

Feb. 14, 1933.

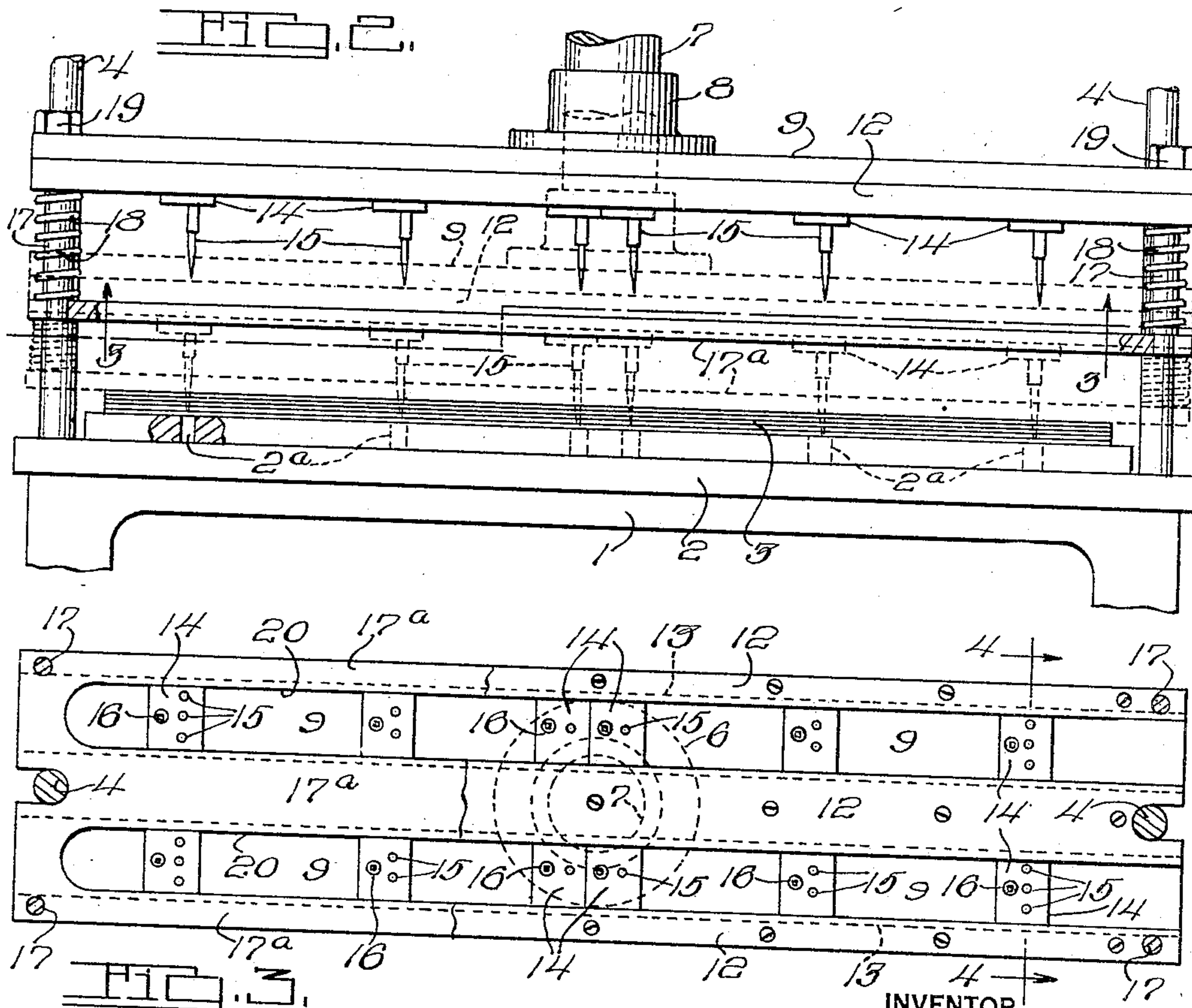
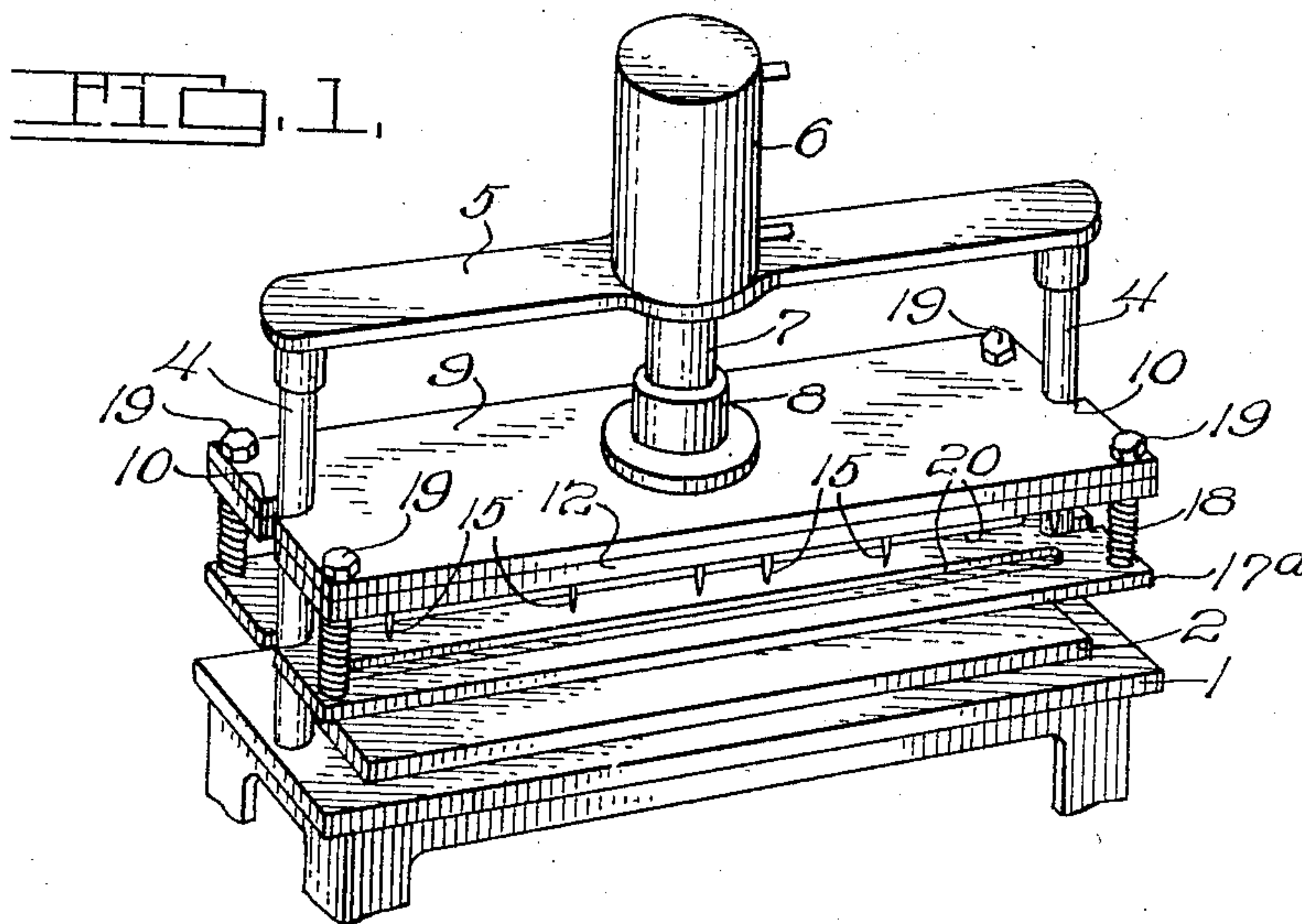
T. MUNRO

1,897,437

PERFORATING DEVICE

Filed June 12, 1929

2 Sheets-Sheet 1



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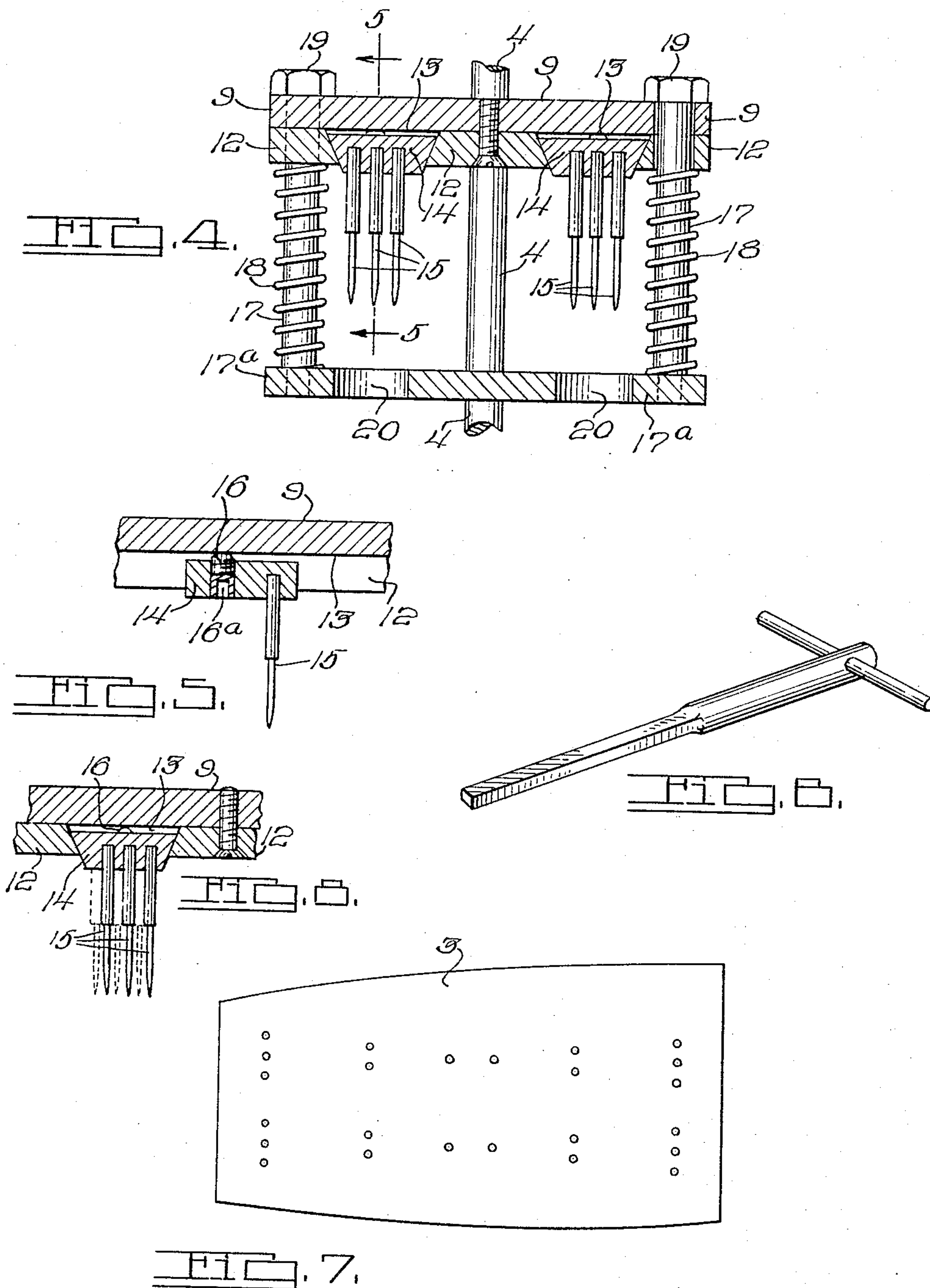
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UNITED STATES PATENT OFFICE

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PERFORATING DEVICE

Application filed June 12, 1929. Serial No. 370,253.

This invention relates to perforating presses, and particularly to presses for simultaneously forming a number of perforations in a pile of superposed sheets of fabric or other thin material.

An object of the invention is to provide a press of the described character, comprising a reciprocatory carrier for perforating elements and a presser member yieldably spaced below said carrier and initially engageable with the work, to compress and hold the same while being perforated, said presser member being suitably apertured for passage of the perforating elements.

Another object is to provide a perforating press having its perforating elements carried by a reciprocatory plate, and adjustable thereon to permit variation of their spaced relation.

These and various other objects the invention attains by the construction hereinafter described and illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of the herein disclosed press, showing the normal raised position of the reciprocatory parts.

Fig. 2 is a view of the press in side elevation, showing the reciprocatory parts, raised and lowered in full and in dash lines respectively.

Fig. 3 is a horizontal sectional view taken upon the line 3—3 of Fig. 2, and primarily showing the adjustable mounting of the perforating elements in a carrier plate.

Fig. 4 is a cross sectional view of the press taken on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary vertical detail taken upon the line 5—5 of Fig. 4 and showing an adjustable support for a group of perforating elements.

Fig. 6 perspective shows a tool for operating a screw, whereby the support shown in Fig. 5 may be clamped in selective positions of sliding adjustment.

Fig. 7 shows in plan a sheet perforated by use of the herein disclosed press.

Fig. 8 is a section taken on line 5—5 of Fig. 4 but showing the adjustable punch block in reversed position.

In these views, the reference character 1

designates a table on which rests a slab or block 2 of wood or other suitable material for supporting a pile of sheets 3 to be perforated. Said block is formed with suitable apertures 2a to receive the ends of the perforating elements during a perforating operation.

Adjacent to the ends of the work-supporting slab 2, a pair of posts 4 are rigidly carried by the table, and their upper extremities are rigidly connected by a bar 5. The bar 5 centrally carries a cylinder 6 for hydraulically actuating a plunger 7, projecting downwardly therefrom. It is to be understood, however, that any suitable means may be provided for reciprocating the plunger 7 under considerable pressure, the particular means shown being merely for the purpose of illustration. The plunger is secured at its lower end by a collar 8 or other suitable means to a plate 9, preferably metallic, reciprocatory above the table 1 and terminally notched as indicated at 10, for guiding engagement with the posts 4. To the under face of the plate 9 there are secured by screws 11 or the like means, three metallic bars 12 which form a pair of parallel dove-tailed slots 13 extending substantially the full length of the press. In each of the slots is slidably fitted a plurality of dove-tailed blocks 14, each carrying one or more perforating elements 15 projecting downwardly a suitable distance. As illustrated, these elements are substantially needle-shaped, adapting them to produce small perforations in the work and if it is desired to form larger perforations, said elements may have the form of punches. Vertically extending through each block 14 is an opening tapped to receive a clamping screw 16 (see Fig. 5), and a suitable socket opening 16a is formed in each of the screws to permit its operation by a small wrench such as Fig. 6 illustrates. Any suitable number of the blocks 14 may be provided, according to the nature of the sheets to be perforated, six being mounted in each slot 13 in the illustrated construction.

The plate 9 at its corner carries four depending bolts 17, to the lower ends of which is secured a presser plate 17a, downwardly spaced from the plate 9. Springs 18 coiled

upon the bolts 17 and under an initial compression normally maintain a maximum spaced relation between the plates 9 and 17a, said bolts being headed, as indicated at 19, above the plate 9 to take the thrust of said springs. The plate 9 is free to slide upon the bolts 17 toward the plate 17a when resistance of the springs 18 is overcome. The plate 17a is formed with a pair of elongated slots 20 registered with the perforating elements 15 for passage of the latter during a perforating operation.

In the use of the described press, a suitable number of the sheets 3 to be pierced are piled one upon another and placed upon the slab 2, and the press is then operated to move the plunger 7 downwardly. The two plates 9 and 17a, with their connecting bolts 17, are actuated by the plunger downwardly as a unit until the plate 17a engages the work. Responsive to continued travel of the plunger, the plate 17a holds the sheets 3 to be perforated firmly in place against the slab 2 while the carrier plate 9 continues to travel downwardly, overcoming the springs 18. Thus the perforating elements 15 pass through the slots 20 of the plate 17a and are then forced through the sheets 3, which in the meantime are maintained in position by the plate 17a.

Upon completion of the perforating operation, the plunger 7 is caused to move upwardly, and as the perforating elements move upwardly with the plate 9, the springs 18 acting through the plate 17a, serve to strip the sheets 3 from the perforating elements. When the upward travel has proceeded sufficiently to bring the heads of the bolts 17 into contact with the plate 9, the perforating elements will have been withdrawn from the work, and the parts 9, 12, 17a, and 18 will complete their upward travel without relative motion.

It is an important advantage of the described construction that the needle-carrying blocks 14 may be variously spaced to permit the press to form the perforations in the work in different selective relations. One use of said press in which this adjustability has proven highly desirable is the perforating of such sheets as are shown in Fig. 7, to guide an operator in applying rows of stitching to covers for vehicle leaf springs, said adjustment permitting the perforations to be arranged to suit different lengths of covering blanks.

Lateral adjustment is provided as follows: It will be noted from an inspection of Fig. 4, that the perforating elements 15 are relatively grouped closer to the outside edge of the blocks 14 than to the inside. By withdrawing the blocks 14 endwise out of the grooves 13 and replacing them in lengthwise reversed position the elements 15 will then, as a group, be positioned closer to the inside

edges of the grooves 13 than to the outside. This is illustrated in Fig. 8 which shows the elements 15 in full in one position of the block 14 and in dotted lines in reversed position of the block 14. By this means the elements 15 may be positioned for operation on three different widths of work, as well as being adjustable along the length of the work.

While it will be apparent that the illustrated embodiment of the invention herein disclosed is well calculated to adequately fulfill the objects and advantages primarily stated, it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claims.

What I claim is:

1. In a device of the type described, in combination, a vertically reciprocable head having a pair of horizontally spaced parallel ways in the lower face thereof, a block slidably received in each of said ways, means for locking said blocks in longitudinally adjusted position in said ways, a piercing element carried by each of said blocks and extending downwardly therefrom, each of said piercing elements being laterally offset from the longitudinal center line of its respective block, and said blocks being endwise reversible in said ways whereby the lateral spacing of said elements may be varied by reversing said blocks in said ways.

2. In a device of the type described, in combination, a reciprocatory head having a transversely extending groove therein, said groove being wider at its bottom than at its open side, a block fitting into said groove and slidable therein longitudinally thereof, a piercing element carried by said block, and means for locking said block against movement in said groove comprising a member threaded in said block and bearing against the bottom of said groove.

3. A perforating press comprising a table, a pair of spaced guide members rising from said table, a vertically reciprocable head having a pair of horizontally spaced parallel ways in the lower face thereof, a block slidably received in each of said ways, a piercing element carried by each of said blocks and extending downwardly therefrom, each of said piercing elements being laterally offset from the longitudinal center line of its respective block and means for locking said block against movement in said groove comprising a member threaded in said block and bearing against the bottom of said groove.

THOMAS MUNRO.