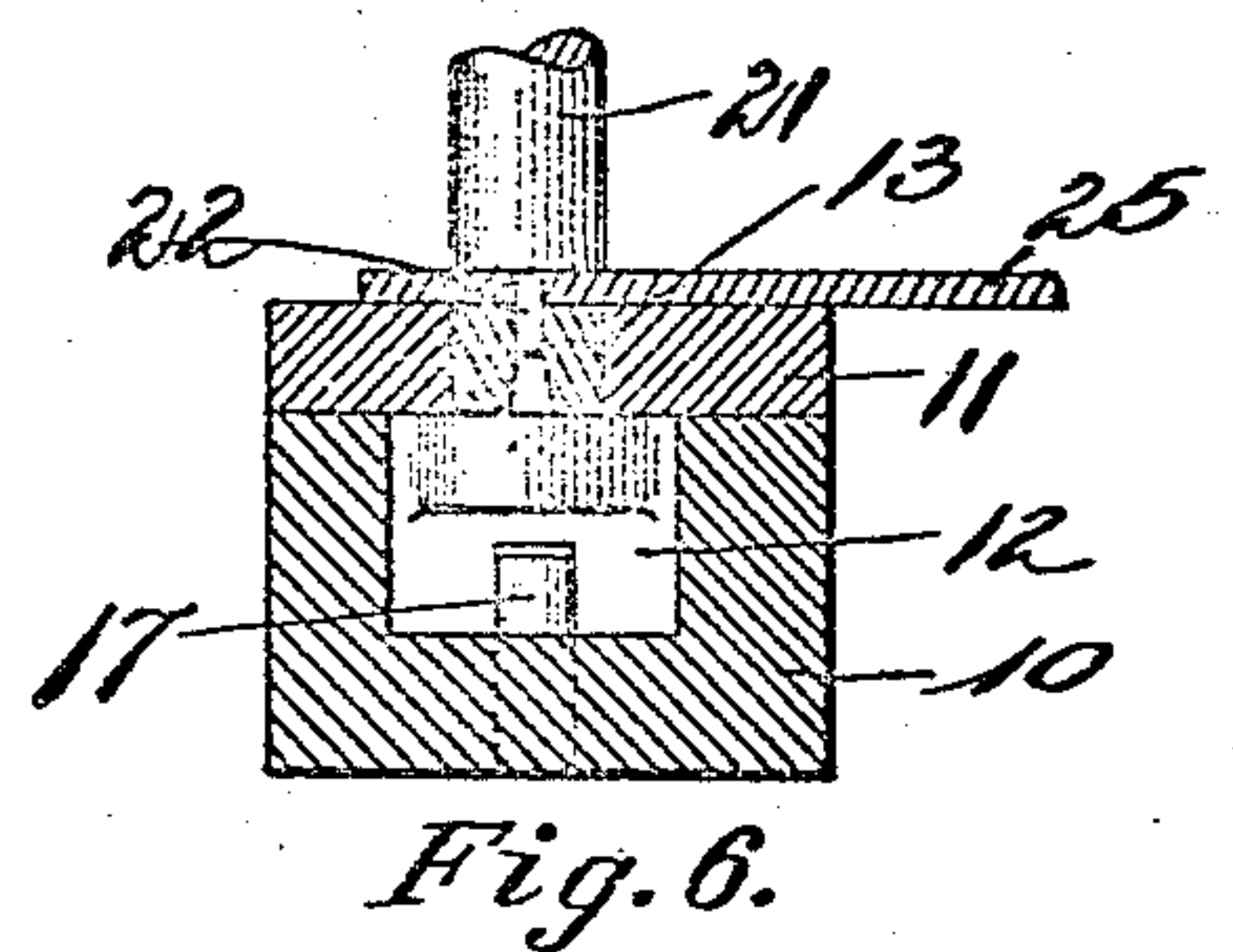
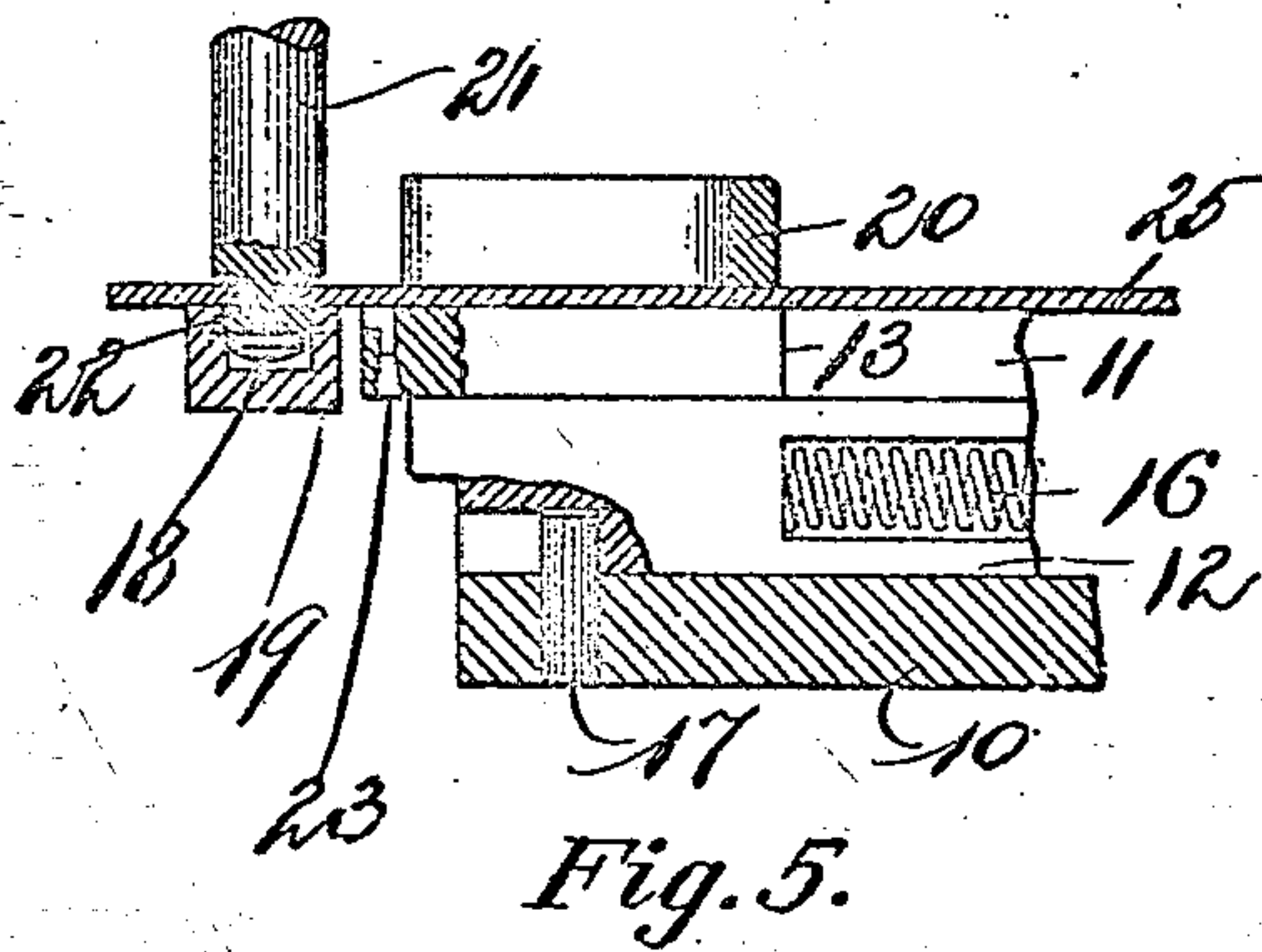
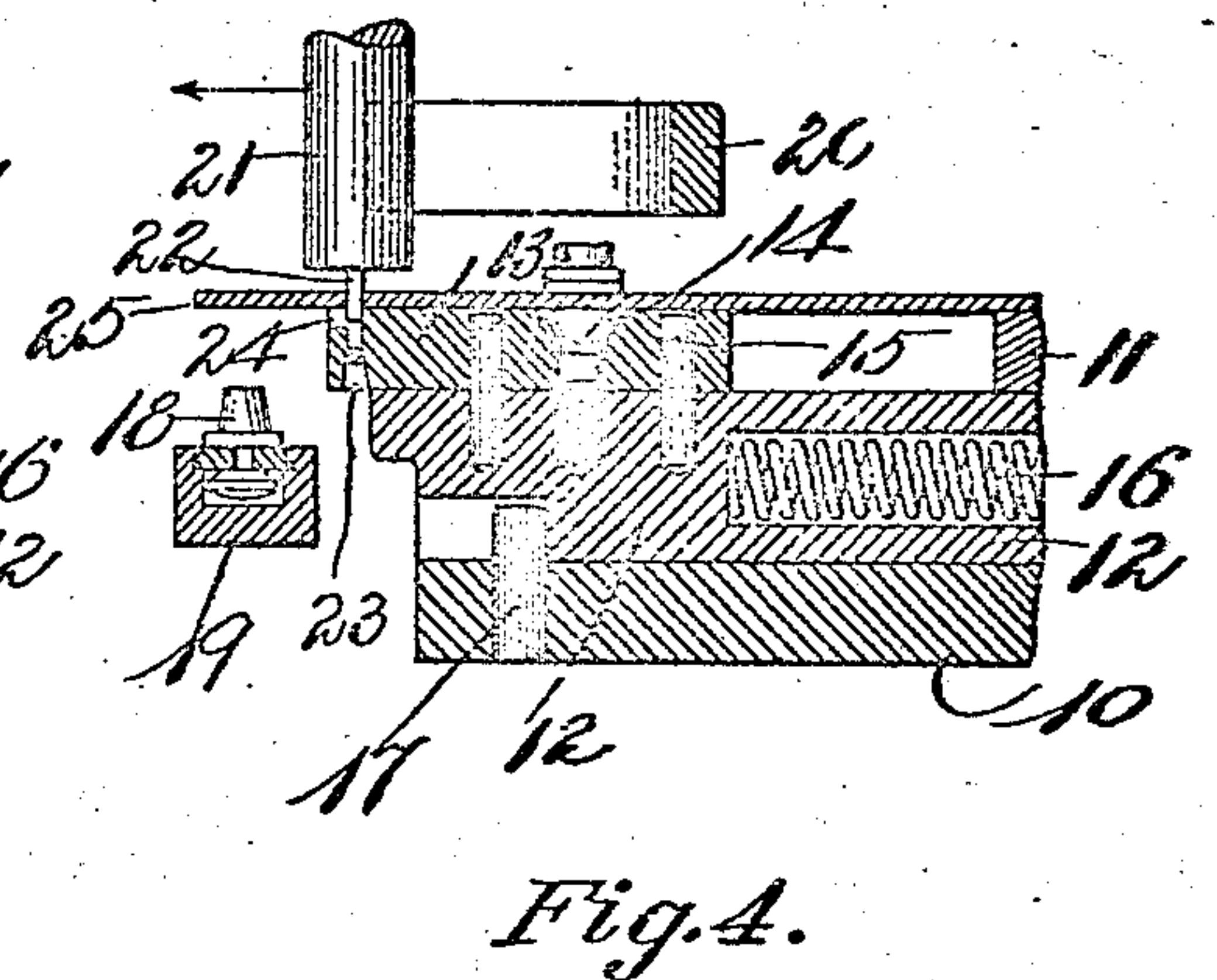
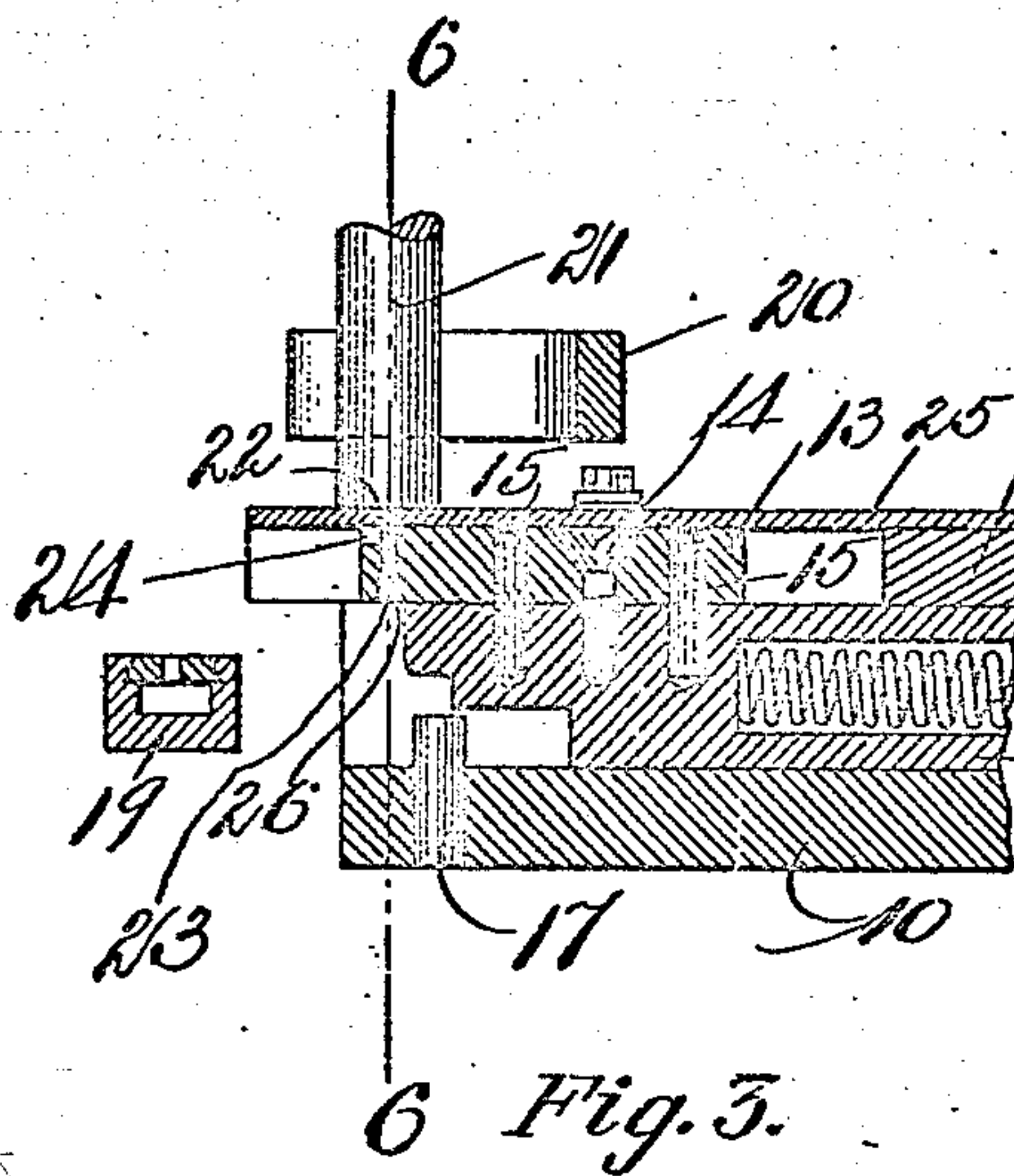
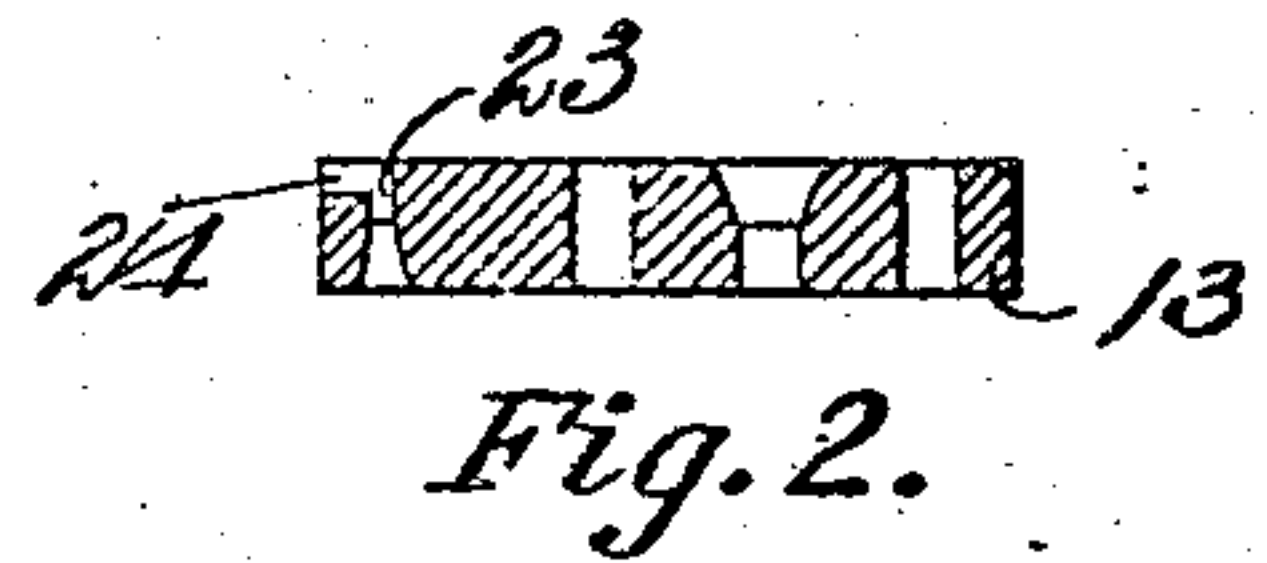
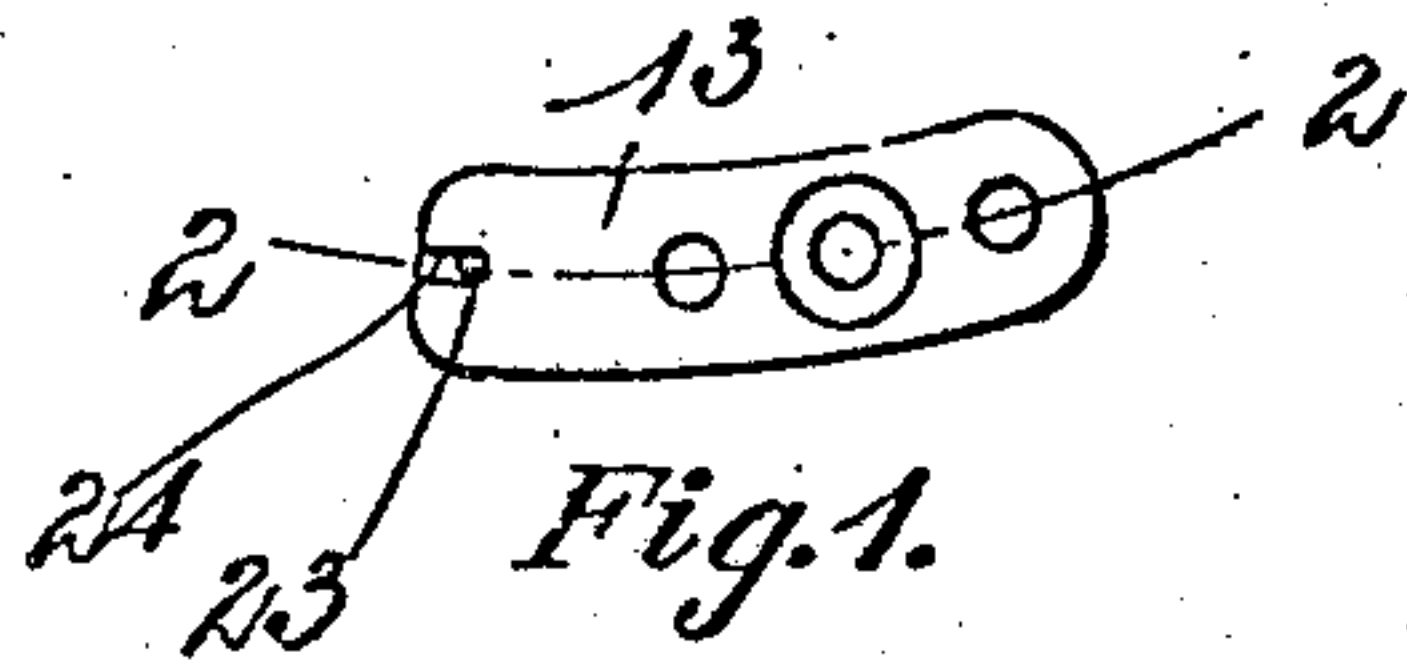


J. E. PERRAULT.
LACING HOOK SETTING MACHINE.
APPLICATION FILED SEPT. 9, 1907.

899,067.

Patented Sept. 22, 1908.



Witnesses:
Francis H. Bishop.
William C. Glass.

Inventor:
Joseph E. Perrault.
By his attorney,
Charles S. Gooding.

UNITED STATES PATENT OFFICE.

JOSEPH E. PERRAULT, OF WALTHAM, MASSACHUSETTS, ASSIGNOR TO AMERICAN LACING HOOK CO., A CORPORATION OF NEW JERSEY.

LACING-HOOK-SETTING MACHINE.

No. 899,067.

Specification of Letters Patent.

Patented Sept. 22, 1908.

Application filed September 9, 1907. Serial No. 391,940.

To all whom it may concern:

Be it known that I, JOSEPH E. PERRAULT, a citizen of the United States, residing at Waltham, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Lacing-Hook-Setting Machines, of which the following is a specification.

This invention relates to machines for setting lacing hooks and the like in sheet material such as the uppers of boots and shoes and relates particularly to the punch and die by means of which the upper is perforated and fed into position to have a lacing hook set therein.

While I have in the following specification described my device as particularly adapted to the setting of the lacing hooks in the uppers of boots and shoes, it is evident that the same may be used for setting other articles in sheet material, as, for instance, the same may be used for setting eyelets in the uppers of boots and shoes.

The device of my invention is particularly adapted to that class of machines in which the lacing hooks are set in the upper and the upper fed automatically by the machine, and the device of this invention is an improvement upon the machine for setting lacing hooks invented by Sydney E. Taft for which he obtained U. S. Letters Patent No. 883,256, dated Mar. 31, 1908. In machines of the class to which this invention relates the machine is run at a very high rate of speed and the feeding of the upper especially in uppers of thin, flexible leather becomes a matter of great difficulty. In the present invention the punch is adapted to be moved downwardly through the upper until the lower end of said punch projects downwardly into a hole which surrounds and fits said punch and is formed in a female die. After the punch has perforated the upper and descended, as hereinbefore set forth, below the under surface of the upper the mechanism is so arranged as to move the punch upwardly until the lower end of the punch just clears the bottom of a groove which is formed in the top of the die and leads out of one side of the hole in the die, said groove being of less depth than that of said hole. The lower end of the punch, it will be understood, at this time still projects through the upper, the mechanism is then adapted to move the punch laterally

while the lower end of the punch projects into the groove in the female die and below the lower surface of the material which it has perforated. The lateral movement of the punch, as hereinafter more fully described, moves the leather forward until the punch is in alinement with a lacing hook to be set therein held upon a suitable carrier or driver and the setting operation then takes place, the punch during the setting operation still projecting below the under surface of the upper, thus forming a guide for the stem of the lacing hook when it first enters the upper, and guiding the same accurately into the hole formed by the punch. The mechanism by means of which the punch and anvil are operated as well as the lacing hook carrier may be the same as that illustrated in said Letters Patent to which reference may be had for the details of mechanism for operating the punch, die and setting mechanism.

Referring to the drawings: Figure 1 is a plan view of my improved die. Fig. 2 is a sectional elevation taken on line 2—2, Fig. 1. Fig. 3 is a sectional elevation taken through the center of the die illustrating the relative position of the punch, anvil and die to the lacing hook carrier and to the work support, a presser foot also being shown in connection therewith, the parts being in the position occupied thereby when the punch has perforated the upper and before the feeding operation takes place. Fig. 4 is a view similar to Fig. 3 showing the punch partly retracted from the upper and from the die in readiness to be moved laterally to feed the upper into position to have a lacing hook set therein, a lacing hook being also shown in position upon the carrier. Fig. 5 is a sectional elevation similar to Fig. 3 illustrating the parts in the position assumed thereby when the lacing hook has been set. Fig. 6 is a transverse section taken on line 6—6, Fig. 3, and shown partly in elevation.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 10 is a work-support, 11 is a cap fastened to said work support, 12 is a die holder arranged to slide in said work support, and 13 is the die which is fastened by means of a screw 14 and dowel pins 15, 15 to said holder. A spring 16 acts to hold the holder normally against the stop pin 17, suitable mechanism being supplied to move the

die holder and the die attached thereto in the opposite direction to that in which it is moved by the spring 16. The lacing hook 18 is held upon a carrier 19 to which a vertical reciprocatory motion is imparted by suitable mechanism. The upper is held upon the work support in a stationary position, when so desired, by a presser foot 20 which is moved toward or away from the upper by suitable mechanism at the proper time. An anvil 21 against which the lacing hook is clenched is provided with a projection 22 constituting a punch. All of said parts are substantially the same as shown and described in the said Letters Patent with the exception of the die 13. Said die has a hole 23 therein which preferably extends from the top to the bottom of the die, as illustrated in Figs. 1 to 6, inclusive. A groove 24 is provided in the upper surface of the die which leads out of one side of the hole 23 and is continued to one end of the die, said groove being of less depth than that of the hole 23. The upper surface of the die and of the work support or the cap of said work support which in function forms a portion thereof, are flush and form a support together for the upper 25, while the same is being punched and fed.

The general operation of the mechanism hereinbefore specifically described is as follows: The upper 25 is placed upon the top of the work support 10 and die 13 and the punch is moved downwardly perforating the upper and descending until the lower end of the punch passes through the upper and into the hole 23 in the die 13, the piece of leather 26 punched from the upper being pushed downwardly into the hole 23. The punch and die are then moved laterally to about the position illustrated in Fig. 4 and during the last part of said lateral movement the punch is raised to the position illustrated in Fig. 4, that is, with the lower end of said punch just clearing the bottom of the groove 24. When the holder 12 comes to a stop together with the die 13 fast thereto, the punch and anvil continue the lateral movement in the direction of the arrow, Fig. 4, and the upper is fed forward until the punch 22 aligns with the lacing hook 18 held upon the carrier 19, said carrier is then brought upwardly and the punch, the lower end of which is projecting through the upper and downwardly therebeneath, acts as a guide for the neck of the lacing hook which is thus guided through the hole made by the punch in the upper and clenched against the anvil 21, as illustrated in Fig. 5.

It is evident that if desired the movement of the holder 12 may be dispensed with and the die be made stationary, in which case the punching of the upper would take place as hereinbefore described, but the die would remain stationary at all times while the upper was being fed laterally by the punch. The

lower end of the punch, however, would project through the upper, as hereinbefore described, and as illustrated in Fig. 4, during the feeding operations. It will be seen that by providing the groove 24 in the die 13 the upper can remain at all times resting upon the upper surface of the die and of the work support and cannot fall off of the punch or become disconnected therefrom during the feeding operation no matter how thin or flexible said upper may be, and in addition it will be noted that the upper is always held in the same horizontal plane both before, during and after the feeding operation. As soon as the lacing hook has been set in the upper the punch is withdrawn by moving the same vertically and then laterally in a direction opposite to the arrow in Fig. 4 and the operation of punching, feeding the upper, and setting the lacing hook in the upper is repeated until the required number of lacing hooks has been set in the upper, when the machine is stopped and the upper removed by the operator.

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

1. In a machine for setting lacing hooks and the like in sheet material, a punch, a die provided with a hole adapted to surround and fit said punch and to coact therewith in perforating said sheet material, said die provided with a groove in one face thereof of less depth than that of said hole leading out of one side of said hole.

2. In a machine for setting lacing hooks and the like in sheet material, a punch, and a die provided with a hole extending vertically therethrough adapted to surround and fit said punch and to coact therewith in perforating said sheet material, said die provided with a groove in its upper face of less depth than that of said hole leading out of one side of said hole and opening out of one end of said die.

3. In a machine for setting lacing hooks and the like in sheet material, a die provided with a hole adapted to surround and fit said punch and to coact therewith in perforating said sheet material, said die provided with a groove in one face of less depth than that of said hole leading out of one side of said hole, mechanism to impart a vertical reciprocatory motion to said punch, and mechanism to impart a lateral motion to said punch while the same projects through said sheet material.

4. In a machine for setting lacing hooks and the like in sheet material, a punch, a die provided with a hole adapted to surround and fit said punch and to coact therewith in perforating said sheet material, said die provided with a groove in one face thereof of less depth than that of said hole leading out of one side of said hole, and mechanism to impart a reciprocatory motion to said punch

and also a lateral motion thereto while the punch is projecting through said material and into said die.

5. In a machine for setting lacing hooks and the like in the upper of a boot or shoe, a lacing hook carrier, a punch, a die provided with a hole adapted to surround and fit said punch and to coact therewith in perforating said upper, said die provided with a groove in one face thereof of less depth than that of said hole leading out of one side of said hole, mechanism to impart a vertical reciprocatory motion to said punch, and mechanism to impart a lateral movement to said punch while the same projects through said upper, whereby said upper may be fed into position to have a lacing hook set therein with said punch projecting therethrough.

6. In a machine for setting lacing hooks and the like in the upper of a boot or shoe, a lacing hook carrier, an anvil, a feed point on said anvil constituting a punch, a die provided with a hole adapted to surround and fit said punch and to coact therewith in perforating said upper, said die provided with a groove in one face thereof of less depth than that of said hole leading out of one side of said hole, mechanism to impart a vertical reciprocatory motion to said punch and anvil, and mechanism to impart a lateral movement thereto, whereby said punch may be brought into alinement with a lacing hook held in said carrier while said punch projects through said upper and moved out of alinement with said hook after the setting operation.

7. In a machine for setting lacing hooks and the like in the upper of a boot or shoe, a lacing hook carrier, mechanism to impart a vertical reciprocatory motion thereto, a punch, a die provided with a hole adapted to surround and fit said punch and to coact therewith in perforating said upper, said die provided with a groove in one face thereof of less depth than that of said hole leading out of one side of said hole, mechanism to impart a vertical reciprocatory motion to said punch, and mechanism to impart a lateral movement to said punch while the same projects through said upper, whereby said upper may be fed into position to have a lacing hook set therein with said punch projecting therethrough.

8. In a machine for setting lacing hooks

and the like in the upper of a boot or shoe, a lacing hook carrier, mechanism to impart a vertical reciprocatory motion thereto, an anvil, a feed point on said anvil constituting a punch, a die provided with a hole, adapted to surround and fit said punch and to coact therewith in perforating said upper, said die provided with a groove in one face thereof of less depth than that of said hole leading out of one side of said hole, mechanism to impart a vertical reciprocatory motion to said punch and anvil, and mechanism to impart a lateral movement thereto, whereby said punch may be brought into alinement with a lacing hook held in said carrier, while said punch projects through said upper and moved out of alinement with said hook after the setting operation.

9. In a machine for setting lacing hooks and the like in sheet material, a punch, a work support, a die provided with a hole adapted to surround and fit said punch and to coact therewith in perforating said sheet material, the upper face of said die flush with said work support and adapted to form with said work support a support for said sheet material, said die provided with a groove in one face thereof of less depth than that of said hole and leading out of one side of said hole adjacent to said upper.

10. In a machine for setting lacing hooks and the like in sheet material, a punch, a work support, a die provided with a hole adapted to surround and fit said punch and to coact therewith in perforating said sheet material, the upper face of said die flush with said work support and adapted to form with said work support a support for said sheet material, said die provided with a groove in one face thereof of less depth than that of said hole and leading out of one side of said hole adjacent to said upper, mechanism to impart a reciprocatory motion to said punch toward and away from said die, and mechanism to impart a lateral movement to said punch while the same projects through said sheet material.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH E. PERRAULT.

Witnesses:

CHARLES S. GOODING,
LOUIS A. JONES.