

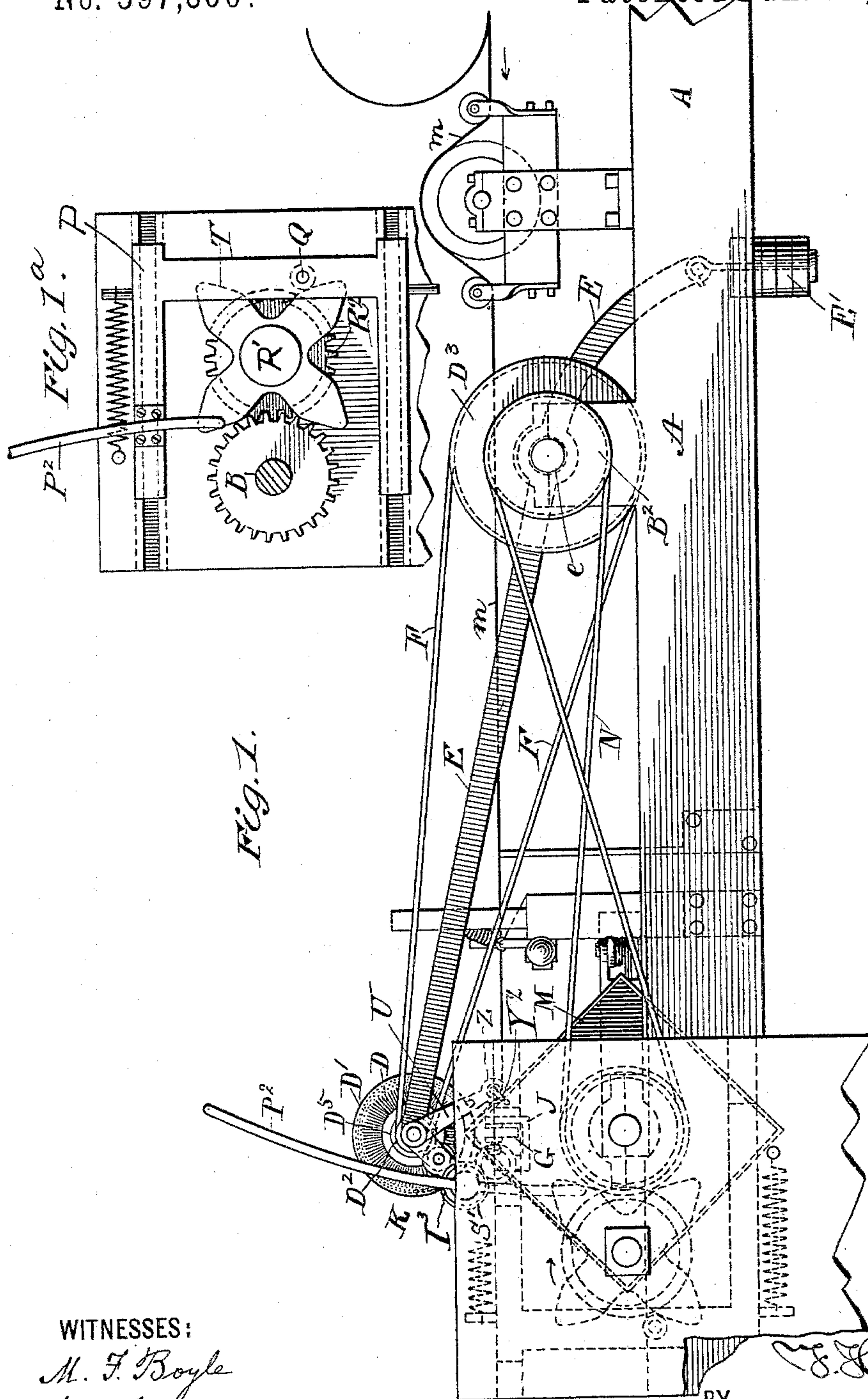
(No Model.)

4 Sheets—Sheet 1.

F. H. LAUTEN.
BOX COVERING MACHINE.

No. 597,360.

Patented Jan. 11, 1898.



WITNESSES:

M. F. Boyle

J. B. Clautice

INVENTOR

F. H. Lauten

BY

James D. Stetson

ATTORNEY

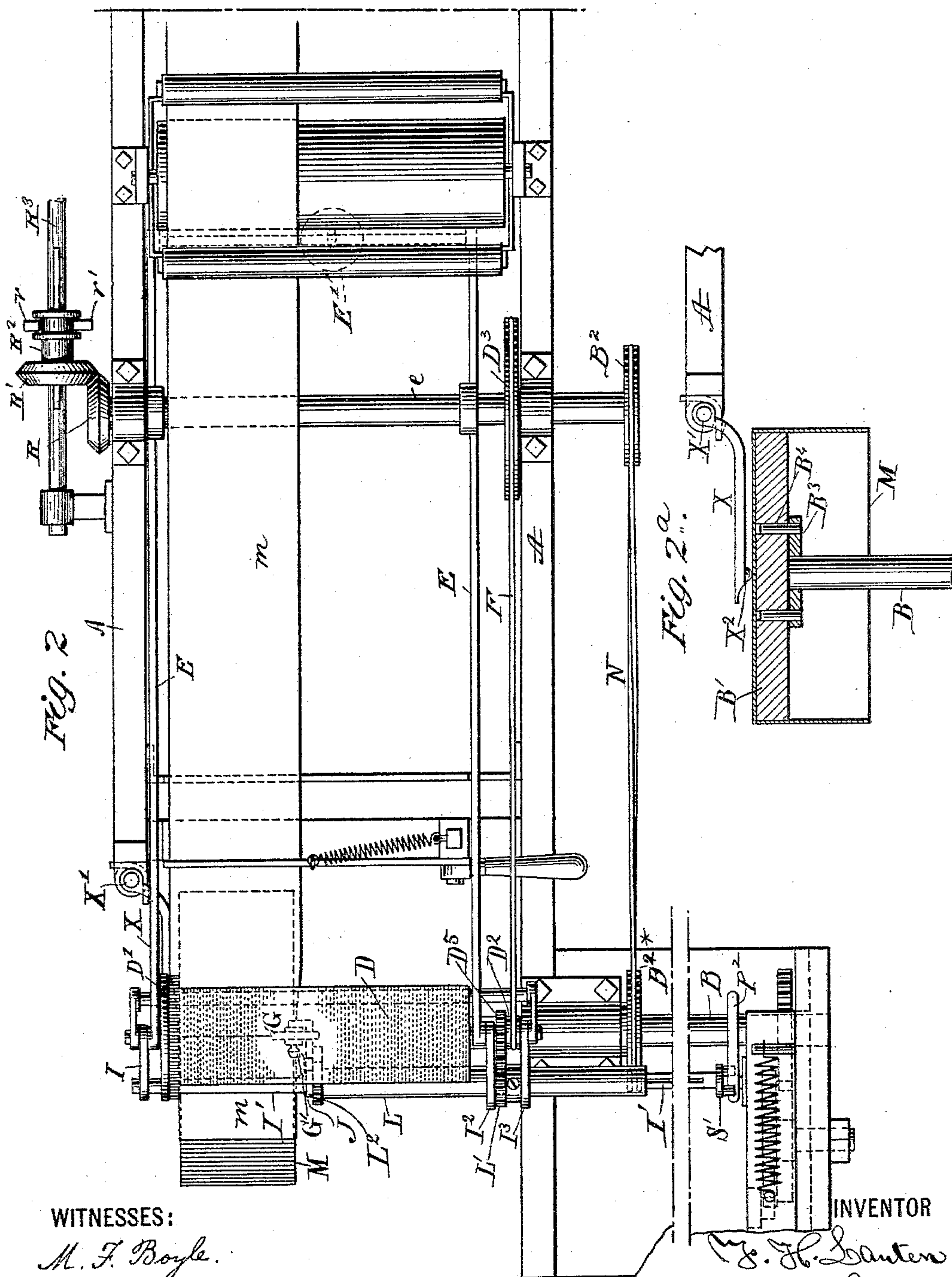
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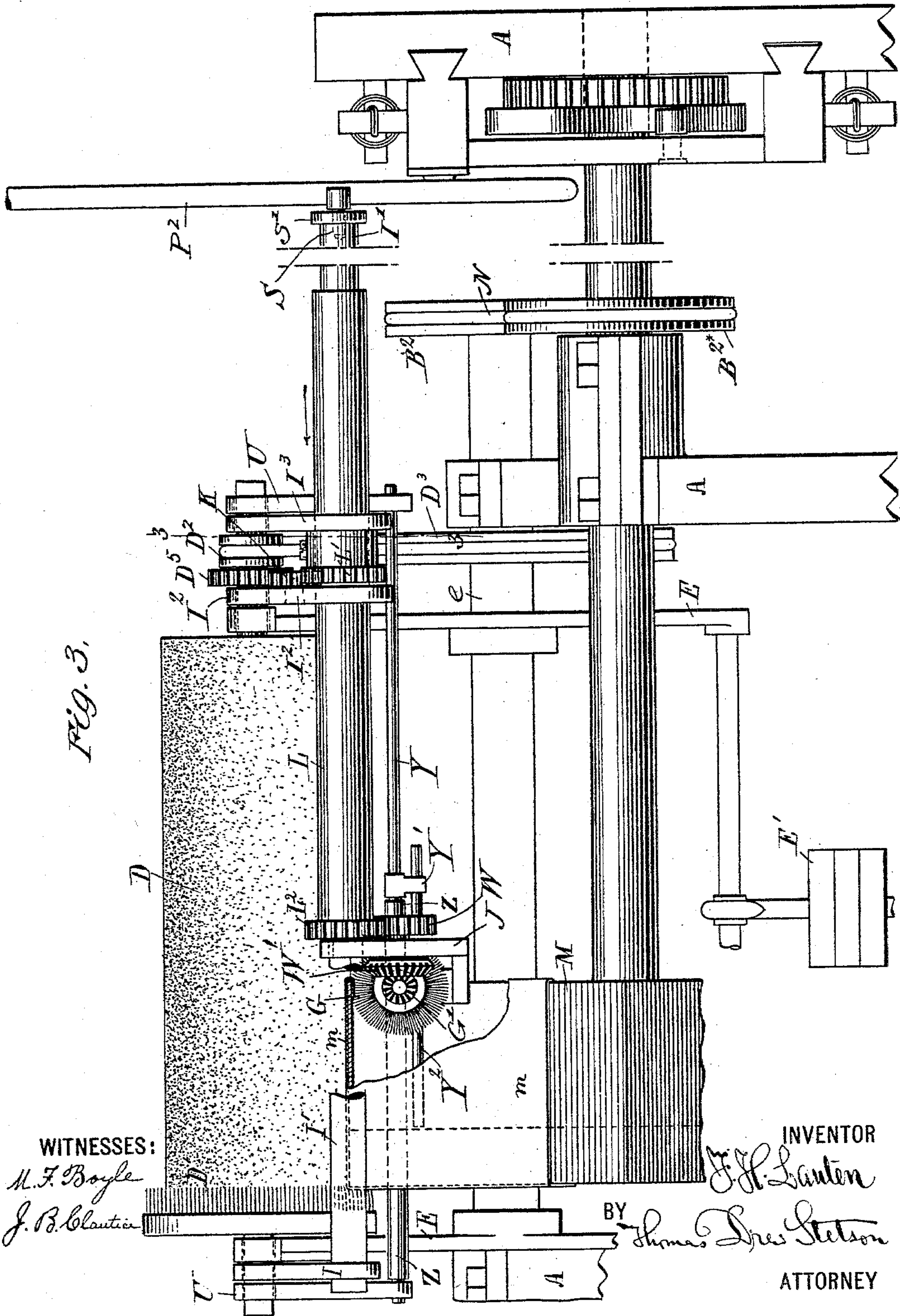
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4 Sheets—Sheet 3.

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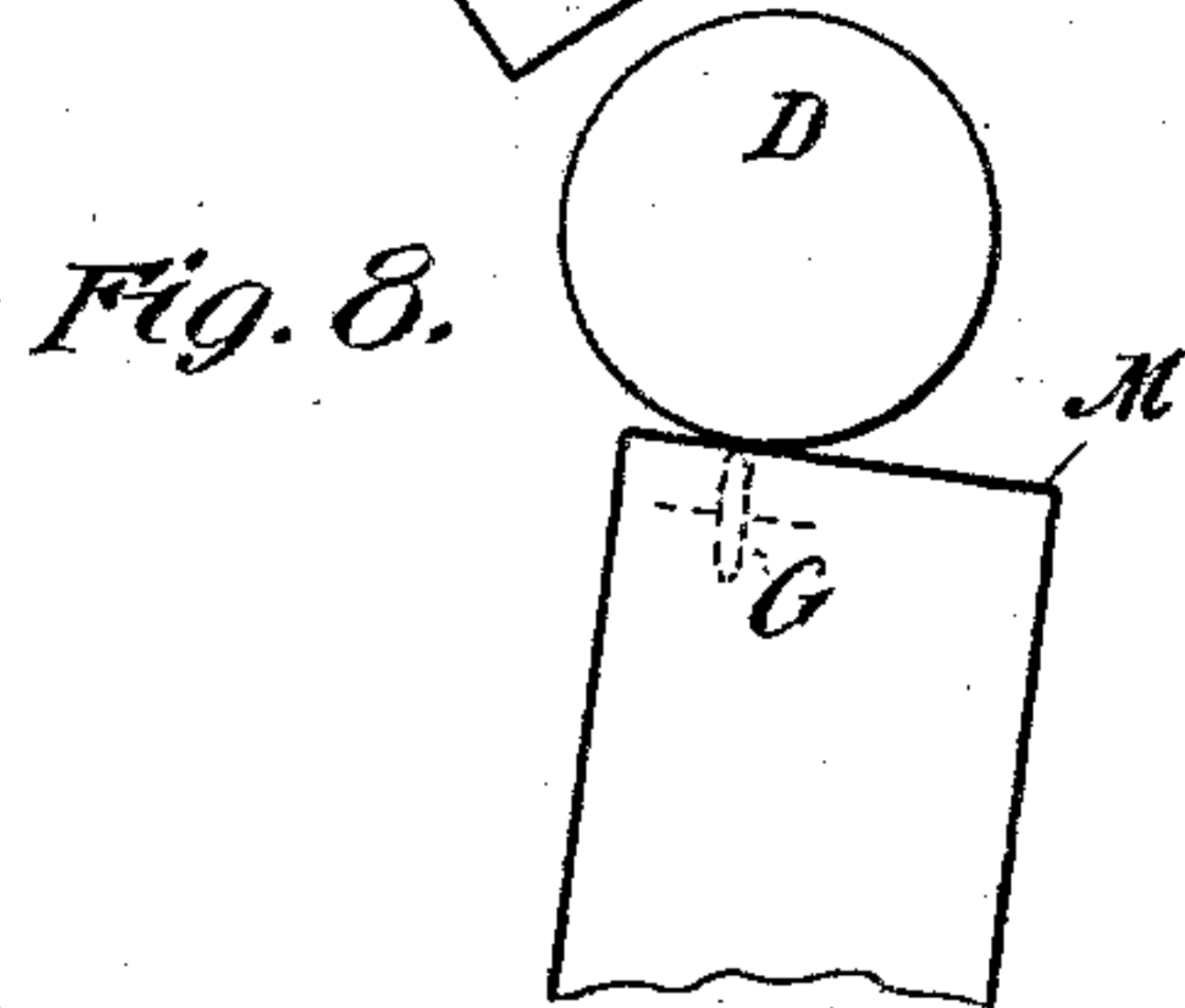
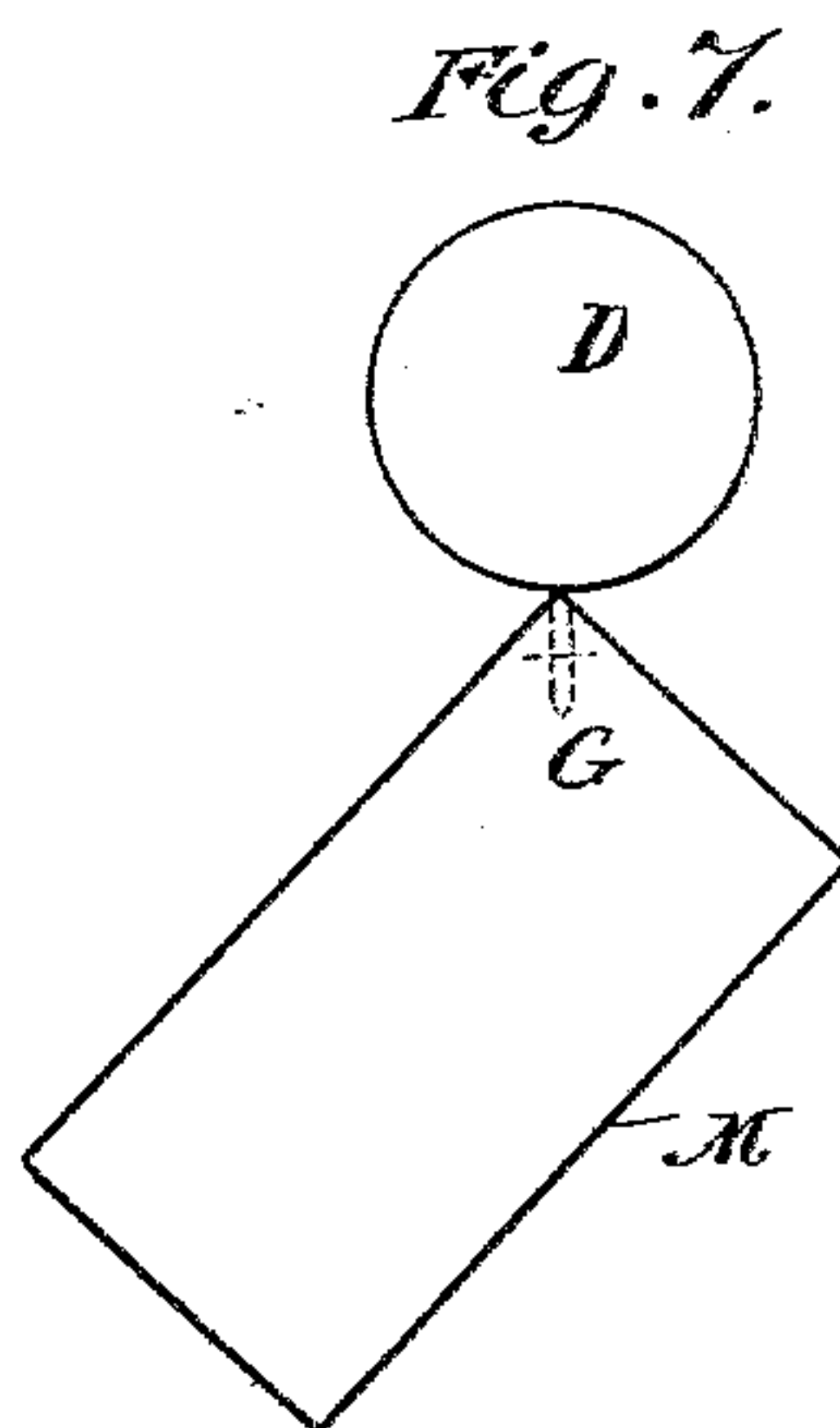
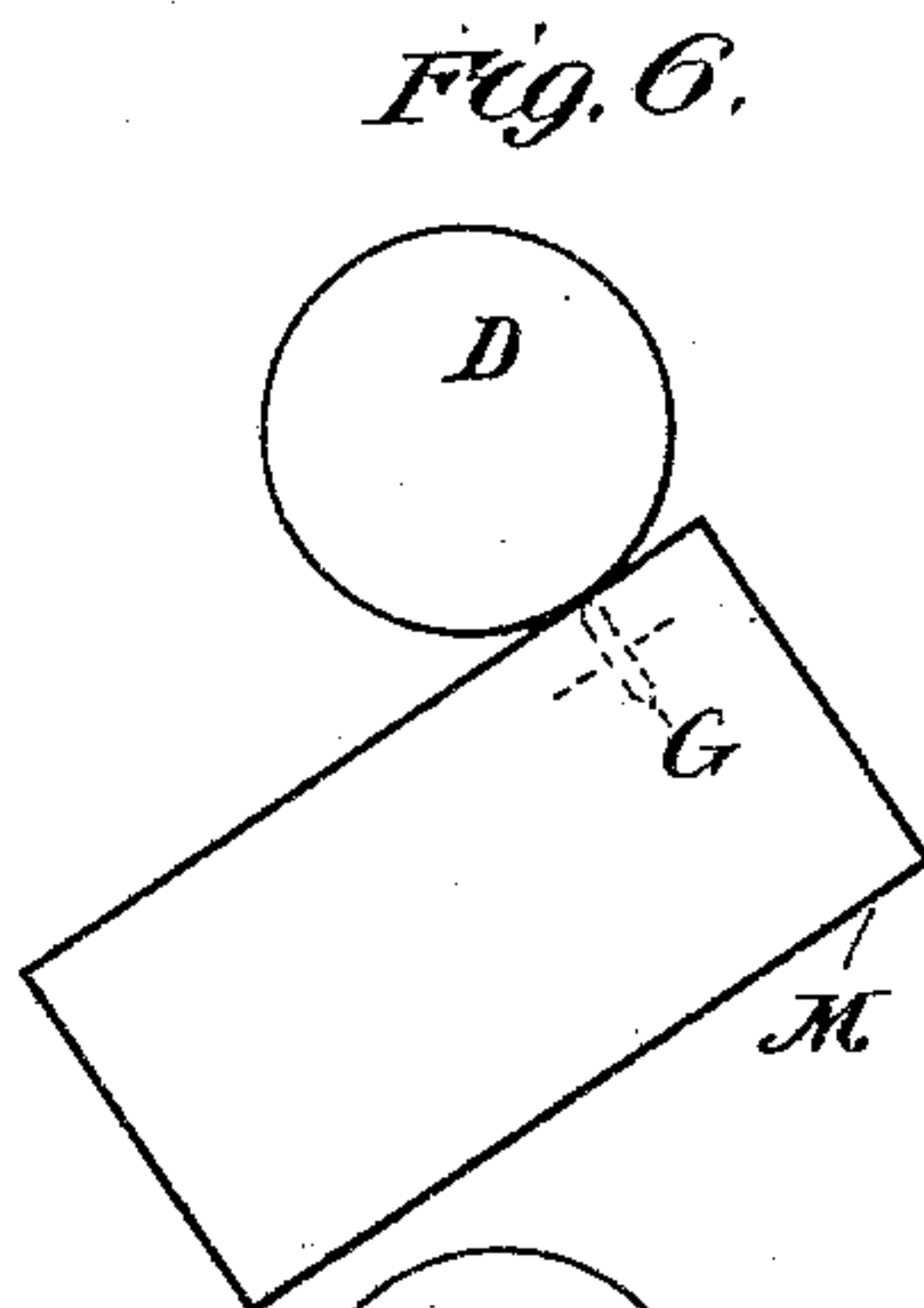
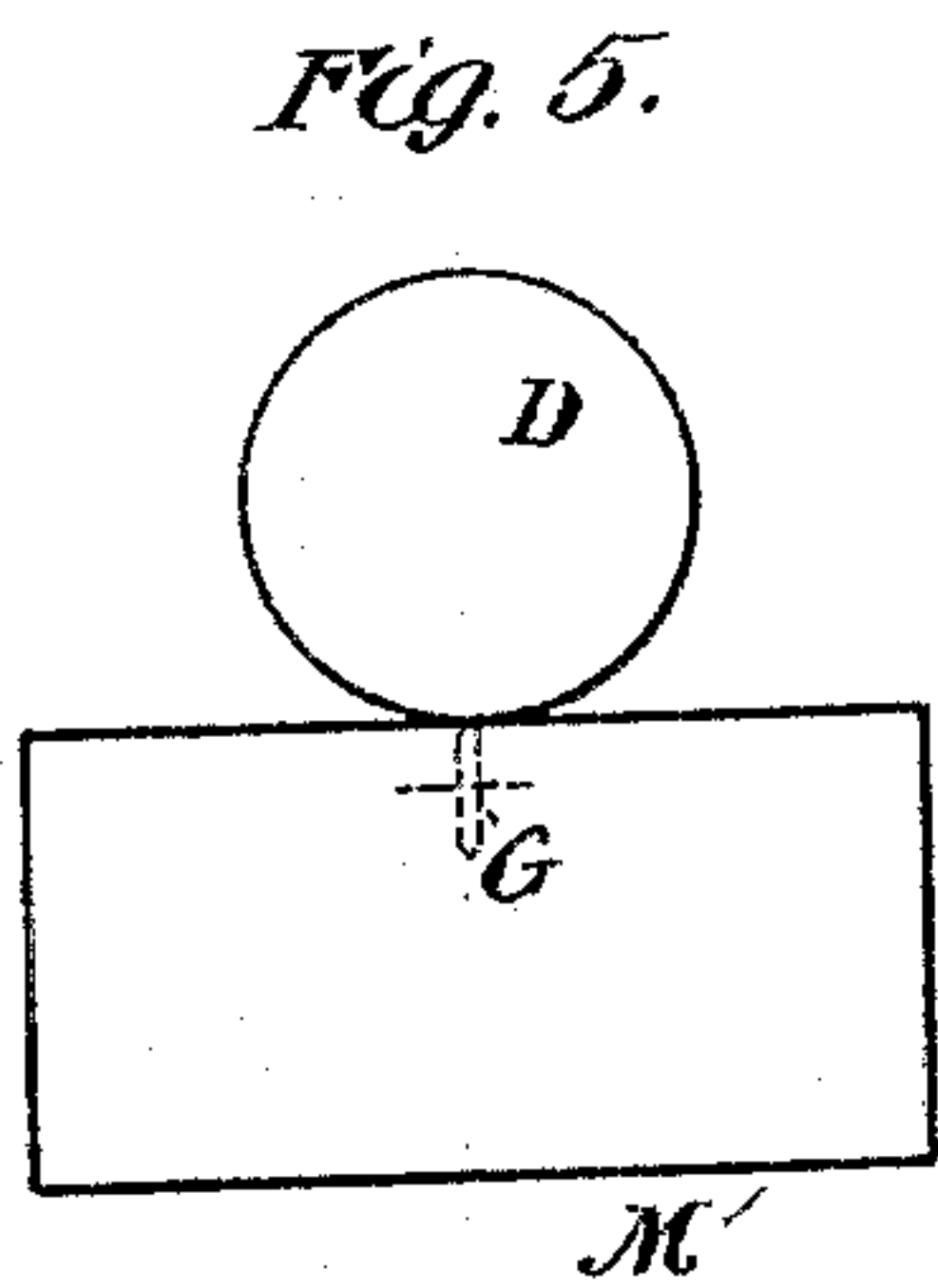
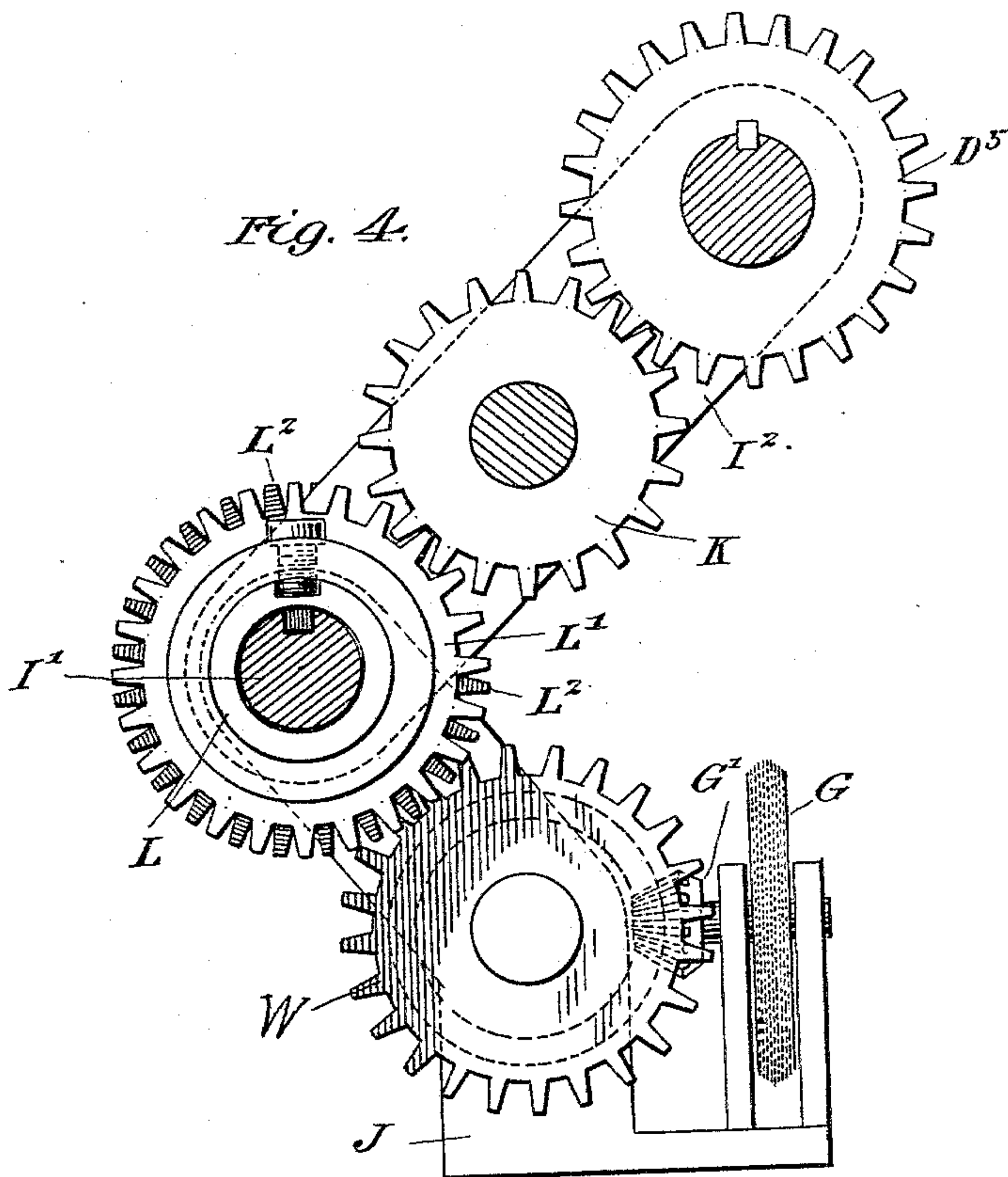
(No Model.)

4 Sheets—Sheet 4.

F. H. LAUTEN.
BOX COVERING MACHINE.

No. 597,360.

Patented Jan. 11, 1898.



WITNESSES:

Frank S. Ober
M. F. Boyle

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UNITED STATES PATENT OFFICE.

FRANK H. LAUTEN, OF NEW YORK, N. Y.

BOX-COVERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 597,360, dated January 11, 1898.

Application filed November 6, 1896. Serial No. 611,229. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. LAUTEN, a citizen of the United States, residing in the city and county of New York, in the State of New York, have invented a certain new and useful Improvement in Box-Covering Machines, of which the following is a specification.

The improvement applies to machines for making all that class of boxes and box-covers of rectangular form made of pasteboard or analogous material. It relates to the application of the covering-paper and more particularly to the folding of the edge of such covering-paper over the upper edge of the box and down a little on its inner face. It will be understood that the covering-paper, as usual, has a width somewhat greater than the depth of the box and that after having its inner face covered with glue or paste in the proper condition to make it both adhesive and flexible is applied on the box in the usual position with both edges overhanging—that is to say, with one edge extending beyond the bottom to be folded inward upon the outside of the bottom and the other edge extending above the top to be folded over and downward on the inner face to give a finish to the upper edge of the box. Machines have been proposed to attain these ends, but the objections have been such that it has been considered generally preferable to effect the last-named folding operation by hand. My invention avoids the difficulties.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation of a portion of a box-covering machine having my invention applied and in use. Fig. 1^a is a corresponding elevation of a small portion as seen from the opposite side. Fig. 2 is a plan view showing the same parts, but with a portion broken out to allow the drawing on a large scale to be shown within the proper limits. Fig. 2^a is a horizontal section of a portion through the box and the immediately-adjacent parts. Fig. 3 is an end elevation showing these parts on a larger scale, the same means being em-

ployed by breaking out a portion to allow a large scale to be used within the required limits of size. Fig. 4 is a sectional view taken in the plane indicated by the dotted lines 3 3 in Fig. 3 and looking in the direction of the arrow. Figs. 5 to 8, inclusive, are diagrams illustrating the several positions of the brushes with relation to the box during the application of the covering-strip.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

I will describe the invention as applied to the ordinary style of paper-box-covering machines, of which a good example is that set forth in the patent to Isaac G. Raffel, dated January 17, 1893, No. 490,124, the properly-formed bodies of the box being applied successively on a suitable former and a strip of paper adapted to cover all the four sides being fed forward over a pasting-roller and wound around upon the exterior. The strip must have a width in excess of the depth of the box and is guided so that the edges shall extend both above and below the pasteboard sides. The operation of cutting off each length and applying it in this manner, so as to be extended around upon the rectangular exterior of a box to form a little more than one complete circuit, is effected in the ordinary manner. My invention operates to press the strip of paper gently and uniformly upon the box and folds both the edges, pressing them snugly and firmly into their proper positions.

A is the fixed framing, of cast-iron or other suitable material.

B' is a former carrying a box M and turning with a shaft B. There is a roller or other guide Z, under which is received the strip of paper *m*, which is applied upon the box and drawn with the ordinary tightness around upon its exterior with the edges overhanging.

E E are levers connected to form a frame capable of rising and sinking by turning on a fixed axis *e* and partially counterbalanced by an adjustable weight E', exerting a lifting force on the frame E and its entire connections, which should be adjusted by changing the weights so that they will nearly bal-

ance. The frame E affords bearings for a revolving brush D D', the part D' of which is of larger diameter than the part D. In the part D' the bristles are arranged to stand parallel to the axis. This portion thus equipped may be termed a "crown-brush" or simply a "crown."

The entire main brush D D' receives a rapid rotatory motion through a pulley D² by means of a belt F, running over a driving-pulley D³, which revolves on an axis coinciding with the axis e, so that as the frame E rises and sinks to accommodate the corners and the differences between the length and breadth of a long box the driving-belt F will be always kept equally tight. The brush D D' performs by its main body D the function of smoothing the dampened paper strip *m* and pressing it into the desired intimate contact with the body of the box, and by its crown portion D' performs the further function of folding inward the edge which is to constitute the lower edge and pressing it smoothly into contact with the adjacent portion of the bottom of the box. The folding and pressing smoothly thus effected by the crown-brush D' is simple and will require no further elucidation. The body D of the brush also, by the action of the bristles upon the other edge of the flexible paper—i. e., that which extends beyond what is to be the upper edge of the box—partially folds such edge of the paper inward, leaving it in a position to be easily seized by a small brush G, which I will call the "inside" brush, having peculiar motions. This is revolved in bearings which are carried upward and downward with the main brush, so as to maintain the required close relation thereto in all positions. I provide means for changing it forward and backward under the main brush, holding it outward in all positions against the interior of the box. As the former B' and the box M held thereon are turned at the proper moderate speed the strip of paper *m* is applied thereon by the attendant and cut off in proper lengths by a shearing cut in the ordinary manner. The revolutions of the box are effected by a crossed belt N on the pulleys B² B^{2*}, but if necessary that belt may be removed and the box may be revolved at any required variable rate controlled by the attendant.

In order to work effectively in the corners of the box as they are successively presented, it is necessary that the inside brush be narrow, and for treating shallow boxes and shallow covers it is important that it be of small diameter. I provide means for automatically effecting the required swinging to a variable extent forward and backward as the box is turned to present corners and sides in different positions.

When a mid-length of a side or end of the box is being treated, the inside brush G is working directly below the brush D, as shown in Fig. 5; but as the box is turned and the

treatment progresses the side is presented in an inclined position, Fig. 6, and the line of contact with the main brush D D' is rearward of that central position (to the right in Fig. 1) and the inside brush G must be correspondingly shifted rearward. Later, as the next corner is presented, the line of contact of the box with the main brush D D' is again central, (see Fig. 7,) and as soon as the corner has passed the line of contact is correspondingly shifted forward and a little later again backward, and the inside brush G is correspondingly moved forward and backward, (the latter position being indicated in Fig. 8,) so as to be always acting on the interior of the box substantially coincident with that line of contact. I will now describe in detail the means by which these changes of position of the axis of the brush G are effected, and also by which continuous rotation is imparted to it in all positions.

A framing free to turn loosely on the shaft of the brush D is composed of a movable arm or link I, which engages loosely with the shaft and is rigidly connected to one end of a cross-bar I', the other end of which is indirectly supported by links I² I³ through the mechanism of a sleeve L. On the cross-bar is feathered an arm J, extending rearward under the main brush D D' and serving to support the inside brush G, while the turning of the frame I I' relatively to the frame E allows it to be changed forward and backward within wide limits. The sleeve L receives continuous rotatory motion through a gear-wheel L', feathered thereon and meshing with an intermediate gear-wheel K, engaging with a gear-wheel D⁵ on the shaft of the main brush D D'. A gear-wheel L², mounted on the sleeve, transmits the motion so acquired to a wheel W, which in turn communicates it via bevel-gears W' G' to a short shaft supported in bearings in the arm J and carrying the brush G. The feathering of the parts allows the sleeve L to be shifted endwise to accommodate various depths of boxes to be covered. The required continuous and rapid revolutions are thus communicated through the sleeve L and the gear-wheels D⁵, K, L', L², W, W', and G' to the inside brush G, while the latter is at liberty to swing forward and backward, being always kept in close relation to the main brush D D' and therefore in the proper contact with the interior of the box.

P is a carriage adapted to slide forward and backward to a small extent in horizontal ways on the fixed framing. On a pin set in such carriage a roller Q is mounted, said roller being in contact with a cam T for imparting motion to the frame, said cam being carried on a rotating shaft R', which receives through a gear-wheel R² a continuous rotatory motion corresponding with the revolution of the box. The carriage P, thrust forward by the action of the cam, is returned by the action of long gentle spiral springs, Figs. 1 and 1^a.

P^2 is an arm rigidly attached extending upward from the carriage P, curved, as shown, and partaking of the forward-and-backward motion of such carriage. A swiveling device in the form of a strong screw S, loosely fitting on the end of the cross-bar I' , takes hold by its forked head S' of this curved arm P^2 , and as the carriage P moves forward and backward the frame I is correspondingly rocked, and consequently the inside brush G is moved forward and backward and slightly rocked to the proper extent the proper number of times. This favorably presents the brushes to the several sides and corners of the box. Otherwise the inside brush would be particularly difficult to accommodate. The pasteboard boxes to be covered being successively applied on the "former" from the left side in Fig. 3 and rotated at the required rate are successively removed by a return movement to the left in the completely-finished condition, requiring no further treatment by hand or by any other machinery. The frame E and its attachments may be readily raised to any height required to allow the removal of the finished box and the introduction of another for each operation.

The delivery end of the box-covering machine must be wider than shown. It should be of such width that the cross-bar I and shaft B are nearly twice as long as shown. This allows a sufficient range of adjustment of the sleeve L on the cross-bar I' . It will be understood that the purpose of feathering the arm J on the cross-bar I' is to allow it and its connected parts to be adjusted from one side to the other to allow of treating boxes of different depths—that is to say, the bottom of the box is always pressed into contact with the crown-brush D' —but the other edge and the adjacent parts which fold the paper over it must be at variable distances therefrom in treating boxes of different depths.

To facilitate the exchange of formers for different sizes and shapes of boxes, I provide the shaft B, on which the former is mounted, with a widened head or end B^3 (see Fig. 2^a) and set in this head pins $B^4 B^4$. The former B' has corresponding holes which receive these pins. The former may be made of wood of proper thickness. For small and shallow boxes it should be thin.

X is a clamp capable of turning on a center X' on the framing. It has a smoothly-fitting surface X^2 , adapted to press on the center of the box-bottom and hold it with sufficient firmness on the former. To remove a box, this clamp is turned outward. When a new box has been applied on the former, the clamp is restored to its place.

I have shown the ordinary cutter and actuating-spring for clipping off the paper at the proper time. These parts may be varied. The requisite motion may be imparted to the axis or shaft e through the medium of bevel friction gear-wheels R R' , the latter being

carried by a grooved sleeve R^2 , feathered on a drive-shaft R^3 to revolve therewith, but capable of longitudinal movement thereon. The fork members $r r'$ of a lever (the other parts of which are not shown) controlled by the foot of the attendant enables the wheel R' to be moved into and out of contact with the wheel R to start or stop the actuation of the machine.

It is important to bring the strip of paper m into contact with the exterior of the box before it is subjected to the action of the brushes D, D' , and G. I attain this by means of a long sleeve Z of small diameter, which I will term a "roller," mounted loosely, so that it can roll on a cross-bar Y, which is supported in links U U of proper length, turning freely on the extended shaft of the brush D D' . This roller rises and sinks with such brush as the box is revolved and the corners and sides are successively presented. The gravity of the parts, aided, if required, by a gentle spring, (not shown,) holds it down, and the strip m being passed under it is thereby stuck lightly upon the box ready to be fully and firmly pressed thereon by the brushing which follows.

It will be observed that my former is of a thickness much less than the depth of the box. I support the interior of the box by means of a loosely-held inside bar Y^2 , extending from the upper edge nearly to the former. (See Figs. 1 and 3.) It is mounted in an arm Y' , which is fixed firmly on the slightly-rocking rod Y and extends parallel to the latter at the proper distance therefrom. The rod Y by turning freely in its supporting-links U U allows the arm Y' , with the inside bar, to turn to accommodate itself to the varying positions in which the box is presented as it turns. The inside bar Y^2 , with the inside brush G pressing outward on the inner face of the box at the points where such support is mainly needed, allows all other internal support, except the shallow former B' , to be dispensed with.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention. I can employ an additional brush to effect the more perfect compression of the lower edges of the paper m upon the bottom of the box; but my experiments do not indicate that such is necessary or desirable, the crown or face brush D' effecting the end with great perfection.

The cam T may be readily changed, so as to vary the action, if required. In adjusting the machine to treat boxes of different depths the part of the box which is to be the bottom will always come in a fixed position near the left side of the machine, where it can be acted on by the bristles of the crown-brush D' . The other edge of the box—that which is to be the upper edge—will come at various positions on the length of the main brush D,

according to the depth of the box. Not only is the transverse bar I' grooved longitudinally, as above described, and the arm J secured thereon by a key in the obvious manner, but the sleeve L is also splined longitudinally and the gear-wheel L' is fitted thereon by the aid of a key or feather, (not shown,) so that the gearing D⁵, K, L', and L² may be shifted longitudinally, according to the depth of the box to be treated. These changes should be made in harmony, and will adapt the machine to treat boxes of any depth less than the full length of the brush D.

Parts of the invention may be used without the whole. I can use the brush D and its face-brush D' to effect their respective parts of the work without the inside brush G or any of the driving mechanism therefor.

Instead of revolving the box-former B' at the required rate by a belt on the pulley B², as indicated, I can remove the belt and effect the revolution by hand. In such case, in making boxes of any peculiar proportion, the attendant can revolve the box-former irregularly, so as to favor the action and present the box always correctly.

I claim as my invention—

1. In a machine for covering paper boxes, the brush-rim or crown-brush D' in combination with the cylindrical brush D arranged to operate relatively to a former B', all substantially as herein specified.

2. In a machine for covering paper boxes, the brush-rim or crown-brush D', in combination with the cylindrical brush D, and with a frame E, partially counterbalancing weight E', and the driving-pulleys D² and D³ and belt F, all arranged to serve relatively to each other and to a former B', substantially as and for the purposes herein specified.

3. In a machine for covering paper boxes, the brush-rim or crown-brush D' and the cylindrical brush D, arranged to operate relatively to a former B', in combination with the revoluble inside brush G, for pressing the paper into contact with the inner face of the box, substantially as herein specified.

4. In a machine for covering paper boxes, the combination with provisions as the former B' for holding and slowly revolving the box-body, and provisions as the brush D D' for pressing a sufficiently broad paper strip into intimate contact with the exterior and deflecting the edges inward, and an inside brush G arranged to act on one edge of the covering-paper so as to unite it smoothly with the inner face of the box, a framing I supporting such inside brush and adapted to turn on an axis coincident with the center of the main brush D D' and a train of gears D⁵, K, W, W', G', for rotating the inside brush G in all positions, substantially as herein specified.

5. In a machine for covering paper boxes, the combination with provisions as the former B' for holding and slowly revolving the box-body, of provisions as the brush D D', for

pressing a sufficiently broad paper strip into intimate contact with the exterior and deflecting the edges inward, and an inside brush G arranged to act on one edge of the covering-paper and unite it smoothly with the inner face of the box, a framing I supporting such inside brush and free to turn on an axis coincident with the center of the main brush D, and a train of gears D⁵, K, W, W', G', for rotating the inside brush in all positions, and means as the reciprocating carriage P with its curved upper arm P', and swiveling piece S, S', engaged with said frame I, arranged to move the inside brush G forward and backward, and to impart continuous rotation to it in all positions, all adapted for joint operation substantially as herein specified.

6. In a machine for covering paper boxes, the main brush D D', and rising-and-sinking frame E with provisions for partially counterbalancing, and provisions for holding the box to be covered and slowly revolving it as required, and provisions for supplying a strip of glued paper to be fixed thereon, in combination with the link I and cross-bar I' turning on an axis coincident with the axis of the main brush D D', and with the arm J fixed on said cross-bar, and the inside brush G carried on such arm, so that the brush may swing forward and backward to maintain its close relation to the main brush D, all adapted for joint operation substantially as herein specified.

7. In a machine for covering paper boxes, the main brush D D', a rising-and-sinking frame E with provisions for partially counterbalancing, and provisions for holding the box to be covered and slowly revolving it as required and provisions for supplying a strip of glued paper to be fixed thereon, in combination with the link I and cross-bar I' turning on an axis coincident with the axis of the main brush, and with the arm J fixed on said cross-bar, and the inside brush G carried on such arm, so that said brush may swing forward and backward to maintain its close relation to the main brush, and with the gearing D⁵, K, W, W' and G', adapted to communicate the required rapid rotary motion from the main brush D D' to the brush G in all positions of the latter, substantially as herein specified.

8. In a machine for covering paper boxes, the main brush D D', and rising-and-sinking frame E, with provisions for partially counterbalancing and provisions for holding the box to be covered and slowly revolving it as required, and provisions for supplying a strip of glued paper to be fixed thereon, in combination with an inside brush and means for operating it, and with provisions as the splined cross-bar I' and the splined sleeve L for adjusting the position of the inside brush and its connected parts to allow for different depths of box, all substantially as herein specified.

9. In a machine for covering paper boxes,

the main brush D D', and rising-and-sinking frame E with provisions for partially counterbalancing, and provisions for holding the box to be covered and slowly revolving it as required, and provisions for supplying a strip of glued paper to be fixed thereon, in combination with the link I, cross-bar I' turning on an axis coincident with the axis of the main brush, and with the arm J fixed on said cross-bar and the inside brush G carried on such arm, so that said brush may swing forward and backward to maintain its close relation to the main brush, and with the gearing D⁵, K, W, W' and G', adapted to communicate the required rapid rotary motion from the main brush D D' to the brush G in all positions of the latter, and with the reciprocating carriage P and the arm P² extending upward therefrom and partaking of the reciprocating motion thereof, adapted to serve relatively to the said inside brush, substantially as herein specified.

10. In a machine for covering paper boxes, the main brush D D', and rising-and-sinking frame E with provisions for partially counterbalancing, and provisions for holding the box to be covered and slowly revolving it as required, and provisions for supplying a strip of glued paper to be fixed thereon, in combination with the link I, cross-bar I', turning on an axis coinciding with the axis of the main brush D D', and with the arm J fixed on said cross-bar, and the inside brush G carried on such arm, so that said brush may swing forward and backward to maintain its close relation to the main brush D, and with the gearing D⁵, K, W, W' and G', adapted to communicate the required rapid rotary motion from the main brush D D' to the brush G in all positions of the latter, and with the reciprocating carriage P and the arm P² extending upward therefrom and partaking of the reciprocating motion thereof adapted to serve with the forked headed screw S S or equivalent swiveling piece mounted of the parts connected with the inside brush and engaged with said arm, all arranged for joint operation substantially as specified.

11. In a machine for covering paper boxes, the main brush D D' and rising-and-sinking frame E with provisions for partially counterbalancing, and provisions for holding the box to be covered and slowly revolving the latter as required, and provisions for supplying a strip of glued paper to be fixed thereon, in combination with the link I and cross-bar I' turning on an axis coincident with the axis of the main brush D D', and with the arm J fixed on said cross-bar, and the inside brush G carried on such arm, and with a cam T receiving motion from the former and connected to the carriage so as to give a predetermined traverse backward and forward to the said inside brush, all arranged for joint operation substantially as herein specified.

12. In a machine for covering paper boxes,

the main brush D D', and rising-and-sinking frame E with provisions for partially counterbalancing, and provisions for holding the box to be covered and slowly revolving it as required, and provisions for supplying a strip of glued paper to be fixed thereon, in combination with the link I and cross-bar I' turning on an axis coincident with the axis of the frame E of the main brush D D', and with the arm J fixed on the said cross-bar and the inside brush G carried on such arm and with the cam T receiving motion from the former and connected to the carriage so as to give a predetermined traverse backward and forward to the said inside brush, and with the clutch R adapted to disconnect a portion of the mechanism at will, all substantially as herein specified.

13. In a machine for covering paper boxes, the main brush D D', and rising-and-sinking frame E, with provisions for partially counterbalancing, and provisions for holding the box to be treated and slowly revolving it as required, and provisions for supplying a strip of glued paper to be fixed thereon, in combination with the removable clamp X adapted to hold the box on the former, all arranged for joint operation substantially as herein specified.

14. In a machine for covering paper boxes, the main brush D D', and rising-and-sinking frame E, with provisions for partially counterbalancing, and provisions for holding the box to be covered and slowly revolving it as required, and provisions for supplying a strip of glued paper to be fixed thereon, in combination with the removable clamp X adapted to hold the box on the former, and with the removable former B' and the pins B⁴ on the shaft B engaged therewith adapted to allow of ready change of the former, substantially as herein specified.

15. In a machine for covering paper boxes, the main brush D D' and rising-and-sinking frame E with provisions for partially counterbalancing, and provisions for holding the box to be covered and slowly revolving it as required, and provisions for supplying a strip of glued paper to be fixed thereon, in combination with the link I, cross-bar I' turning on an axis coincident with the axis of the main brush, and with the arm J fixed on the said cross-bar, and the inside brush G carried on such arm, arranged as shown, so that the brush may swing forward and backward maintaining its close relation to the main brush, and with the gearing D⁵, K, W, W', and G', adapted to communicate the required rapid rotary motion from the main brush D D' to the brush G in all positions of the latter, and with the reciprocating carriage P, and the arm P² extending upward therefrom and partaking of the reciprocating motion thereof, adapted to serve relatively to the said inside brush, and with the fork-headed screw S S or equivalent swiveling piece mounted on the

parts connected with the inside brush and engaged with the said arm and with the inside bar Y adapted to serve as an inside support for the box, with provisions for changing its position so that it shall be always near the line where the brushes D D' and G act, all adapted for joint operation substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

FRANK H. LAUTEN.

Witnesses:

J. B. CLAUTICE,
M. F. BOYLE.