

(No Model.)

4 Sheets—Sheet 1.

J. W. HUTT.

MACHINE FOR THE MANUFACTURE OF PAPER BOXES.

No. 440,570.

Patented Nov. 11, 1890.

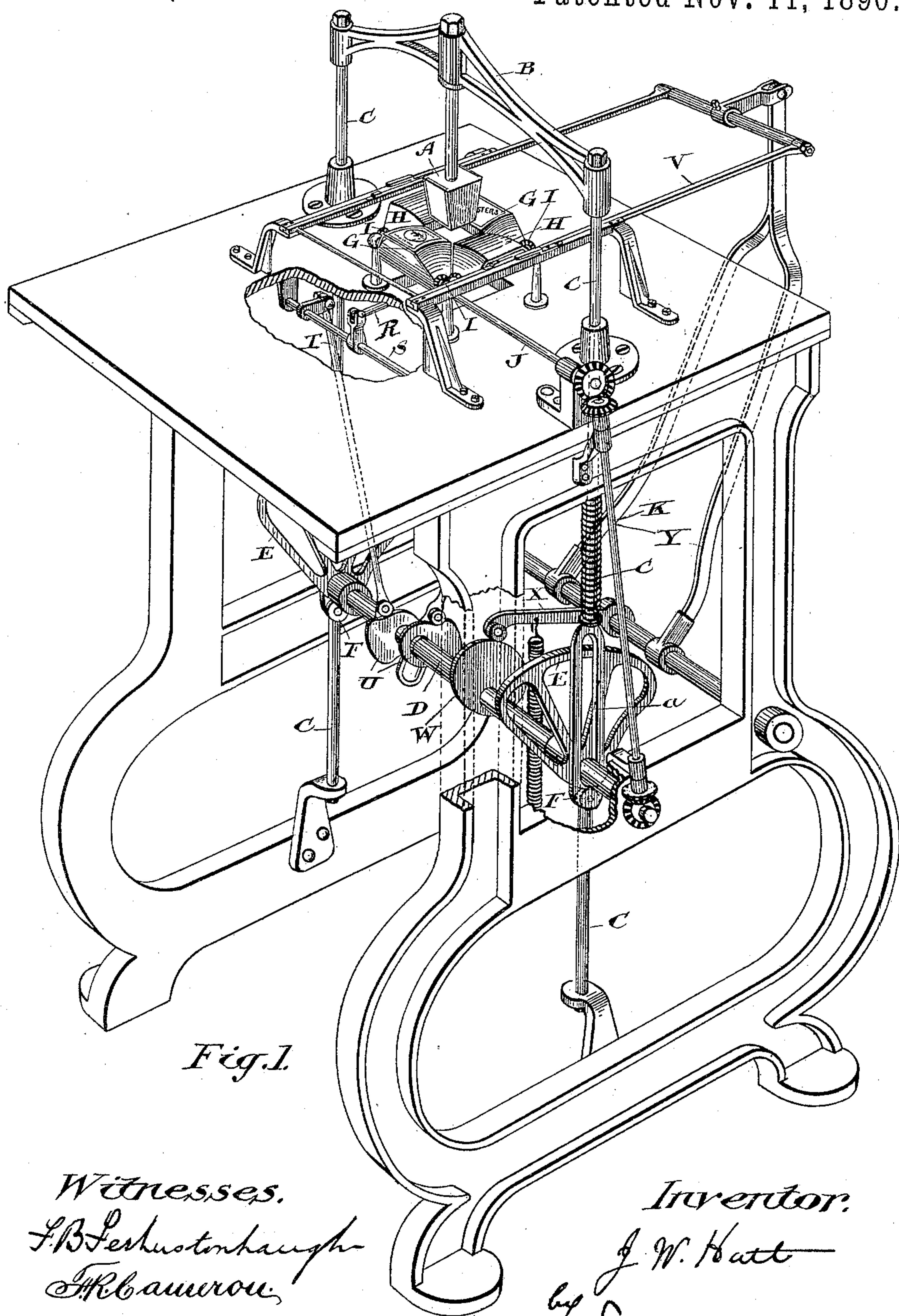


Fig. 1

Witnesses.
F. B. Feshunhaugh
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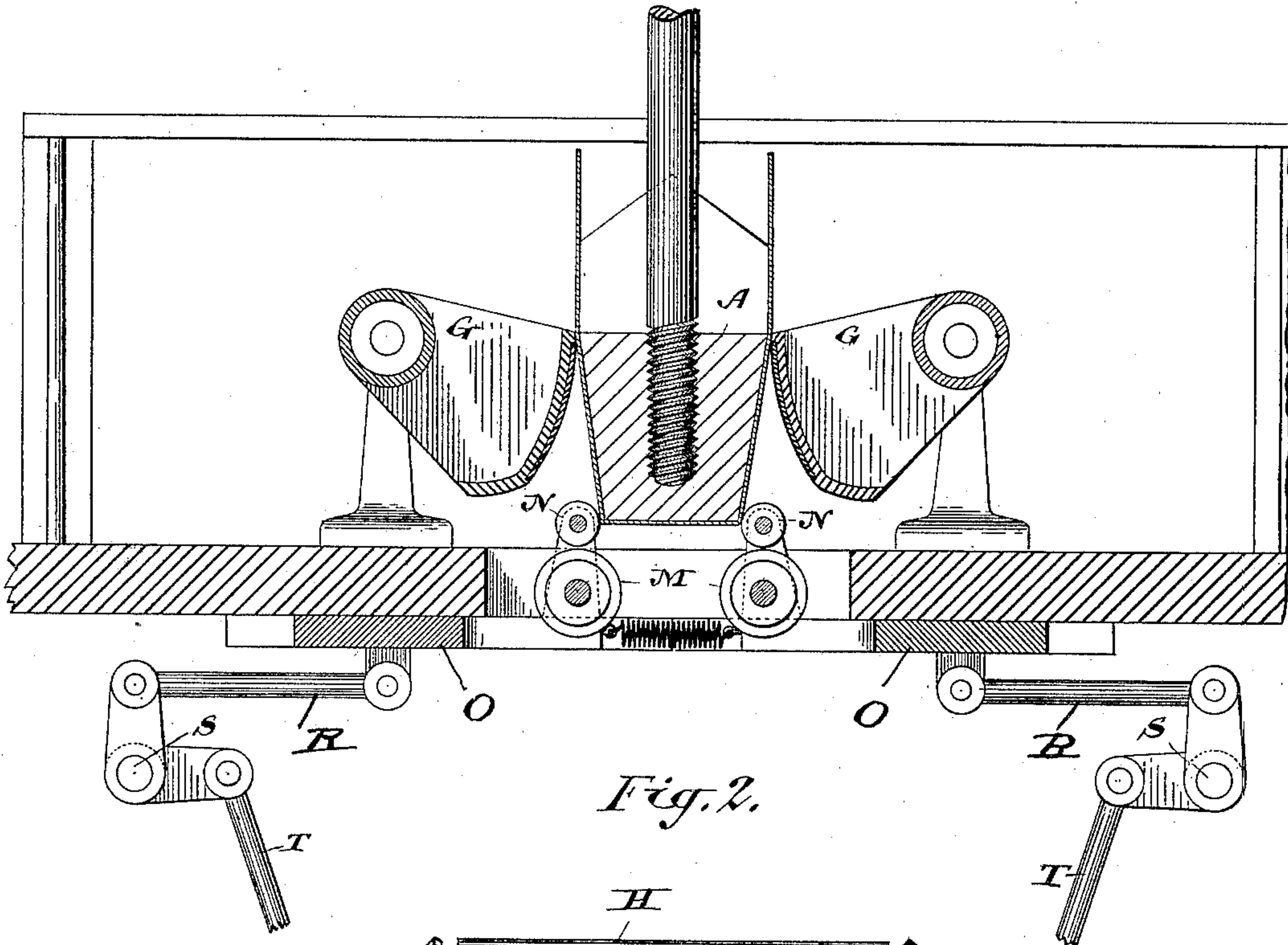


Fig. 2.

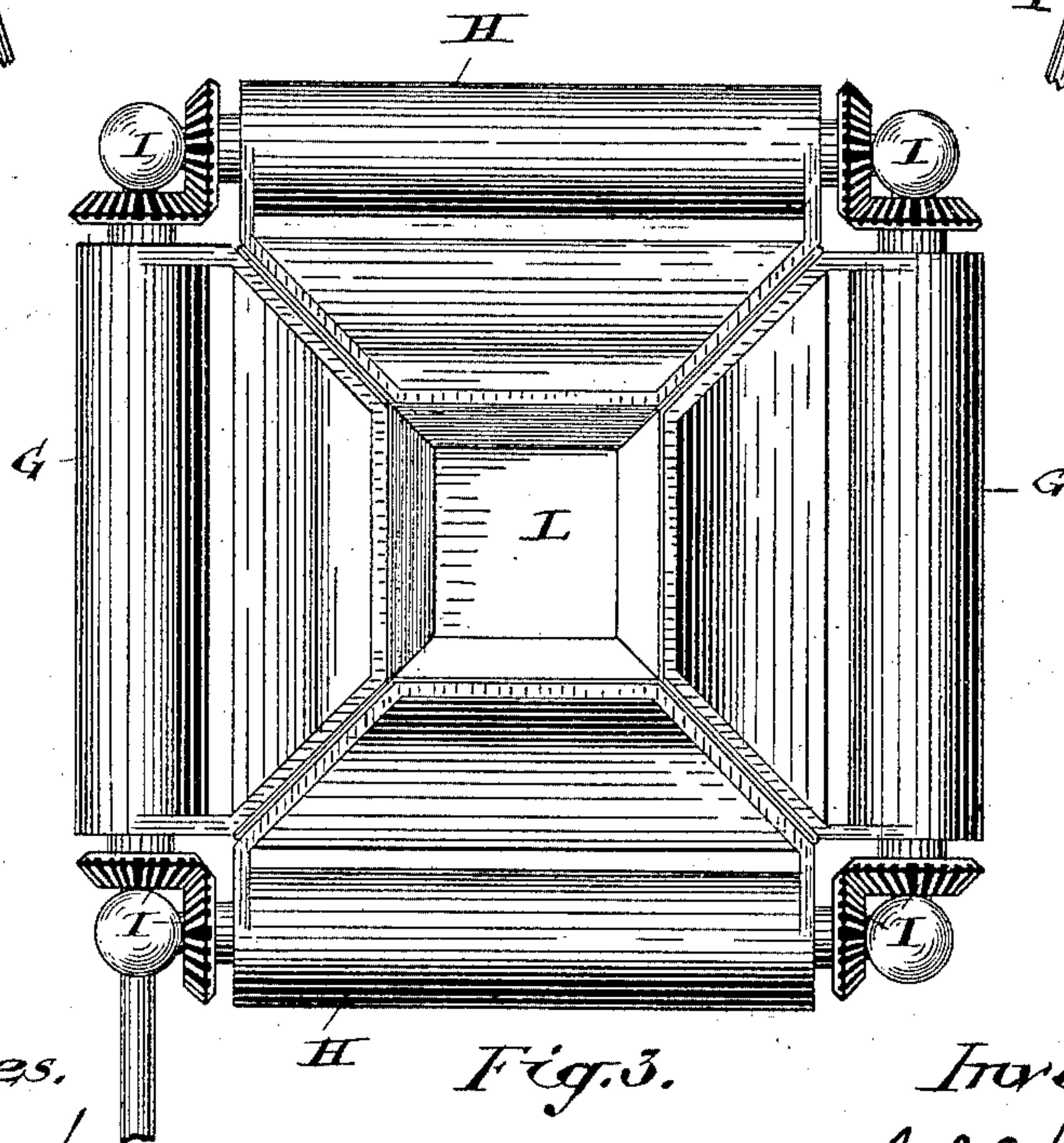


Fig. 3.

Witnesses.
F. B. Fetherstonhaugh.
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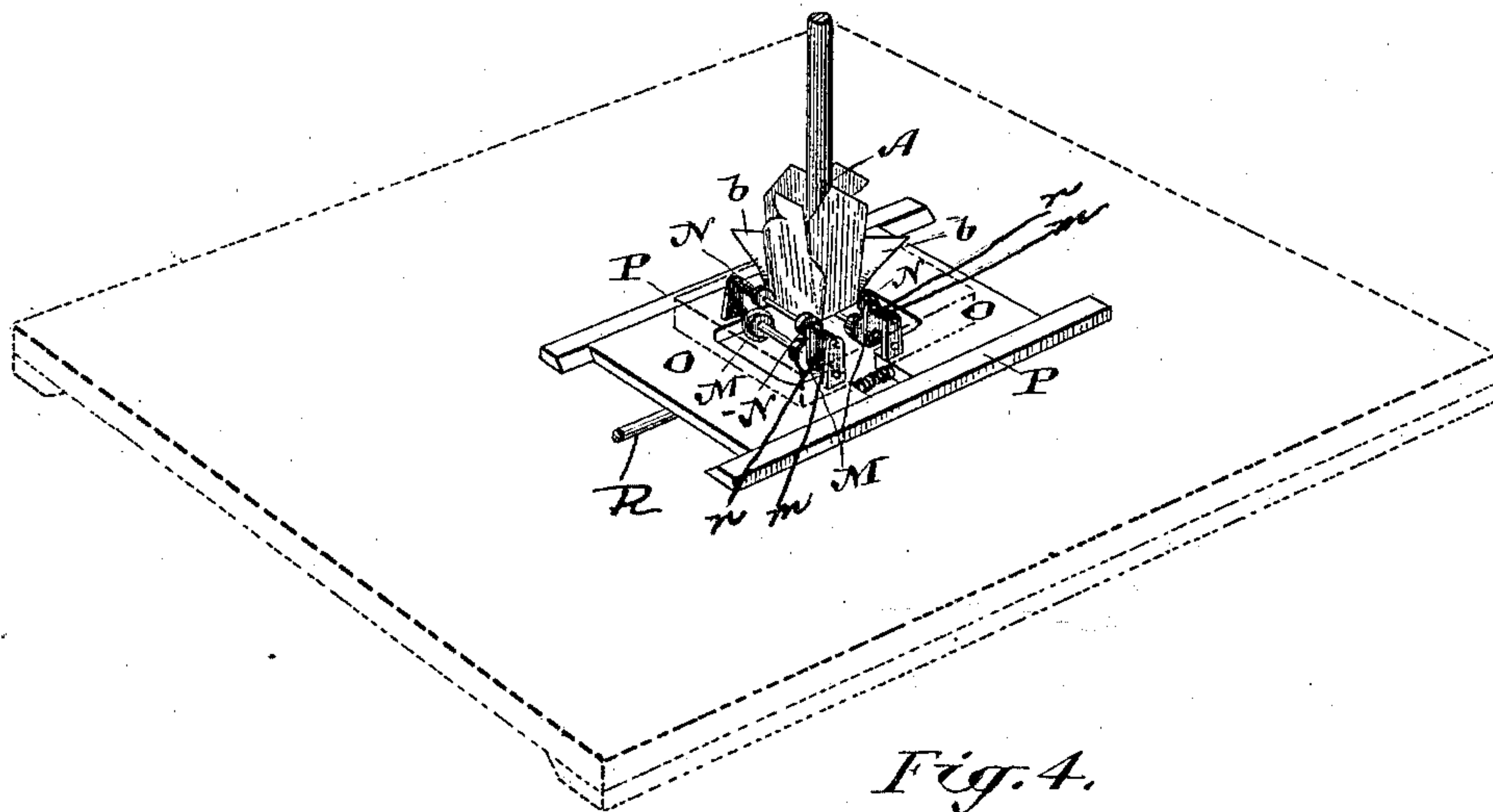


Fig. 4.

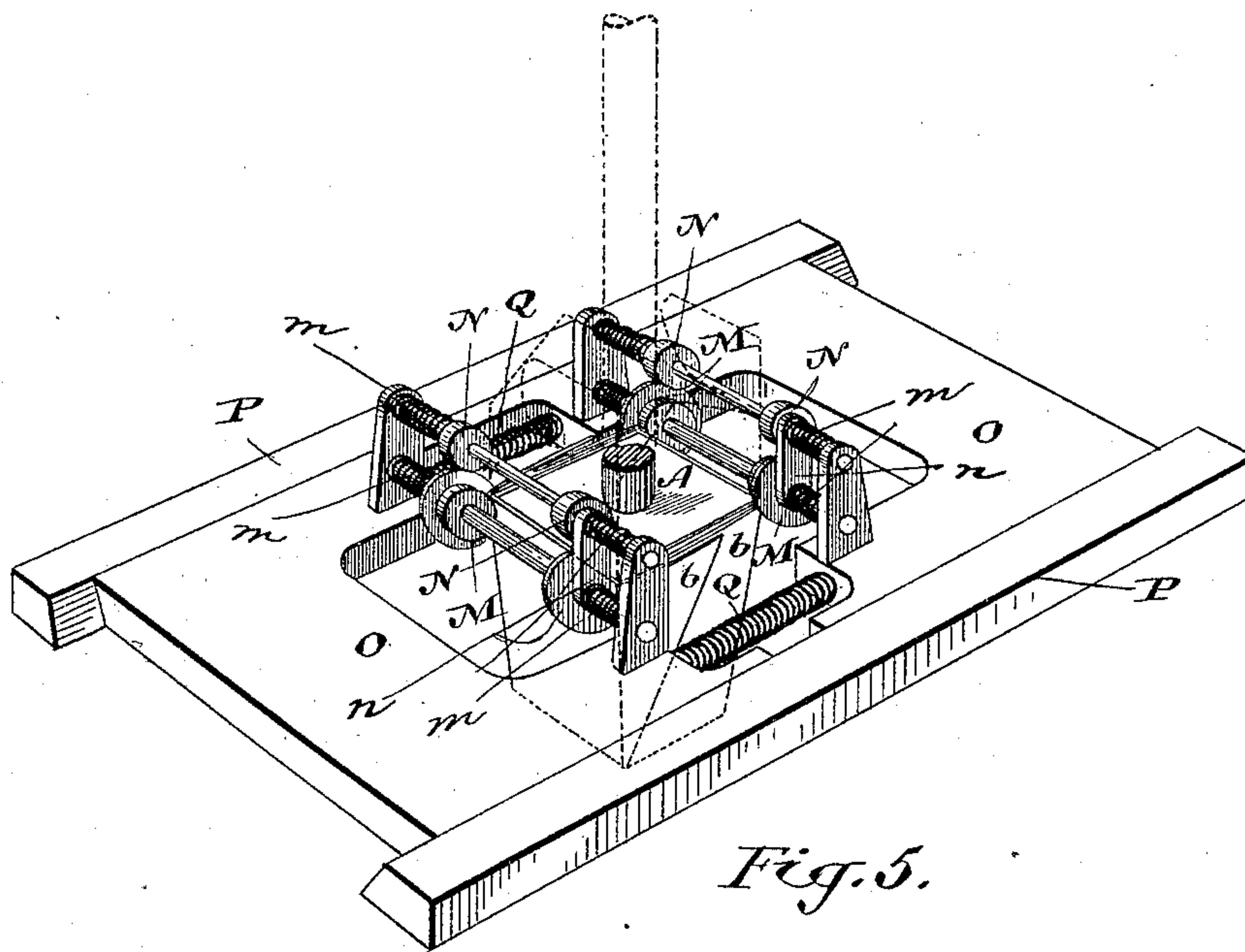


Fig. 5.

Witnesses.
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(No Model.)

4 Sheets—Sheet 4.

J. W. HUTT.

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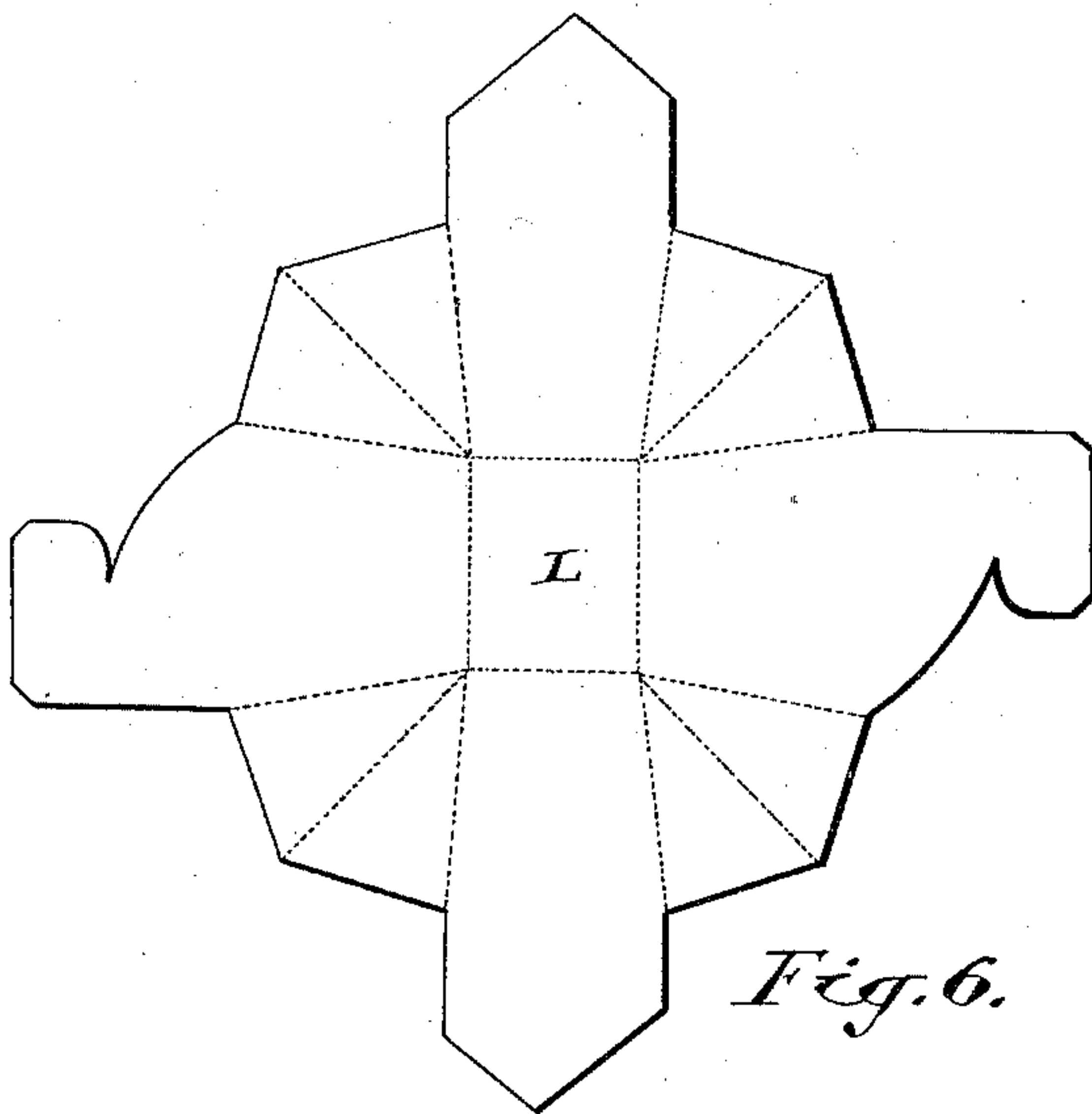


Fig. 6.

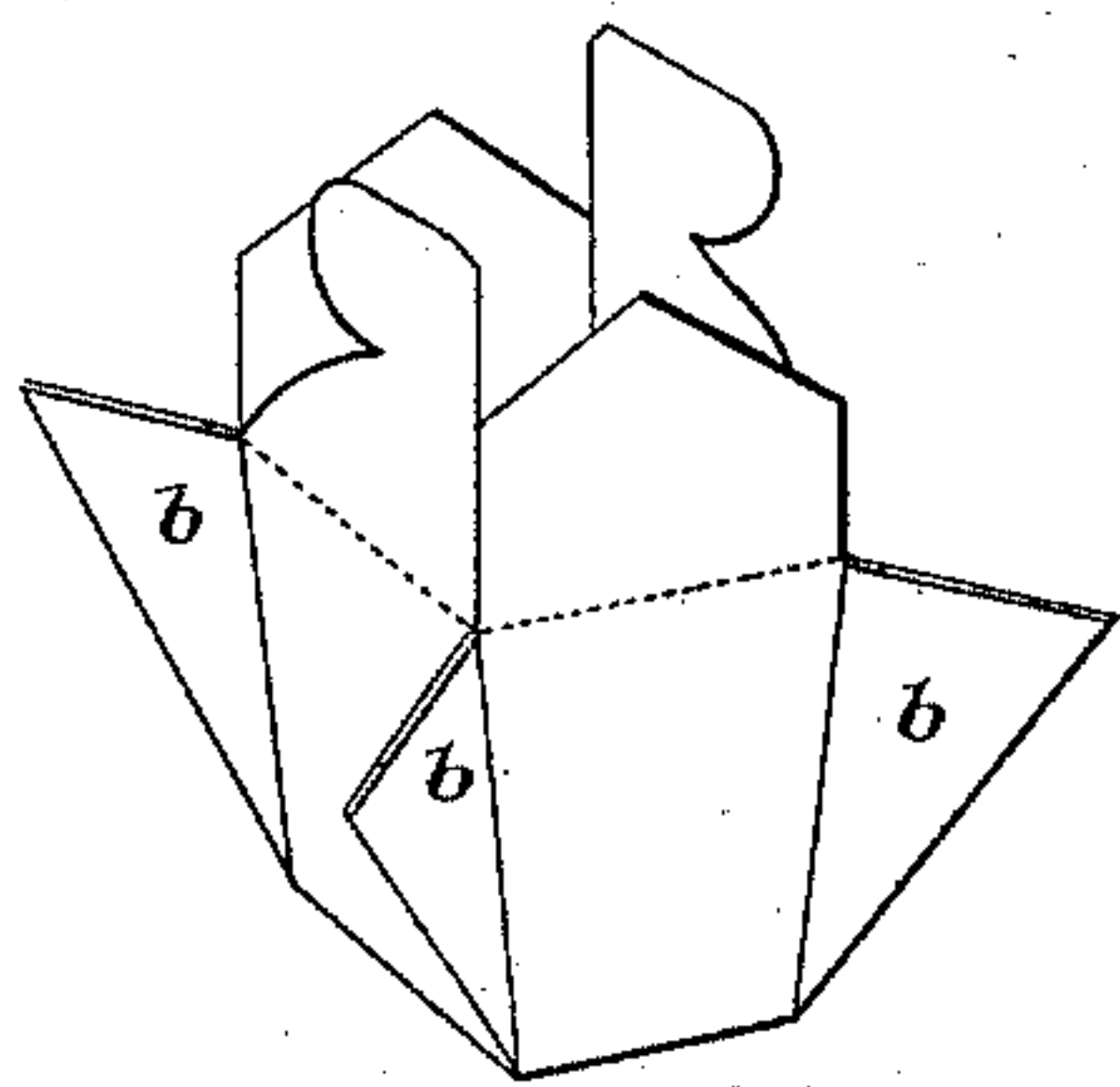


Fig. 7.

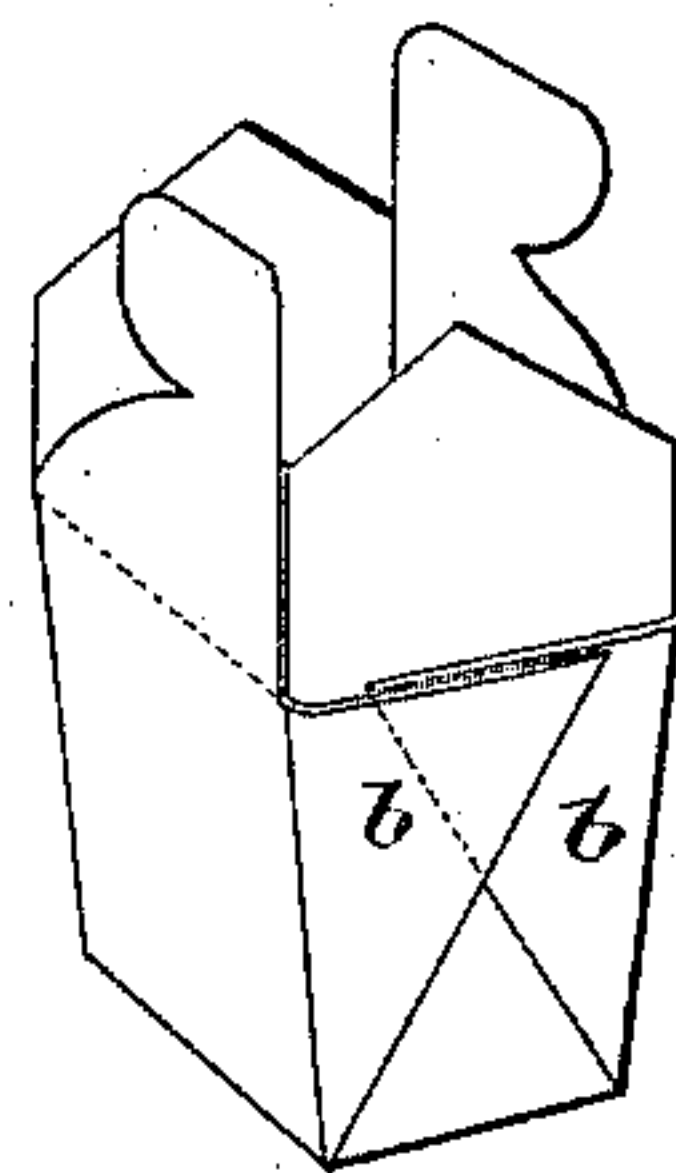


Fig. 8.

Witnesses.

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E. B. Cameron.

Inventor.

J. W. Hutt
By Donald C. Ridout of
att'y

UNITED STATES PATENT OFFICE.

JAMES W. HUTT, OF TORONTO, CANADA, ASSIGNOR OF ONE-THIRD TO
WILLIAM RAINSFORD DRAPER, OF SAME PLACE.

MACHINE FOR THE MANUFACTURE OF PAPER BOXES.

SPECIFICATION forming part of Letters Patent No. 440,570, dated November 11, 1890.

Application filed August 24, 1889. Serial No. 321,829. (No model.)

To all whom it may concern:

Be it known that I, JAMES WILLIAM HUTT, machinist, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented a certain new and Improved Machine for the Manufacture of Paper Boxes, of which the following is a specification.

The object of the invention is to design a machine by which oyster and other boxes may be expeditiously and accurately folded into form without any manual exertion other than that necessary to feed the blanks into the machine; and it consists, essentially, of a plunger arranged to force the blank between peculiarly formed and operated rollers in such a manner as to crease, fold, and complete the box ready for its bail, substantially as hereinafter more particularly explained.

Figure 1 is a perspective view of my improved machine with the table partially broken away to expose certain working parts, which would otherwise be obscured. Fig. 2 is an enlarged sectional elevation of the folding-rollers and mechanism connected therewith. Fig. 3 is a plan of the first folding-rollers. Fig. 4 is a perspective detail showing the plunger and the half-formed box entering the finishing-rollers. Fig. 5 is a similar view, slightly enlarged, showing the plunger and the box passing through the finishing-rollers. Fig. 6 is a plan of the blank before it enters the machine. Fig. 7 is a view of the box as it appears after passing the first folding-rollers. Fig. 8 is a view of the finished box.

In the drawings like letters of reference indicate corresponding parts in the different figures.

A is the plunger, which is made the desired shape of the interior of the box. This plunger is suspended, as indicated, from the cross-head B, which is carried on the vertical rods C, located on either side of the machine, as shown.

D is the driving-shaft, which derives its motion from any suitable motor. A slot *a* is made in each of the vertical rods C to fit upon the driving-shaft D, on which driving-shaft the cams E are fixed. On each of the rods C, I journal below the slot *a* a friction-roller F, designed to be in contact with the working-surface of its respective cam E. Owing to

the connection between the cams E and the rollers F, the revolving of the shaft D imparts a vertical reciprocating motion to the cross-head B and through it to the plunger A.

Below the plunger A, I journal four rollers or formers, marked, respectively, G and H, the rollers or formers G being journaled at right angles to the rollers or formers H in such a manner as to leave a rectangular opening immediately below the plunger A. The rollers or formers G and H are connected together by beveled gearing I and derive motion from the horizontal shaft J, which is connected by beveled gearing to the vertical shaft K, which derives its motion from the driving-shaft D, as indicated. The said gearing is arranged and timed so that the revolving of the rollers or formers G and H shall correspond with the vertical reciprocating motion of the plunger A—that is to say, as the plunger A enters the space between the said rollers or formers their forming-surfaces shall be brought by their gearing into contact with the sides of the plunger A, the said forming-surfaces being accurately shaped so as to follow exactly the surfaces of the plunger A.

In the drawings I have shown the plunger A tapered as it is designed to form a tapered box. When the plunger is thus tapered, the rollers or formers G and H must have their forming-surfaces made eccentric, so as to correspond with the tapered form of the said plunger. If the sides of the box to be formed are to be parallel, the forming-surfaces of the rollers G and H must be made concentric. From this description it will be understood that if a blank L is placed below the plunger A upon the forming-surfaces of the rollers or formers G and H in the position indicated in Fig. 1 the downward movement of the plunger A and the revolving motion of the said rollers or formers G and H must form the said blank to correspond in shape with the plunger A, making it into the shape shown in Fig. 7. As the box thus shaped would not be complete, I arrange the stroke of the cross-head B so that it will carry its plunger A past the formers G and H and down past the finishing-rollers M and N the rollers M being flanged, as indicated, so as to turn over the wings *b*, and the two sets of

rollers M and N effectually complete the box into the form shown in Fig. 8. As will be seen on reference to Figs. 4 and 5, the rollers M and N are journaled in suitable bearing-boxes supported by the plates O. These plates are movably supported by the frame P, and are elastically held together by the springs Q.

As it is necessary in order to drop the finished box and permit the plunger A to return upwardly into its initial position, I connect each of the plates O by a rod R to a rock-shaft S, which rock-shaft is connected by a rod T to the driving-shaft D, on which a properly-formed cam U is fixed, the said cam being shaped so as to hold the plates O in proper position to permit the rollers M and N to accomplish their work, and the instant that such work has been accomplished to move the plates and carry the said rollers clear of the plunger A, permitting the box to fall off and the plunger to return upwardly to its initial position.

On the shafts of the rollers M and N are placed coiled springs *m*, the purpose of which is to retain said rollers in the proper position for their operation on the box-blank.

V designates what I term a "conveyer" or "feeder," and this conveyer is the same as is used in envelope-making machines, and derives its motion from the driving-shaft D through cam W, rod X, and rocking arm Y. The conveyer V may be used in connection with the machine, as shown in the drawings, to carry the blanks L into position below the plunger A, the movement of the said conveyer being regulated to correspond with the rest of the mechanism already described, or the blanks L may be placed by hand in position below the said plunger. If desired, the sides of the boxes formed by my machine may be printed either by ordinarily-inked letters or by embossing-letters. In either case the type or letters will be inserted in the forming-surfaces of the letters G or H, or both of them.

As shown in Figs. 4 and 5, the rollers N and M are mounted on separate shafts, and these shafts are connected by links *n*, against which bear the springs *m*, the purpose of which is to retain the rollers N and M in line with each other and then to revolve in the proper plane.

What I claim as my invention is—

1. In a box-making machine, the combination of the frame, a driving-shaft mounted therein, the plunger operated by the driving-shaft, the rollers having the forming-surfaces, and the sliding finishing-rollers.

2. In a box-making machine, the combination of a frame, a driving-shaft mounted therein having cams or projections, rods carrying a plunger and acted upon by said cams or projections, and the forming and finishing rollers.

3. In a box-forming machine, the plunger and forming-rollers deriving motion substantially as described, in combination with the finishing-rollers, the movable plates supporting the rollers, the rods R and T, rock-shaft S, and cams U on the driving-shaft.

4. In a box-making machine, the combination of the plunger, the forming-rollers, the finishing-rollers, the plates carrying the said rollers and connected together, and the frame in which said plates move, substantially as described.

5. In a box-making machine, the combination of the driving-shaft carrying the cams, the rods carrying the plunger and operated upon by said cams, the forming-rollers geared together, and the gearing for operating said rollers, the finishing-rollers, and the sliding plates carrying said rollers.

6. In a box-making machine, the combination of the frame, the driving-shaft having the cams, the rods having the slots to receive the driving-shaft and operated by the cams, the anti-friction rollers on said rods against which the cams ride, the springs on the rods, the plunger carried by the rods, the forming-rollers, the sliding finishing-rollers, the cam on the driving-shaft, the arm operated upon by said cam, the shaft on which the arm is mounted, and the conveyer connected to and operated by said shaft.

Toronto, July 26, 1889.

JAMES W. HUTT.

In presence of—

CHARLES C. BALDWIN,
F. R. CAMERON.