(No Model.) 2 Sheets—Sheet 1.

H. P. FEISTER.

PAPER CUTTING MACHINE.

No. 400,652. Patented Apr. 2, 1889.

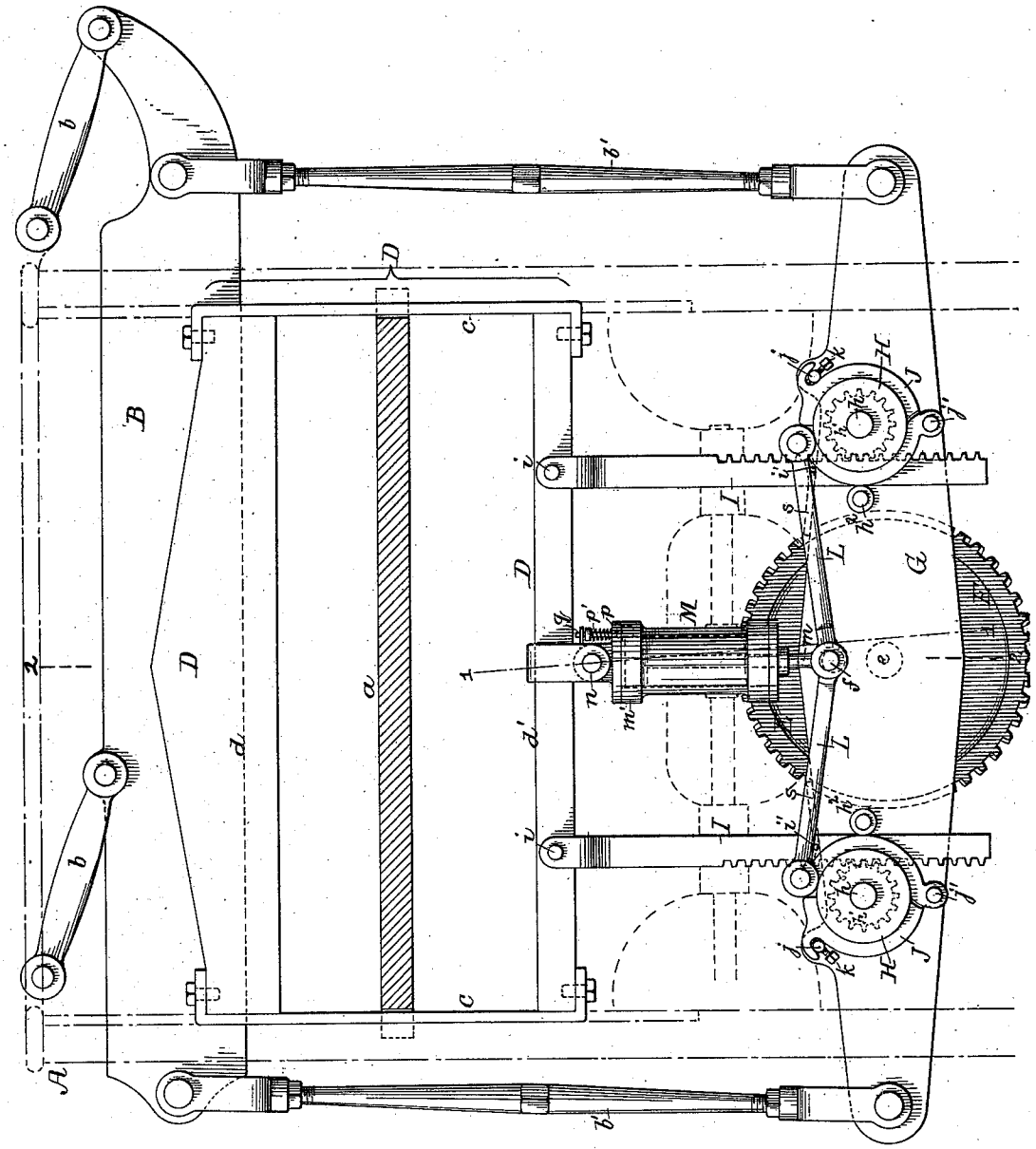


FIG. 1.

Witnesses:
Hamilton D. Turner.
Edward M. Riley.

Inventor:
Henry P. Feister
by his Attorneys
Howson & Howson

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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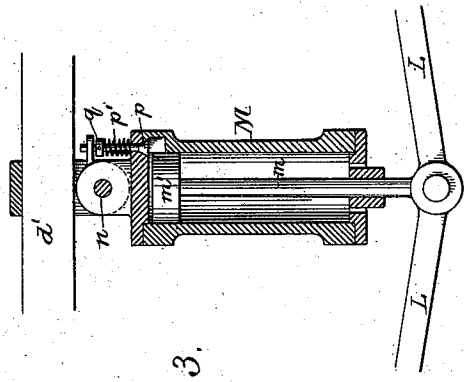


FIG. 3.

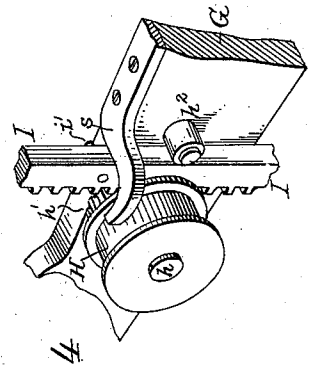


FIG. 4.

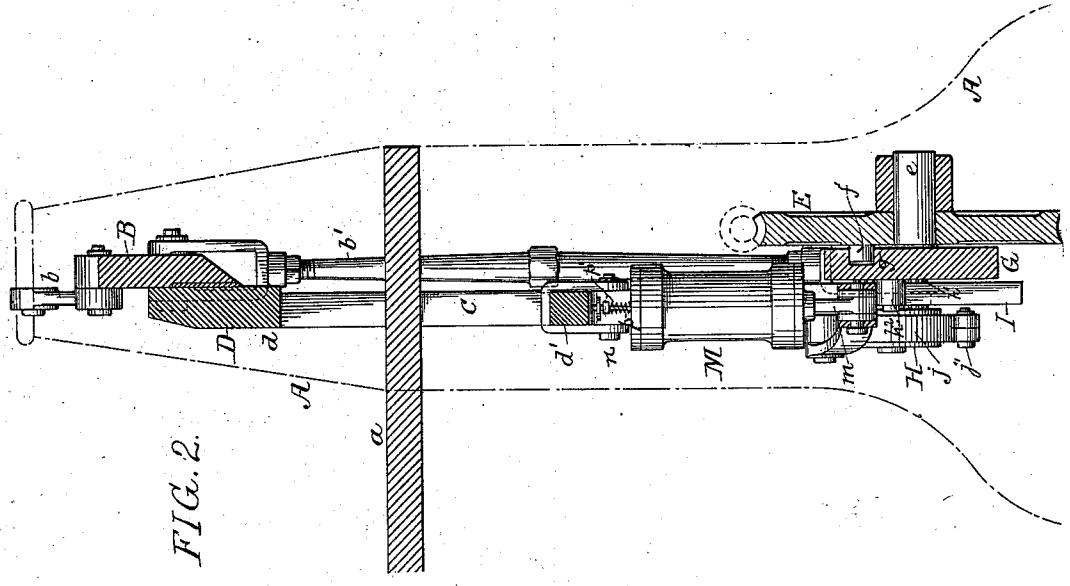


FIG. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY P. FEISTER, OF PHILADELPHIA, PENNSYLVANIA.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 400,652, dated April 2, 1889.

Application filed April 12, 1888. Serial No. 270,386. (No model.)

To all whom it may concern:

Be it known that I, HENRY P. FEISTER, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Paper-Cutting Machines, of which the following is a specification.

The object of my invention is to construct an accurate, efficient, and automatic clamping device for a paper-cutting machine, whereby a uniform pressure is imparted to the paper irrespective of the height of the pile. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a rear view of sufficient of a paper-cutting machine to illustrate my invention, the frame of the machine being shown by dotted lines in order to avoid confusion. Fig. 2 is a transverse section on the line 2 2. Fig. 3 is an enlarged sectional view of the vacuum-cylinder, and Fig. 4 is a detached perspective view of another part of the machine.

A is the frame of the paper-cutter. (Shown by dotted lines.)

a is the cutting-table, (shown by full lines,) and B is the knife-bar, hung to the frame by two links, *b b*, in the usual manner.

D is the paper-clamping frame, which in the present instance is of quadrangular shape, having the clamp *d*, the lower frame, *d'*, and the side connecting-bars, *c c*, secured to the portions *d d'* in any suitable manner.

E is the driving gear-wheel, on a shaft or spindle, *e*, mounted in suitable bearings in the frame of the machine, and said wheel is driven in the present instance by means of a worm. (Shown by dotted lines in Fig. 2.) A crank-pin, *f*, on the wheel E is adapted to an orifice, *g*, in a beam, G, connected to the knife-bar B by rods *b' b'*, so that as the wheel E rotates the beam G is raised and lowered, and also has a sidewise movement dictated by the crank-pin *f*. As shown in Fig. 1, the crank-pin is at its highest point, and consequently the knife-bar B is raised.

On the beam G are two studs, *h h*, on which are loosely hung friction band-wheels H H, each having a pinion, *h'*, gearing with vertical racks I I, pivoted at *i* to the portion *d'* of the paper-clamping frame, and on the beam G are also two pins, *j j*, to which are hung the straps J J, made in two parts and pivoted together at *j'*. Two links, L L, connect these straps J together. The links are pivoted to each other and to a piston-rod, *m*, so that the links L L form a toggle-lever to clamp the straps J J to the wheels H H.

Stop-plates *s s* are secured to the beam G to limit the outward movement of the straps, and adjusting-screws *k* are tapped into the pivot-pins *j j* to take up slack caused by wear on the straps and drums.

In some instances the band-wheels H H may have a friction-surface of leather or other suitable material, or the straps may be faced with leather.

The piston-rod *m* is provided with a suitable piston, *m'*, adapted to a cylinder, M, pivotally hung at *n* to the portion *d'* of the paper-clamping frame, and a relief-valve, *p*, opening inward in the present instance, is situated in the upper portion of the cylinder M, and is supplied with a suitable spring, *p'*, and nut or adjusting-collar *q*, so that by adjusting said nut or collar the amount of force necessary to open the valve can be accurately regulated. The valve is so situated that it will be opened by contact of the upper end of its stem with the under side of the portion *d'* of the clamping-frame D when the beam is starting on its upward motion, thereby permitting the atmosphere to gain access to the cylinder above the piston, thus destroying any partial vacuum that may have been created therein.

On each rack I are pins *i'*, with which the beam engages on its upward movement, in order to raise the clamping-frame D.

The operation of the machine is as follows: The paper being placed on the cutting-table *a* and the machine put in motion, the wheel E and its crank-pin rotate, and said crank-pin carries the beam G with it, a downward motion being consequently imparted to both the clamping-frame D and the knife B; but the clamping-frame, being in advance of the knife, will reach the paper first, and its descent will be arrested by the paper. As the beam G carries the clamps, toggles, and piston-rod and piston, while the vacuum-cylin-

der is secured to the clamping-frame D, it follows that on the arrest of the descent of said frame the continued downward movement of the beam G will cause a downward movement of the piston in the cylinder, thus creating a partial vacuum, which retards the descent of the piston, and consequently straightens out the toggles, thus causing the straps J to tighten upon the wheels H and tend to prevent the pinions h' from turning on the pins $h\,h$. The racks I being at all times held in gear with the pinions h by means of wheels or pinions h' on the beam, said racks will now be drawn down with the beam until the resistance of the movement of the clamping-frame overcomes the friction of the straps j on the band-wheels H, whereupon said wheels will slip and further downward movement of the clamping-frame will be prevented; but said frame will be held in position with a pressure governed by the frictional hold of the straps on the band-wheel, and as the pressure of the latter is determined by the partial vacuum in the cylinder M it is evident that the pressure on the paper can never be excessive, and when once determined is always the same, whatever may be the height of the pile of paper to be cut. By adjusting the nut or collar on the stem of the valve p, and thus regulating the force of the spring acting on said valve, the character of the vacuum maintained and the consequent amount of pressure to be exerted upon the paper can be readily governed. When the crank-pin has reached its lowest position and the knife has cut the paper, the cylinder M will, as the crank-pin f continues to move, swing to the position indicated by the dotted line 1, Fig. 1, and the valve p will be opened by contact of its stem with the lower bar of the clamping-frame, thus destroying the partial vacuum in the cylinder and permitting the clamping-frame to rise with the beam, so as to release the cut paper. Both the knife-bar and clamping-frame will be raised to their normal position and then locked, as in ordinary paper-cutting machines, until the operator releases the driving mechanism.

I claim as my invention—

1. The combination, in a paper-cutting machine, of the paper-clamp D, the cutter-beam, and mechanism, substantially as described, for operating said beam, with depending rack or racks hung to the clamp, devices, substantially as specified, for frictionally holding the rack or racks to the beam, and a cylinder and piston, one of which is connected to the clamp and the other to the said frictional holding devices, substantially as set forth.

2. The combination, in a paper-cutting machine, of the paper-clamp D, the beam, and mechanism, substantially as described, for operating the same, with pinions and friction-wheels on said beam, racks attached to the clamp and engaging with the said pinions, friction-bands adapted to act upon the band-wheels, a cylinder carried by the clamp D, a piston in said cylinder, and means, substantially as described, for connecting said piston to the friction-bands, all substantially as set forth.

3. The combination, in a paper-cutting machine, of the paper-clamp D, the beam, and mechanism, substantially as described, for operating the same, pinions and friction-wheels on said beam, racks attached to the clamp and engaging with said pinions, friction-bands adapted to act upon the band-wheels, and a cylinder carried by the clamp D, with links L L, connected together to the piston and to the friction-bands, all substantially as set forth.

4. The combination, in a paper-cutting machine, of the paper-clamping frame, an operating beam therefor, a cylinder, M, pivoted to the frame, a piston therein, mechanism, substantially as described, connected to said piston for frictionally retaining the clamping-frame to the beam, and a relief-valve so seated in the cylinder that it will be operated at a certain point in the stroke of the driving mechanism, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY P. FEISTER.

Witnesses:
WILLIAM G. WISE,
EDWARD M. RILEY.