No. 689,394. Patented Dec. 24, 1901.

F. L. GREGORY.

PERFORATING AND CLENCHING DEVICE.

(Application filed Jan. 26, 1901.)

(No Model.)

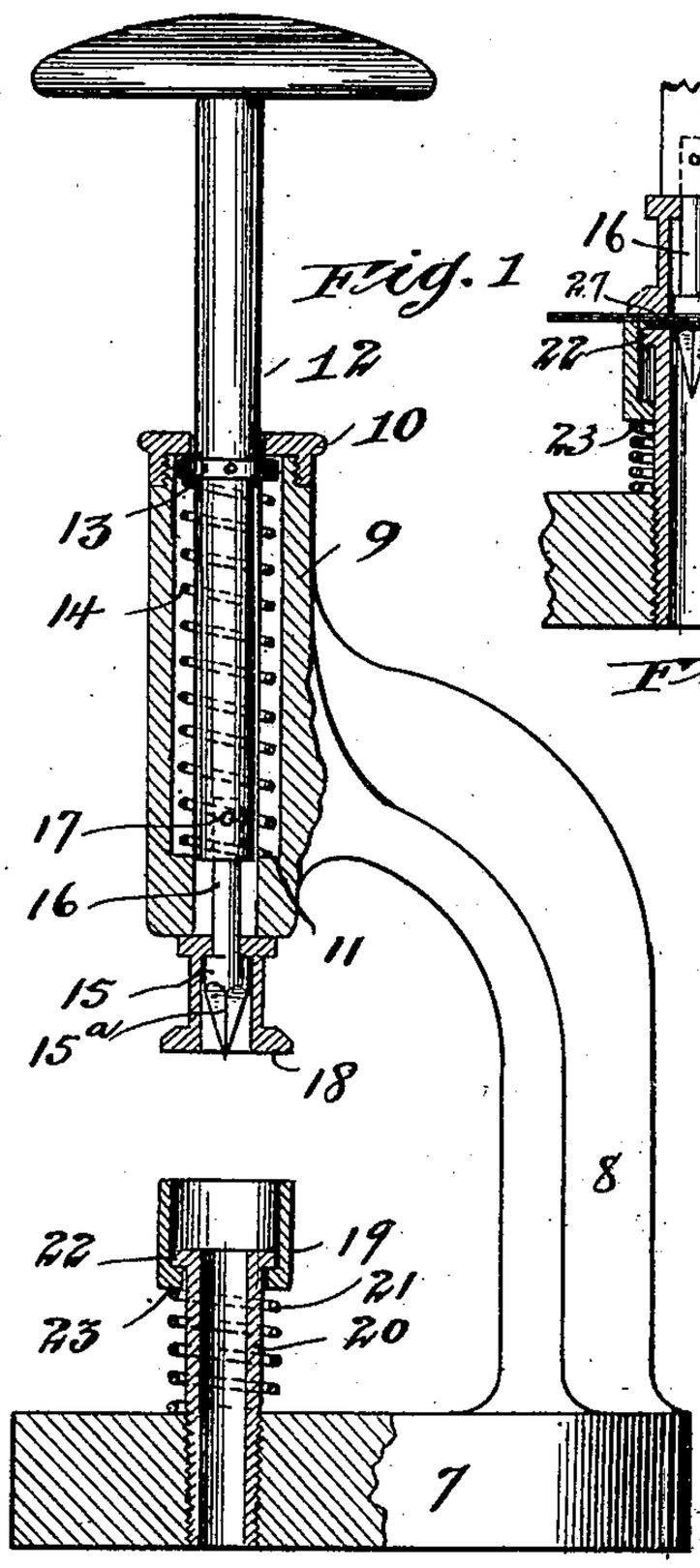

Fig. 1

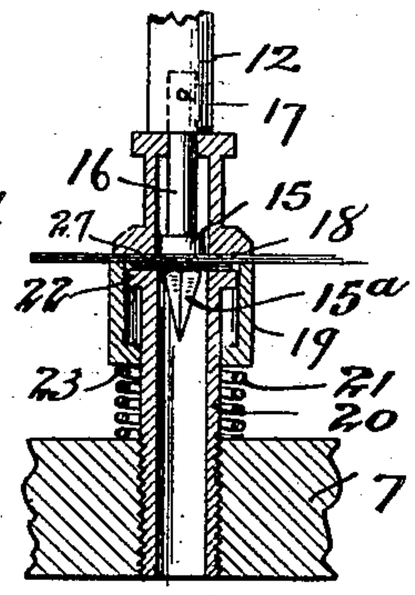

Fig. 3.

Fig. 2.

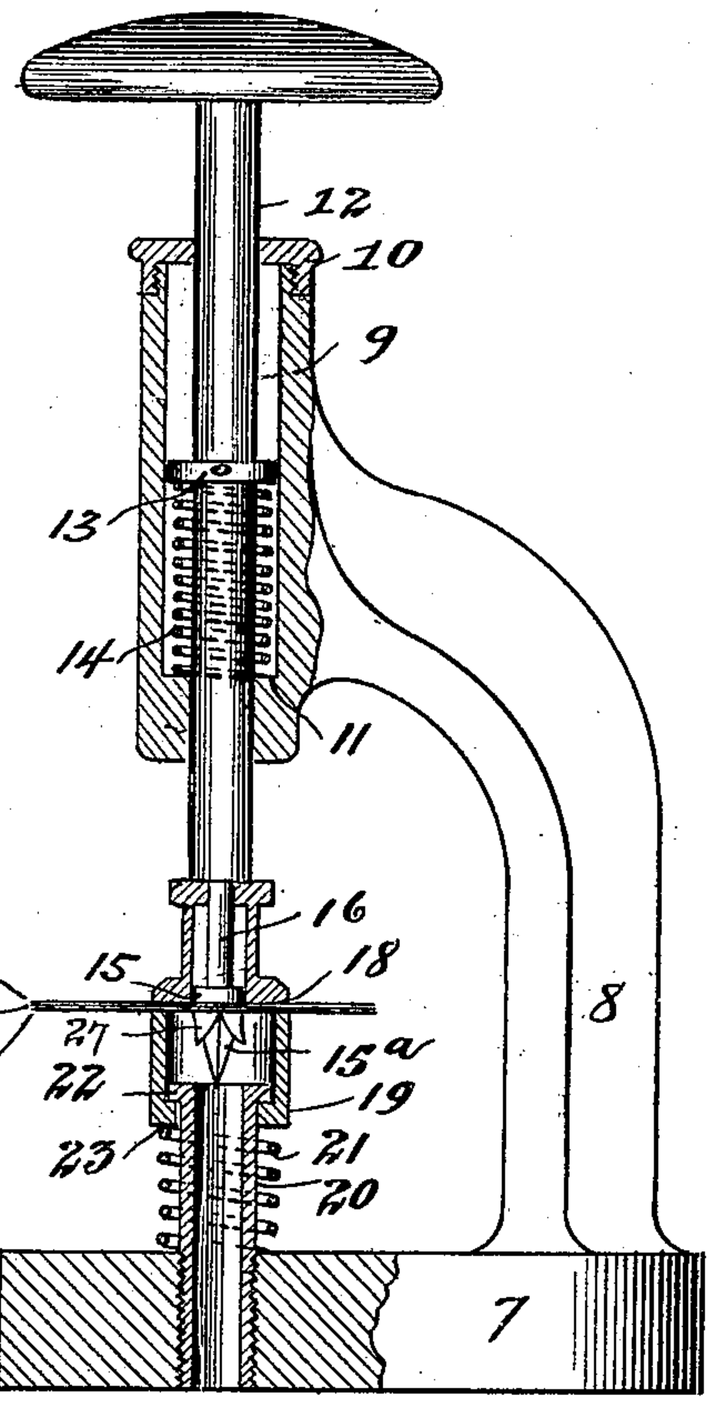

Fig. 4

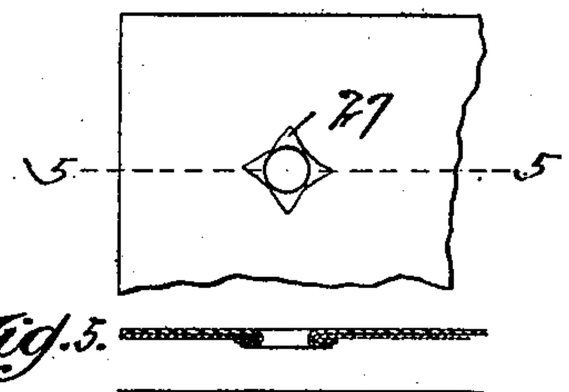

Fig. 5.

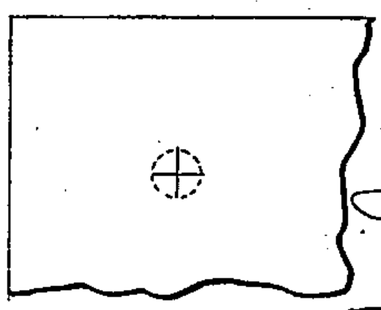

Fig. 6.

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UNITED STATES PATENT OFFICE.

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PERFORATING AND CLENCHING DEVICE.

SPECIFICATION forming part of Letters Patent No. 689,394, dated December 24, 1901.

Application filed January 26, 1901. Serial No. 44,934. (No model.)

To all whom it may concern:

Be it known that I, FRED L. GREGORY, of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Perforating and Clenching Devices, of which the following is a specification.

My invention relates to a device for perforating superposed sheets of thin or fragile material, such as paper, without removing the ruptured portions of the material and for bending back and clenching the ruptured portions, points, or tongues, so as to secure the sheets together.

The invention will find its most useful embodiment and chief application for the purpose of fastening temporarily sheets of paper or other thin fragile sheets together; and the device is so constructed that the perforating and securing is performed by a single continuous operation and without the aid of extraneous devices, such as eylets or other fasteners.

I have shown my invention as embodied in a combined perforating and clenching device adapted to be secured in a fixed position; but the invention may be embodied in a movable device or one which is not stationary and can be made to embody a plunger movement, a lever movement, or any other form and so compacted as to be carried in the pocket.

In the accompanying drawings, Figure 1 is a side elevation, partly in vertical section, of a device embodying my invention and in a form adapted to be secured stationarily to any suitable support or to stand upon a table. Fig. 2 is a similar view showing the movable parts in a different position and in relation to a plurality of superposed sheets of material which have been perforated. Fig. 3 is a broken detail showing the position of the movable parts at a succeeding step—namely, the clenching step—of the operation. Figs. 4, 5, and 6 are views of the superposed sheets, Figs. 4 and 5 being, respectively, a plan and a sectional view of the clench, and Fig. 6 showing the tongues or ruptured portions when pressed back into the plane of the sheets to demonstrate that none of the material is removed.

In the drawings, 7 represents a base; 8, an arm or standard rising therefrom; 9, a hollow head; 10, a cap applied thereto and forming a stop, and 11 a shoulder toward the bottom of said head, forming a second stop.

12 represents a stem or plunger, mounted to reciprocate within the hollow head 9 and having a collar 13 pinned thereon and serving to compress the coiled spring 14, the lower end of which seats upon the shoulder 11.

15 represents a perforator or piercing-die having a stem 16 secured within a socket in the plunger 12, as by means of the pin 17. The piercing-die or perforator may be of any desired formation, but preferably terminates in a conical point, the sides being preferably flattened so as to produce the cutting edges 15^a. Four of these cutting edges will slit the material, as shown in Fig. 6, upon radial lines, producing four tongues or points.

For the purpose of stripping the paper from the die I have shown a movable stripper 18, which in the normal position of the parts abuts against the lower end of the hollow head 9 and rests upon the shoulder of the piercing-die 15. This stripper instead of being made movable may be simply an extension of the hollow head 9; but it serves in the construction shown the further purpose of depressing the yielding platen 19, on which the material rests, the stripper forming, in effect, a shoulder on the plunger, which clamps the sheets between its lower surface and the upper surface of the platen. If the stripper be formed integral with the head, the lower end of the plunger itself is made to clamp the sheets and depress the platen. The movement of the plunger is thus transmitted directly to the platen, and the movement of the platen is not dependent upon the rigidity of the sheets. This platen is mounted concentrically to the female die 20 upon the spring 21, and to prevent the spring from throwing the platen off the outer end of the die 20 is flanged, as shown at 22, and the lower end of the platen is provided with an engaging flange 23. The female die 20 is shown hollow throughout its length. Obviously it need only be chambered corresponding to the distance it is entered by the piercing-die 15.

24 25 26 represent sheets of material, such as paper, thin metal, or the like. To fasten such sheets together, they are superposed and laid upon the platen 19. The plunger is depressed, compressing the spring 14 and mov-

ing the piercing-die and stripper down into contact with the paper. The stripper comes to rest on the topmost sheet, clamping the sheets firmly on the platen, and the piercing-die pierces the sheets, turning down the tongues or points 27, as shown in Fig. 2. The continued movement of the plunger brings the points 27 into contact with the upper end or outturned flange of the female die, whereby they are deflected outwardly and pressed against the under side of the sheets, thus clenching them as the plunger completes its movement. Upon release of pressure the spring 14 returns the plunger, piercing-die, and stripper to their normal positions, as shown in Fig. 1, and the sheets secured together are stripped off from the point of the die as it retracts or recedes within the hollow of the stripper. The platen moves upwardly under the influence of its spring, returning to its normal position.

Among other obvious modifications the piercing-die might be mounted upon one jaw of a pair of levers pivoted together in the same manner as pliers, pincers, and the like are arranged. A plurality of the dies may be mounted side by side to enable the fastening of sheets together by two or more clenches. The stripper may be entirely omitted and the platen and other parts may be of modified construction. Likewise the invention may be embodied in a device having a reversal of the parts—that is to say, the piercing-die might be made stationary and the female or clenching die have relative movement. This and like changes, which are obvious without description or illustration, are within the scope of the invention.

I claim—

1. In a perforating and clenching device, the combination with a male and female die having relative movement, of a perforated yielding platen interposed between the dies and adapted to support superposed sheets, the movable die being of greater area than the aperture of the platen and constructed to clamp the sheets upon the platen and to transmit its movement directly thereto, substantially as described.

2. In a perforating and clenching device the combination with male and female dies having relative movement, of a perforated platen mounted to slide on one of said dies, said platen and said die having overlapping flanges and a spring on which the platen is mounted said spring being adapted to project the platen beyond the acting face of the die, substantially as described.

3. In a perforating and clenching device, the combination with a stand or support, of a piercing-die adapted to reciprocate therein and having a retracting-spring, a clenching-die mounted in the base of said stand or support, and having an outturned or flanged portion and a platen yieldingly supported in a position intermediate the acting faces of said dies and adapted to support superposed sheets of material against the thrust of the piercing-die, whereby said sheets may be perforated, and to yield during the continued movement of the piercing-die to permit the outturned portions of the sheets to be clenched by the clenching-die, substantially as described.

4. In a device of the character described, the combination of a piercing-die and a clenching-die having relative movement, a spring-sustained platen having its supporting-face interposed between said dies, and a stripper into which the piercing-die is retracted, substantially as described.

5. In a device of the character described, the combination of a reciprocating piercing-die having a retracting-spring, a stripper suspended upon and movable with the piercing-die, a clenching-die and a platen arranged concentrically thereto and yieldingly supported, substantially as and for the purpose described.

6. In a device of the character described, the combination with a support having a base, a standard and a hollow head, a reciprocating piercing-die mounted within said hollow head and having a retracting-spring, a stripper having a sliding connection with the piercing-die and having a chamber to receive the same, a clenching-die mounted in the base or support and having a chamber to receive the point of the piercing-die, a movable platen arranged concentrically to the clenching-die and having a spring on which the platen is seated said clenching-die and platen having engaging flanges to prevent their separation, substantially as described.

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