

No. 824,130.

PATENTED JUNE 26, 1906.

J. F. MEIGS & H. G. JAKOBSSON.  
FIRING MECHANISM OF GUNS.

APPLICATION FILED JULY 12, 1905.

3 SHEETS—SHEET 1.

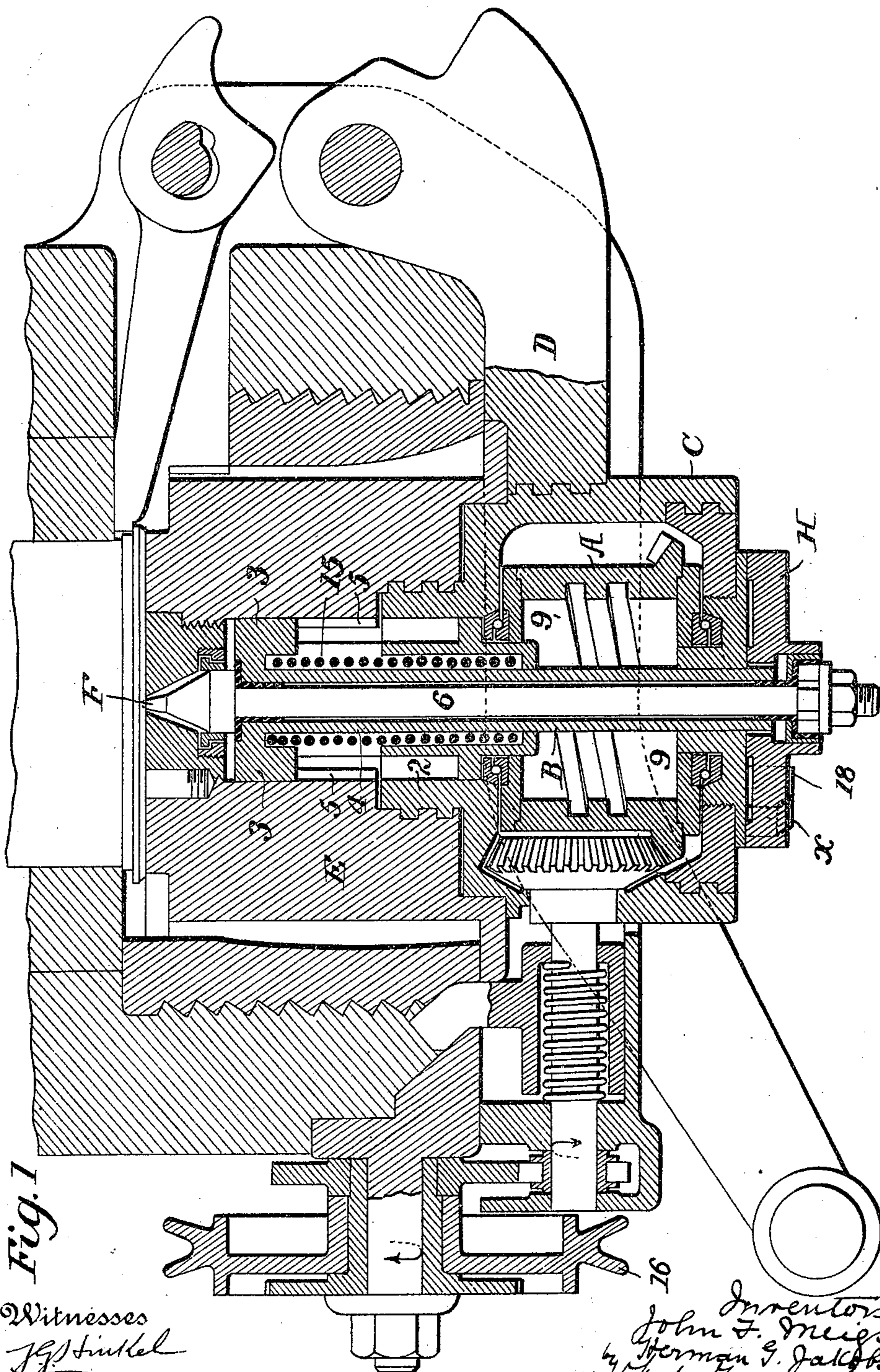


Fig. 1

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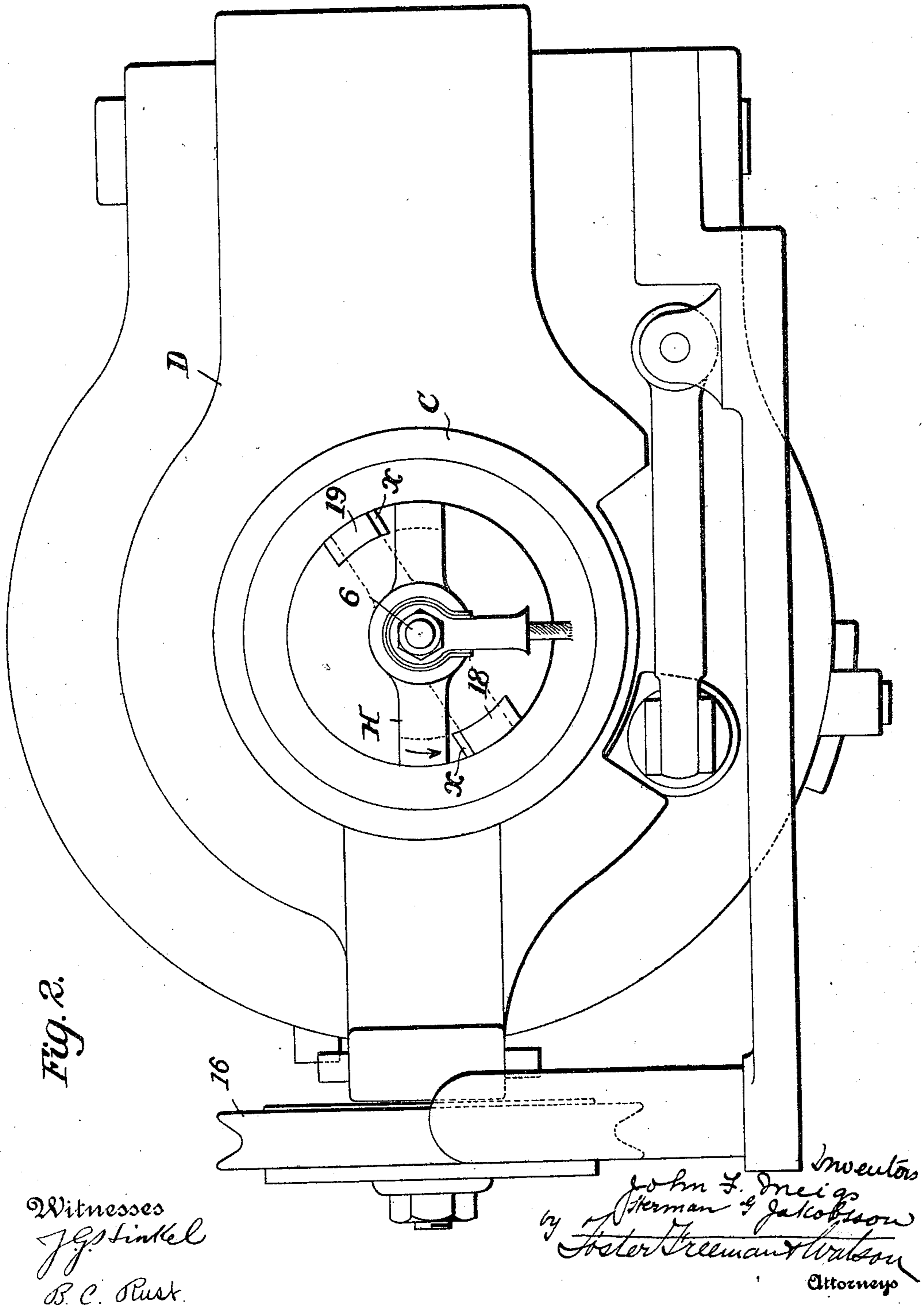
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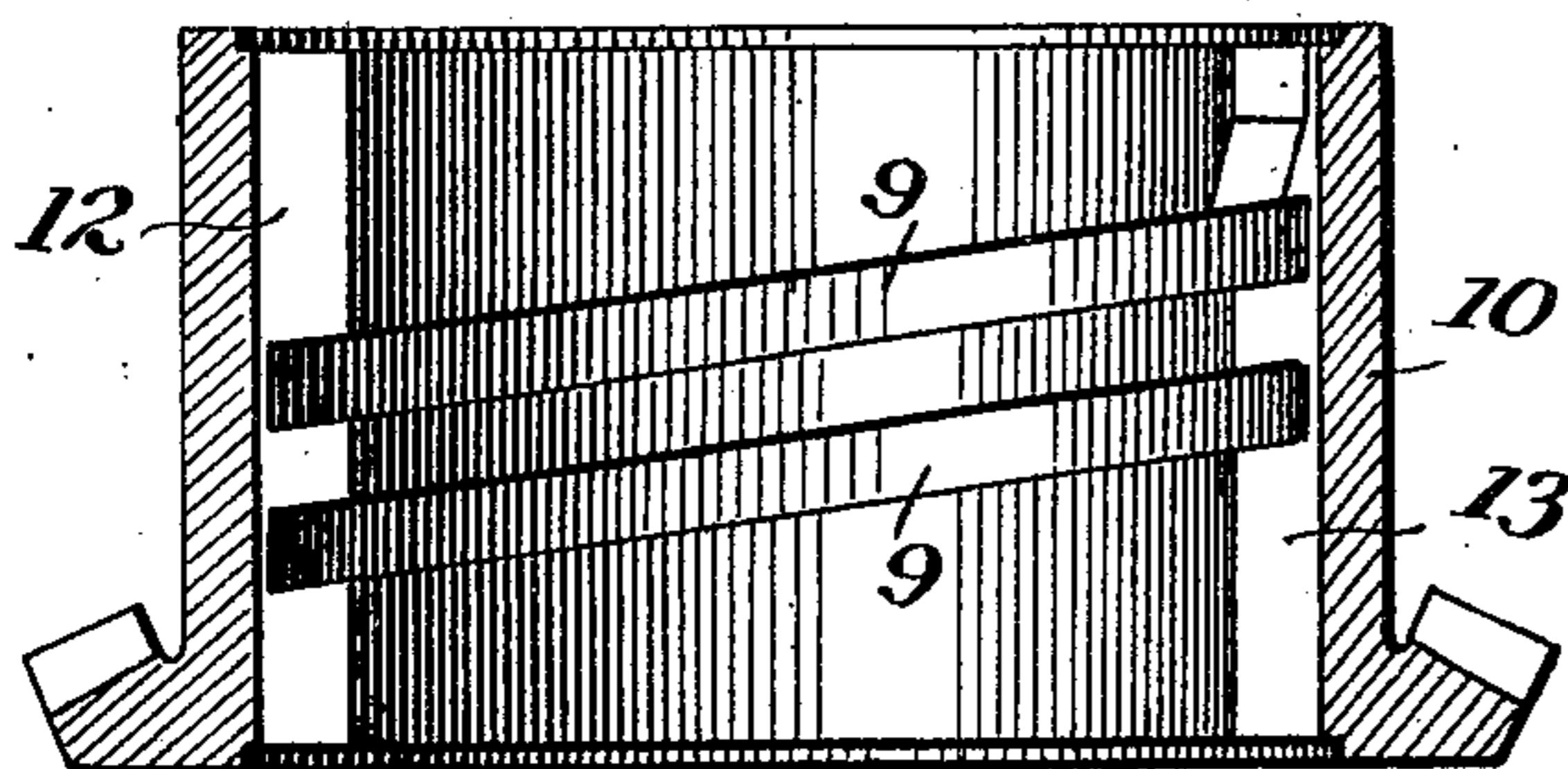
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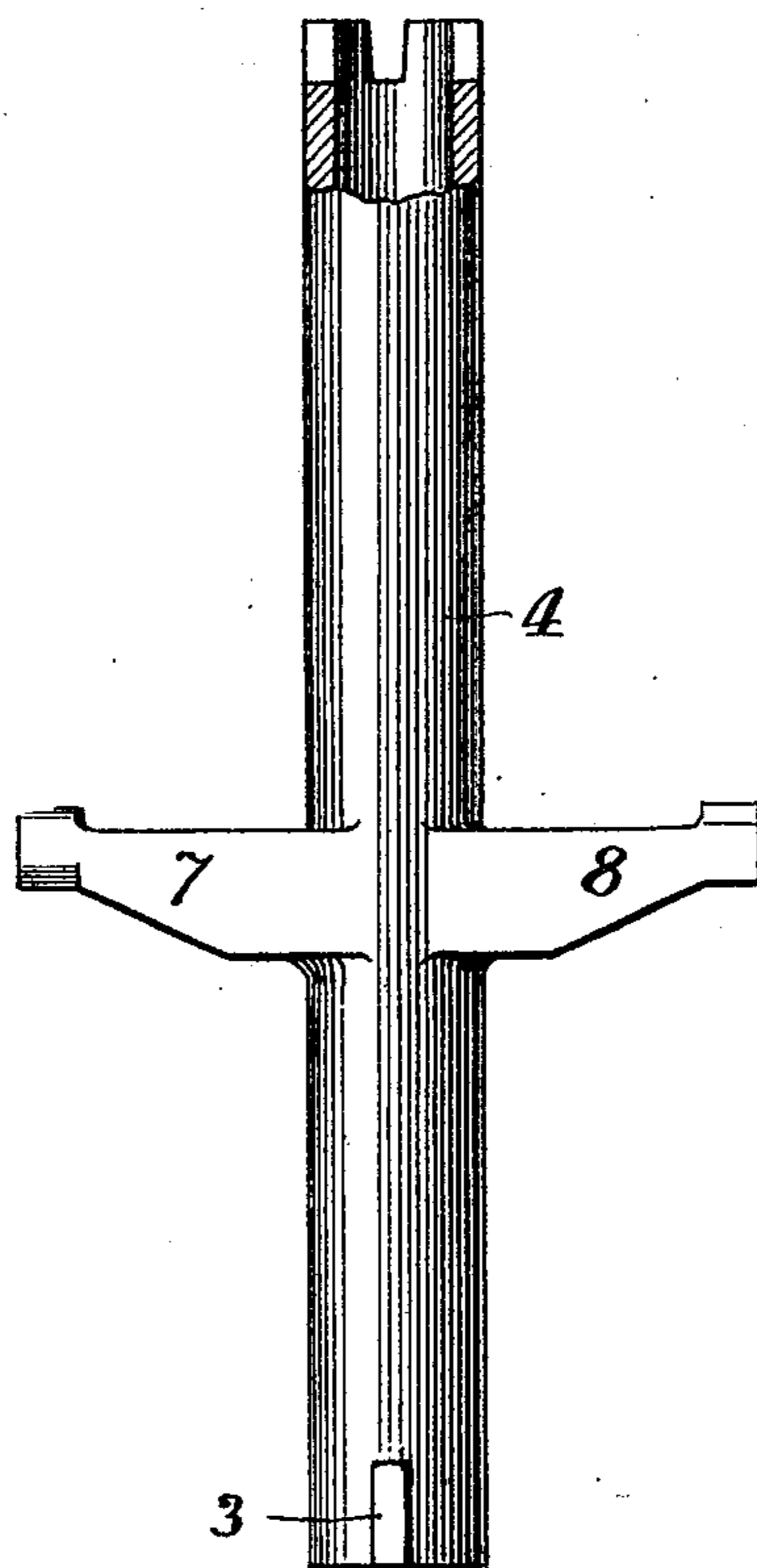
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3 SHEETS—SHEET 3.

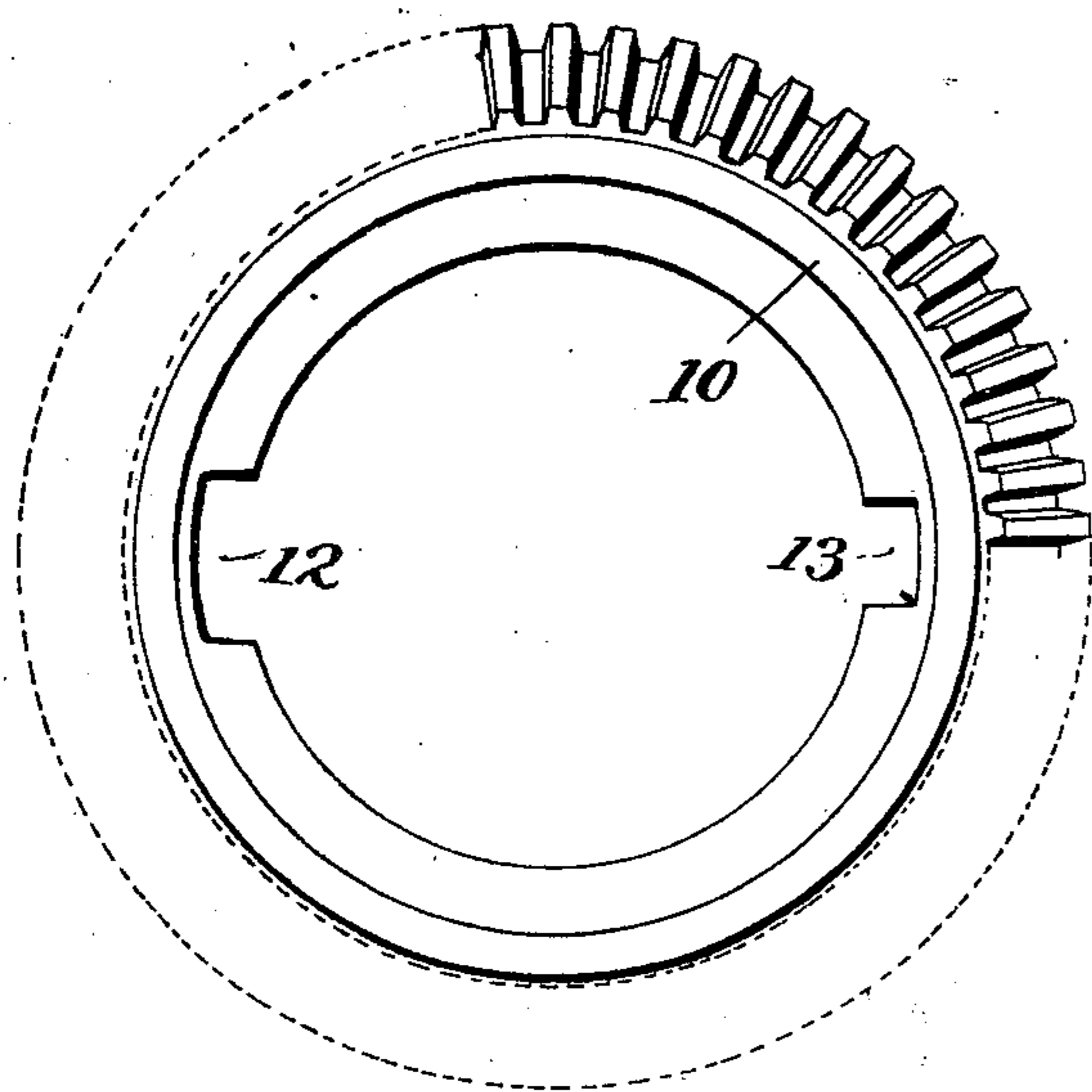
*Fig. 3.*



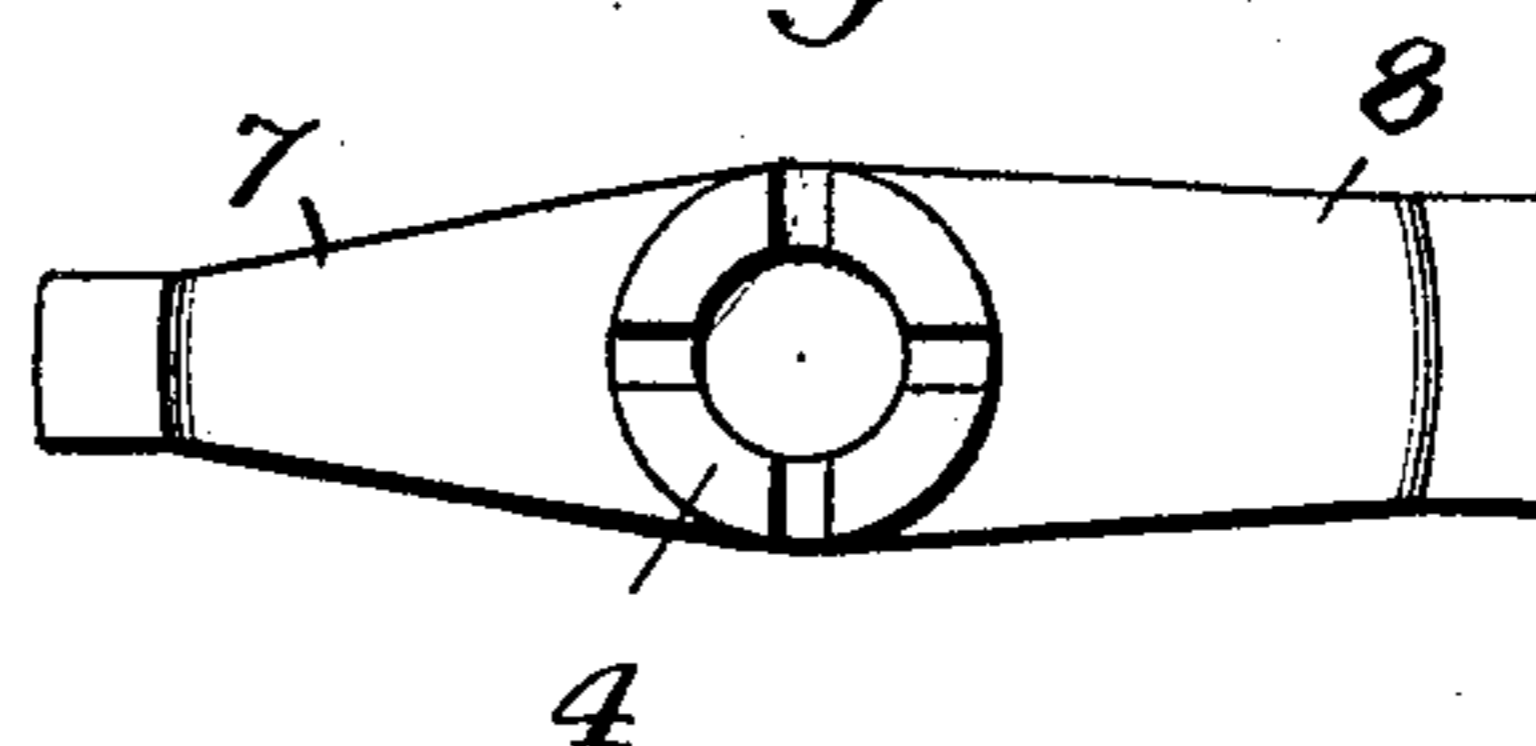
*Fig. 5.*



*Fig. 4.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

JOHN F. MEIGS AND HERMAN G. JAKOBSSON, OF SOUTH BETHLEHEM, PENNSYLVANIA, ASSIGNORS TO BETHLEHEM STEEL COMPANY, OF SOUTH BETHLEHEM, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## FIRING MECHANISM OF GUNS.

No. 824,130.

Specification of Letters Patent.

Patented June 26, 1906.

Application filed July 12, 1905. Serial No. 269,351.

*To all whom it may concern:*

Be it known that we, JOHN F. MEIGS, a citizen of the United States, and HERMAN G. JAKOBSSON, a subject of the King of Sweden and Norway, residing at South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in the Firing Mechanism of Guns, of which the following is a specification.

Our invention relates to firing mechanism of guns and to means whereby the firing-head may be retracted by the use of a rotatable cam of limited length and whereby to prevent the forward movement of the firing-head except when the parts are in firing position, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of the breech of a gun and adjuncts sufficient to illustrate our invention; Fig. 2, a rear view; Fig. 3, a section of the operating-cam detached, this section being at right angles to that in Fig. 1; Fig. 4, a plan of Fig. 3; Fig. 5, a side view of the sleeve of the firing-head detached; Fig. 6, an end view of Fig. 5.

The firing mechanism is of that class in which a positively-driven retracting device, as a cam A, is the means of carrying back the firing-head B against the stress of a spring 15, the head, as shown, being mounted to slide and turn in the hub C of the carrier D, which is hinged to the breech of the gun, as usual. The hub has a threaded projection 2, on which turns the breech-block E of usual character, the firing-head turning with the block from the projection of wings 3 3 from the sleeve of the firing-head 4 into longitudinal grooves 5 5 of the breech-block.

The firing-head has the usual firing-pin F, the shank 6 of which extends through the sleeve and, as shown, is insulated therefrom for electric firing. From the sleeve 4 extend two wings 7 8, the ends of which bear on inclined cam-faces 9 9 at the inside of the cylinder 10 of the cam A, said faces starting from opposite sides of the cylinder at the same distance from the forward end thereof and extending spirally backward parallel to each other and each making a complete rotation. Each cam-face starts from one of two longitu-

dinal grooves 12 13 in the inner face of the cam-cylinder, and the grooves intersect the said cam-faces, so that the firing-head may be set in the cam, with the ends of its wings 7 8 at the starting-points of the cam-faces, and when the cam is turned the said cam-faces bearing on said wings will carry back the firing-head.

To secure the proper extent of backward movement without an abrupt incline, it is necessary for each cam-face to extend completely round the inner face of the cam-cylinder, and it will therefore cross the groove 12 or 13, and the wings 7 8 as the cam A revolves half a rotation are therefore then both brought simultaneously opposite said grooves, and the firing-head could move forward were it not that the grooves 12 13 and wings 7 8 are of different widths, so that when the cam has rotated half a rotation the wide wing 8 will cross the narrow groove 13, and the rotation of the cam must be completed before the grooves are in position to allow the firing-head to be thrown forward by the spring 15.

By the above-described arrangement both wings 7 8 are in the same transverse plane, and it is not required to extend one spiral cam-face back farther than the other, as is needed when one wing is farther from the end of the firing-head than the other, and consequently the depth of the cam (in a longitudinal direction) and of the recessed hub to receive it may be greatly reduced.

The cam may be turned in any suitable manner, as by a shaft carrying a bevel-gear engaging a ring-gear on the cam, said shaft being turned in any suitable manner from a band-wheel 16 outside the gun. If before opening the breech the firing-cam is accidentally or improperly turned for a part of a full rotation—say three hundred and forty degrees—carrying the firing-head partially back, the rotation of the breech-block on opening the breech will complete the rotation of the firing-head in respect to the cam, carrying the wings 7 8 opposite the grooves 12 13, and the firing-head will be released and projected forward and will explode the charge if one should be in the gun. To prevent this, we provide a firing-head with a cross-head H (shown in the accompanying drawings) back of the hub C, and upon

a non-rotating part (shown on the carrier-hub) are placed two curved ribs or projections 18 and 19, so situated that they will not interfere with the full play of the firing-head when the parts are in proper position. When, however, the firing-head is turned by the rotation of the breech-block to an extent beyond the normal, the ends of the cross-bar as the firing-head turns and moves back will be carried to position above said ribs, and when the firing-head is released these ribs will prevent it from passing forward to firing position.

The projections or ribs 18 and 19 may be cam projections with the same inclination as the cams 9, or they may be made steeper with abrupt faces  $\alpha$  more inclined than those of the cams 9. In the latter case the cross-bar H will ride on ribs 18 and 19, but the wings 7 and 8 will be either lifted from the cams 9, if the grooves behind are wide enough, or the wings will cause the firing-cam A to turn with them, but not at so great a speed, if there is no play in these grooves. When, therefore, the breech-block is turned in closing the breech, the cross-bar will ride down these faces until its wings 7 and 8 are brought slowly onto the cam-faces of the cam A or into firing position, so that the firing-pin cannot strike the cartridge until the breech-block is fully home. There are therefore two distinct movements of the firing-head:

First. Its straight rearward movement without turning, caused by the revolving of the cam A when firing. The cross-bar H consequently keeps its horizontal position in running out.

Second. The turning movement imparted to the firing-head when operating the block, and subsequently forcing the wings 7 and 8 and cross-bar H to run up the slopes. The cross-bar in this case turns to a certain angle off from the horizontal position.

We do not here claim any features shown herein and also shown and claimed in our application Serial No. 243,552.

Without limiting ourselves to the construction shown, we claim—

1. The combination with a firing-head having lateral arms, of a rotatable cam having spiral faces engaged by said arms, and each making a complete rotation, and longitudinal grooves intersecting said faces, the said grooves and arms relatively proportioned to permit the forward passage of the arms only when opposite the grooves at their rear ends, substantially as set forth.

2. The combination with a firing-head having lateral arms of different widths, of a rotatable cam-cylinder having spiral cam-faces, and longitudinal grooves of different widths, intersecting said faces, and arranged to permit the forward passage of the arms

only when the parts are in firing position, substantially as set forth.

3. The combination with the firing-head of a gun having arms extending laterally therefrom in the same plane and of different widths, of a rotating cam having spiral cam-faces, and longitudinal grooves from which said spiral faces start at the forward end and at which they terminate at the rear end, said grooves of different widths corresponding to the widths of the said arms, substantially as set forth.

4. The combination with the carrier, breech-block, firing-head, means for turning and cam for retracting the firing-head, of a cross-bar at the rear of the firing-head, and projections upon the carrier at the rear thereof arranged to limit the forward movement of the cross-bar and firing-head after the latter has been turned from firing position, substantially as set forth.

5. The combination with the carrier, breech-block, firing-head, means for turning and cam for retracting the firing-head, of a cross-bar on the firing-head at the rear of the carrier, and projections on the carrier at the rear having inclined ends arranged to carry back the firing-head and to limit the forward movement of the cross-bar and firing-head after the latter has been turned from firing position, substantially as set forth.

6. The combination with the sliding firing-head having lateral arms, a rotatable cam with faces for engaging said arms and retracting said head, and with grooves adapted to be traversed by the arms on moving forward, of a cross-bar at the rear end of the firing-head, and projections arranged to limit the forward movement of the cross-bar and firing-head when the latter has been turned from firing position, substantially as set forth.

7. The combination with the sliding firing-head having lateral arms, a rotatable cam with faces for engaging said arms and retracting said head, and with grooves adapted to be traversed by the arms on moving forward, of a cross-bar at the rear end of the firing-head, and projections having inclined ends arranged to carry back the firing-head and to limit the forward movement of the cross-bar and firing-head when the latter has been turned from firing position, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN F. MEIGS.

HERMAN G. JAKOBSSON.

Witnesses:

EDWIN A. MILLER,

CHAS. H. CHEMBERLIN.