H. C. HINCHCLIFF.

PUNCHING AND SETTING MACHINE.

APPLICATION FILED MAY 3, 1919.

1,437,245. **Patented Nov. 28, 1922.**

2 SHEETS—SHEET 1.

Fig. 1.

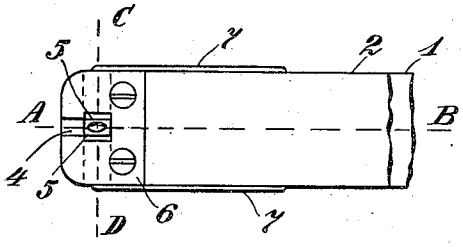


Fig. 6.

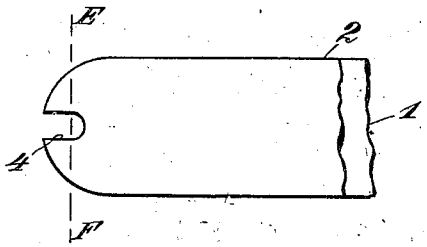


Fig. 2.

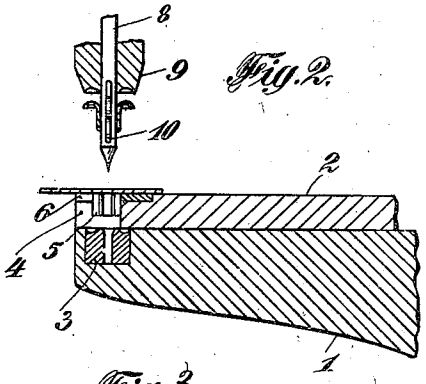


Fig. 5.

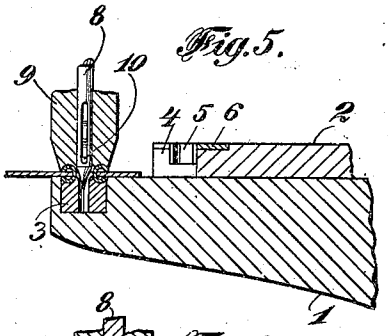


Fig. 3.

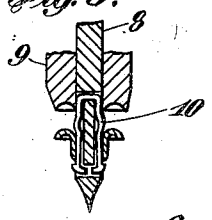


Fig. 7.

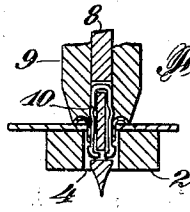


Fig. 4.

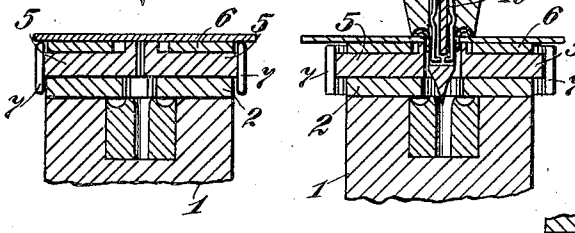


Fig. 12.

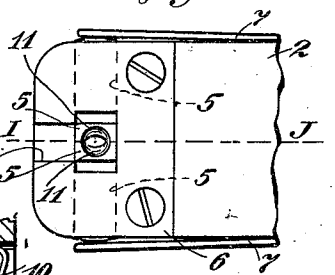


Fig. 8.

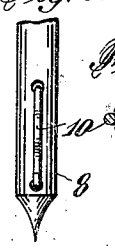


Fig. 9.

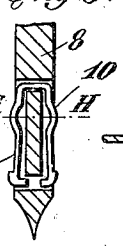


Fig. 10.



Fig. 11.

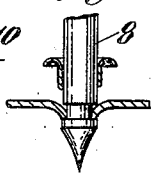
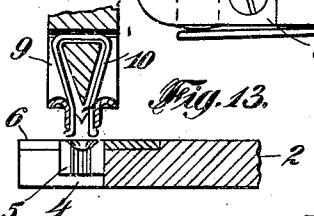


Fig. 13.



INVENTOR

Henry C. Hinchcliff

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PUNCHING AND SETTING MACHINE.

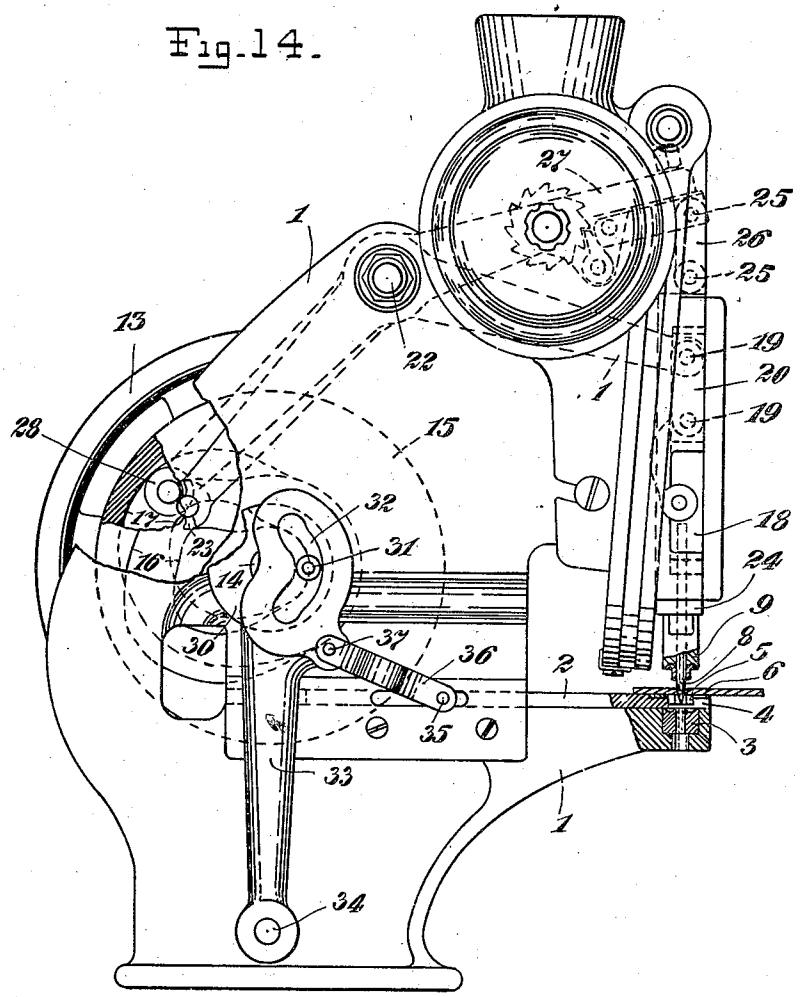
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2 SHEETS—SHEET 2.

Fig. 14.



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Patented Nov. 28, 1922. 1,437,245

UNITED STATES PATENT OFFICE.

HENRY C. HINCHCLIFF, OF BROOKLYN, NEW YORK.

PUNCHING AND SETTING MACHINE.

Application filed May 3, 1919. Serial No. 294,421.

To all whom it may concern:

Be it known that I, HENRY C. HINCHCLIFF, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings and State of New York, have invented new and useful Improvements in Punching and Setting Machines, of which the following is a specification.

My invention relates to improvements in punching and setting machines and consists in an improved construction and arrangement adapted particularly for piercing material for the insertion and setting therein of eyelets, rivets, and like articles.

A particularly valuable advantage attained by my present improvements consists in the adaptability of my mechanism to the piercing of fabrics, soft leather or like yielding material, where it is desirable to retain the full strength of the material and to avoid cutting or damaging the fibre thereof.

My improvements may desirably be embodied in the class of punching and eyeleting machines described in prior Patent #1,120,939, dated December 15th, 1914, wherein the punch and set are arranged permanently to be in axial alinement and in which a support is moved beneath the punch and set to insert an eyelet in the material, the actuating members in my improved machine being substantially the same.

Important features of my invention comprise means for piercing the material with a pointed punch, means for supporting the material while being pierced, and means for retaining the eyelet to the punch until the setting of the same in the material is completed.

The described and other features of my invention are illustrated in the accompanying drawings wherein like reference characters are applied to the corresponding parts in the several views.

Fig. 1— is a plan of a slidable plate, provided with supporting jaws for the material.

Fig. 2— is a sectional view of the same, and also of the punch and set on the line A—B of Fig. 1 showing an eyelet impaled on the punch, the set positioned for the eyelet retaining means to retain an eyelet and the material placed above the supporting members ready for piercing.

Fig. 3— is a cross sectional view of the same on the line C—D of Fig. 1.

Fig. 4— is a cross sectional view on the line C—D of Fig. 1 showing the material pierced and the eyelet pushed through the pierced material with the material supporting jaws open.

Fig. 5 is a sectional view on the line A—B of Fig. 1 showing the slidable plate and material supporting jaws moved out of alinement with the punch and set, and the punch and set brought down with the eyelet clinched into the material.

Fig. 6— is a plan view of a simple support for the material, provided with a clearance recess for the punch.

Fig. 7— is a cross sectional view of the same on the line E—F of Fig. 6 showing the material pierced and an eyelet impaled and pushed through the material.

Fig. 8— is an enlarged view of the piercing punch and the eyelet retainer.

Fig. 9— is a vertical sectional view of the same taken at a right angle.

Fig. 10— is a sectional view of Fig. 9, on the line G—H.

Fig. 11— shows an improved form of punch designed for piercing material.

Fig. 12— is a plan of a slidable plate provided with material supporting jaws adapted to co-act with an eyelet to pierce the material.

Fig. 13— is a sectional view of the same and also of a set on the line I—J of Fig. 12.

Fig. 14— is a side elevation of a complete machine, showing means for operating the several members: some parts being shown broken away, and some in section.

The operating parts of these improvements are mounted upon a supporting frame (1) upon which is slidably mounted the plate (2). The frame (1) is recessed to receive the anvil (3) and the plate (2) is provided with a clearance recess (4) and channeled to receive the slidable support jaws (5, 5) which are retained in their channel by the cover (6). Leaf springs (7, 7) fastened to the plate (2) compress the support jaws (5, 5) together. The supporting jaws (5, 5) are shaped on their abutting ends to conform to the shape of the punch (8), which is slidably located within the set (9). The punch (8) is formed to receive an expanding spring (10) which is provided with lips adapted to retain an eyelet on the punch when in expanded position and release it when compressed.

Referring now to Fig. 14, wherein there is

illustrated means for actuating the described members in their operations as follows: Motion may be imparted to the pulley 13, which is adapted to engage with and rotate the shaft 14, upon which is secured the disk 15, which is grooved on its sides with the cam tracks 16, and 17.

The punch 8, is secured to the punch-plunger 18, which is connected by the studs 19 and the connecting link 20, to the lever 21.

The lever 21 is pivotally mounted at 22 upon the frame 1, and is provided at one end with a roller 23, which engages with the cam track 16, formed in the disk 15, which when rotated imparts the afore described movements to the punch 8.

The set 9 is secured to the set-plunger 24 which is connected by the studs 25 and the links 26 to the lever 27.

The lever 27 is also pivotally mounted at 22 upon the frame 1, and is provided at one end with a roller 28 which engages with the cam track 17, formed in the disc 15, which when rotated imparts the afore described movements to the set 9.

Upon the shaft 14 is secured a disk 30 having a crank stud 31, which engages with a cam slot 32 formed in an arm 33 which may be pivotally mounted upon a stud 34 erected on the frame 1.

Upon the slide 2 is erected the stud 35, which engages a link 36 connected to the arm 33 by a stud 37. Thus when the disk 30 with the crank stud 31 is rotated, the crank stud 31 moving in the cam slot 32 is adapted to rock the arm 33, and by means of its connecting link move the slide 2 with the supporting jaws 5 to or from beneath the material being operated upon.

The operation of the described mechanism in piercing a hole in the material and setting an eyelet, or like article therein is as follows:

The material supporting jaws (5, 5) being in alinement with the punch (8) and set (9) the material is placed thereover, an eyelet is impaled on the punch (8) and with the punch and set (9) positioned relative as shown in Fig. 2 the punch operates to pierce the material and the set then further descends to push the eyelet through the material into the position shown in Fig. 4.

The punch (8) and set (9) are now elevated sufficiently to remove any pressure on the eyelet and the material and the plate (2) with the supporting jaws (5, 5) is withdrawn from under the material, the jaws (5, 5) yielding from the eyelet, thus bringing the anvil (3) into co-acting relation with the punch (8) and set (9) which are now brought down respectively to guide and set the eyelet to the material as shown in Fig. 5.

The retaining spring (10) in this position is compressed by the set (9) thus freeing the eyelet from the punch (8) and the punch and set are elevated in this relative position from the material, thus completeing the operation.

It will be noticed that the jaws (5, 5) are so formed as to support the material at the entrance of the point of the punch and by yielding laterally continue such support throughout the operation of piercing the material.

A form of punch particularly adapted to pierce material is shown in Fig. 11. A further advantage of this form of punch is that in piercing material over a simple supporting member as shown in Fig. 6, the material is apt to wedge and remain therein unless the punch is grooved as shown, the groove acting to free the material from the supporting plate 6.

While I have shown and described an approved embodiment of the features of my present invention, it will be understood that many modifications of the various features thereof may be made without departing from the scope of my invention. For instance, as will be understood, the piercing of the material may be effected by the eyelet being forced therethrough without the use of the punch, a modification of this character is shown in Fig. 13 wherein as shown it is arranged that the piercing of the material is done by forcing the eyelet therethrough which might be successfully used on certain classes of material. In so operating the yielding jaws (5, 5) will cooperate with the eyelet and are suitably formed with inclined abutting faces (11, 11) so that the engagement therewith of the eyelet will cause the jaws to yield in the manner heretofore described.

It is therefore intended that all matters herein contained shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim is:

1. A machine of the character described, comprising piercing means, a set, an anvil, divided supporting means arranged to move transversely in opposite directions to the line of movement of the piercing means and adapted to cooperate with the piercing means to pierce the material above the anvil, and means for moving the supporting means out of alignment with the piercing means.

2. In a punching and setting machine, a punch and a tubular set arranged to be in permanent alinement, and adapted to cooperate independently with a laterally shiftable dividing support for the material in piercing the material and inserting an eyelet therein, and an anvil permanently arranged in alinement with the said punch and set and adapted to co-operate therewith in clinching an eyelet in the material, substantially as described.

3. A machine of the character described having a piercing or needle punch operative

to pierce the material, a set, and divided supporting means arranged to be separable transversely in opposite directions and shiftable laterally in a fixed horizontal plane.

4. A machine of the character described comprising means operative to force an eyelet through the material, a set, an anvil, divided supporting means for the material arranged to yield transversely in opposite directions to the line of movement of the eyelet, and means for shifting the supporting means laterally.

5. A machine of the character described comprising an upper set operative to force an eyelet through the material, a lower set, and divided supporting means for the material arranged to move transversely in opposite directions to the line of movement of the eyelet and shiftable laterally.

6. In a punching and setting machine, an upper set and a punch arranged to be in permanent alignment, a lower set, and dividing supporting means for the material while it is being pierced and an eyelet forced therein and means operative to withdraw laterally said supporting means after the eyelet is forced therethrough.

7. In a machine of the character described, a piercing punch provided with an annular groove adapted to retain the material pierced and a support for the material arranged to be withdrawn laterally after the material is pierced and an eyelet forced therethrough.

8. A machine of the character described comprising setting tools and a piercing punch arranged in permanent alignment, a support for the material, and means for withdrawing said support laterally after the material is pierced and an eyelet is forced therethrough.

9. A machine of the character described comprising setting tools and a piercing punch arranged in permanent alignment, a support for the material adapted to divide transversely to the line of movement of the piercing punch, and means for moving said support laterally after the material is pierced.

10. A machine of the character described, setting tools, means operative to force an eyelet through the material, a support for the material adapted to divide transversely to the line of movement of the eyelet when it is forced therein, and means for moving said support laterally thereafter in a fixed horizontal plane.

11. A machine of the character described, tubular setting tools adapted to receive a piercing punch, a support for the material and means for withdrawing said support laterally after the material is pierced and an eyelet is forced therethrough.

12. A machine of the character described, comprising a piercing punch and tubular setting tools adapted to receive said punch all arranged in permanent alignment, a divided support for the material arranged to separate in opposite directions on its operative plane when the material is pierced and an eyelet is forced therein, and means for shifting the said support laterally.

13. In a punching and setting machine the combination of a punch and set arranged permanently to be in alinement, a support for the material while being pierced, said support being arranged to be moved into and out of alinement with said punch and set during the eyelet clinching operation, said punch being adapted to thread an eyelet previous to the clinching operation, and means operative to retain the eyelet to the said punch during the work piercing operation.

14. A machine of the character described, comprising a piercing punch and tubular setting tools adapted to receive said punch all arranged in permanent alignment, a divided support for the material arranged to separate in opposite directions on its operative plane when the material is pierced and an eyelet is forced therein and means for withdrawing laterally said support after the material is pierced and an eyelet is forced thereinto.

15. In a machine of the character described, tubular setting tools, a divided support for the material arranged to separate transversely in opposite directions while an eyelet is being inserted therein, and means for withdrawing the said support laterally after the eyelet is inserted in the material said separating and withdrawing movements being in a fixed horizontal plane.

16. In a machine of the character described, setting tools, a punch and an anvil arranged permanently to be in axial alignment, a dividing support for the material adapted to co-operate with the punch to pierce the material and means for shifting said support from alignment with the punch.

In witness whereof I have signed my name to the foregoing.

Dated: May 2, 1919.

HENRY C. HINCHCLIFF.

Witness:

C. L. BACKER,