

No. 706,279.

H. S. TEMPLE.  
PUNCH.

Patented Aug. 5, 1902.

(Application filed Dec. 20, 1901.)

(No Model.)

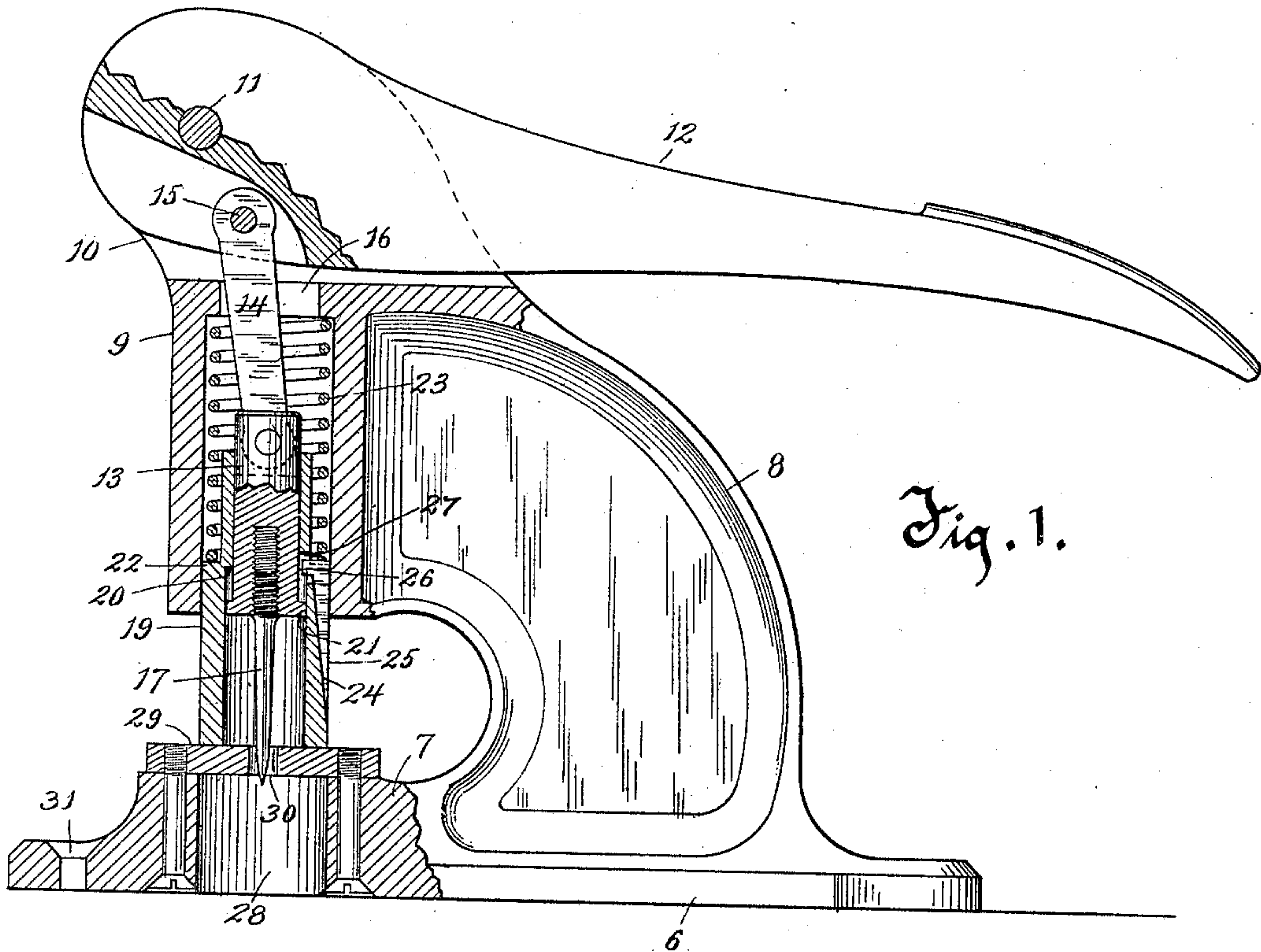


Fig. 1.

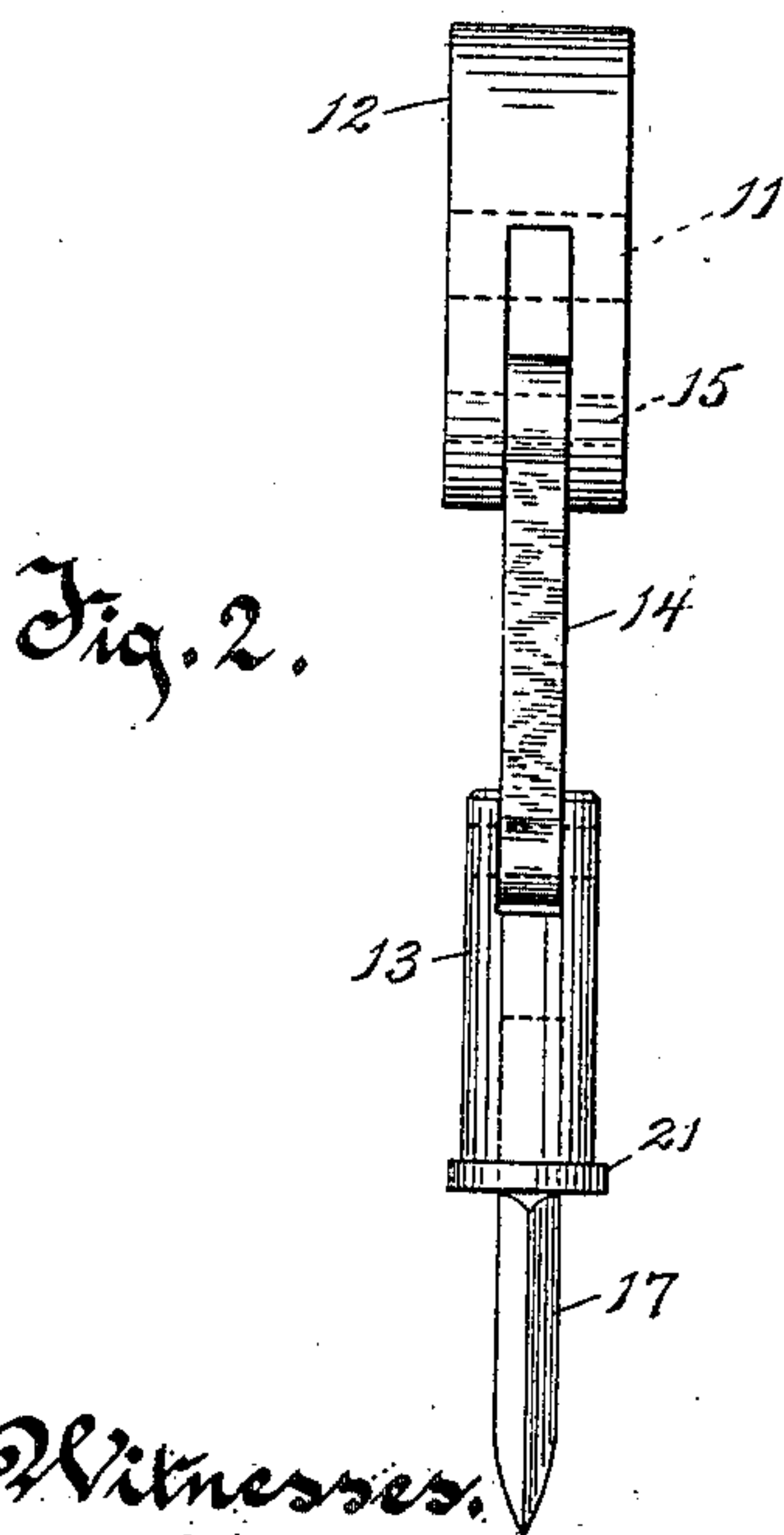


Fig. 2.

Fig. 3.

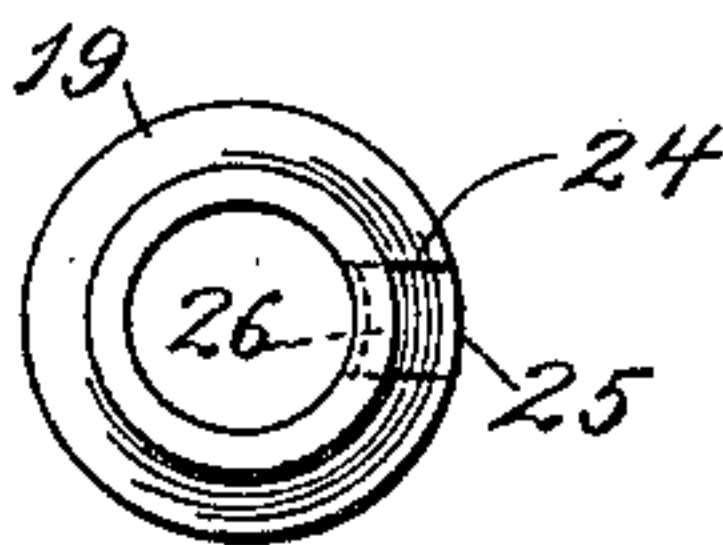


Fig. 4.

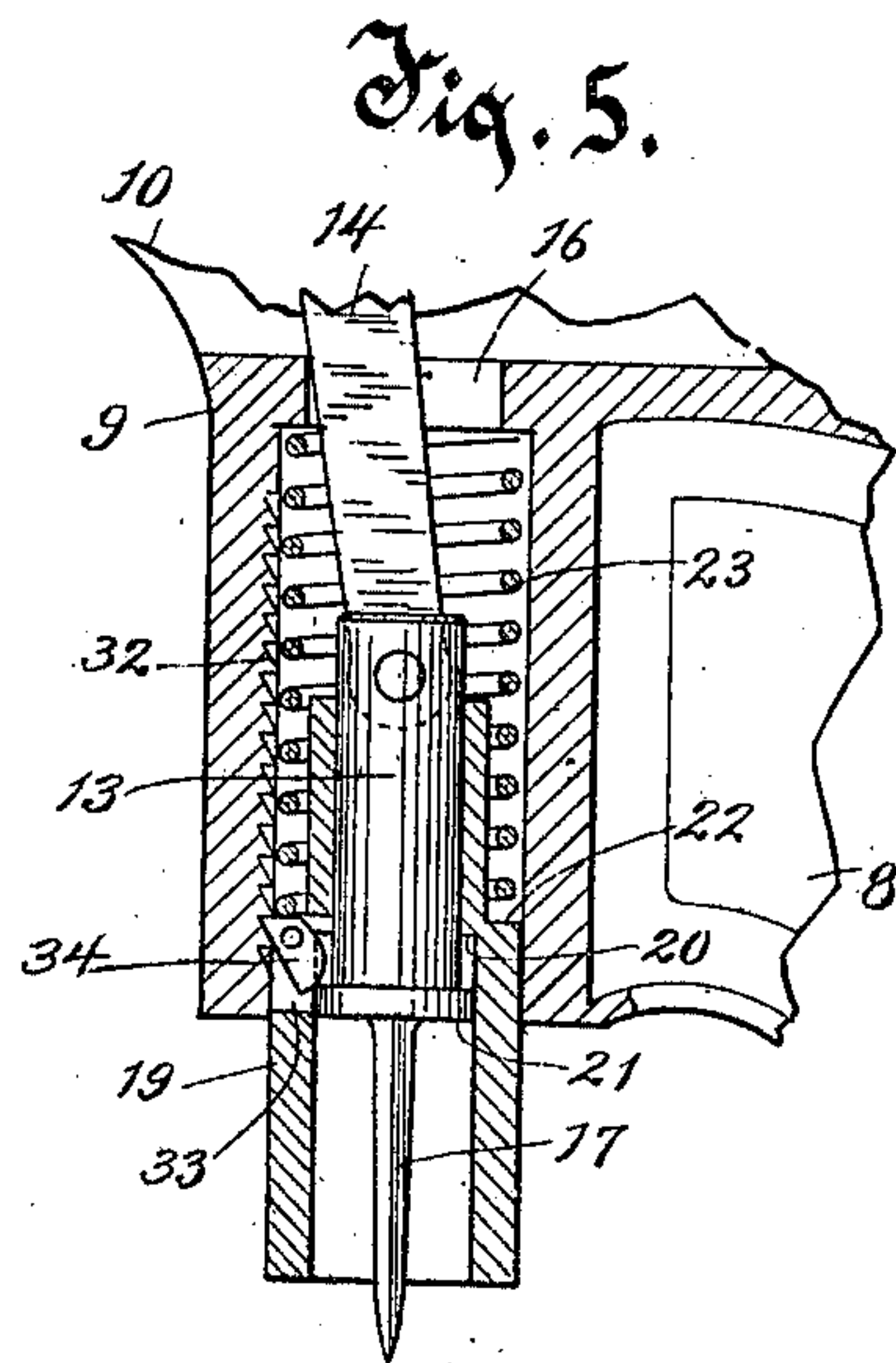
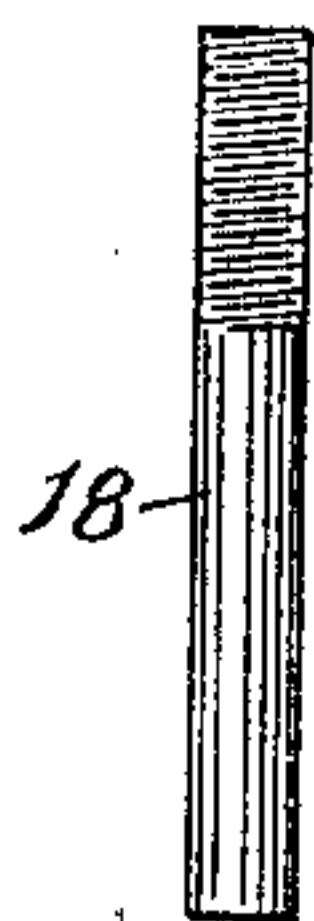


Fig. 5.

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# UNITED STATES PATENT OFFICE.

HENRY S. TEMPLE, OF MILWAUKEE, WISCONSIN.

## PUNCH.

SPECIFICATION forming part of Letters Patent No. 706,279, dated August 5, 1902.

Application filed December 20, 1901. Serial No. 86,683. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY S. TEMPLE, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Punches, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in punches, more especially intended, although not necessarily, for punching holes through paper.

One of the primary objects of the invention is to provide an improved construction whereby the maximum leverage or power is secured and the punch thereby adapted for punching holes through a considerable number of sheets or thicknesses of paper or other material to be punched.

A further object is the provision of means for compelling the punch to be withdrawn out of the punched holes before pressure on the paper or other material is removed, thereby providing for firmly holding down the paper during the operation of withdrawing the punch.

With the above and other incidental objects in view the invention consists of the devices and parts or their equivalents, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a side elevation of a punch embodying my improvements, parts being broken away and in section. Fig. 2 is a front edge view of Fig. 1 with the plunger-chamber, coiled spring, and plunger removed. Fig. 3 is a plan view looking down on the upper end of the plunger. Fig. 4 is a detail view of a form of punch adapted for punching round holes, and Fig. 5 is a sectional fragmentary view of a modified form of construction.

Referring to the drawings, the numeral 6 indicates the base of the punch, said base provided with a projecting arm 7. Extending upwardly from the base is the usual curved standard 8, which extends forwardly to form an upper arm 9. The said arm 9 is provided with an upper bifurcated projection 10, and between the furcate parts of this projection is pivoted, on a pivot-bolt 11, a hand-lever 12. The arm is provided longitudinally with a

chamber, and within this chamber is adapted to work a punch-carrier 13. A link 14 is pivotally connected at its lower end to the punch-carrier, and its upper end is pivotally connected to the lever by means of a pivot-bolt 15, an opening 16 being provided in the upper end of the arm 9 to permit the link to extend upwardly, so as to engage the lever. This pivot-bolt 15 when the lever is down to its full extent, as shown in Fig. 1, is slightly to one side of a line carried downwardly from the pivot-bolt 11.

The punch may be of any desired shape to suit the character of the holes to be punched.

In Figs. 1, 2, and 5 I show a punch 17 of an ordinary form of construction, having its lower end tapered or pointed.

In Fig. 4 I show a punch 18 of cylindrical form, adapted for punching round holes.

The punch may be connected to the carrier in any desired manner, although I prefer to connect the same in the manner shown in the drawings—viz., by threading the upper end of the punch and causing said threaded end to engage a threaded socket extending upwardly from the lower end of the carrier.

The numeral 19 indicates a tubular plunger which fits and is adapted to be moved vertically in the chamber of the arm 9. The upper portion of the bore of the plunger is reduced in diameter to form an interior shoulder 20. The punch-carrier is fitted in the plunger, and the diameter of said carrier is sufficient to fill the contracted portion of the bore of the plunger, the fit, however, being loose enough to permit of movement of the carrier in the plunger. At the lower end of the carrier is formed a shoulder 21, which fits against the greatest diameter of the bore of the plunger. From its upper end downwardly for a desired distance the exterior surface of the plunger is reduced in diameter to form an exterior shoulder 22. A coiled spring 23 is arranged within the chamber of the arm 9, and the upper end of this spring bears against the upper end of said chamber, and the lower portion of the spring surrounds the upper reduced portion of the plunger, the end of said spring bearing against the shoulder 22. At one side of the enlarged diameter of the plunger and extending longitudinally thereof is a tapered or wedge-shaped key-seat 24. A ta-



pered or wedge-shaped key 25 fits in this seat, and the upper end of said key is provided with a lug 26, which extends inwardly through a slot 27 in the plunger and into the bore of said plunger for a slight distance.

The lower arm 7 of the punch is provided with a chamber 28. The top 29 of this chamber is formed with a small opening 30, through which the punch is adapted to pass when said punch is forced downwardly.

In the use of my invention the base-piece of course is placed upon a suitable support and is preferably screwed thereto by means of screws passed through openings 31, provided therefor in the base, said screws being turned into the supporting medium. In the adjustment of the device shown in Fig. 1 the plunger and punch are shown as having been forced down to the full extent permitted, this being the position the parts assume at the completion of the punching operation. It will be supposed that it is desired to punch openings through a number of sheets of paper or other material. The first operation is to grasp the free end of the lever and push the same upwardly. This operation will cause the carrier and the punch to move upwardly in the chamber of the arm 9, and after the slight initial independent movement of the carrier the plunger is also carried upwardly, the reduced upper ends of the carrier and plunger when the parts are raised to their full limit extending through the opening 16 and the extremity of the carrier abutting against the end of the lever. On this action of the lever the spring 23 is of course compressed. The sheets of paper or other materials to be punched are now placed on the top piece 29. The lever 12 is next brought downwardly, and as the compression of the spring is thereby gradually lessened the spring expands and causes the plunger to move downwardly, the action of the link 14 at the same time causing a simultaneous down movement of the punch-carrier. The two parts referred to thus move together until the lower end of the plunger comes in contact with the paper or material to be punched. This will of course prevent further down movement of the plunger. With the continued down movement of the lever after the plunger thus comes to rest the punch-carrier will move downwardly independently thereof, and thereby cause the punch to be forced through the paper, the end of the punch on this final stroke passing into and through the opening 30. This opening also permits the punched pieces of paper to pass into the chamber 28. It will be evident that as the punch-carrier is moved downwardly in the manner described the pivot-pin 15 is brought nearer and nearer to a direct vertical line beneath the pivot 11 of the lever, and hence the leverage is thereby gradually increased, the leverage being the greatest when the pivot 15 gets nearest to a vertical line beneath the pivot 11 and which occurs when the punch is passing through the

paper or other material to be punched, whereby the greatest leverage is obtained at the time it is most desired, and this with the necessity of but a minimum of force being necessary to be applied to the lever.

Another important feature of my invention is the provision for holding the paper firmly during the time the punch is being withdrawn, my special means contemplating the retention of the pressure of the plunger on the paper until the punch is withdrawn, and after this permitting said plunger to rise. This operation takes place when the lever is uplifted. The first up movement of the lever causes the punch-carrier to be moved upwardly and withdraw the punch from the paper. This withdrawal of the punch from the paper necessarily causes the paper to press upwardly against the lower end of the plunger, and this pressure against the plunger causes the same to firmly wedge against the key 25, and thereby lock the plunger in its lowered position while the punch is being withdrawn. It is therefore evident that during the time the punch is being pulled out of the punched holes the plunger cannot be moved upwardly, and consequently the carrier moves upwardly independently thereof until the shoulder 21 of the carrier strikes the lug 26 of the wedge-shaped key. When this occurs, the key is raised slightly or to the extent permitted by contact of the upper end of said key with the upper end of the slot 27. This up movement of the key unlocks the plunger from the wall of the chamber of the arm 9. With the continued up movement of the carrier and by reason of the engagement of the shoulder 21 thereof with the lug 26 of the key and with the inner shoulder 20 of the plunger the parts referred to are lifted upwardly in the plunger-chamber to the limit permitted, and the punch is now ready for a repetition of the operation described.

In Fig. 5 of the drawings I show a modified form of construction, wherein the tapered wedge key and its seat are omitted and other mechanism employed in lieu thereof. Referring to this mechanism, the numeral 32 indicates a series of ratchet-teeth which are arranged longitudinally of the chamber of the arm 9. The plunger (indicated in this view by the numeral 19') is provided with an opening 33, in which is pivoted a dog 34, the outer end of said dog adapted to engage with the teeth 32. In the operation of this form of the device, when the lever is turned downwardly the plunger and carrier move downwardly together, the shoulder 20 of the plunger being in engagement with the shoulder 21 of the carrier. When, however, the plunger reaches the paper and further movement thereof is stopped, the carrier starts on its independent down movement in order to force the punch through the paper, and by reason of this independent movement the shoulder 21 of the carrier is brought below the dog 34 to the position shown in Fig. 5, this occurring immedi-



ately upon the commencement of the punching operation, and at this time the spring 23 acts on the dog and causes the same to engage the ratchet-teeth 32. Now on the succeeding uplifting of the lever the shoulder 21 acts against the cam edge of the dog, and by the time the carrier is moved upwardly sufficiently far to bring the shoulder 21 thereof into engagement with the shoulder 20 of the plunger the dog will have been turned fully out of engagement and out of line with the teeth and held in this position by the pressure of the shoulder 21 on the cam edge of the dog, so that with the continued uplifting of the lever the carrier and plunger will be moved together. This throwing of the dog out of engagement with the teeth, however, does not occur until the punch is withdrawn from the paper, so that during the operation of withdrawing said punch the plunger is held down, and the paper thereby prevented from being pulled upwardly during said operation of withdrawing the punch.

While my invention is more especially intended for punching holes through paper, yet I do not wish to be understood as restricting myself to that particular adaptation, inasmuch as the mechanism could be employed for making apertures through sheets or plates of various materials or by modification in the punch can be employed for the purpose of cutting out shapes from sheets or plates.

What I claim as my invention is—

1. The combination of a base having a standard projecting therefrom, and a chambered arm extending from the standard, a lever pivoted to the standard, a tubular spring-pressed plunger movable in the chamber of the arm, the spring-pressure being exerted in a direction to force the plunger outwardly from the chamber, a punch-carrier fitting movably in the bore of the plunger, a connection between the carrier and the lever, whereby when the lever is operated the carrier is moved either toward or from the material to be punched, in accordance with the direction of the turning of the lever, a supporting medium for the material to be punched, said supporting medium located beyond, and in line with, the chambered arm, and provided with an opening therethrough for the passage of the punch, means for causing the plunger and carrier to move outwardly together for a certain distance, and for causing the carrier and its punch to move outwardly after the plunger comes in contact with the material to be punched, to thereby force the punch through said material, means for holding the plunger in contact with the punched material during the withdrawal of the punch, and means, after the withdrawal of the punch, for causing the carrier and plunger to move together away from said punched material.

2. The combination of a base having a standard projecting therefrom, and a chambered arm extending from the standard, a lever piv-

oted to the standard, a spring-pressed tubular plunger movable in the chamber of the arm, the spring-pressure being exerted in a direction to force the plunger outwardly from the chamber, and said plunger provided longitudinally with a key-seat, one end of said key-seat leading to a slot extending through the plunger into the bore thereof, a key fitting said seat and bearing against the wall of the chambered arm, said key having one end provided with a lug projecting through the slot and into the bore of the plunger, a punch-carrier fitting movably in the bore of the plunger and provided with a shoulder adapted, at certain periods of the movement, to make contact with the lug of the key, a connection between the carrier and the lever, whereby when the lever is operated the carrier is moved toward or from the material to be punched, in accordance with the direction of turning of the lever, and a supporting medium for the material to be punched, said medium provided with an opening through which the punch is adapted to pass.

3. The combination of a base having a standard projecting therefrom, and a chambered arm extending from the standard, a lever pivoted to the standard, a spring-pressed tubular plunger movable in the chamber of the arm, the spring-pressure being exerted in a direction to force the plunger outwardly from the chamber, and said plunger provided within its bore with a shoulder, and also provided longitudinally with a key-seat, one end of said key-seat leading to a slot extending through the plunger into the bore thereof, a key fitting said seat and bearing against the wall of the chambered arm, said key having one end provided with a lug projecting through the slot and into the bore of the plunger, a punch-carrier fitting movably in the bore of the plunger and provided with a shoulder adapted, at certain periods of the movement, to make contact with the lug of the key and also with the interior shoulder of the plunger, a connection between the carrier and the lever, whereby when the lever is operated the carrier is moved toward or from the material to be punched, in accordance with the direction of turning of the lever, and a supporting medium for the material to be punched, said supporting medium provided with an opening through which the punch is adapted to pass.

4. The combination of a base having a standard projecting therefrom, and a chambered arm extending from the standard, a lever pivoted to the standard, a spring-pressed tubular plunger movable in the chamber of the arm, the spring-pressure being exerted in a direction to force the plunger outwardly from the chamber, a wedge-key adapted to be wedged in between the plunger and the inner wall of the chambered arm, when the plunger engages the material to be punched, a punch-carrier fitting movably in the bore of the plun-



ger and adapted, at certain periods of the movement, to release said key from wedging engagement, a connection between the carrier and the lever, whereby when the lever is  
5 operated the carrier is moved toward or from the material to be punched, in accordance with the direction of turning of the lever, and a supporting medium for the material to be punched, said supporting medium provided

with an opening through which the punch is adapted to pass.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY S. TEMPLE.

Witnesses:

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A. L. MORSELL.