J. W. BRECKENRIDGE.

Pneumatic Stencil-Pen.

No. 211,375. Patented Jan. 14, 1879.

Fig. 1.

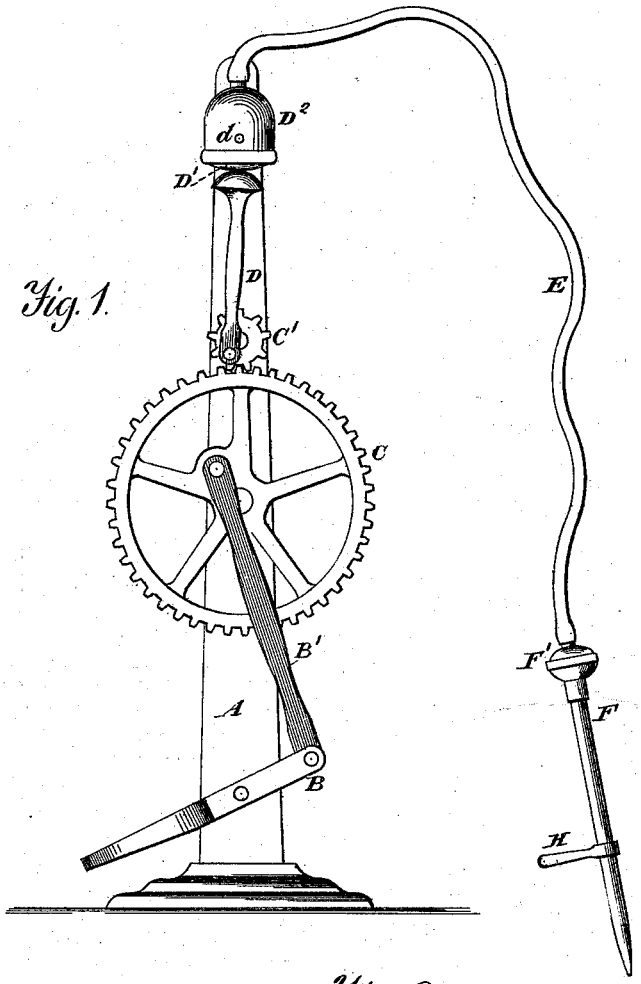


Fig. 3.

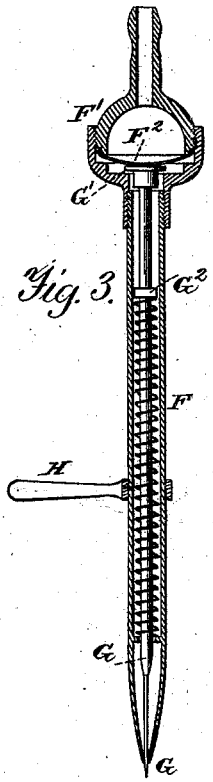
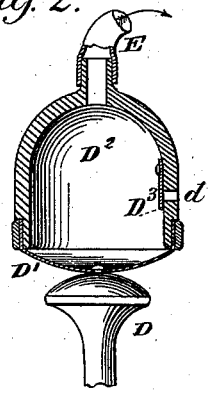


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOSEPH W. BRECKENRIDGE, OF LA FAYETTE, INDIANA, ASSIGNOR TO HIMSELF, JACOB F. MARKS, AND JOHN A. STEIN, OF SAME PLACE.

IMPROVEMENT IN PNEUMATIC STENCIL-PENS.

Specification forming part of Letters Patent No. **211,375**, dated January 14, 1879; application filed August 9, 1878.

To all whom it may concern:

Be it known that I, JOSEPH W. BRECKENRIDGE, of La Fayette, in the county of Tippecanoe and State of Indiana, have invented certain new and useful Improvements in Pneumatic Stencil-Pens; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification—

Figure 1 being an elevation of a machine for putting in practice the principle of my invention, showing the frame-work, the gearing for giving motion to a body of compressed air, a conducting-pipe, and a perforating device. Fig. 2 is a sectional elevation, showing the chamber and an elastic diaphragm; and Fig. 3 is a sectional elevation of the perforating mechanism, with its air-chamber and diaphragm.

Corresponding letters denote like parts in all of the figures.

This invention relates to that type of instruments which are used for perforating paper, and thus forming a stencil, from or through which letters, characters, and figures of any desired form may be transferred to paper; and it consists in providing a perforating implement for such purposes, which is operated by a rapid concussion of the alternating rod D upon the elastic diaphragm D^1, connected with a similar diaphragm, F^2, by means of an elastic tube, and these containing compressed air; and it further consists in the combination of some of the parts of which the implement is composed, as will be more fully described hereinafter.

In constructing implements in which to use compressed air as the motive force for driving a perforating-needle, and in order that the machine may be capable of doing effective work unaided by any other mechanism, I make a frame, A, of any desired form and configuration that will cause it to stand firmly upon a floor, it being of such height as to enable it to receive and support the driving mechanism, that is attached to it. To one of the legs of the frame, A, a treadle, B, is pivoted, the outer end of which is adapted for the reception of the feet of the operator, while to its inner end a connecting-rod, B′, is pivoted, from which point it extends upward to and is made to embrace a crank-pin placed in the arm of a wheel, C, which wheel rotates freely upon a stud or other bearing attached to the frame A. Immediately above the wheel C, and also rotating upon a stud or shaft secured in said frame, there is placed a smaller wheel, C′, the two being so arranged with reference to each other that when the treadle is operated both will be revolved. Instead, however, of these wheels being furnished with cogs upon their peripheries, as shown, their surfaces may be smooth and brought into contact with each other, and thus the larger one be made to drive the smaller; or their surfaces may be separated, and motion given to the smaller one by a belt passing around both. However the small wheel may be driven, it should bear such a proportionate size to the larger ones as to cause it to rotate rapidly when a movement easily attainable by the foot of the operator is given to the larger one.

The small wheel or pulley has a crank-pin inserted in it at such a distance from its center as to cause a rod, D, connected thereto, to give the required movement to a diaphragm, D^1, which is secured to the lower end of the chamber D^2. The upper end of connecting-rod D is secured to the diaphragm D^1, in such a manner that as the wheel or pulley is revolved it will cause the compressed air to pulsate in the flexible pipe E, which is attached to a metallic cap which covers the upper end of the chamber D^2, it being provided with a suitable nozzle to which to attach the pipe.

I transmit the motion imparted to diaphragm D^1 by the actuating-rod D to the diaphragm F^2 and shaft G by or through the medium of compressed air contained in chambers D^2 and F^1 and the flexible connecting-pipe E.

In the operation of my invention I at all times secure and maintain the requisite amount or degree of compression of air by the means and operation of the valve D^3, which is attached to and closes upon the inner side of the chamber D^2, closing the aperture *d* therein.

This valve will admit air into the chamber D^2 to fill any vacuum caused by wastage or a very rapid operation of the actuating-rod D, and will cease to admit air when the inner pressure is at all times, in the operation of the machine, greater in chamber D^2 than the normal outside pressure.

To the outer end of the flexible pipe E there is attached a metallic tube, F, the outer end of which is the frustum of a cone inverted, and has a small aperture formed in it for the passage of a perforating-needle, soon to be described. Upon the upper end of tube F there is placed a chamber, F^1, across which there is stretched a flexible diaphragm, F^2, which, owing to its arrangement, will have its central portion pressed downward by the movement of the compressed air communicated to it by the depression and extension of the diaphragm D^1, actuated by the connecting-rod D.

Passing through the lower portion of chamber F^1 and through the tube F, with its head or upper end abutted against the diaphragm F^2, there is a needle, G, which is held in position by suitable guides. The lower or outer end of this needle is sharp pointed, and is made to pass through the conical end of tube F, and when forced outward to its greatest extent it passes far enough beyond the end of said tube to allow it to perforate one or more sheets of paper. For giving motion to this needle there is placed upon its upper end a disk, G^1, which, when the same is withdrawn from the paper, rests against the under surface of the diaphragm F^2, so that when it is forced downward the needle will be carried with it to such an extent as to cause it to perforate the paper. The reduction of pressure in chamber F^1, caused by the downward movement of connecting-rod D, will allow the diaphragm to rise, and so relieve the pressure upon the disk of the needle which may be attached thereto, and thus be carried upward by it. For the purpose of aiding the inward movement of the needle, or for causing such movement when it is not connected to the diaphragm, there is placed upon it a collar, G^2, which rests upon the end of a spiral spring, whose lower end is supported by one of the guides through which the needle passes, and thus the needle in its outward movement compresses the spring, the recoil of which carries the needle inward when the pressure is reduced from the upper side of the diaphragm F^2.

H is a projection, adjustably attached to the tube F, which serves as a support for the perforating instrument by resting upon the fingers or hand of the operator, and also as a convenient handle for the same. By placing the valve D^3 in the diaphragm D^1, a greater compression of the air might be attained.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an instrument for perforating paper, the actuating-rod D, in combination with the diaphragm D^1, the chamber D^2, the valve D^3, located inside of the chamber D^2, the flexible tube E, the diaphragm F^2, and the perforating instrument G, constructed and operating together as and for the purposes substantially as described.

2. In an instrument for perforating paper, the diaphragm D^1, the chamber D^2, the valve D^3, located as described, in combination with the flexible tube E, chamber F^1, and the diaphragm F^2, constructed and operating together as and for the purposes substantially as described.

3. The combination of the hand-rest or handle H with the tube F, adjustably attached thereto at right angles with the same, as and for the purposes substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOSEPH W. BRECKENRIDGE.

Witnesses:

E. J. COVAULT,

T. H. FLORER.