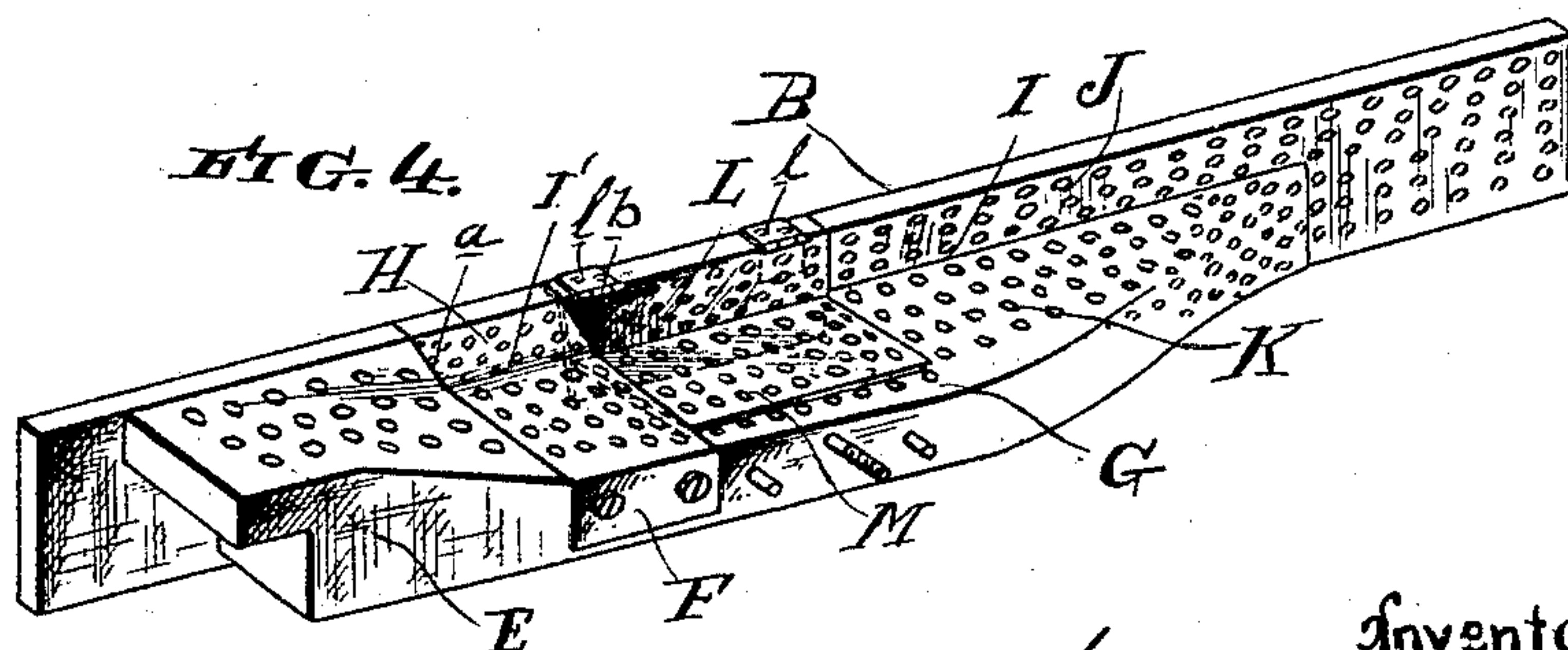
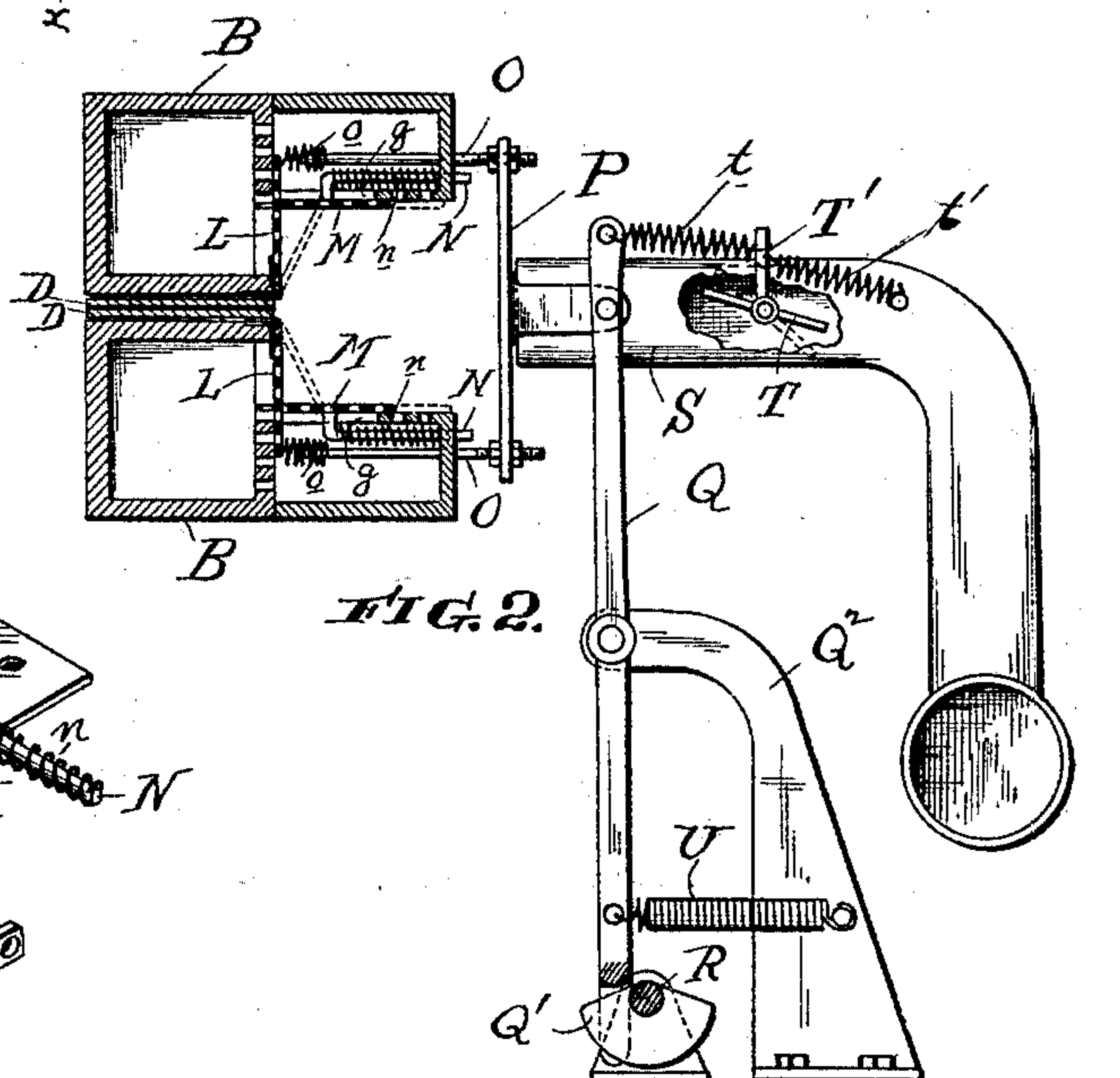
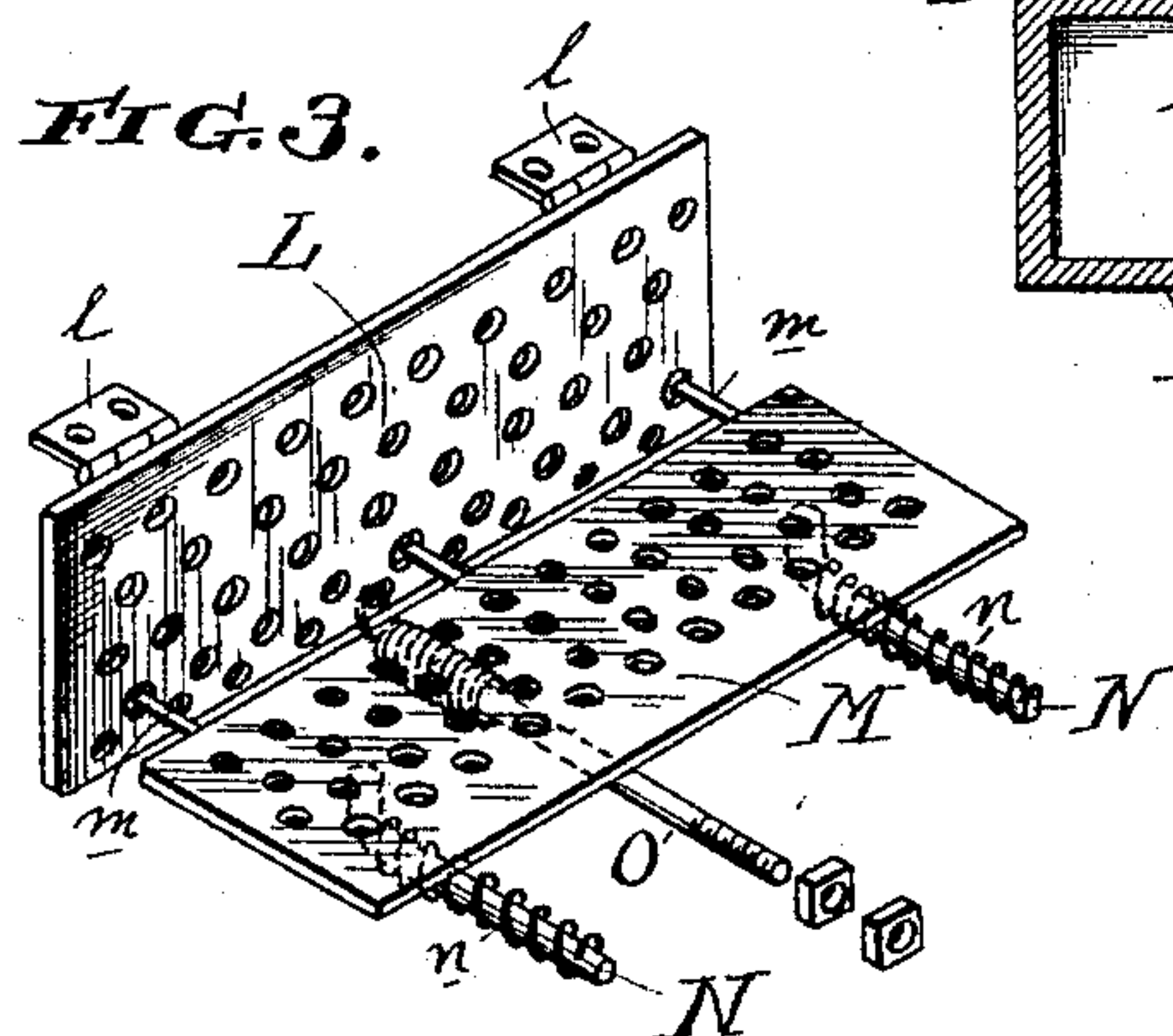
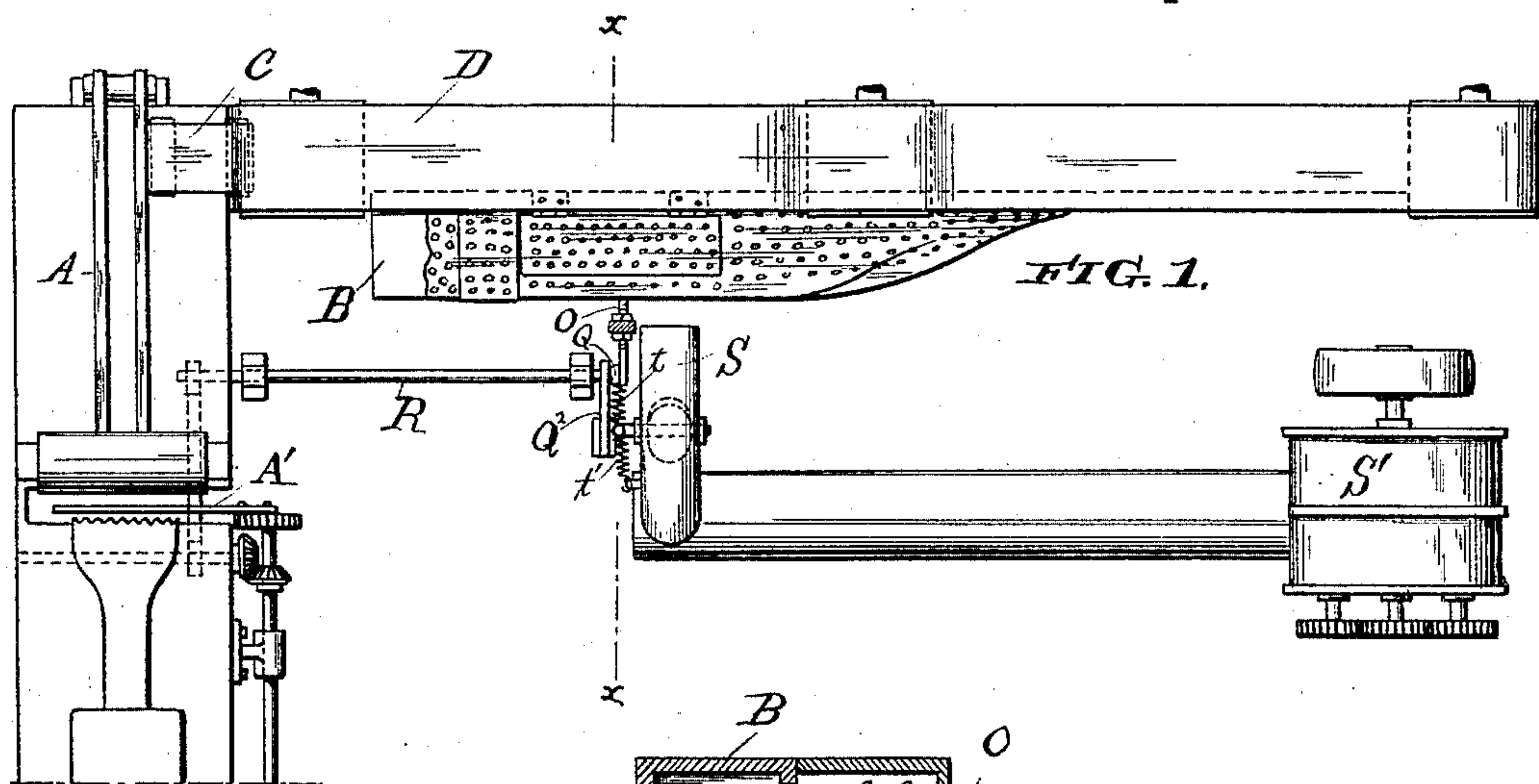


(No Model.)

W. B. PURVIS.
PAPER BAG MACHINE.

No. 460,093.

Patented Sept. 22, 1891.



Witnesses:

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A. J. Quinn

Inventor:

William B. Purvis
by his attorney.

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UNITED STATES PATENT OFFICE.

WILLIAM B. PURVIS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
EASTERN PAPER BAG COMPANY.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 460,093, dated September 22, 1891.

Application filed November 28, 1890. Serial No. 372,851. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. PURVIS, of the city and county of Philadelphia, and State of Pennsylvania, have invented certain Improvements in Paper-Bag Machines, of which the following is a specification.

My invention has reference to paper-bag machines; and it consists of certain improvements which are fully set forth in the following specification, and shown in the accompanying drawings, which form a part thereof.

More particularly my invention relates to machines for forming satchel-bottoms upon a bellows side-fold tube, producing what is known as the "satchel-square" bag.

The present invention is an improvement upon prior machines patented by me for the purpose, and particularly upon the machine disclosed in Letters Patent No. 434,461, granted to me on the 19th day of August, 1890. In that patent there are disclosed, among other features, certain improvements in the construction and arrangement of the perforated suction-formers, between which the ends of the bellows side-fold tube are moved and formed into the satchel-bottom. The present invention is intended to assist the action of these perforated suction-formers in shaping the end of the bag, so that the operation may be performed with more positiveness and precision.

The construction of the apparatus and its mode of operation are more fully set forth hereinafter.

In the drawings, Figure 1 is a plan view of a paper-bag machine embodying my invention with one of the suction-formers removed. Fig. 2 is a cross-sectional view of the same on the line $x x$ of Fig. 1, showing both formers. Fig. 3 is a perspective view, on an enlarged scale, of the movable forming-plate detached from the former; and Fig. 4 is a perspective view of one of the formers.

The devices for forming the bellows side-fold tubes and feeding them to the bottom formers are no part of the present invention, and any convenient form of mechanism may be employed for these purposes.

In the drawings I have shown endless feeding-bands A for feeding the tube-sections longitudinally from the cutters A' to the end-

less apron or carrier C, by which they are fed transversely to the carriers D. These carriers D travel between the formers B B and conduct the tube-sections between them, with their ends which are to be formed projecting between their perforated faces. The formers B B are of a hollow-box shape with longitudinally-grooved perforated faces. The formers are arranged with their perforated faces adjacent, and the ends of the paper tube are fed between them. By means of suction the paper is drawn out against the perforated faces of the formers and is broken down into the box shape, as is fully set out in my Letters Patent, No. 430,684, dated June 24, 1890, and No. 434,461, dated August 19, 1890. The perforated faces of the formers are formed with longitudinal grooves I and I' and with a series of steps or offsets $a b$, by which the paper is caused to abruptly open.

The upper portion or section E of the perforated face of the former B extends laterally and inclines slightly downward, as shown. Adjacent to this portion E is the second portion or section F, in a lower plane than the portion E, forming therewith the step or offset a . The section or portion F is provided with the groove I' and the upwardly-inclining perforated portion H.

The section or portion G consists of the vertical perforated face J and the lateral perforated face K, forming the offset or step b with the section F, and being provided with the longitudinal groove I.

L is a perforated plate hinged to the upper edge of the former B at l and lying flat against the vertical perforated face J immediately adjacent to the step or offset b . M is a similar perforated plate supported upon the lateral face K and movable thereon, provided upon its end with pins m , which project through the perforations of the plate L and serve to form a loose connection between the two. The lower face of the plate M is provided with pins N N, which extend laterally and project through the side of the former B. Springs n upon the rods N tend to prevent movement of the latter.

The face G of the former B is provided with an aperture or slot, as shown at g in Fig. 2, adjacent to the step or offset b , to permit

the movement of the rods N and the free end of the plate L, which may project down into the aperture, as shown.

O is a rod extending laterally through the horizontal portion of the former B and connected by means of a spring *o* with the vertical hinged plate L. By the movement of the rod O it will be seen that the plate L will be swung upon its hinges *l*, moving with it the plate M. Thus the hinged plate L may be moved to an angle corresponding with the inclination of the inclined face H, bringing the faces H and L in the same plane. This movement is indicated in dotted lines in Fig. 2. The rods O of the two formers are connected by a link P with the lever Q, which is rocked by a cam Q' upon the shaft R.

Q² is a bracket in which the lever Q is pivoted.

S is an air-pipe for introducing air-blasts to the formers to assist the suction thereof, and leads from the blower or fan S'.

T is a damper in the air-pipes for controlling the air-blasts therefrom. It is provided with a lever T', having a connection by means of a spring *t* with the lever Q. By this means the damper T is opened and closed by the action of the lever Q, so that the blasts of air from the pipe S are introduced to the formers B simultaneously with the movement of the plates L and M. This action is so timed that the damper T is opened and the air-blast admitted simultaneously with the inward movement of the plates L and M, as shown in full lines in Fig. 2.

By means of a spring *t'*, connected with the lever T', the damper T is closed, when the tension of the spring *t* is diminished by the movement of the lever Q.

U is a spring between the lever Q and the bracket Q² for moving the lever against the action of the cam Q'.

By the loose connection between the hinged plate L and the plate M by means of the pins *m* the two parts may be adjusted relatively to each other to suit different sizes of bags. This adjustment is accomplished by inserting the pins *m* of the plate M through a different line of perforation in the plate L, thus exposing a greater area or width of the surface of the plate L from the upper edge of the former B, correspondingly increasing or decreasing the distance from the edges of the formers B of the groove formed between the plates L and M and the size of the bottom of the bag. In making this adjustment the lateral portions of the formers F and G are correspondingly adjusted, as is fully set out in my Letters Patent No. 434,461, heretofore referred to.

The shaft R, which carries the cam Q', is connected by means of suitable gearing (shown in dotted lines in Fig. 1) with the shaft of the cutters A', so that the operation of the hinged plate L and the admission of the air-blast may be properly timed with the tube-forming devices.

The operation of the machine is as follows: The bellows side-fold tube-sections are fed from the cutters A' to the carriers D by means of the carriers A and C. By the carriers D they are conducted between the formers B B with the ends which are to be formed into the bottoms projecting between the perforated faces. As the end of the tube passes between the perforated faces of the portion E the two sides of the paper are drawn apart against the inclined perforated surfaces by the suction through the perforations therein, and as it passes onward to the second portion F it is drawn against the flat face and the inclined face H, the groove I' forming a crease. The sudden movement of the paper from the part E to the part F assists materially in opening the ends of the bag and breaking the paper into the creases. By the action of the lever Q the movable plates L and M are drawn out, so as to be in line with the perforated surfaces H and F, and the paper passes from the portions H and F to these movable plates. The lever Q then rocks backward and causes the plates L and M to assume the right-angular position shown in Figs. 2 and 4, breaking down the end of the tube into the square or box shape. This sudden movement of the plates L and M effectively breaks the paper into the proper creases, which have been partially formed between the sections or portions F. The rocking of the lever Q to operate the plates L and M simultaneously opens the damper T, admitting an air-blast to the formers, which, entering the box-shaped opening in the end of the bag, forces the paper against the faces of the former, and thus assists them in forming the creases. The bag then passes between the faces J and K to the flattening and pasting devices in the usual and well-known manner, and the lever Q rocks back to bring the movable plates L and M into position to receive the next tube.

While I prefer the mere details of construction which are here shown, I do not limit my invention to them, as it is apparent that they may be varied in many ways without departing from the invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a paper-bag machine, the combination of a carrier for carrying the tube-sections, with the suction-formers located one on each side of said carrier and each having a portion of its perforated surface adjacent to said carrier hinged, and means to move said hinged sections.

2. In a paper-bag machine, the combination of the two suction-formers between which the ends of the tube-sections are fed, each having a portion of its perforated surface movable, a connection between said movable portions, and power devices to operate said connection to move said sections correspondingly and simultaneously.

3. The combination, with the suction-form-

ers of a paper-bag machine, of the movable perforated plates L and M, pivotally connected together, the plates L being hinged to the upper edges of the formers.

5 4. The combination, with the suction-formers of a paper-bag machine, of the perforated plates L, hinged to the upper edges of the formers, the plates M, having pins *m* for forming a pivoted and adjustable connection with
10 the plates L, and means to swing the plates L upon their hinges.

15 5. In a paper-bag machine, the combination of the two suction-formers between which the ends of the tube-sections are fed, each having a portion of its perforated surface movable, a connection between said movable portions, power devices to operate said connection to move said sections correspondingly and simultaneously, a blower provided with
20 a damper, and a connection between said damper and the power devices for operating the hinged sections, whereby the damper may be operated simultaneously with said hinged sections.

25 6. In a paper-bag machine, the combination,

with mechanism for forming tube-sections, of two perforated suction-formers for forming the bag-bottoms upon said tube-sections, each having a portion of their perforated surfaces movable, devices to operate said movable sections simultaneously, a blower having a damper connected with the devices for operating the movable sections, so as to operate simultaneously therewith, and connecting timing mechanism between the tube-forming
30 devices and the devices for operating the movable sections and damper. 35

7. The combination, with the suction-formers of a paper-bag machine, of the movable perforated sections pivoted thereto and each
40 consisting of two perforated plates pivotally connected together, said plates forming with each other a longitudinal groove.

In testimony of which invention I have hereunto set my hand.

WILLIAM B. PURVIS.

Witnesses:

ERNEST HOWARD HUNTER,
A. J. DUNN.