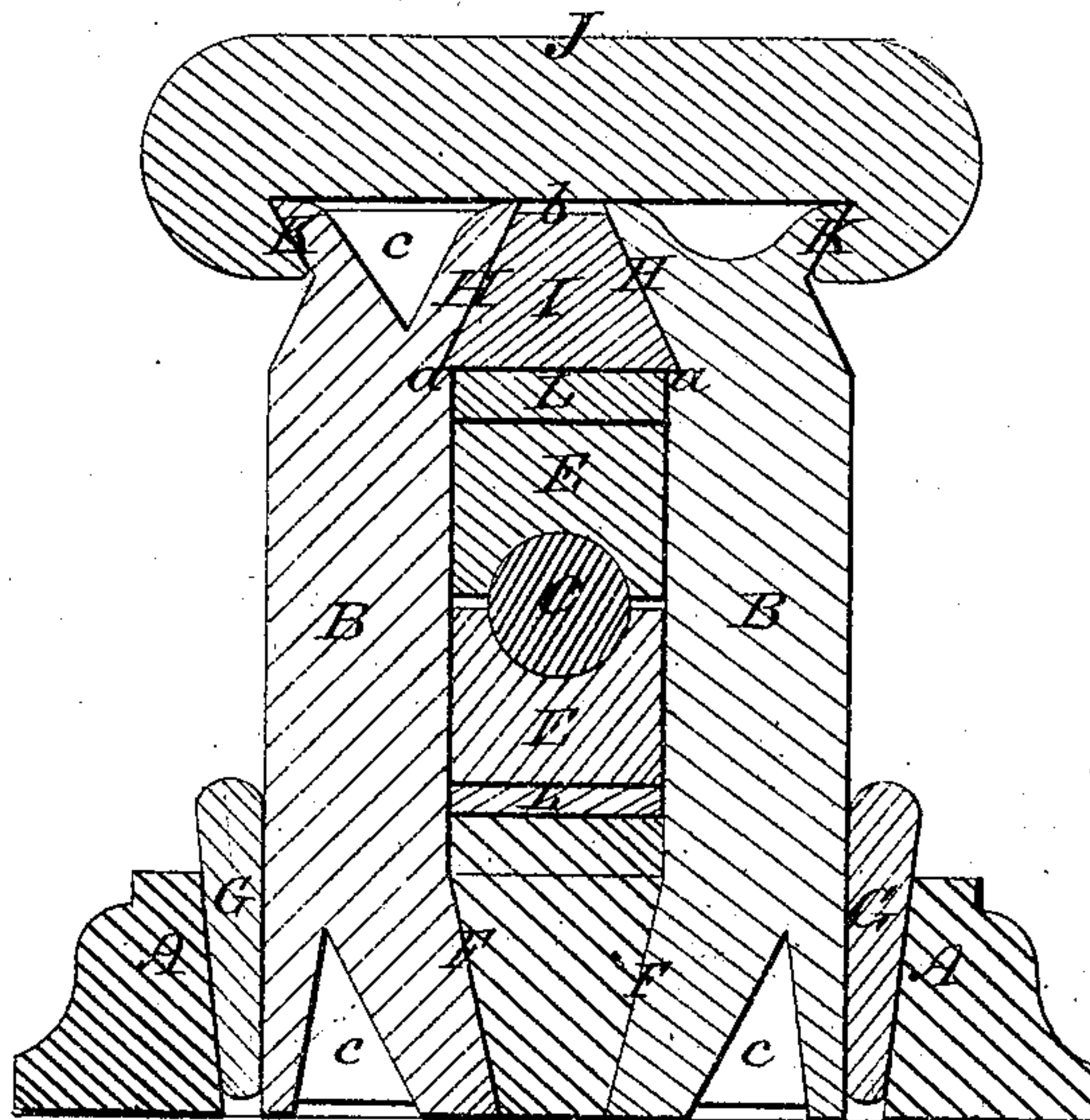


Figure 4.

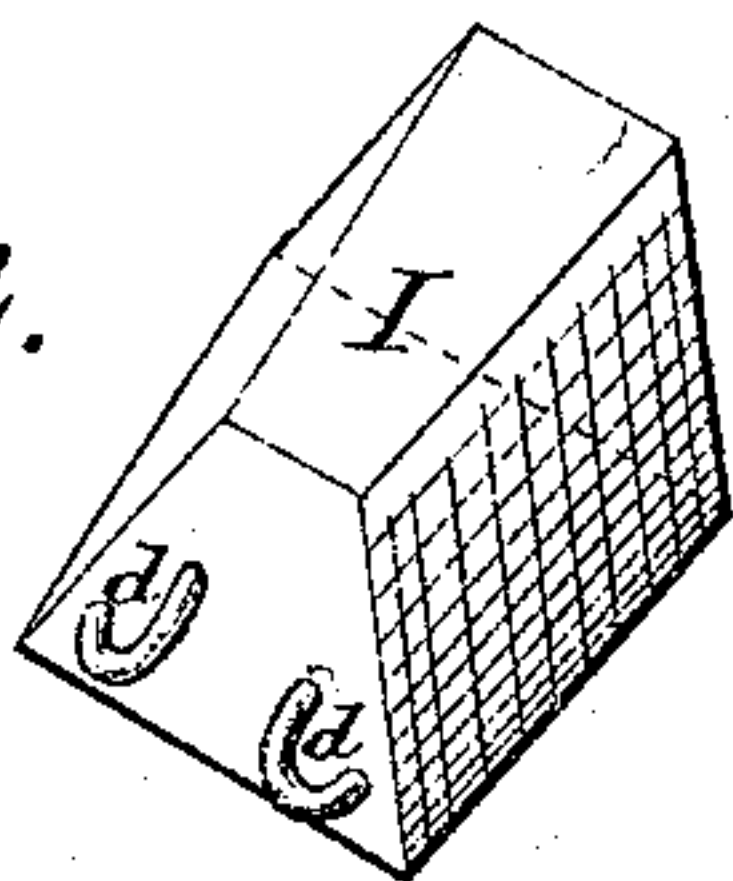


Figure 3.

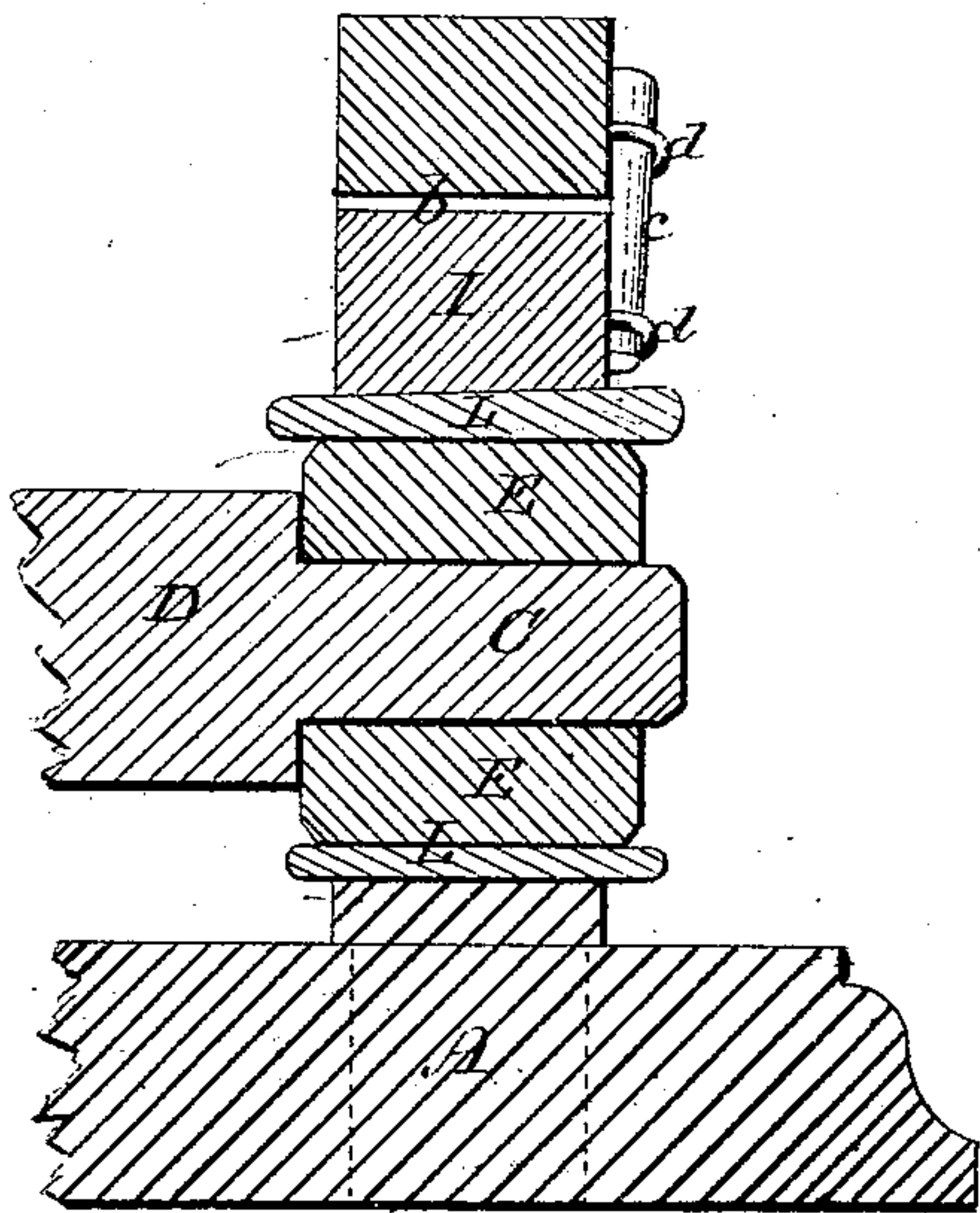
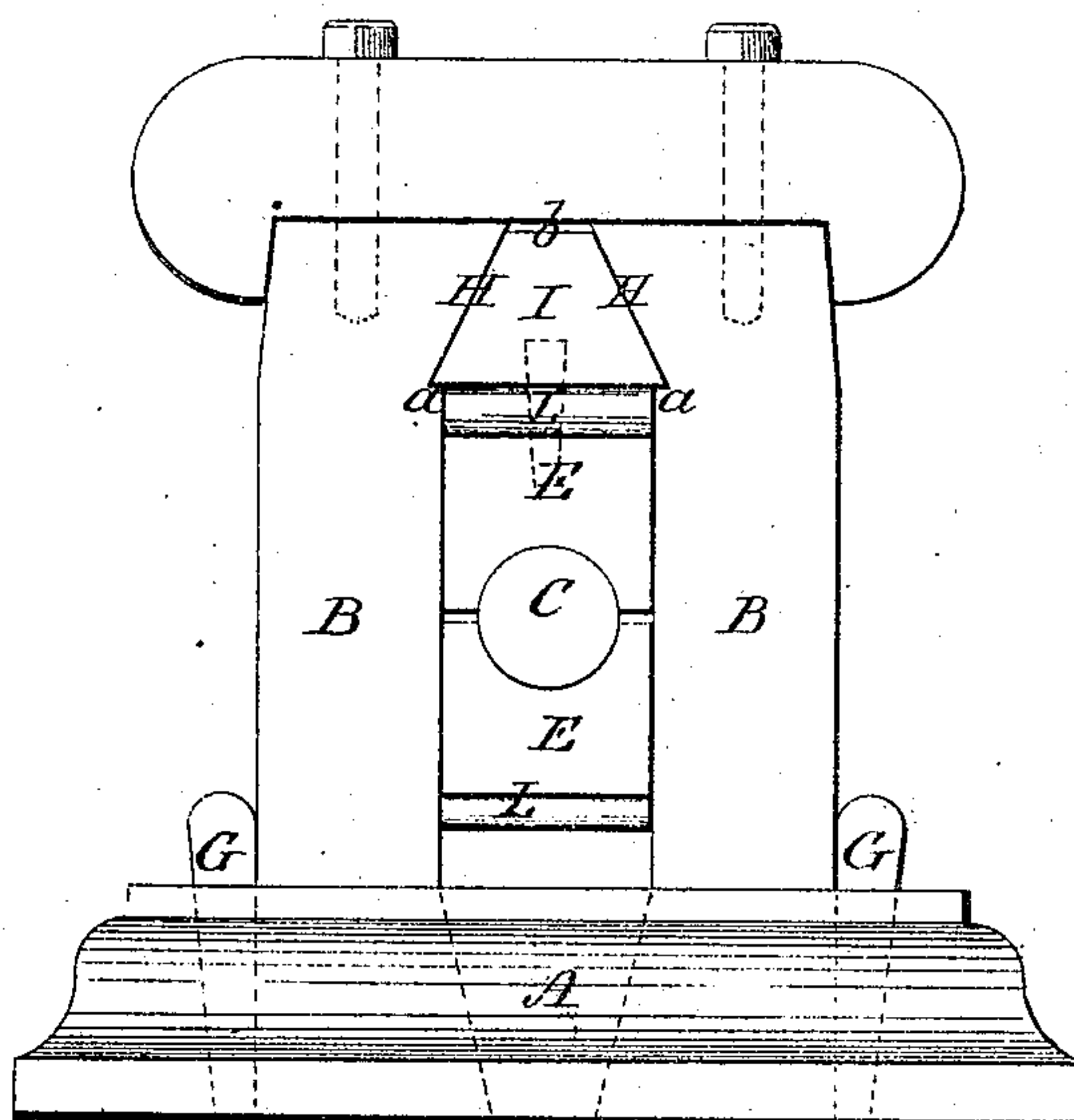


Figure 5.



Witnesses  
Benjamin S. Meedy.  
George R. Gray

William H. Ward.  
By Upferman & Johnson  
Attorneys.



# UNITED STATES PATENT OFFICE.

WILLIAM H. WARD, OF AUBURN, NEW YORK.

## IMPROVED HOUSING FOR METAL-ROLLING MILLS.

Specification forming part of Letters Patent No. 103,399, dated May 24, 1870.

*To all whom it may concern:*

Be it known that I, WILLIAM H. WARD, of Auburn, in the county of Cayuga and State of New York, have invented certain new and useful improvements in pillar-block locks for rolling-mills, marine-engines, and other machinery in which the journals of cylinders or dies are subjected to heavy vertical pressure; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents an elevation of a pillar-block lock embracing my improvements. Fig. 2 represents a vertical section of the same. Fig. 3 represents a sectional view of the same, taken parallel to the axis of the bearing. Fig. 4 represents a view in perspective of the dovetail locking-block detached, and Fig. 5 represents a slightly-modified form of my improved pillar-block lock.

My improvements consist in constructing the pillar-block lock in such manner as to relieve the horizontal cap-tie from all vertical pressure by the employment of a locking-block whose cross-section has the form of a truncated isosceles triangle, intervened between the journal-bearings and the said horizontal tie-cap, so that whatever strain there is in an upward direction will be communicated in a lateral direction to the standards and resisted entirely in a horizontal direction by the tie-cap, by which a secure lock is produced without any danger whatever of either the horizontal tie-cap being displaced or of the standards between which the bearing-blocks are secured being spread; also, in the employment of wedges arranged so that their lower ends shall converge toward each other and cross the joints of the dovetail locking-block, the inner sides of the standards, and the cap-tie, for the purpose of locking the several parts together; also, in making the standards of separate and distinct parts and securing them to the bed-plate by means of flaring feet fitted into corresponding sockets in said bed-plate, and securely held in place by wedges or their equivalents, so that said standards may be easily removed at pleasure and allow the heavy roll or shaft (as the case may be) to be rolled out instead of being hoisted out, as is now done.

In the accompanying drawings, A represents the bed-plate, and B the standards of the frame; and to illustrate the application of my invention, C represents the journal of a die-roll, D, with its bearing-blocks secured between the said uprights or standards. The die rolls or cylinders are arranged in pairs when used in rolling-mills, so that the pressure will be upon their journals vertically. The journal-bearings E are flanged in the usual manner, and secured between the inner sides of the standards. The feet of these standards are inserted in openings in the bed-plate, made larger at the bottom than at top, and the inner sides, F, of the feet are inclined toward each other, so as to be larger at their bottom, while their outer sides are vertical, to admit wedges G between them and the sides of the socket in the bed-plate, so as to securely lock the foot of each standard B into its socket, and thus render it impossible for them to be started therefrom by any vertical strain, however great it may be. The making of the standards in two distinct parts also allows of the removal of one or both, which greatly facilitates the removal or placing in position of the die-rolls by simply allowing them to be rolled into or from their bearings, instead of hoisting them in or out, as now practiced; and especially is this advantageous in heavy marine and other engines, where the hoisting of shafts is attended with much difficulty for want of room between decks or beams, and it also greatly facilitates the planing up and fitting the pillar-blocks between them. The inner sides, H, of the upper ends of the standards B incline upward toward each other, and are fitted with seats *a* at the base of said inclination, to receive a block, I, whose cross-section has the form of a truncated isosceles triangle, which fits exactly the inclined sides of the uprights. The base of this block I rests upon the seats *a*, so that it cannot descend between the uprights, while between its upper end, which is cut off, so as to form a flat top, a space, *b*, is left beneath the horizontal tie-cap J, to be presently described. The outer sides of the upper ends of the uprights are inclined outwardly, while the lower side of the tie-cap has a dovetail recess formed therein, so as to fit upon the upper ends of the standards, and embrace the outwardly-inclined sides K thereof, from which



it will be seen that the tie-cap J serves as a horizontal brace to the upper ends of the uprights, and they cannot spread without breaking the ends of the tie-caps, by which they are firmly braced, while the intervening space, *b*, between the under side of the tie-cap and the intermediate block, I, relieves the tie-cap from any vertical strain whatever, because such strain is transmitted by the inclined sides of the said block I wholly in a lateral direction; and as this block I is bound tightly between the inclined sides H of the uprights, it is plain that it cannot yield without spreading said uprights. The bearing-blocks E of the journals of the die-rolls are kept firmly in place by wedges L, intervened between them, the block I, and the bed-plate, by which the surfaces of the die rolls or cylinders may be always kept properly and rigidly adjusted. The dovetail block I, being secured between the standards so that it can neither rise nor fall, is a perfect and secure bar against the vertical strain of the bearing-blocks, and when thus used in connection with a horizontal tie, constitutes a rigid and unyielding pillar-block of simple and durable construction. The dovetail locking-block I thus secured would, however, be liable to work out of its seat horizontally by the constant jarring of the mill or other machinery; so, also, would the dovetail tie-cap J, at least to a certain extent, be liable to work either to one side or the other from its seat. To lock the two together, therefore, and to the uprights, I make the dovetail locking-block I wedge-shaped in the direction of its length, as shown more particularly in Fig. 4, so that one of its ends will be wider than the other, and the inclined sides H of the uprights of corresponding form, so that said locking-block can only move in its seat in one direction. To lock the block, therefore, upon its seat I use two wedges, *c*, secured in staples *d* on the vertical side of the horizontal cap-tie and on the smaller end of the dovetail locking-block, so as to converge toward each other, and cross the junction of said locking-block, the up-

rights, and the cap, and as these wedges are driven firmly into the staples they bind against the sides of the several parts, and thus lock the parts liable to be jarred out of place to the fixed frame. It will be seen, therefore, that so long as the converging locking-wedges *c* are in their places, the wedge-shaped block I cannot move in either direction, as it is locked at one end by its wedge shape, and at the other by the keys, which latter also constitute a perfect lock to hold the tie-cap in its seat upon the uprights, while their specific gravity tends always to keep them down. The upper and lower ends of the uprights may be cast with cavities therein to save metal and to reduce the weight of the parts, and these openings may be cast with cross-bars or ribs *e*, to brace the ends against lateral strain. The bed-plate may also be made concave and strengthened by cross-ribs, and the weight of the several parts may be so proportioned as to equalize their strength.

In the modification shown in Fig. 5 the wedge-shaped locking-block I may be held in its seat by a key passed through the small end of the wedge L against the inner end of the said wedge-shaped block, and the cap may be held in position by screws which screw into the uprights B, while the locking ends of the tie-cap may be made vertical instead of inclined, because, being relieved of vertical pressure, it only serves as a horizontal brace to prevent the standards from spreading.

Having thus described my invention, I claim—

For the purpose of directing ultimately the upward pressure of the journal-bearings of the upper roll of a rolling-mill laterally against solid shoulders of the cap-piece, the construction substantially as herein described and shown.

W. H. WARD.

Witnesses:

J. N. STARIN,  
THOS. TOWNE.