

(No Model.)

2 Sheets—Sheet 1.

H. P. FEISTER.
PAPER CUTTING MACHINE.

No. 257,682.

Patented May 9, 1882.

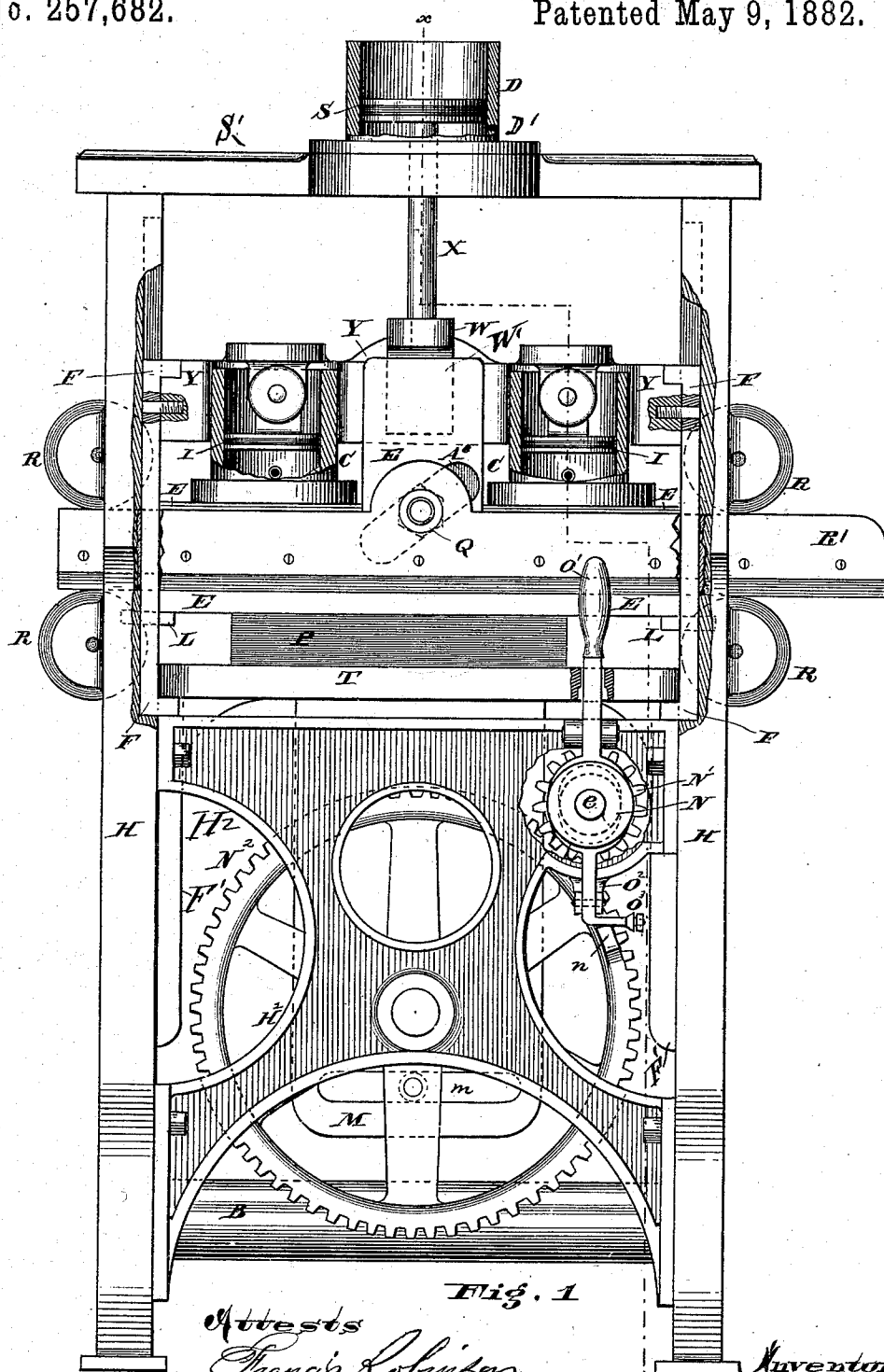


Fig. 1

Attests
Francis Robinson
E. W. Judson.

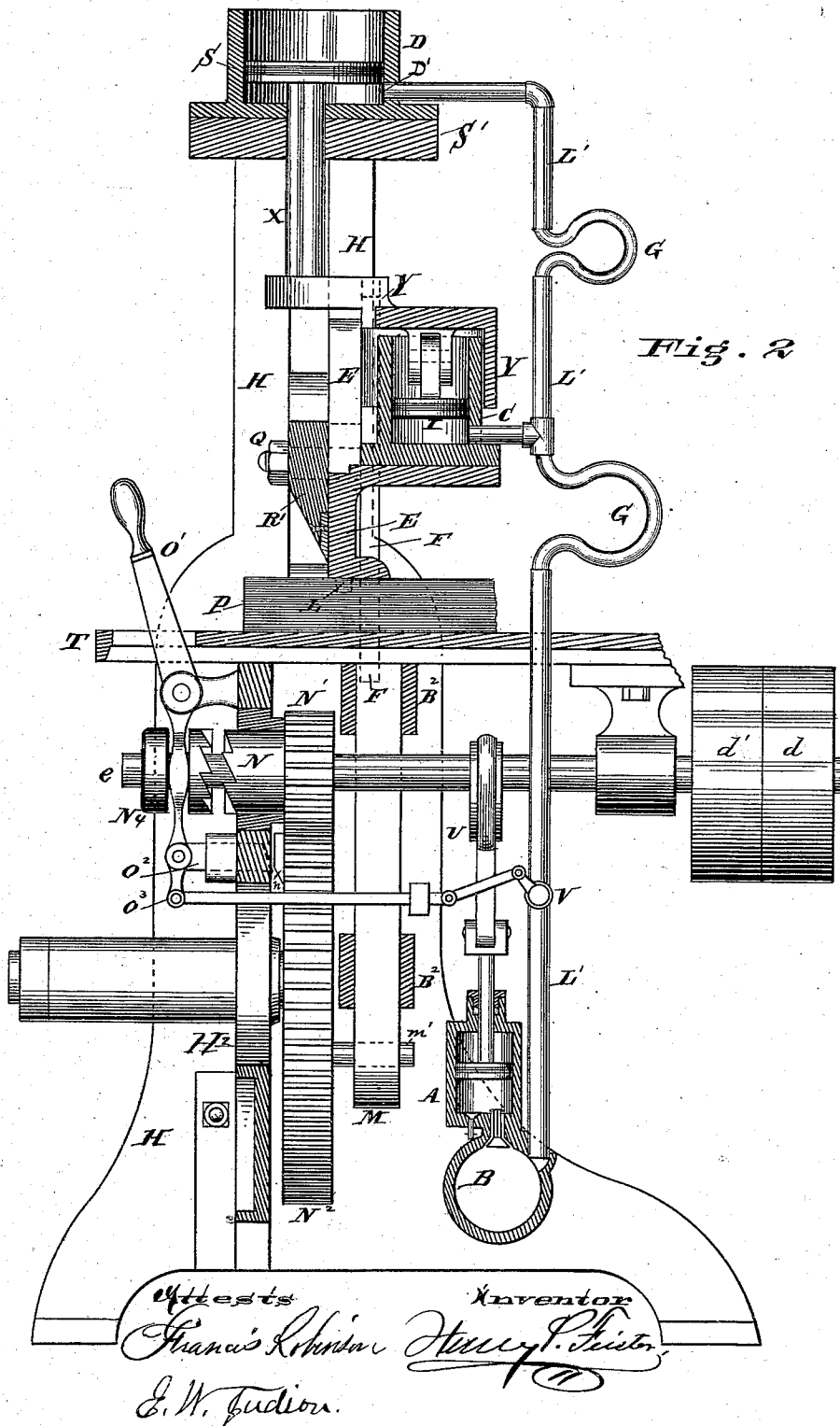
Inventor

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UNITED STATES PATENT OFFICE.

HENRY P. FEISTER, OF PHILADELPHIA, PENNSYLVANIA.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 257,682, dated May 9, 1882.

Application filed September 1, 1880. (No model.)

To all whom it may concern:

Be it known that I, HENRY P. FEISTER, a citizen of the United States, residing in the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Paper-Cutting Machine, of which the following is a specification.

My invention relates to paper-cutting machines in general, but more particularly to a machine in which I use compressed air to clamp the paper previous to and while it is being cut.

The objects of my improvements are, first, to provide an automatic clamping medium capable of accommodating itself automatically to various thicknesses of paper or books and securely clamping or holding the same while being cut or trimmed; second, to insure perfect clamping and holding of the paper without using screws or extreme frictional surfaces to attain that object. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation with parts broken away to better facilitate showing the more obscure working parts. Fig. 2 is a vertical section taken on line *xx* of Fig. 1.

Similar letters refer to similar parts throughout the several views.

The housings H H, cap S', and front brace-plate, H², constitute the frame-work of the machine, housings H H being slotted entirely through for the horizontal travel of knife-bar R'. The said knife-bar R' has a reciprocating motion in precisely horizontal direction between the rollers R R R R, the knife-bar R' having no vertical motion whatever. The rollers R rotate in stationary lugs cast on the outside of housings H H. The table T, upon which the paper is placed to be cut, is fitted with connections F F, piston-yoke Y Y Y, table-guides F' F', and slotted crank-pin extension M. The table has a vertical reciprocating motion imparted to it through the gearing N' N², slotted table-extension M, and crank-pin *m*, and driving-shaft *e*. The housings H H are fitted with suitable vertical grooves on their insides to accommodate the vertical traverse of table-guides F' F', connections F F, and ends of clamping-bar E E E.

In niches near each end of yoke Y Y Y, and secured jointly in the top of said niches, are air-pistons I I, which partake of the same re-

ciprocating motion imparted to yoke Y and table T.

On the insides of housings H H are stop-pins L L. Upon these pins rests clamping-bar E E E. The said clamping-bar E always rests on the stop-pins L, save when forced away by contact with paper P through the upward movement of table T. Upon seats or projections cast on the rear side of clamping-bar E are secured air-cylinders C C, having a caliber suitable to the diameters of pistons I I, previously referred to. The pistons I I are packed air-tight in the cylinders C C, and when the table is at the lower end of its stroke the said pistons I I remain at rest slightly above the air-inlets at the bottoms of air-cylinders C C, save when they are drawn upward or downward in their cylinders by the reciprocating motion of yoke Y and table T, previously referred to. The clamping-bar E is also provided with inclined slot A', placed at an angle of forty-five degrees with its base. In this inclined slot A', and secured fixedly in knife-bar R', are a pin and friction-roller, Q, the roller Q always working in the inclined slot A', which, by the vertical reciprocating motion of clamping-bar E, imparts a horizontal reciprocating motion to knife-bar R', the movement of clamping-bar E and knife-bar R' always being in proportion to the thickness of or height of paper P on table T, there being no movement of clamping-bar E except that given it by the thickness of paper on table T. In fact, there would be no movement at all of clamping-bar E if no paper were placed on table T. The clamping-bar E is also provided with a vertical groove, W', which fits upon and slides on a downward-projecting tongue, W, cast on yoke Y, which serves to guide clamping-bar E and maintain it parallel with the table T, the housings H H being also grooved on their insides for the reception of the ends of clamping-bar E.

On top of the machine-cap is secured air-cylinder D, fitted with the piston S, whose rod X is connected with tongue W on top of yoke Y. This piston S partakes of the same motion (reciprocating) imparted to yoke Y and table T, and is used for a twofold purpose: First, compressed air being admitted at the port D', it counteracts the weight of table T and its connections; second, it assists the gearing N' N² in forcing the table upward and carrying

paper P first against clamp E and clamping the paper, then against the cutting-edge of the knife-bar R' and cutting the paper. Hence the same air-pressure generated in receiver B to clamp the paper or actuate the clamping-bar E also assists in an equal ratio in helping to cut the paper.

The method of generating, controlling, and using the compressed air is fully shown in the vertical section, Fig. 2, in which A is the air-pump; B, its receiver; U, an eccentric, for driving pump A; V, the controlling-valve; O', starting-lever; O², unshipping-bar; O³, valve-connecting rod; n, unshipping-cam; e, driving-shaft; N N, clutches; L' L' L', air-conducting pipe, and G G flexible rubber connections. The air-pump A is fitted with a suitable inlet-valve, the outlet-valve communicating with receiver B and retaining the compressed air as it is forced therein by the rotary motion of driving-shaft e and eccentric U.

The object and uses of lever O' and clutch mechanism are as follows, and will be readily understood by all users of paper-cutting machines. It is desirable that after the table T has been forced upward, the paper cut, and the table again returned to the lower end of its stroke, it should automatically stop there. This is accomplished by cam n of large gear N² coming in contact with and moving unshipping-bar O², carrying with it lever O', clutch N, and valve-connecting rod O³.

The valve V of connecting-pipe L' is fitted with suitable two-way induction and exhaust ports. These ports are so arranged that communication between receiver B and air-cylinders C C and D is controlled by the oscillating motion of valve V, thus admitting compressed air from receiver B to air-cylinders C C and D to clamp and assist in cutting the paper P, and again automatically exhausting the air from the cylinders after the paper has been clamped and cut by contact of cam n with unshipping-bar O².

The operation of my invention is as follows: Rotary motion being imparted to shaft e, carrying eccentric U, the receiver B is quickly charged with compressed air by pump A; but no motion is imparted to the cutting-gearing of the machine, as the shaft e runs idle in pinion-gear N', while clutch N⁴ slides on a spline and always rotates with shaft e, so that when the operator pulls toward him lever O' it carries with it clutch N⁴, engaging clutch N

of pinion-gear N', which starts the cutting and clamping parts of the machine. It must also be observed that when the operator pulls toward him lever O' to engage the clutch-movement he also (through connection O³) moves or oscillates valve V and opens communication with receiver B and air-cylinders C C and D. Thus the air admitted to cylinders C C acts in opposite directions between pistons I I and bottoms of cylinders C C. The cylinders C C, being mounted upon the clamping-bar E, will keep it pressed down firmly against stop-pins L L in proportion to the amount of air-pressure contained in cylinders C C. Now, as the table T, carrying paper P, continues on its upward way, the paper will come against clamp E and become clamped perfectly tight, after which clamp E will be lifted off its stop-pins L L and travel with table T until the upper end of the stroke is reached and the paper cut, when clamp E and table T continue on the downward stroke together until clamping-bar E is arrested by the stop-pins, when the table continues to the lower end of its stroke. The cam n on gear N² now comes in contact with unshipping-bar O², pushing it outward, disengaging clutch N⁴, at the same time reversing valve V and exhausting the air from cylinders C C and D, leaving the paper free from the clamping-bar E.

Having now fully described my invention, I claim as new—

1. The clamp E, in combination with air-cylinders C C, pistons I I, flexible rubber connections G G, and conducting-pipes L, substantially as shown and described.

2. In a paper-cutting machine, the combination, with yoke Y and table T, of air-cylinder D, piston S, and rod X, adapted to operate, as and for the purpose set forth.

3. In a paper-cutting machine, the combination, with clamping-bar E and yoke Y, respectively, of air-cylinders C C, pistons I I, air-pipes L', flexible connections G G, and air-valve V, adapted to operate substantially as set forth.

4. The combination of starting-lever O', unshipping-bar O², cam n, connecting-rod O³, and two-way air-valve V, all substantially as set forth.

HENRY P. FEISTER.

Witnesses:

FRANK ROBINSON,
JOSEPH J. BROADHURST.