

No. 860,354.

PATENTED JULY 16, 1907.

S. D. CUSHING.
FUSE FOR PROJECTILES.
APPLICATION FILED JULY 16, 1906.

2 SHEETS—SHEET 1.

FIG. 1.

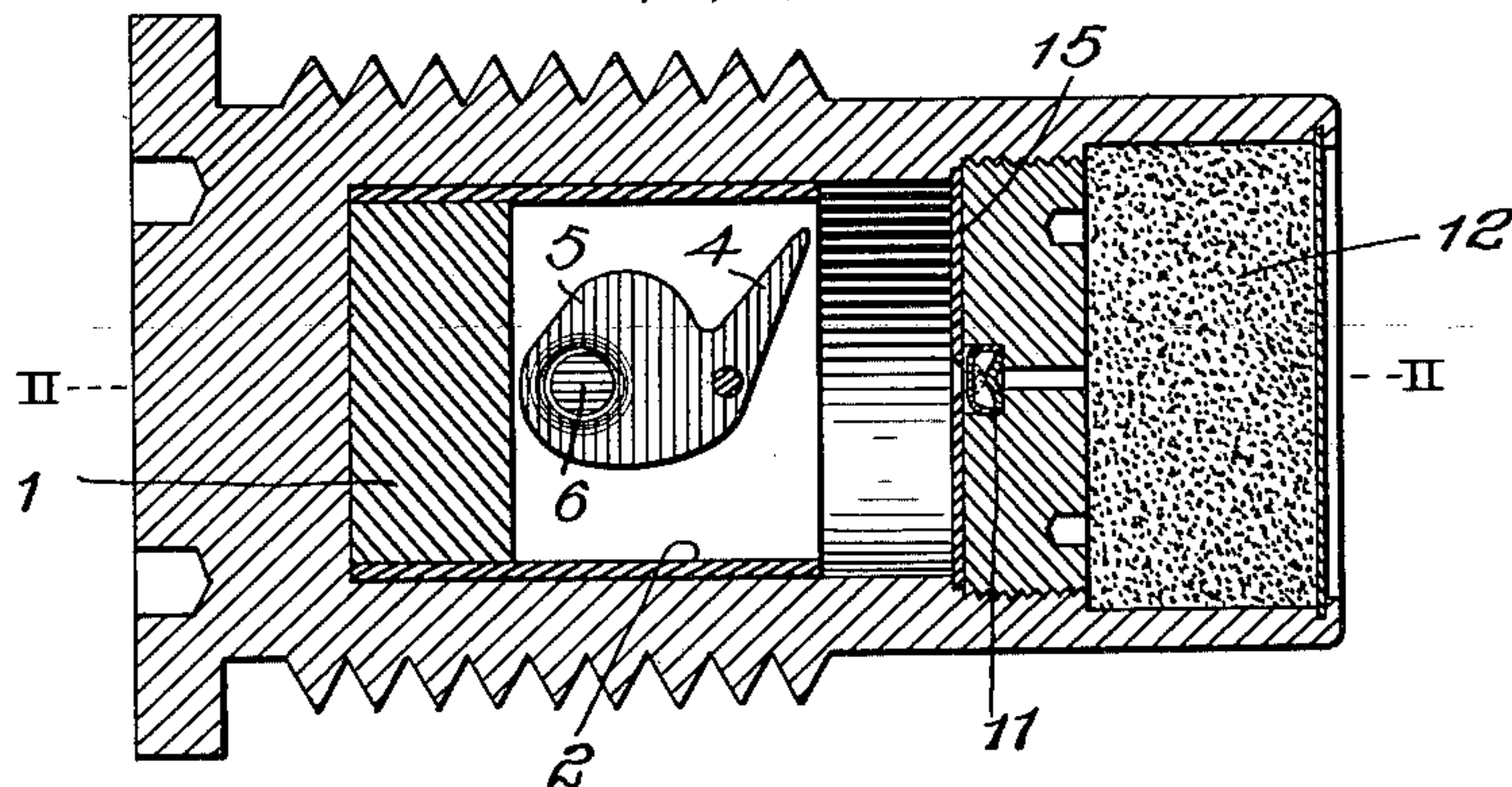


FIG. 2.

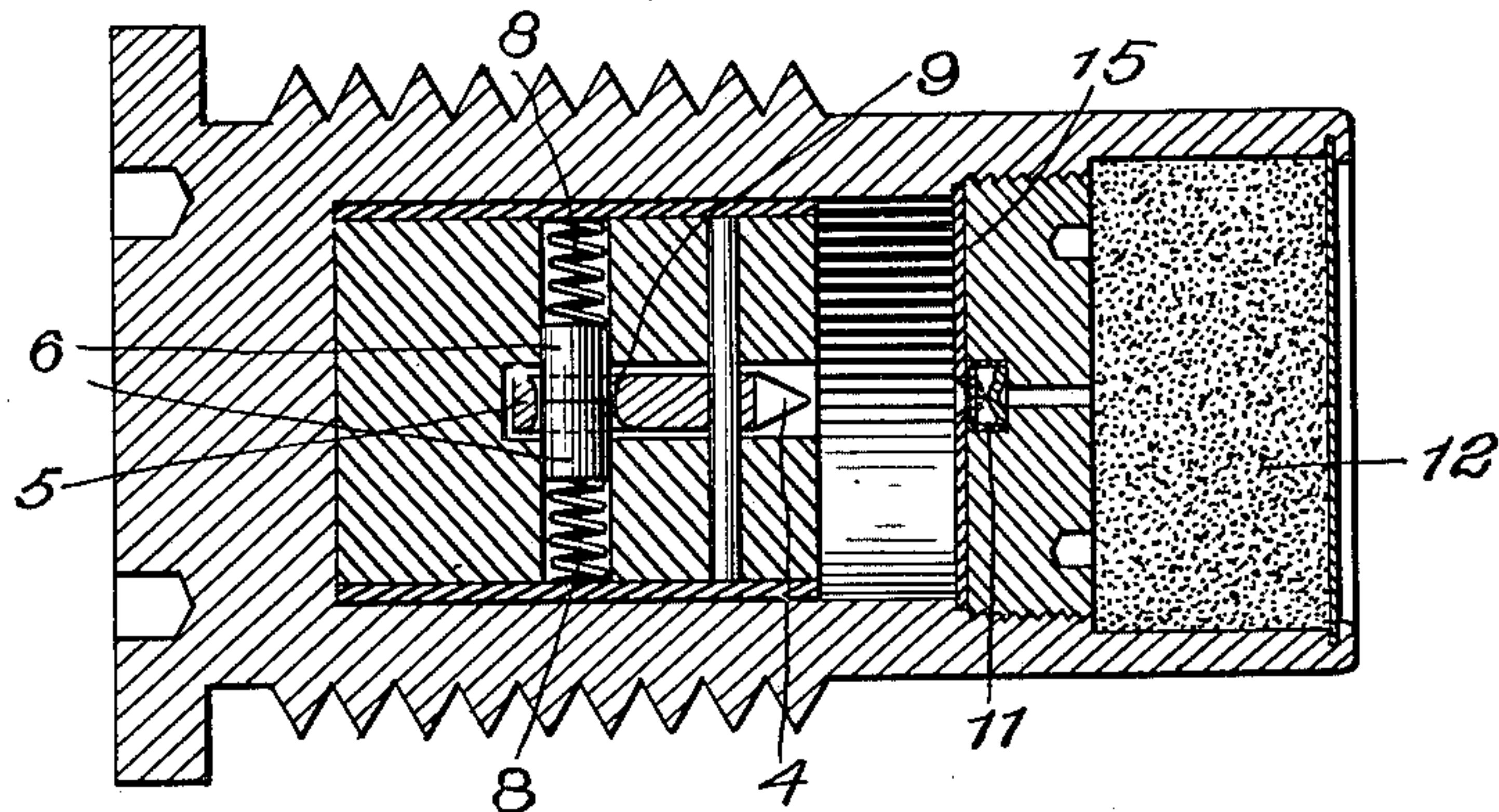


FIG. 5.

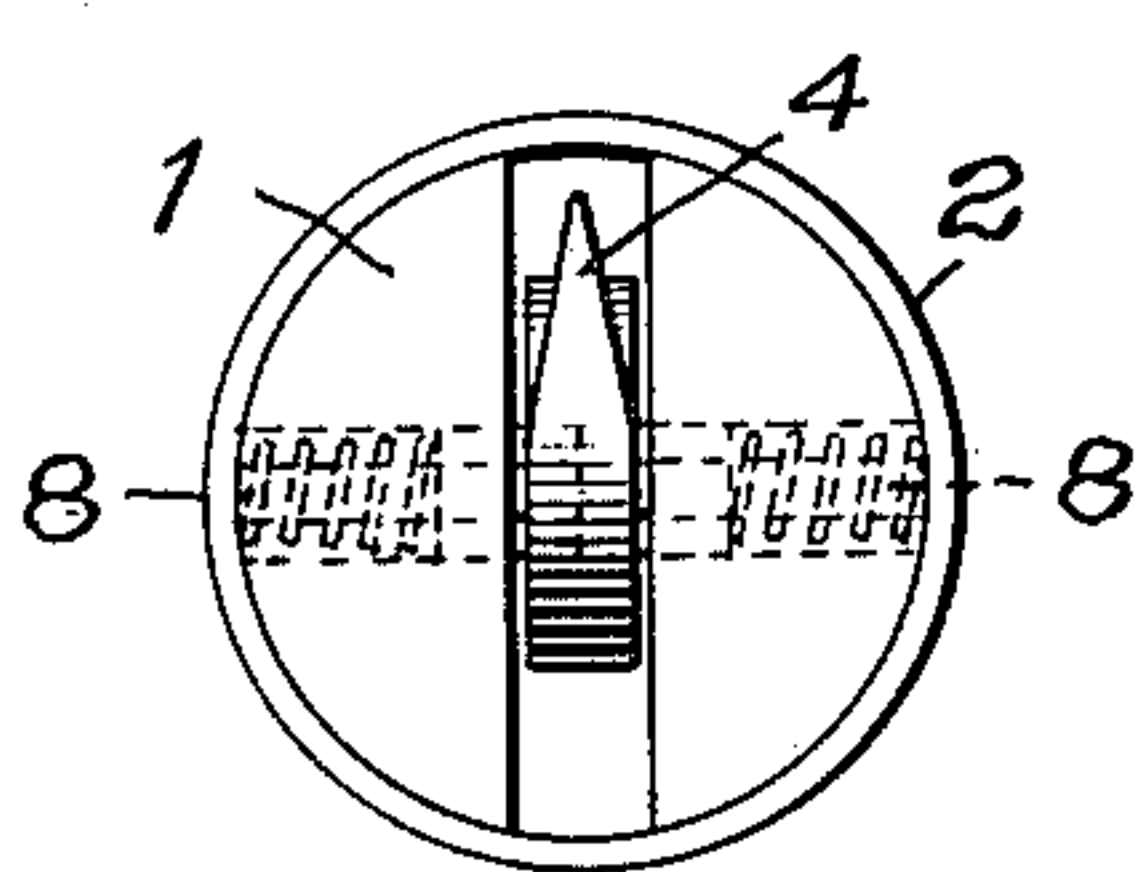


FIG. 3.

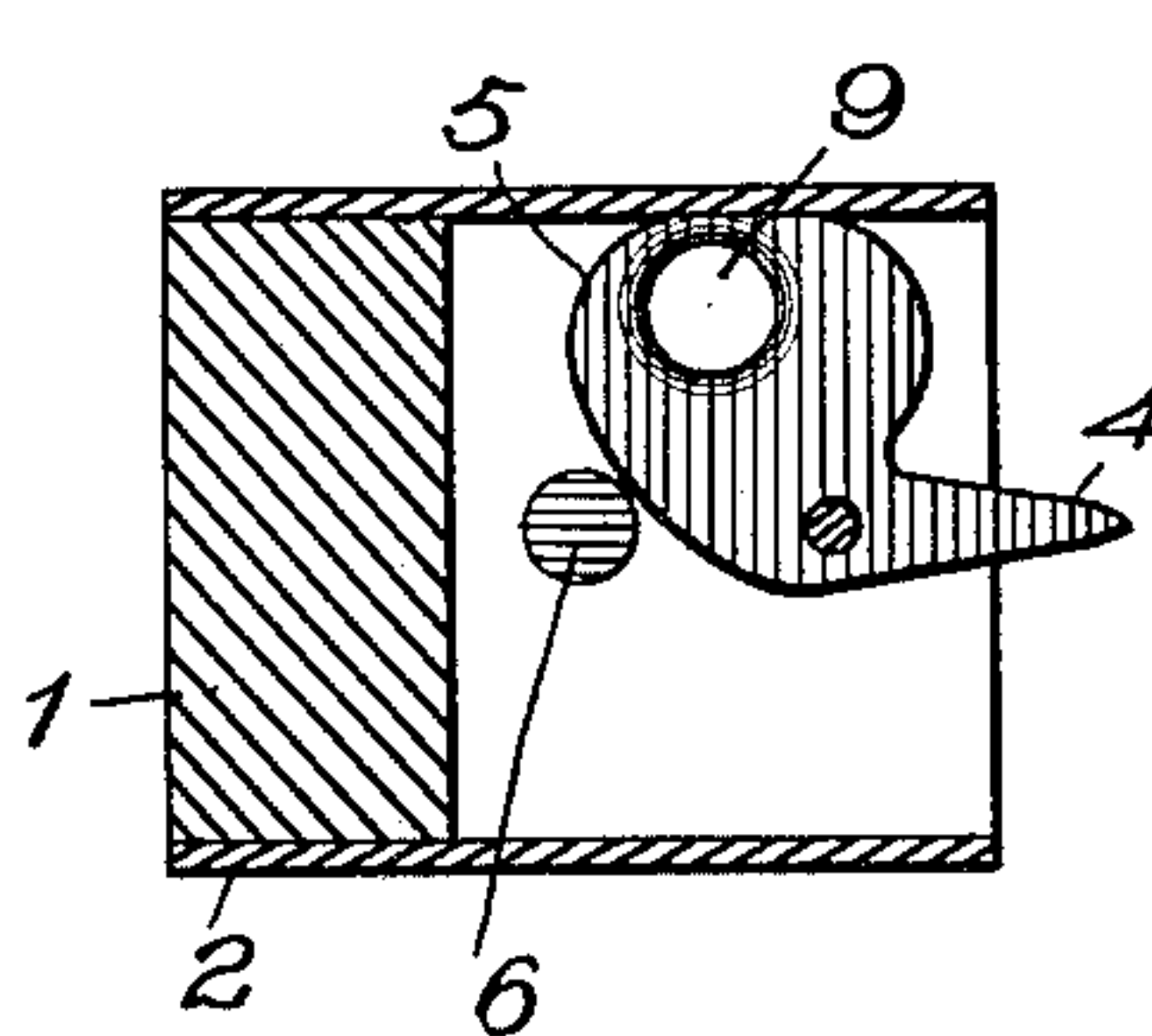
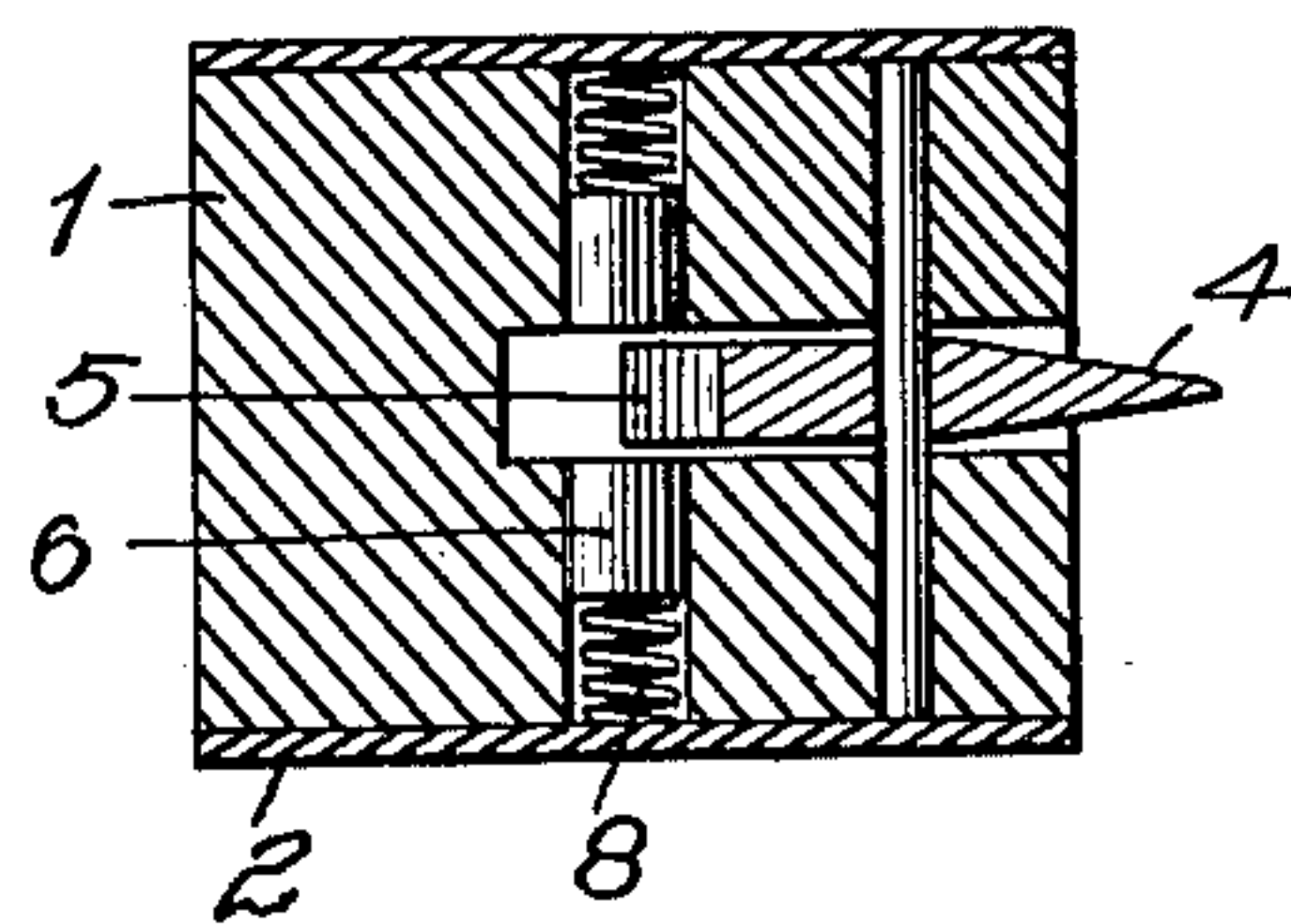


FIG. 4.



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2 SHEETS—SHEET 2.

FIG. 6.

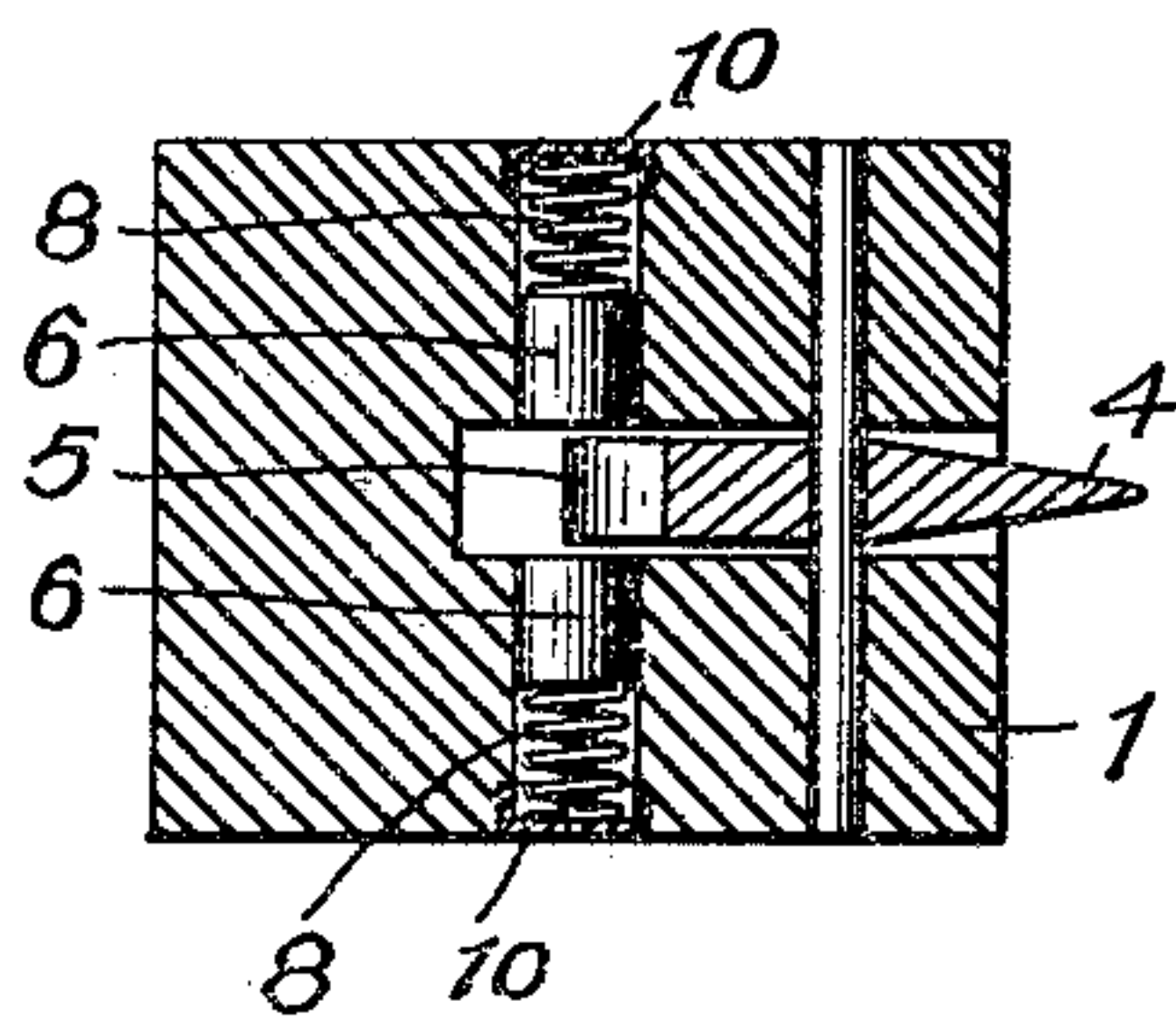


FIG. 7.

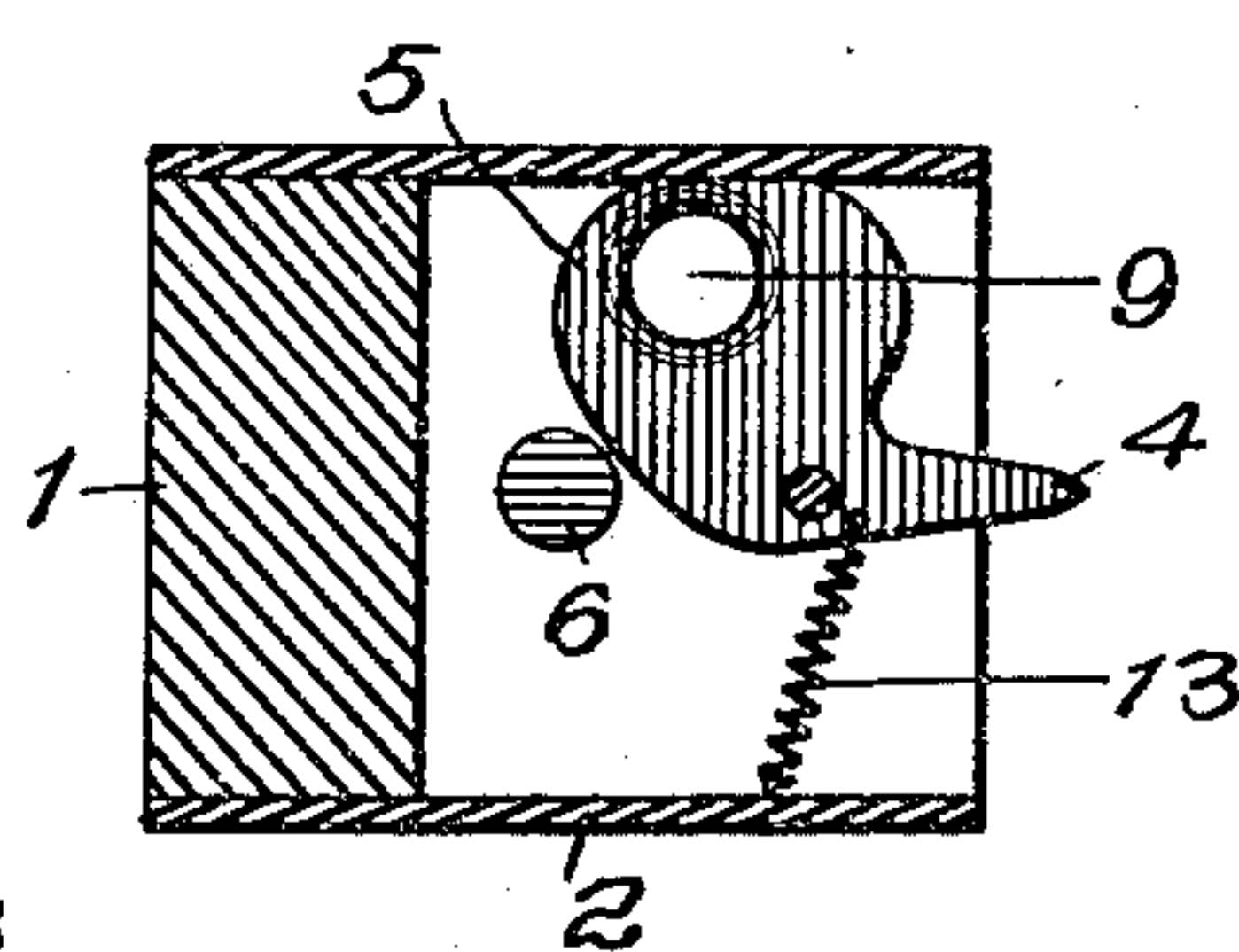


FIG. 10.

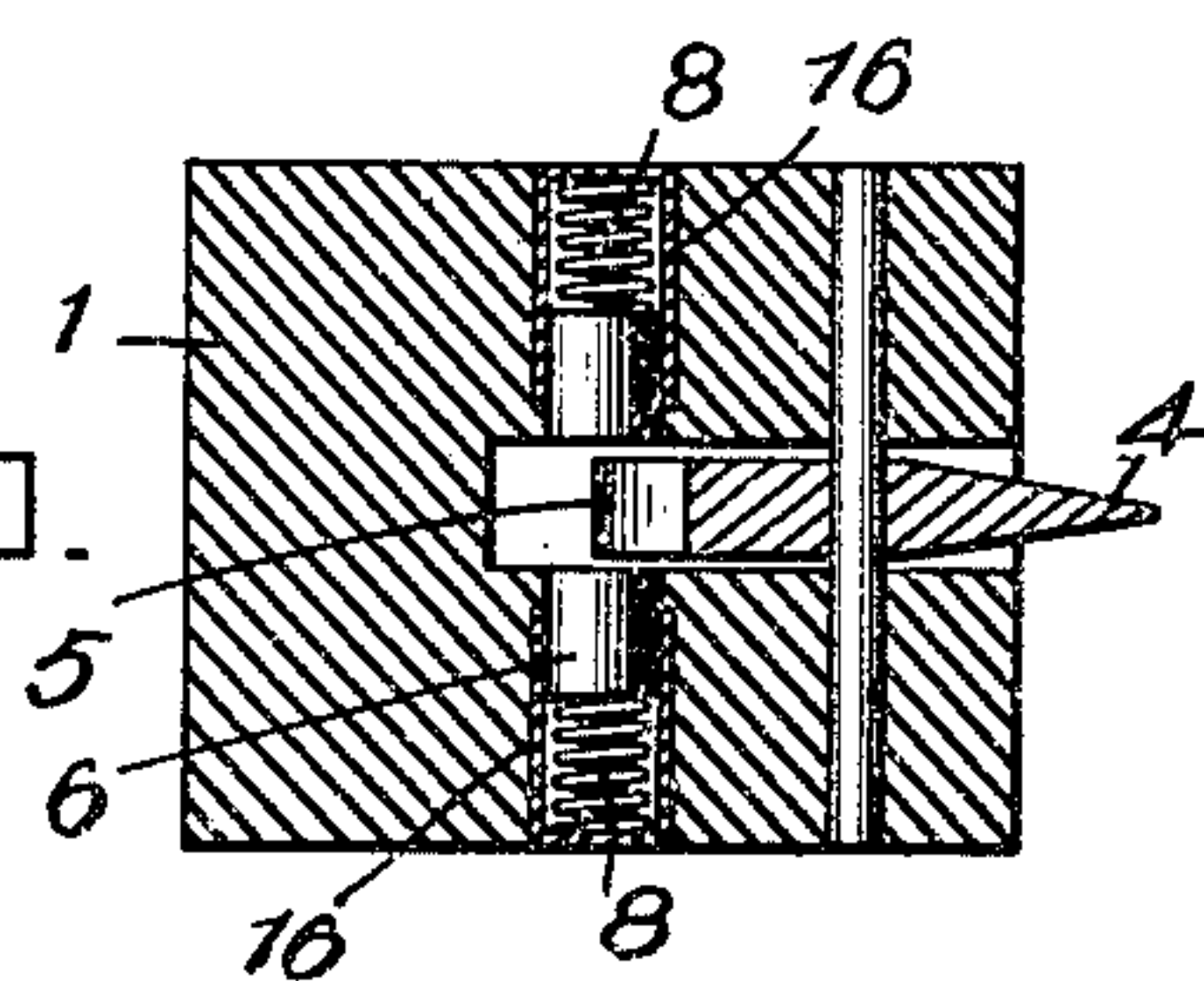


FIG. 8.

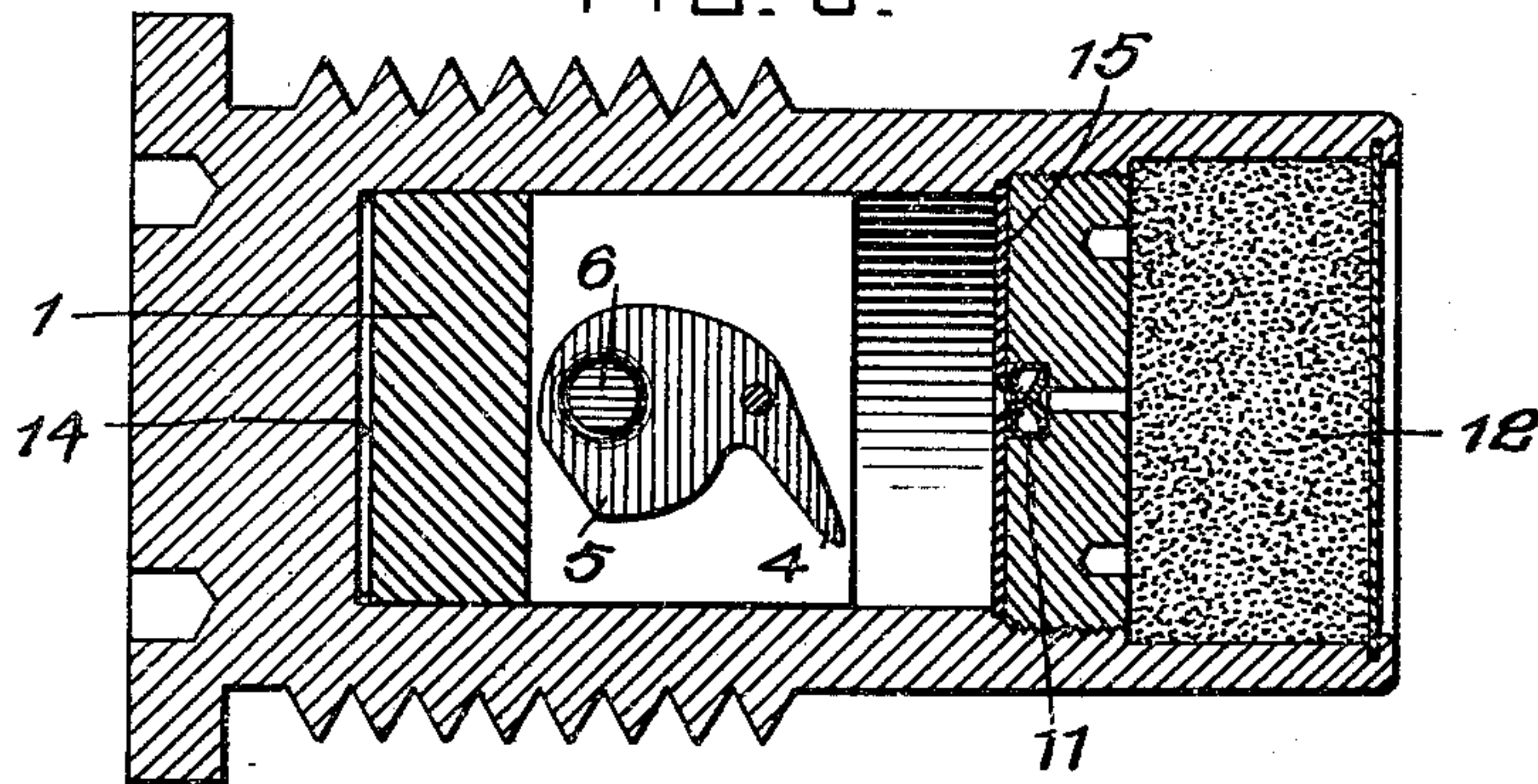
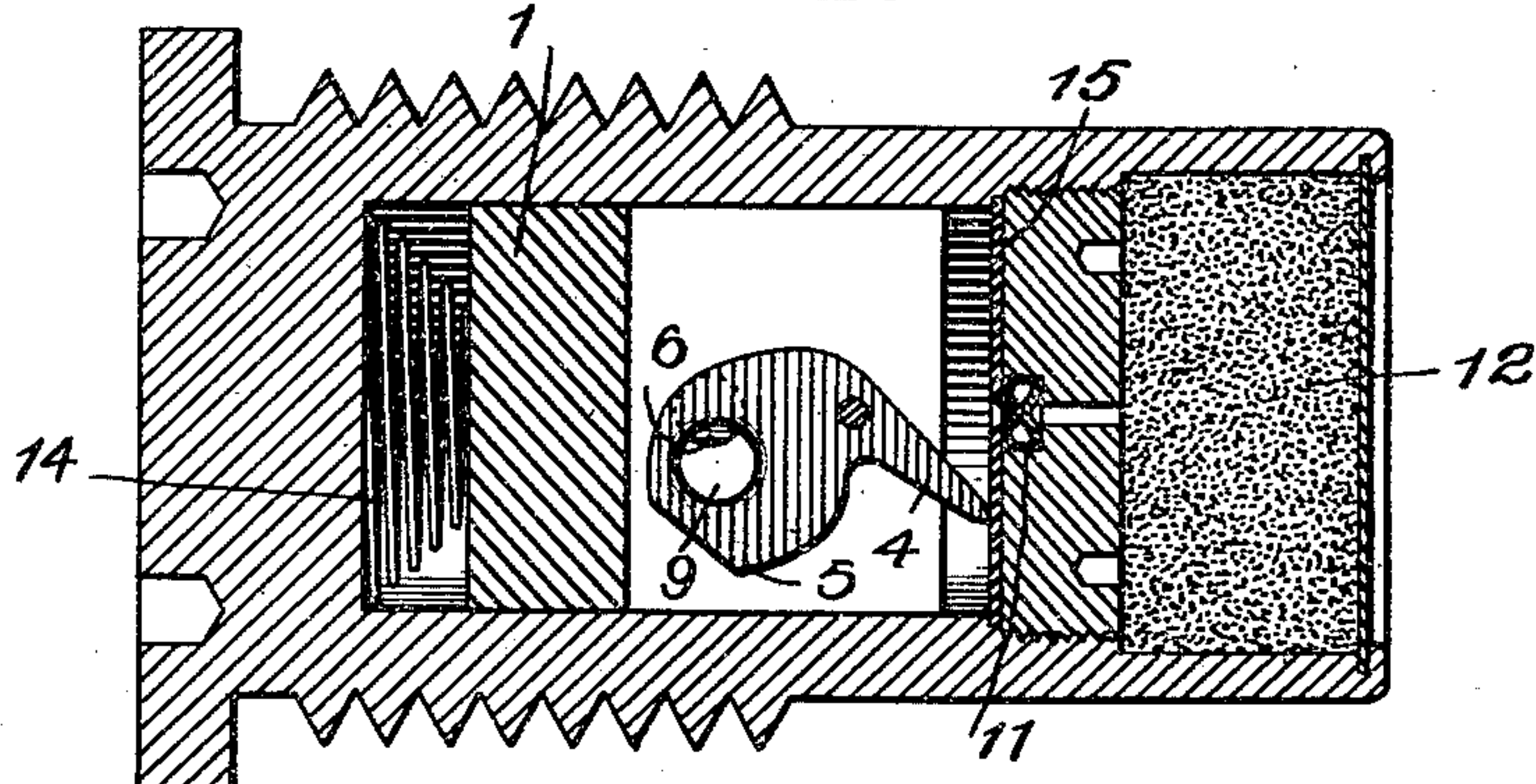


FIG. 9.



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UNITED STATES PATENT OFFICE.

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FUSE FOR PROJECTILES.

No. 860,354.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed July 16, 1906. Serial No. 328,405.

To all whom it may concern:

Be it known that I, SAMUEL DEWEY CUSHING, residing at Sewickley, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Fuses for Projectiles, of which improvements the following is a specification.

The invention described herein relates to certain improvements in fuses for shells, etc., and has for its object a combination of parts or elements with a firing pin whereby the latter will be securely held in unarmed position, until the shell is subjected to a rapid rotation on its axis.

The invention is hereinafter more fully described and claimed.

In the accompanying drawing forming a part of this specification Figure 1 is a sectional elevation of a fuse block having my improved firing mechanism arranged therein. Fig. 2 is a view similar to Fig. 1 the plane of section being indicated by the line II—II Fig. 1. Figs. 3 and 4 are sectional views on planes at right angles to each other of the hammer block and firing pin, the latter being shown in armed position. Fig. 5 is a top plan view of the hammer block and firing pin. Fig. 6 is a view similar to Fig. 3 illustrating a modification and Fig. 7 is a sectional view illustrating a further modification of my improvement. Figs. 8 and 9 illustrate a modification of my improvement in which the hammer block is normally held forward by a spring; Fig. 8 showing the position of the parts immediately on the discharge of a projectile and Fig. 9 while they are in normal position; and Fig. 10 illustrates a modification in the construction and arrangement of the locking bolts.

In the practice of my invention, the hammer block 1 and its inclosing band or sleeve 2 are constructed to have a free longitudinal movement in the axial cavity formed in the fuse block 3. The hammer block is slotted for the reception of the firing pin 4 which is so mounted on the slot that when in unarmed position its point will be below the face of the hammer block as shown in Figs. 1 and 2. The firing pin is provided with a weighted extension 5, so arranged relative to the pin, that when the block is rotated rapidly on its axis, the weight will move outwardly and shift the pin 4 to armed position as shown in Figs. 3 and 4.

A suitable lock is provided for holding the firing pin as against being armed by accidental shock or jar. A suitable construction to this end consists of bolts 6 arranged in openings in the hammer block at an angle to the slot containing the firing pin. The bolts are forced inward towards each other by springs 8, and will bear one against the other, when an opening or hole 9 through the extension 5 is in line with said bolts as shown in

Fig. 2. This opening or hole is so located that the firing pin must be in unarmed position, when the bolts pass into the opening or hole 9. As both springs are under constant inwardly acting pressure, the accidental movement of one bolt outward will be accompanied by a movement of the other bolt in the same direction, thus preserving a lock which might otherwise be released by such accidental movement. The springs and bolts are held in position by any suitable means as the sleeve or band 2, or by screws 10, as shown in Fig. 6.

When a projectile having my improvement is fired from a rifled gun, the rapid rotation of the projectile will cause the bolts to move outwardly against the action of the springs 8, thereby unlocking the firing pin. As soon as released the weighted portion will be caused to move transversely of the hammer block and thereby shift the firing pin to armed position. The movement of the pin is arrested by a suitable stop, said stop of the construction shown, being formed by the band or sleeve 2, against which the extension 5 will strike.

The firing pin being in armed position, the hammer will move forward, when the flight of the projectile is checked or arrested, bring the firing pin into violent contact with the cap 11, exploding the same and thereby igniting the priming charge 12.

While it is preferred to so construct the fuse that the firing pin will be shifted by centrifugal force to armed position, such movement may be accelerated or be produced solely or mainly by a spring, which may be arranged as indicated at 13 in Fig. 7 or any other suitable manner.

It will be observed that the weight of the extension of the firing pin is so disposed that if for any reason the pin should be released, it will be held in unarmed position while the projectile is in or nearly in a vertical position. As shown in Figs. 8 and 9, a spring 14 may be so arranged between hammer block and the end of the fuse, as to constantly press the hammer block forward towards the anvil plate or diaphragm 15, thereby supplementing the locking action of the bolts 6. When the projectile is fired, the hammer block will be set back in the fuse case compressing the spring 14, and permitting of the firing pin being turned to armed position. The spring should have such a tension that while capable of moving the hammer block forward, the movement will not have sufficient force to explode the cap, if the firing pin is in armed position.

As shown in Figs. 6 and 10, the outer bearings or abutments for the springs 8 may be formed by cup-shaped pieces 16, held in place by contact with the wall of the fuse case or shell or by reason of their tight fit in the passages in the hammer block.

I claim herein as my invention:

1. A fuse for projectiles having in combination a firing pin, a lock for positively holding the pin against movement into armed position, and means movable in a plane parallel with or passing through the longitudinal axis of the projectile and operated by the rotation of the projectile to shift the pin into armed position.
2. A fuse for projectiles having in combination a firing pin, a lock normally holding the pin against movement into armed position and shiftable to release the pin by the rotation of the projectile, and means movable in the plane parallel with or passing through the longitudinal axis of the projectile and operated by the rotation of the projectile to shift the firing pin into armed position.
3. A fuse for projectiles having in combination a slotted hammer block, a firing pin movably mounted in said slot, means movable in said slot by the rotation of the projectile for shifting the pin to armed position, and means independent of the pin shifting means for holding the pin as against movement.
4. A fuse for projectiles having in combination a slotted hammer block, a firing pin movably mounted in the slot of the hammer block and means acting in the plane of movement of the firing pin to shift the latter to armed position.
5. A fuse for projectiles having in combination a slotted hammer block, a firing pin mounted in the slot in the hammer block and movable in a plane parallel with or passing through the longitudinal axis of the projectile and adapted to be shifted to armed position by centrifugal force, operative directly on the pin.
6. A fuse for projectiles having in combination a slotted hammer block, a firing pin pivotally mounted in said

slot, and adapted to be shifted by the rotation of the projectile to armed position and bolts normally held in engagement with the firing pin when in unarmed position and adapted to be shifted out of engagement with the pin on the rotation of the projectile.

7. A fuse for projectiles having in combination a slotted hammer block, a firing pin movably mounted in said slot, a lock for positively holding the pin in unarmed position and adapted to be shifted by the rotation of the projectile to release the firing pin, and means operative on the shifting of the lock to move the firing pin to armed position.

8. The combination of a fuse case or shell, a slotted hammer block movably mounted in said shell, a firing pin pivotally mounted in a slot in the hammer block, an anvil plate or diaphragm, and a spring for shifting the hammer block towards the anvil plate whereby the firing pin will be held by the anvil plate as against movement into armed position.

9. A fuse for projectiles having in combination a slotted hammer block, a firing pin pivotally mounted in said slot and provided with a weight so arranged that when shifted by the rotation of the projectile the pin will move to armed position, bolts movably mounted in said block at an angle to the plane of movement of the firing pin and springs for pressing said bolts towards each other and into engagement with the firing pin.

In testimony whereof, I have hereunto set my hand.

SAMUEL DEWEY CUSHING.

Witnesses:

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J. B. SEMPLE.