

No. 798,727.

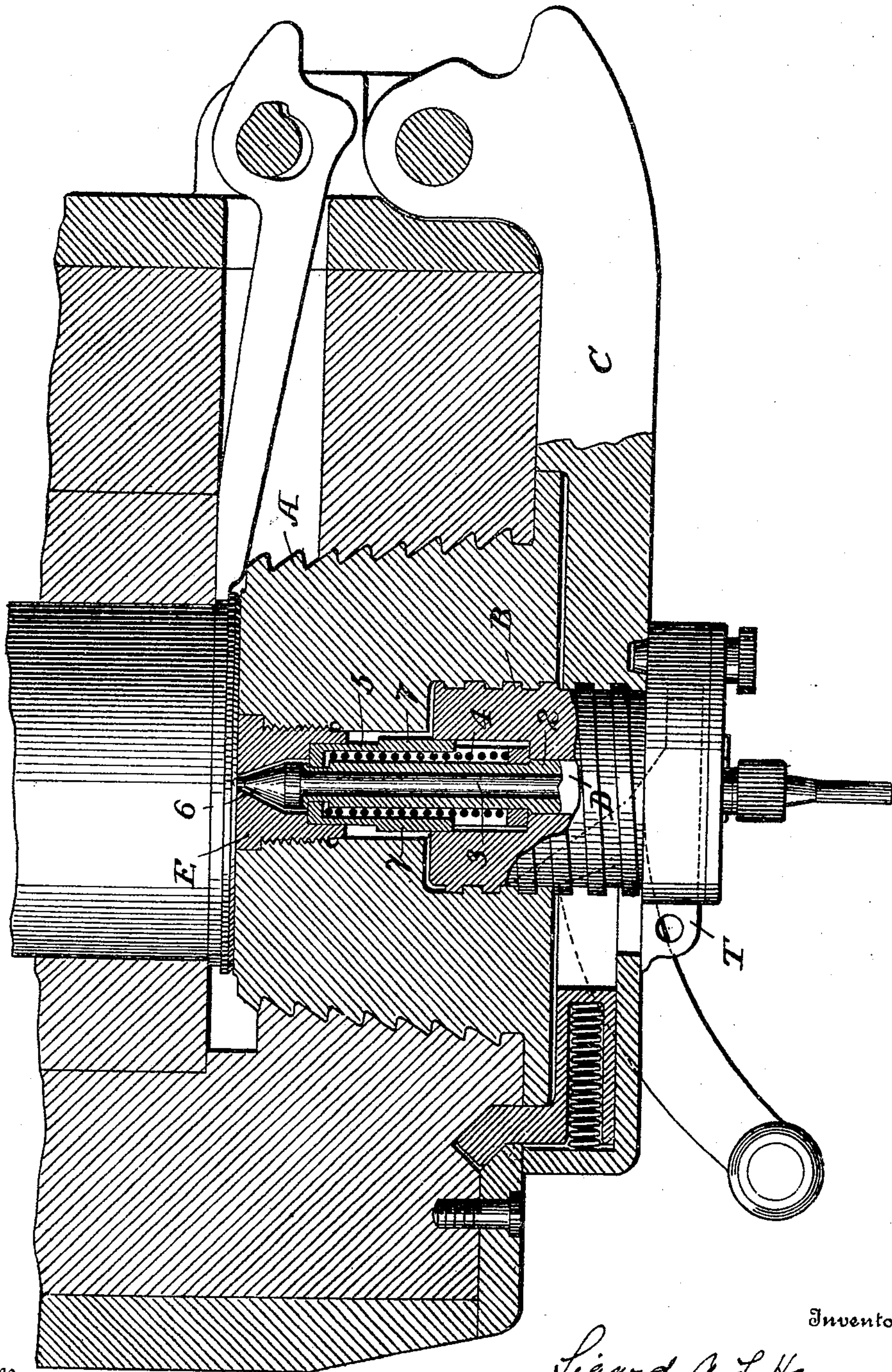
PATENTED SEPT. 5, 1905.

S. A. S. HAMMAR.
SIDE PULL FIRING GEAR FOR GUNS.

APPLICATION FILED DEC. 9, 1902.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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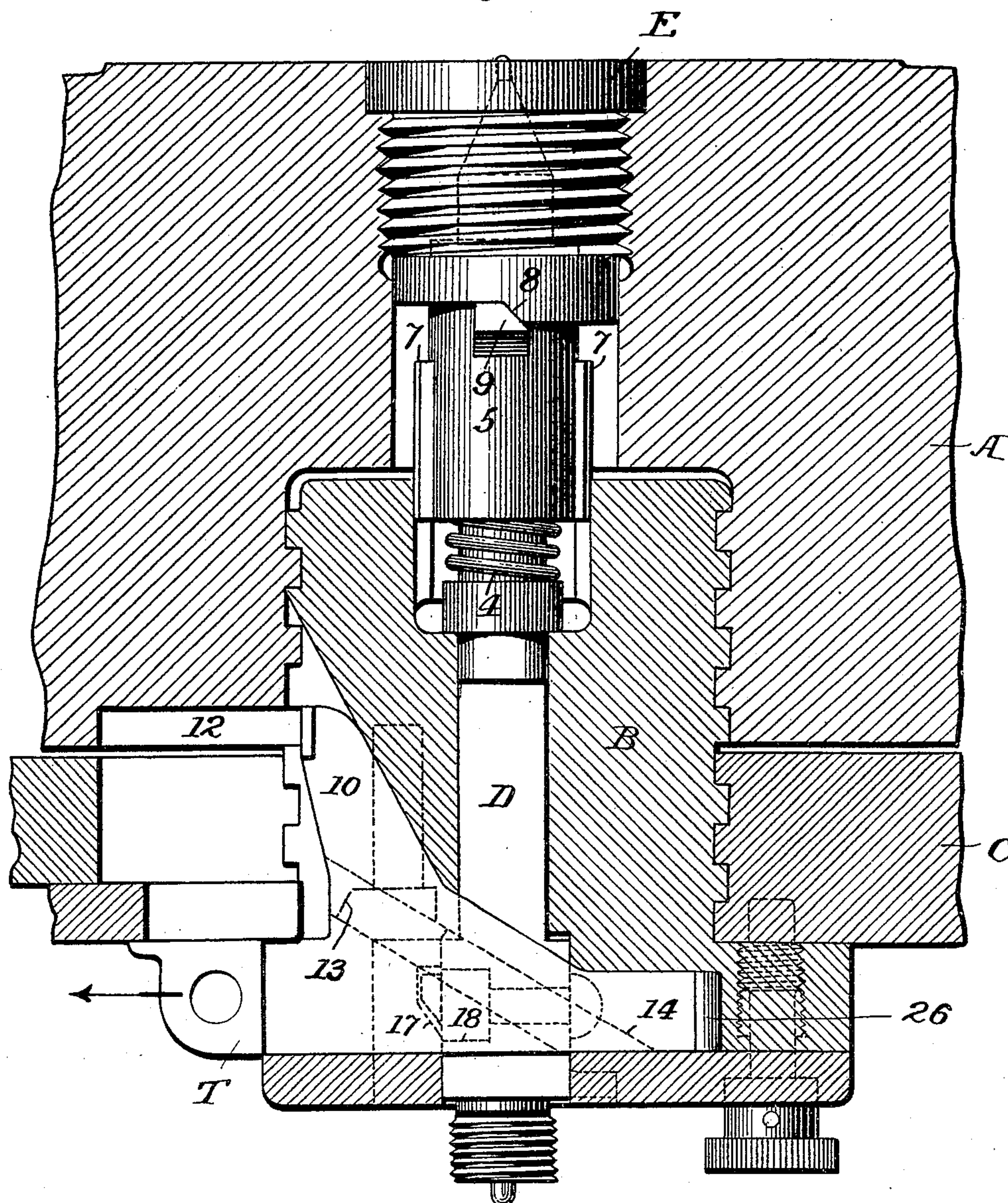
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

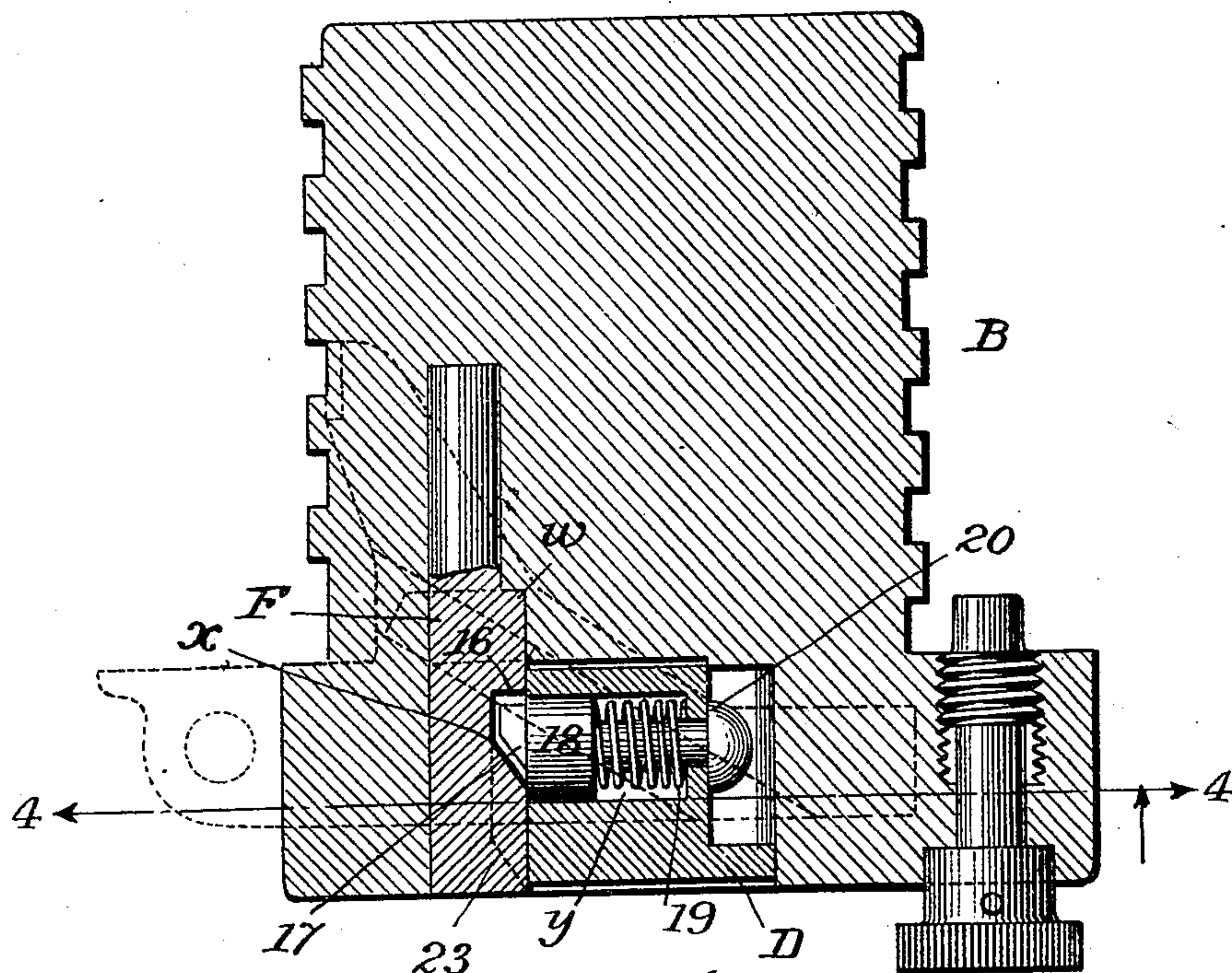
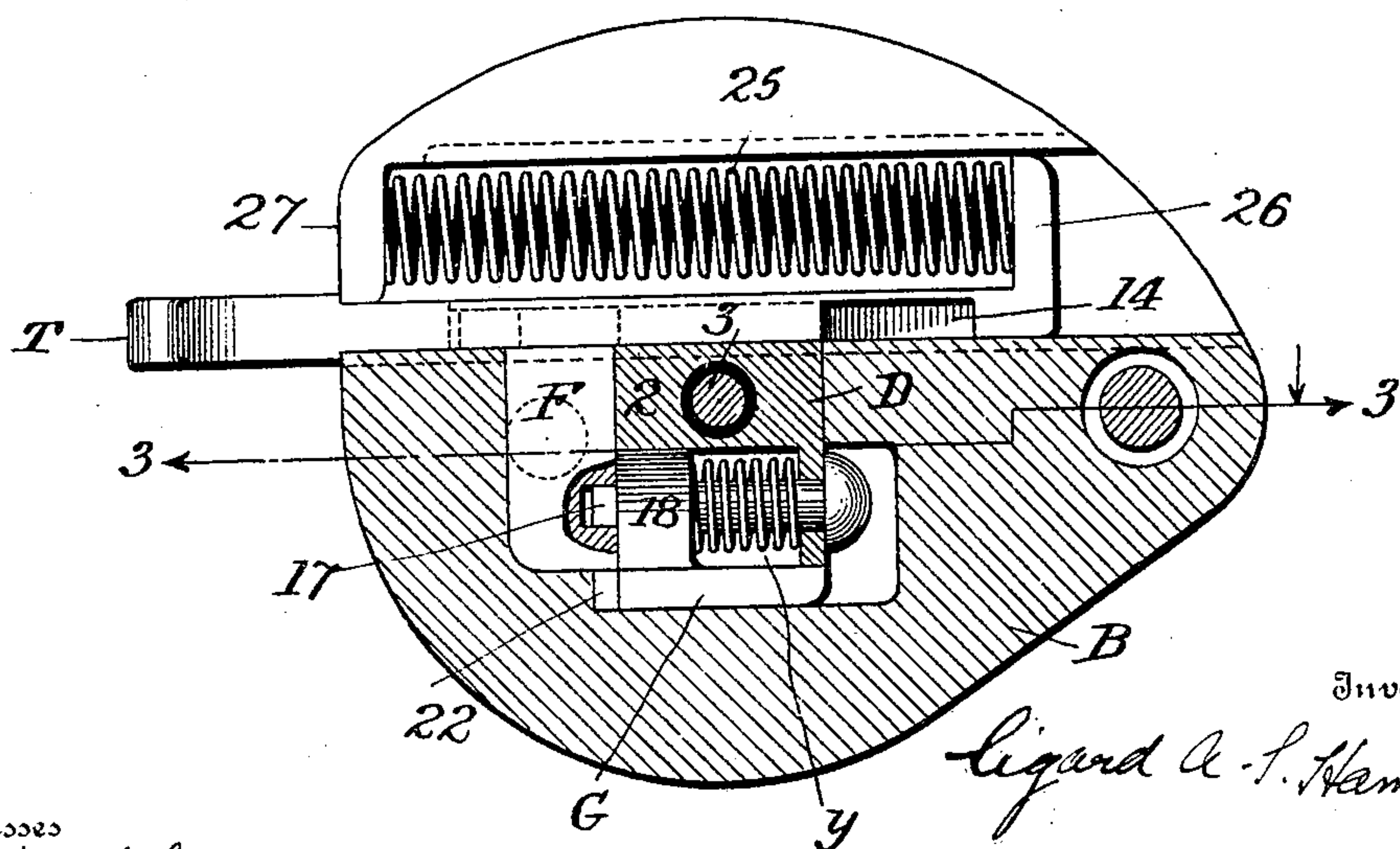


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 5.

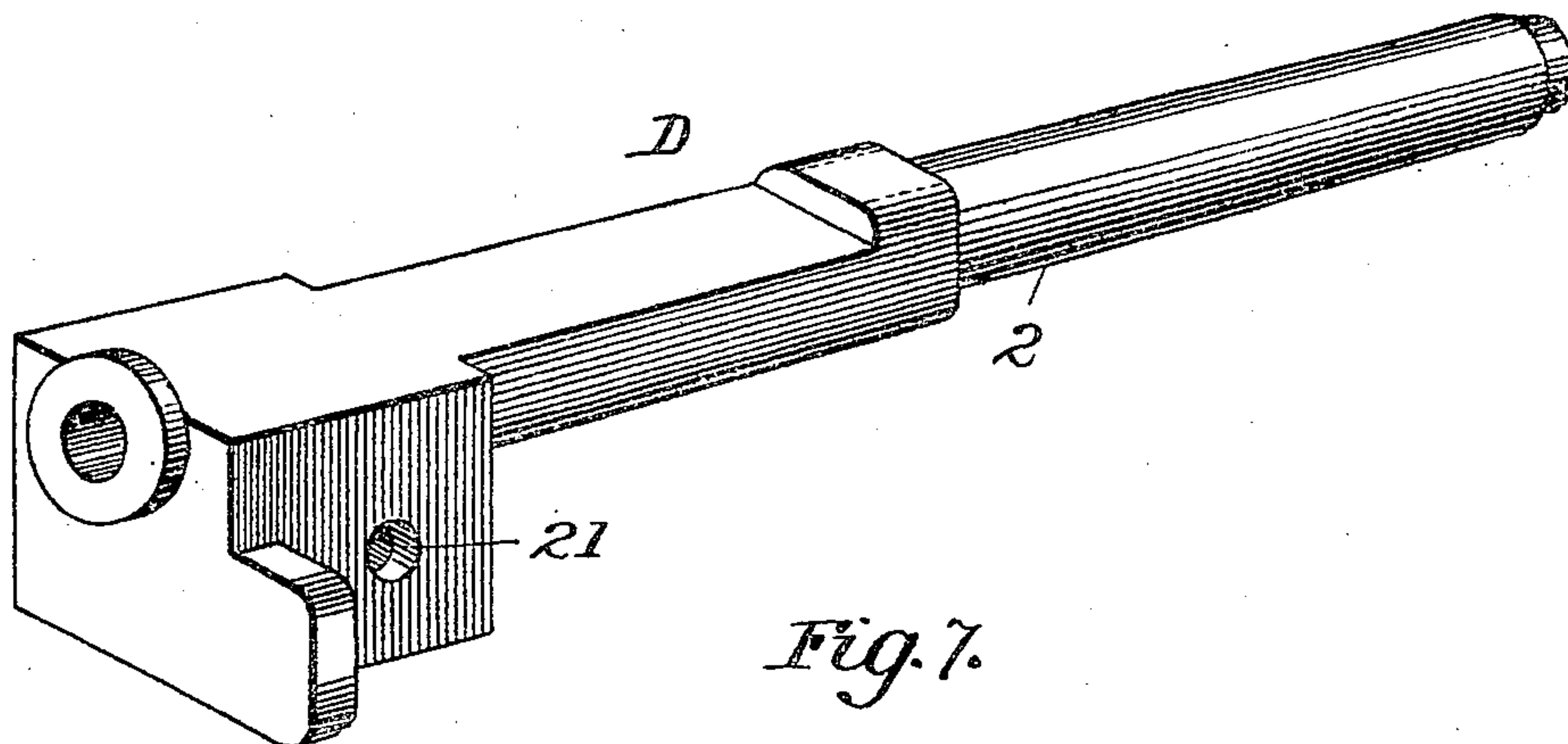


Fig. 7.

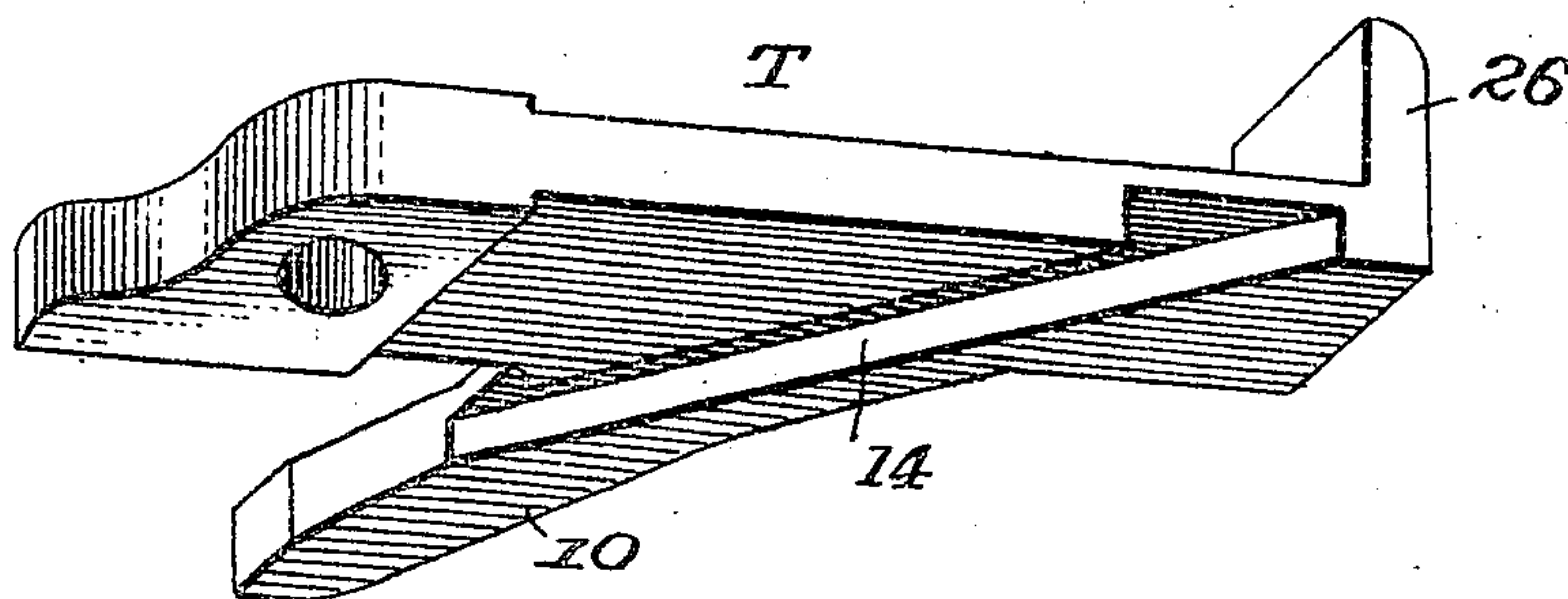


Fig. 8.

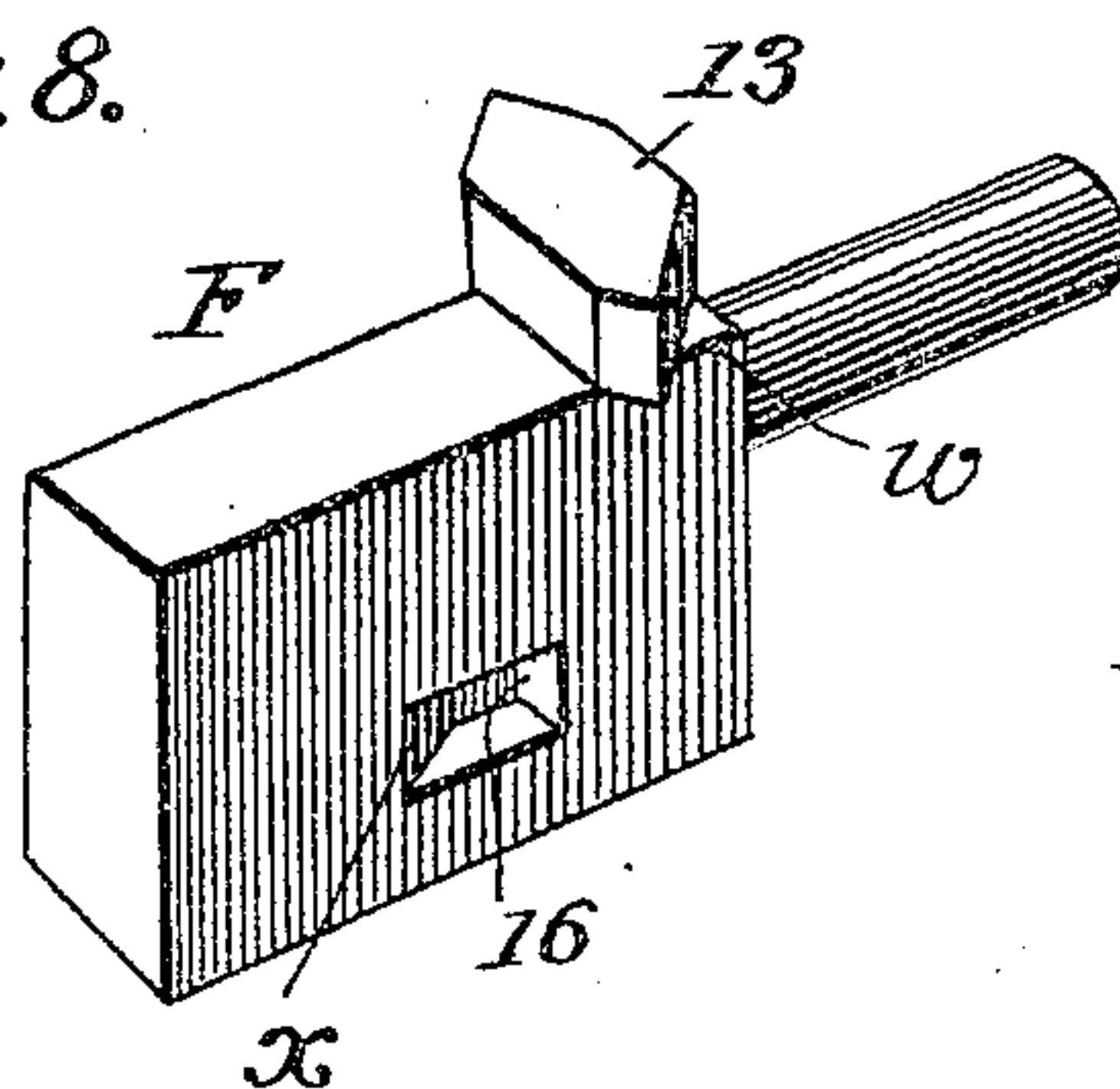
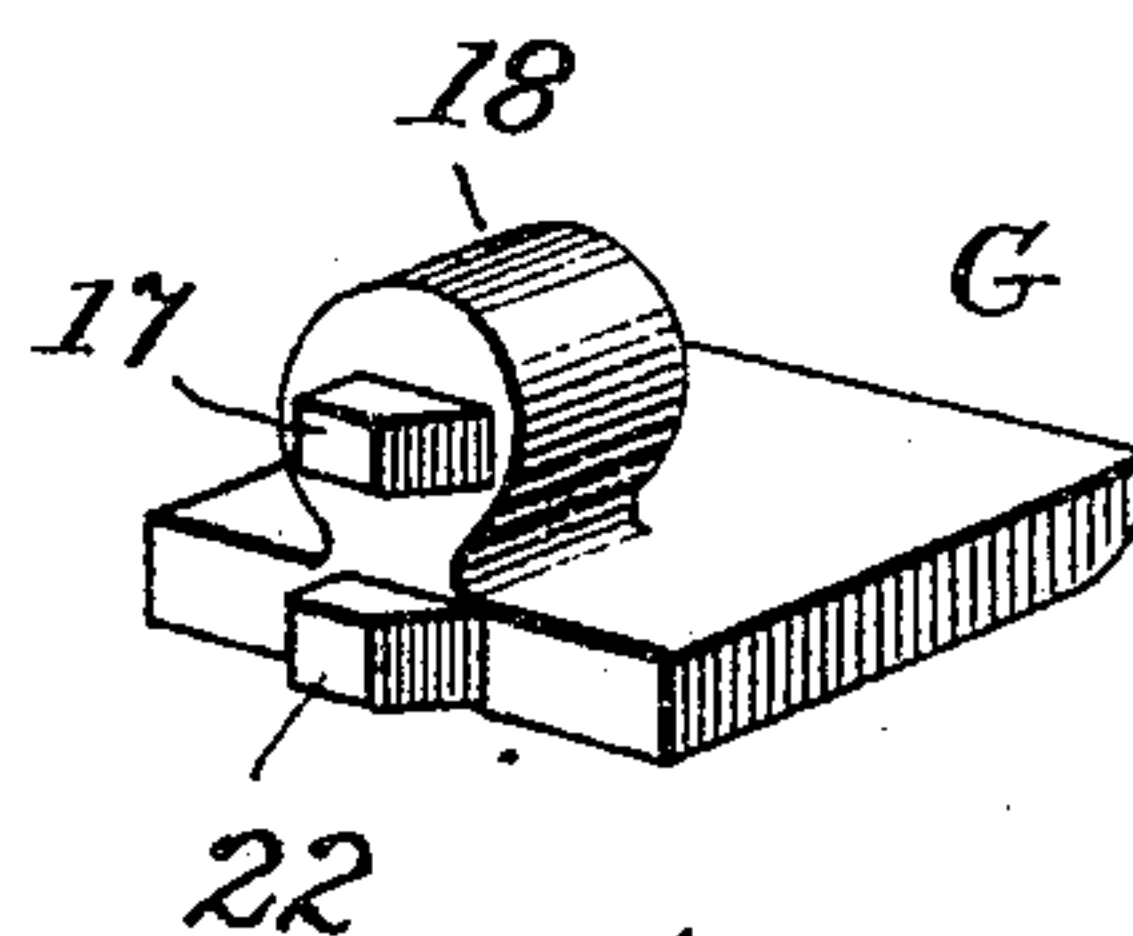


Fig. 6.



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UNITED STATES PATENT OFFICE.

SIGARD A. S. HAMMAR, OF BETHLEHEM, PENNSYLVANIA, ASSIGNOR TO
BETHLEHEM STEEL COMPANY, OF SOUTH BETHLEHEM, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

SIDE-PULL FIRING-GEAR FOR GUNS.

No. 798,727.

Specification of Letters Patent.

Patented Sept. 5, 1905.

Application filed December 9, 1902. Serial No. 134,572.

To all whom it may concern:

Be it known that I, SIGARD A. S. HAMMAR, a subject of the King of Sweden and Norway, residing at Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Side-Pull Firing-Gear for Guns, of which the following is a specification.

My invention relates to firing-gear for guns, and more especially to that class of firing-gear known as "side-pull" firing-gear; and it consists in means for operating the firing-head or firing-pin from a transversely-moving slide and in certain details of construction fully set forth hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional plan of a rapid-fire gun embodying my improvements. Fig. 2 is also a longitudinal sectional view, the firing-head not in section. Fig. 3 is a longitudinal section through the threaded hub of the breech-block and on the line 3 3, Fig. 4. Fig. 4 is a vertical section on the line 4 4, Fig. 3. Fig. 5 is a perspective view of the firing-head; Fig. 6, a perspective view of the firing-head slide; Fig. 7, a perspective view looking against the under side of the main operating-slide; Fig. 8, a perspective view of the sliding block actuated by the main slide.

The breech-block A turns on the threaded boss or hub B, which is supported by the swinging carrier C, as usual. The firing-head D consists of a sleeve 2, supporting an insulated firing-pin 3, and normally the primer is exploded by an electric current transmitted through the pin 3. As, however, under some conditions the electric means are not available, it becomes necessary to explode the primer percussively, and I therefore have provided means for retracting the firing-head with its pin against the stress of a spring, which on the firing-head being released throws it forward and explodes the primer. The sleeve 2 is surrounded by a spring 4, which bears against the head of a sliding hollow case or support 5, which is fitted to the breech-block and bears on the head 6 of the pin 3, and this casing has longitudinal wings 7 7, which slide in grooves in the non-rotating hub B, so that the sleeve cannot turn with the breech-block, but has an axial movement in the block. The firing-head is square-seated in the non-rotat-

table hub and is thus held from turning, but has a limited axial movement in the support 5. The end of the firing-head projects through a breech-block plug E, carried by and turning with the breech-block, and this plug has an incline or cam 8, which engages the beveled face of a lug 9, projecting upward from the casing 5. As soon as the breech-block is turned to withdraw it from the breech the cam edge 8, acting on the lug 9, forces back the support 5 until a lip 30 thereof engages a shoulder 31 of the firing-head and carries the latter back, so that the end of the pin 3 is withdrawn back of the face of the breech-block and is thus guarded from injury and is prevented from striking the primer-head until the breech-block is closed. It will be seen that the part 30 of the support 5 is carried axially as the breech-block is turned and acts as a stop engaging the shoulder 31 of the pin near its point to limit the forward movement of the pin.

In order that the firing-head may be retracted by a side pull of the lanyard, I make use of a cocking-slide T, carried by the hub B and provided with a forwardly-projecting finger 10, which when the breech-block is fully closed is opposite a groove 12 in the breech-block, so that the slide can only be moved in the direction of its arrow to operate the firing-head after the breech-block is in its proper firing position. The firing-head is moved from the slide T through the medium of a sliding block F, with means for connecting it to the firing-head as the block is drawn back and then releasing the head to permit it to be thrown forward by its spring. Thus the block F has a lug 13, which enters an inclined groove 14 in the under face of the slide T, so that when the latter is drawn by the lanyard in the direction of the arrow the block F will be carried backward. The block F has a side socket 16, with a rear inclined face α , which receives a lug 17, also having a rear inclined face projecting from the end of a stud 18, connected to and forming part of a slide G, carried in a transverse recess γ of the firing-head, the stud being carried to the left, Fig. 3, by a spring 19, its movement being limited in this direction by the head of a bolt 20, which extends through an opening 21 in the firing-head. The stud 18 has a second lug 22,

also with a rear beveled face adapted to engage in inclined face 23 (dotted lines, Fig. 3) of the hub B.

When the block F moves back, the lug 17 engages the forward end of the socket 16, so that the stud 18 and the firing-head are carried back with the slide until the lug 22 of the stud 18 meets the face 23, when the stud will be forced to the right until the stud 17 escapes from the socket 16 and the firing-head is carried forward by the spring 4. When now the slide T moves to the right, the block F will be carried forward and the corner thereof will strike the rear inclined face of the lug 17 and force back the stud 18 until the socket 16 is opposite the lug 17, when the parts will assume the position shown in Fig. 3.

The slide T is thrown back by a coiled spring 25, confined between a lip 27 on the hub and a lug 26 on the slide.

Without limiting myself to the precise construction and arrangement of parts shown, I claim as my invention—

1. The combination with the non-rotatable hub and rotatable breech-block, of a firing-head provided with an insulated pin adapted to form part of an electric circuit, a spring for operating the firing-head to explode the primer by percussion, a support for said pin slidably fitted to said non-rotatable hub, means for moving the support and pin axially, and means for retracting and suddenly releasing the firing-head, substantially as set forth.

2. In a breech-loading gun, the combination with a rotatable breech-block and its firing-pin, of a support for said pin fitted to said block, said pin having a limited longitudinal movement in respect to the support, and means for automatically retracting said support with the pin when the block is rotated from "closed" toward "release" position.

3. The combination with the firing-head sliding in its support, of a sliding block also movable in said support, means for moving said block, means for locking the firing-head and block together upon the rearward movement of the block, and means for then unlocking the same automatically, substantially as set forth.

4. The combination with the firing-head and movable block, and means for locking the block to and unlocking it from the firing-head, of a transverse slide having an inclined groove receiving a lug projecting from the block, and a spring for moving said slide in one direction, substantially as set forth.

5. The combination with the sliding firing-head and sliding block and block-operating

means, of a stud carried by the firing-head having two lugs one with an inclined face adapted to a corresponding socket in the block, and the other with an inclined face adapted to engage an inclined face upon the support for the firing-head and block, substantially as set forth.

6. The combination with the firing-head, block and slide for operating the block and with a support for said parts, of a slide carried by the firing-head and provided with two bevel-faced lugs, one engaging a socket in the block and the other adapted to engage an inclined face of the support, and a spring for operating the firing-head slide in one direction, substantially as described.

7. The combination with the firing-head, sliding in its support, the sliding block, means for locking the block to and unlocking it from the firing-head, and the operating-slide T having a projection 10, of a rotatable breech-block having a groove arranged to occupy a position to receive the projection 10 only when the breech-block is in fully-closed position, substantially as set forth.

8. The combination with a gun adapted to use combination electric and percussion primers, and with its rotatable breech-block, of a firing-head carrying a firing-point which is suitable for firing percussively and adapted to act as a terminal contact when used for firing electrically and which extends normally beyond the inner face of the breech-block, a slidable support for the firing-head in which the firing-head has a limited longitudinal movement, means for retracting the support and firing-head during the opening rotation of the breech-block to withdraw the firing-point within the breech-block, and means for moving it forward during the closing rotation of the breech-block, substantially as set forth.

9. In a breech-loading gun, the combination with its rotatable breech-block, of a firing-pin having a shoulder or lateral projection near its point, a part having a longitudinal movement and provided with a seat or stop adapted to be engaged by said shoulder and to limit the forward travel of the pin, said stop having axial movement in said block determined by the rotative movement of the block.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIGARD A. S. HAMMAR.

Witnesses:

LEIGHTON N. D. MIXSELL,
WILLIAM E. HORNE.