

H. A. CARRINGTON & B. LAVERY.
Brush-Making Machines.

No. 156,534.

Patented Nov. 3, 1874.

Fig. 1

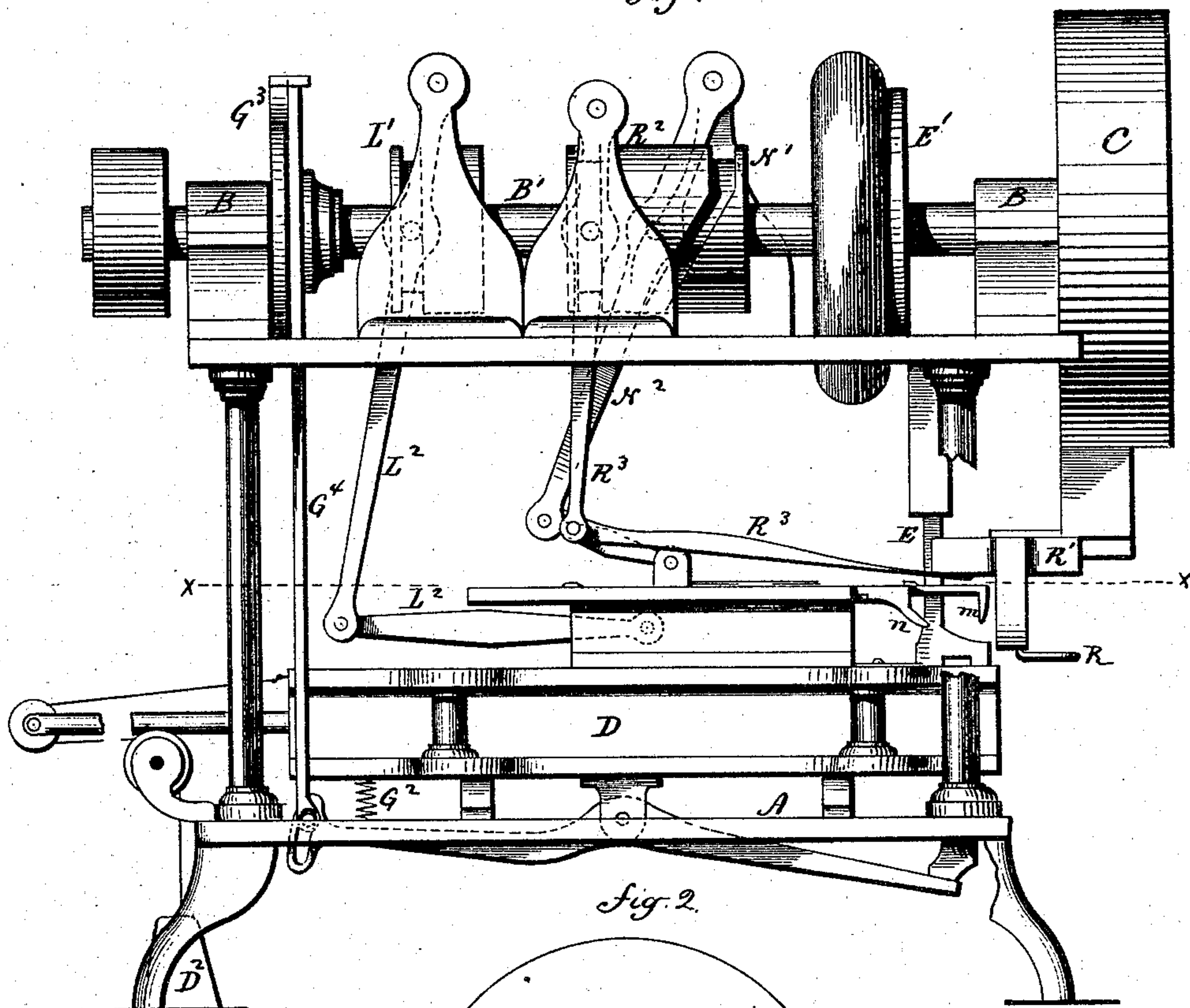
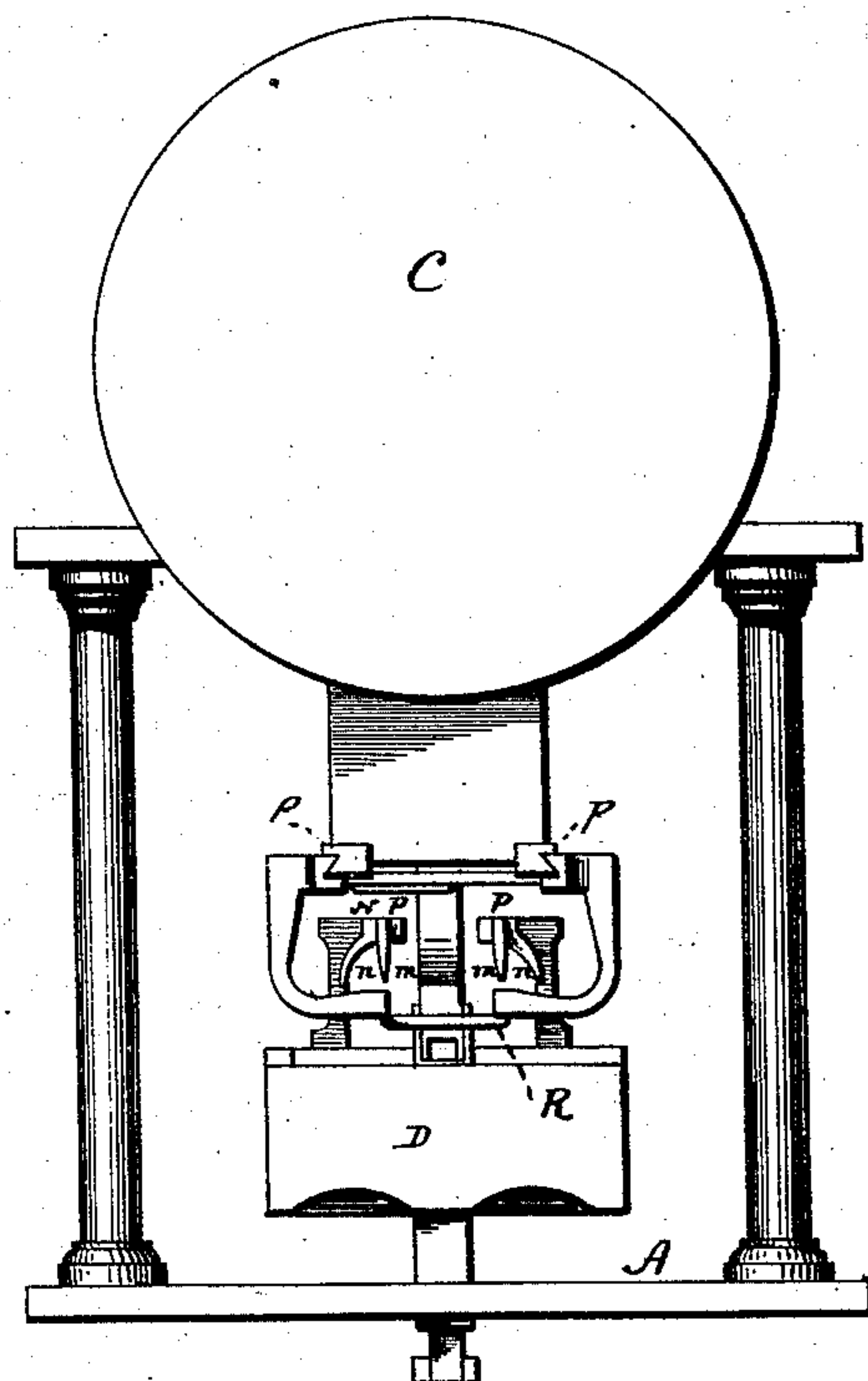


Fig. 2



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fig 3

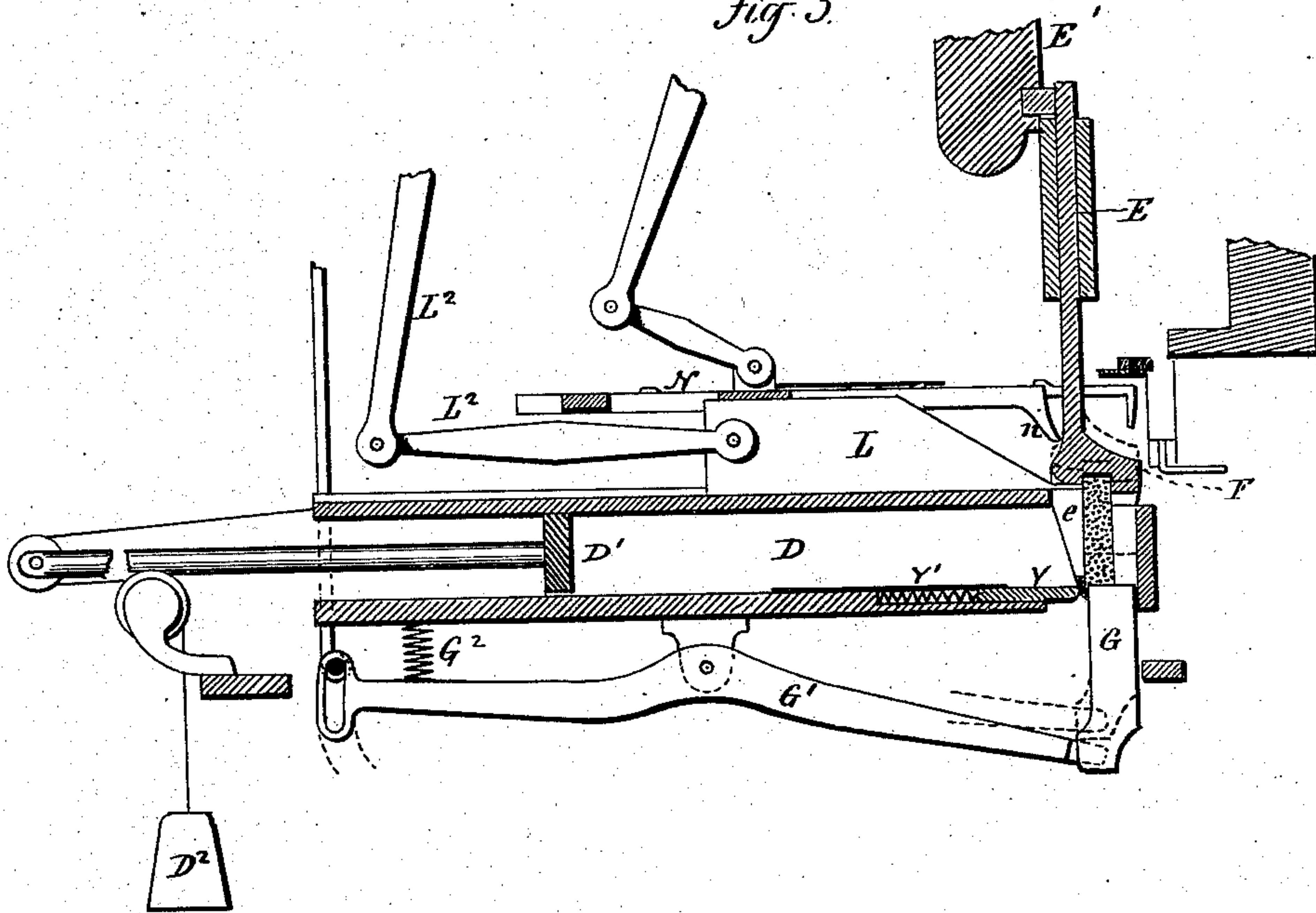


fig 4

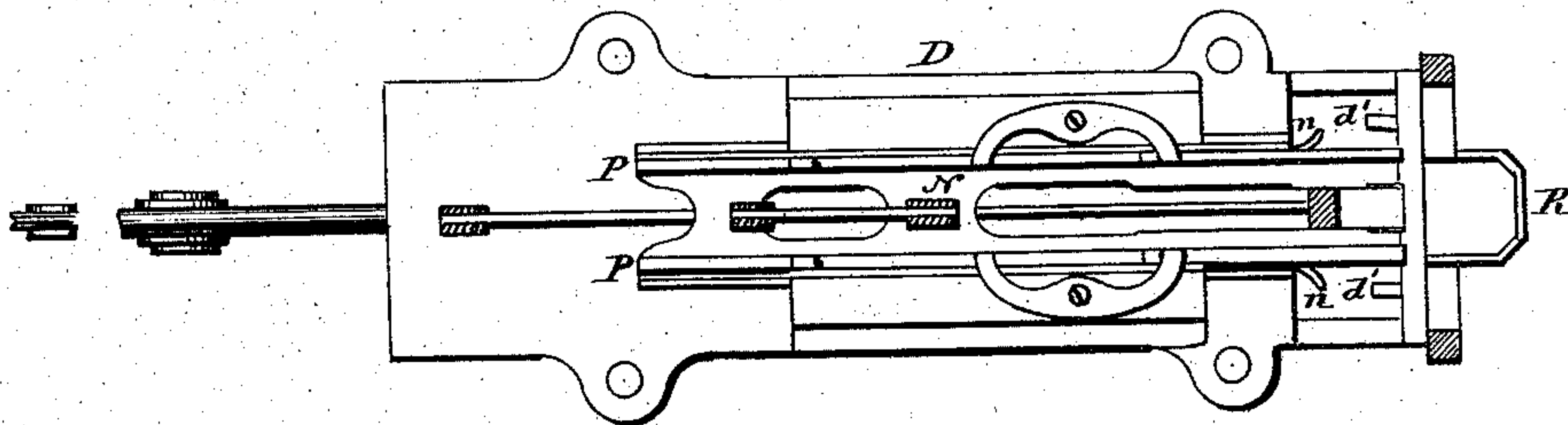
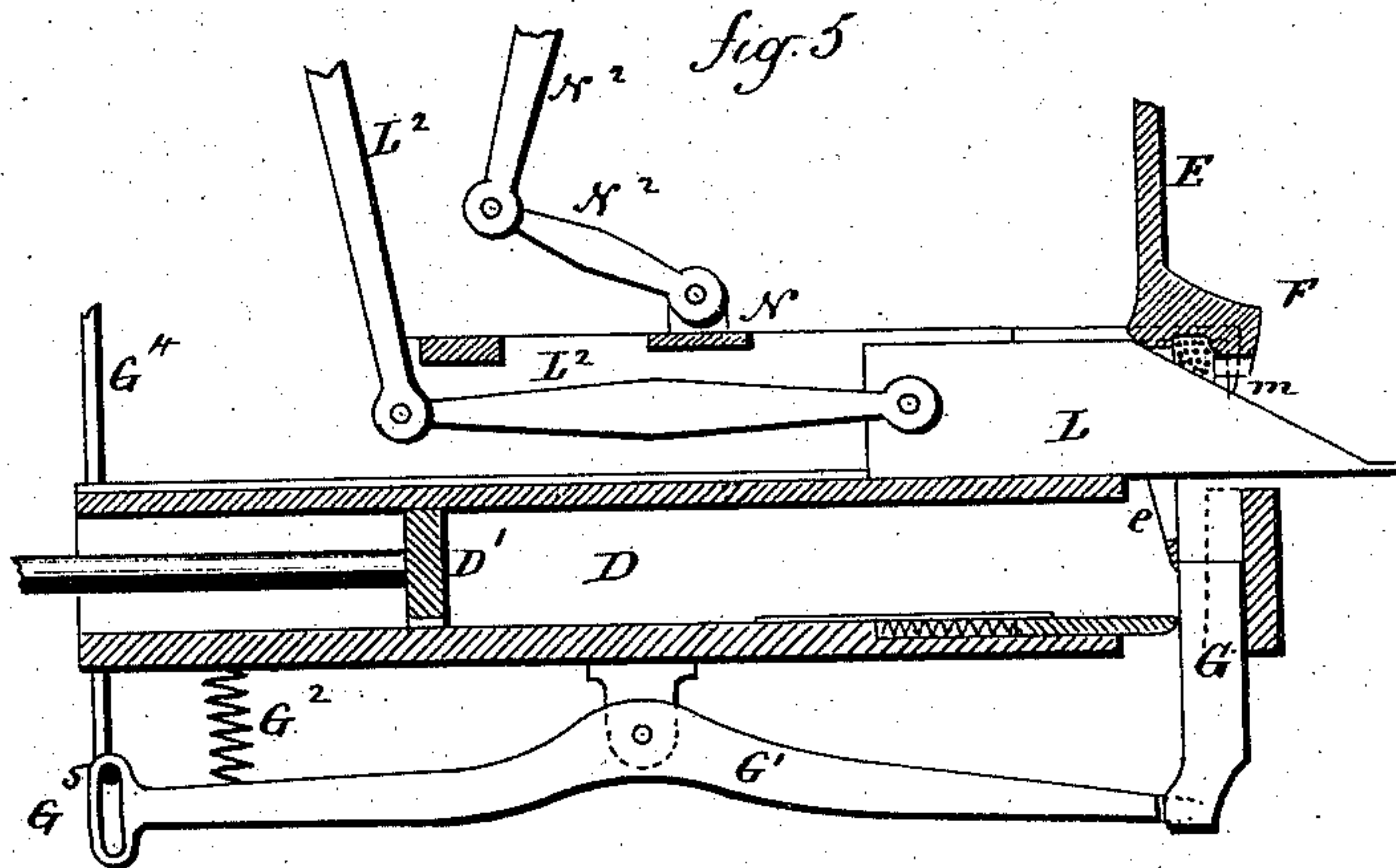


fig 5



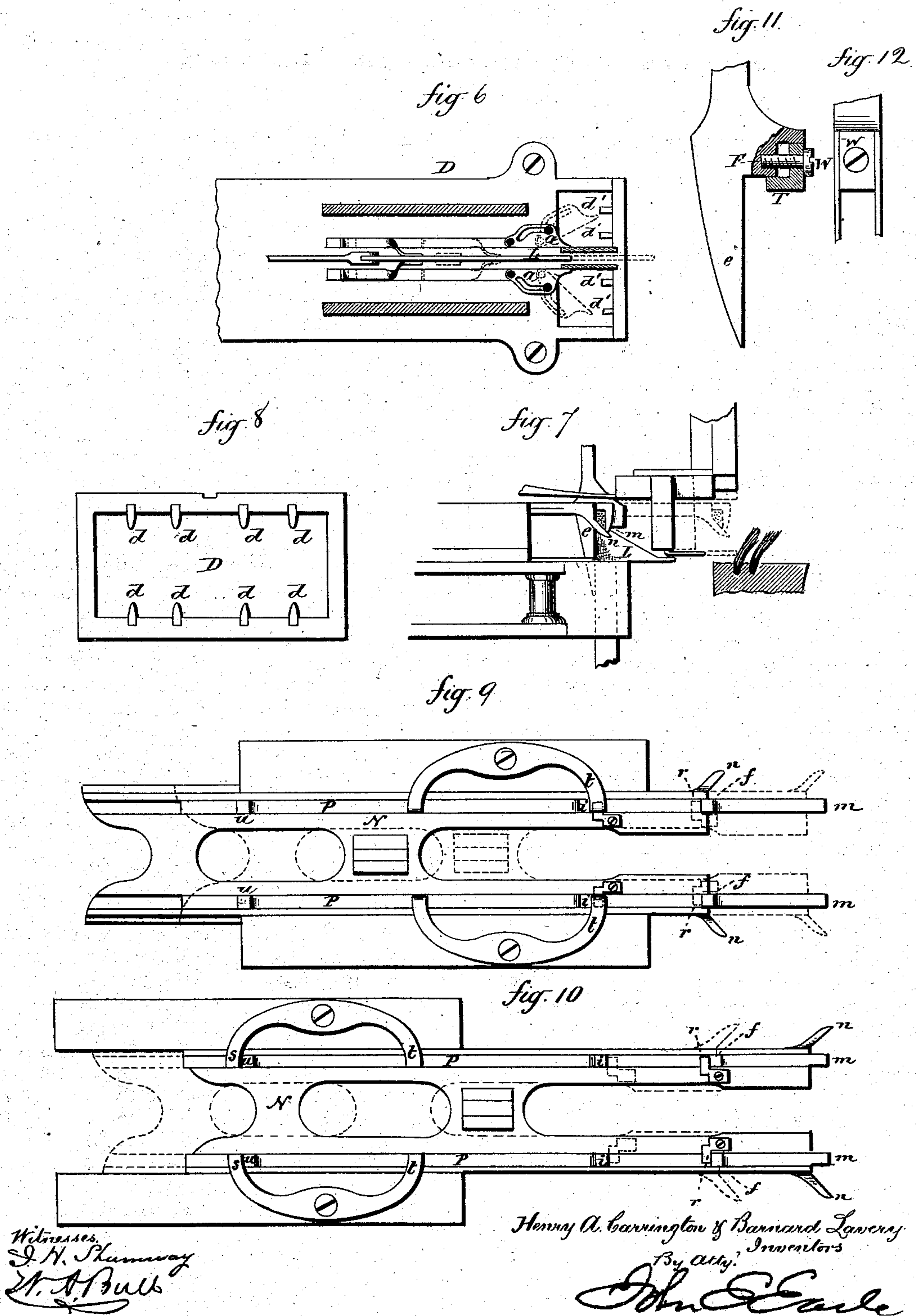
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UNITED STATES PATENT OFFICE.

HENRY A. CARRINGTON, OF NEW HAVEN, AND BARNARD LAVERY, OF EAST HAVEN, CONNECTICUT.

IMPROVEMENT IN BRUSH-MAKING MACHINES.

Specification forming part of Letters Patent No. 156,534, dated November 3, 1874; application filed July 13, 1874.

To all whom it may concern:

Be it known that we, HENRY A. CARRINGTON, of New Haven, and BARNARD LAVERY, of East Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machine for Making Brushes; and we do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view; Fig. 2, a front view; Fig. 3, a longitudinal central section; Fig. 4, a sectional plan view on line *xx*; Figs. 5, 6, 7, detached views to illustrate the operation.

This invention relates to an improvement in devices for automatically feeding the tufts to the setting apparatus in brush-making machines, designed with special reference to the class of machines patented by A. M. White, December 22, 1868, and subsequent patents, but applicable to other setting devices; and the invention consists in combinations of mechanism, as hereinafter described, for determining and taking the requisite quantity of bristles from the mass, and delivering the same to the setting apparatus.

A is the bed of the machine, above which, in suitable bearings B, the driving-shaft B' is arranged and made to revolve by the application of power thereto in any convenient manner. C is the head in which the setting mechanism is arranged; but this is not shown, it not being essential to this invention. D is the hopper to receive the bristles in mass, and consists in a box arranged longitudinally in the machine, the width of the box corresponding to the length of the bristles. The inner surface, top and bottom, is provided with longitudinal ribs *d*, upon which the bristles lie, in order to prevent friction upon the whole surface of the box. Within the hopper a follower, D¹, is arranged to traverse the length of the box, and is made to press against the rear of the mass of bristles in the hopper by means of a weight, D², or other suitable device, which will move the follower and crowd the bristles forward as portions are taken

away. The forward end of the hopper is closed, and is provided with vertical ribs *d'*, corresponding to the longitudinal ribs, so that the follower presses the mass of bristles against the ribs on the front end. At the forward end there is an opening at the top, as seen in Fig. 6, through which the bristles are raised from the hopper. Above the mouth of the hopper a slide, E, is arranged, which has a vertical reciprocating movement imparted to it by a cam, E'. This slide carries a pointed divider, *e*, which in its descent passes down through the mass of bristles, separating a certain quantity, as seen in Fig. 3, the mass thus cut off represented by stipple section. An arm, F, extends from the slide over the mass. Beneath, a compressor, G, is attached to a lever, G¹, which is forced up against this separate section by means of a spring, G², thus forcing the mass up into a cavity in the arm F. So soon as the mass has risen to the height to force the requisite quantity into the arm F, a separator, L, is advanced by the action of a cam, L¹, through levers L², which passes through the mass, separating from the upper portion of the divided mass the requisite quantity for a single tuft. This separator L is inclined upon its upper surface, and it continues to pass beneath the arm F, holding the tuft, and causing it to rise with the slide E up to the position seen in Fig. 5. As the separator L only enters the center of the mass, it is desirable to separate the different fibers of the separated portion from the fibers below throughout their length. To do this there is attached to the separator L, as seen in Fig. 6, a pair of auxiliary separators, *a*. These advance with the separator L until their points have passed through the mass. They are then caused to throw out to the right and left, as seen in Fig. 6, by means of curved slots in the separators *a* working over studs stationary on the hopper, as seen in Fig. 6. These separate the tufts entirely from the mass below. The requisite quantity for the tuft having been thus separated from the mass and raised therefrom, it is necessary to take the tuft and carry it forward to the setting device. To do this a slide, N, is arranged above the hopper, to which a reciprocating

movement is imparted by the cam N^1 through levers N^2 . This slide carries a pair of fingers, n , and near each side of this slide N is a bar, P , each terminating in a finger, m , the fingers m lying in front of the separated portion, as seen in Fig. 5. The fingers m rest while the fingers n advance and grasp the tuft between the said fingers n and m , as seen in Fig. 7. The slide E then rises sufficiently to clear the tuft, and the fingers, grasping the tuft, are then advanced to present the tuft to the setting apparatus, as denoted in broken lines, Fig. 7.

The bars P , which carry the fingers m , are caused to operate at the proper time in the following manner, as shown enlarged in Figs. 9 and 10: Starting from the position seen in Fig. 9, the slide N moves forward to the position denoted by the broken lines. The bars P are prevented from moving during this time by a spring, t , lying upon the slides forward of a lug, i , on the said bars P ; but when the slides N have reached the position denoted in Fig. 9, a projection, r , on the slide N strikes a lug, f , on the bars P . At this time the fingers n have been brought into the position relative to the fingers m , as seen in Fig. 7, and grasped the bristles for the tuft. From this point the projections r cause the bars to move forward with the slide N , carrying the fingers and the tuft, which they embrace, to the extreme forward position, as seen in broken lines, Fig. 7, and as seen in Fig. 10. When the tuft has thus been carried forward it is taken by the setting apparatus, and the slide N is moved back. When the bars P have reached their extreme forward position, as seen in Fig. 10, another spring, s , falls in rear of a lug, u , on the bars P , as seen in Fig. 10. This prevents the fingers n from moving back with the slide until after the tuft has been carried down from the fingers. In returning, the projections r on the slide N strike the lugs i on the bars P , as seen in broken lines, Fig. 10, and from that point the bars P are forced back until both slides and their fingers come into the first position or place of rest, as seen in Fig. 9, and also seen in Fig. 3. As the tufts are necessarily set close together in the setting of each succeeding tuft, there is a liability of entangling the setting tuft with previously-set tufts. To avoid this a yoke, R , is arranged in front of the fingers m , on a slide, R^1 , this yoke being of sufficient width to allow the fingers with the tuft to pass over it, as seen in Fig. 2, and to be turned down through it. The slide R^1 has a longitudinal movement imparted to it by a cam, R^2 , through levers R^3 , and this is moved forward with the fingers and tuft, as seen in broken lines, Fig. 7. This presses back the previously-set tufts in all directions, as seen in Fig. 7, so that as the tuft is carried down all liability of entanglement is avoided. The hopper D is of greater depth than the body required for a single tuft. The divided portion is carried up, as before described, by

compressor G , by the pressure of the spring G^2 ; but after each operation or removal of the bristles for a tuft the compressor G is returned to the bottom of the hopper by means of a cam, G^3 , through a rod, G^4 , working in a slot, G^5 , in the end of the lever G^1 . This will always bring the compressor down to the same point; but the slot will allow variation in the rise, so that the same movement of the compressor G will answer for different-sized tufts. The action of the spring G^2 compresses the bristles for the tuft between it and the arm F , and that again compressed in a transverse direction by the fingers n m , so that the bristles are brought into a close, compact form before presentation to the setting apparatus. As soon as the compressor has dropped to its lowest position, and the divider e raised, the mass of bristles in the hopper is pressed forward by the follower D^1 to supply the place of the last-taken tuft.

The quantity of bristles taken for a tuft may be varied or adjusted by means of the arm F , which is constructed as seen in Figs. 11 and 12, enlarged. A slide, T , is attached to the arm, and an adjusting-screw, W , arranged to move the slide to or from the divider e . The space between the slide T and the divider e will always be filled by the bristles pressed up by the compressor G ; hence, as that space is greater or less, the tuft will be accordingly greater or less. This adjustment may, however, be accomplished by raising the arm F .

It is necessary that the divider e pass completely through the mass, and meet the compressor G below, as seen in Fig. 3. In order to prevent the divider from forcing the bristles down through the bottom, beside the compressor, a slide or false bottom, V , is arranged, pressed forward by a spring, V' , as seen in Fig. 3, and yielding as the divider strikes its end, and falling back as the divider descends, and returning as the divider ascends to close up against the compressor G , and thus prevent any opening in the bottom through which the bristles may be forced, and thereby prevent the successful working of the feeding device.

By the use of the word "bristles," we wish to be understood as embracing all materials used for making brushes.

We claim as our invention—

1. In a brush-making machine, the hopper D , provided with the longitudinal ribs d , and the vertical ribs d' at its open end, combined with the automatic follower D^1 , substantially as and for the purpose specified.

2. In combination with the hopper D , and a follower to force the bristles forward, the divider e , combined with the arm F and compressor G , substantially as set forth.

3. The hopper D , constructed with the spring-slide V , combined with the divider e , provided with the arm F and the compressor G , substantially as set forth.

4. The combination of the hopper D , di-

vider *e*, provided with the arm *F*, compressor *G*, and separator *L*, substantially as and for the purpose described.

5. In combination with the divider *e*, arm *F*, and separator *L*, the auxiliary separators *a*, substantially in the manner and for the purpose set forth.

6. In combination with the hopper *D*, separator *L*, the divider *e*, and arm *F*, the movable fingers *n m*, operating together to receive the tuft and transfer it to the setting device, substantially as described.

7. In combination with the divider *e*, its arm *F*, and compressor *G*, the slide *T* and adjusting-screw *W*, substantially as and for the purpose described.

8. In combination with the reciprocating transferring-fingers *n m*, the yoke *R*, operating substantially as and for the purpose described.

9. The combination of the slide *N* and carrying-fingers *n*, the bars *P*, carrying the fingers *m*, combined with the stationary springs *s t*, the projections *r* on the slide *N*, and the lugs *f i u* on the bars, substantially as set forth.

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Witnesses:

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