

No. 876,240.

PATENTED JAN. 7, 1908.

L. P. SCHLAMB.
STARTER FOR ENGINES.
APPLICATION FILED MAR. 8, 1907.

3 SHEETS—SHEET 2.

Fig. 2.

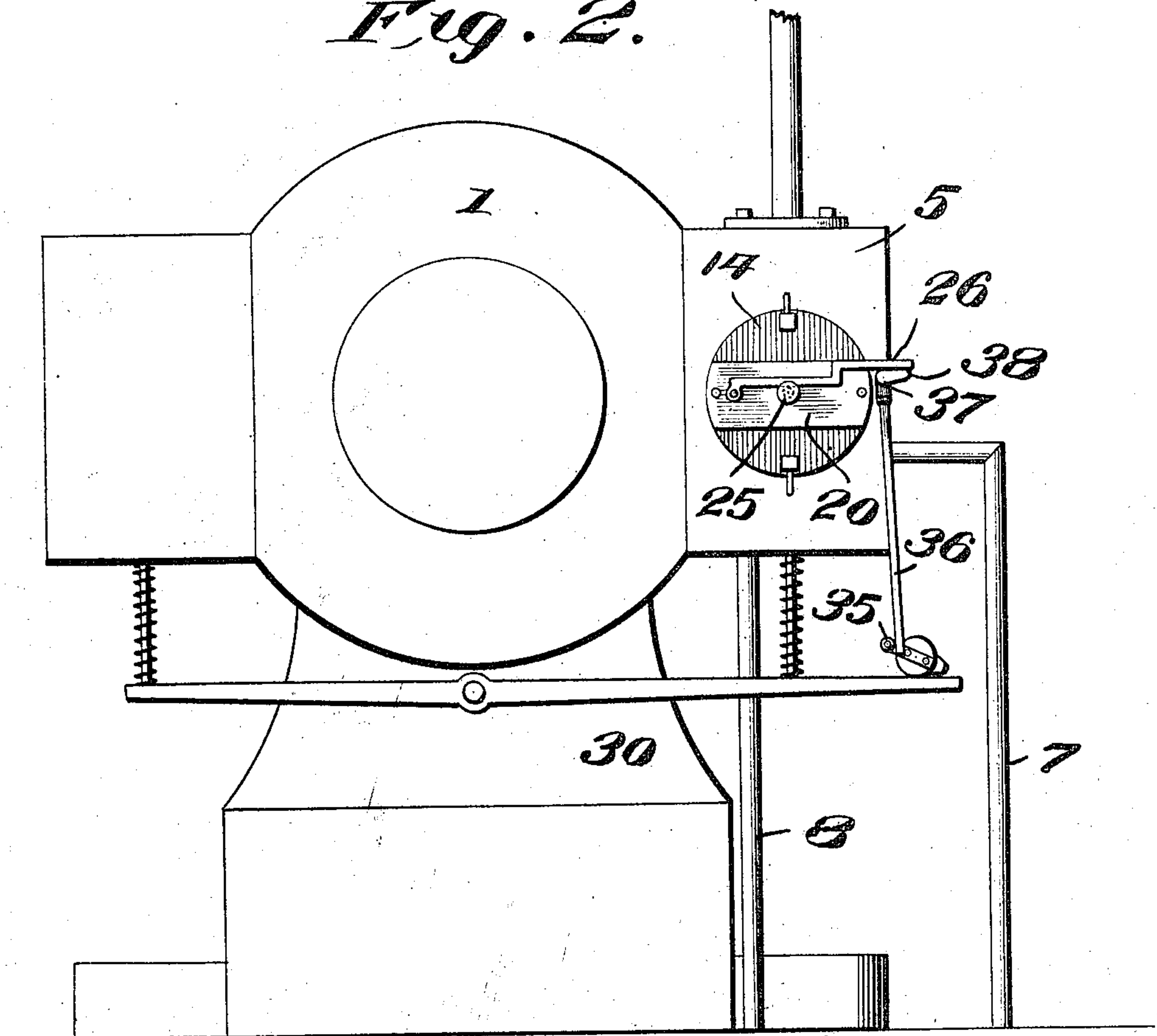


Fig. 6.

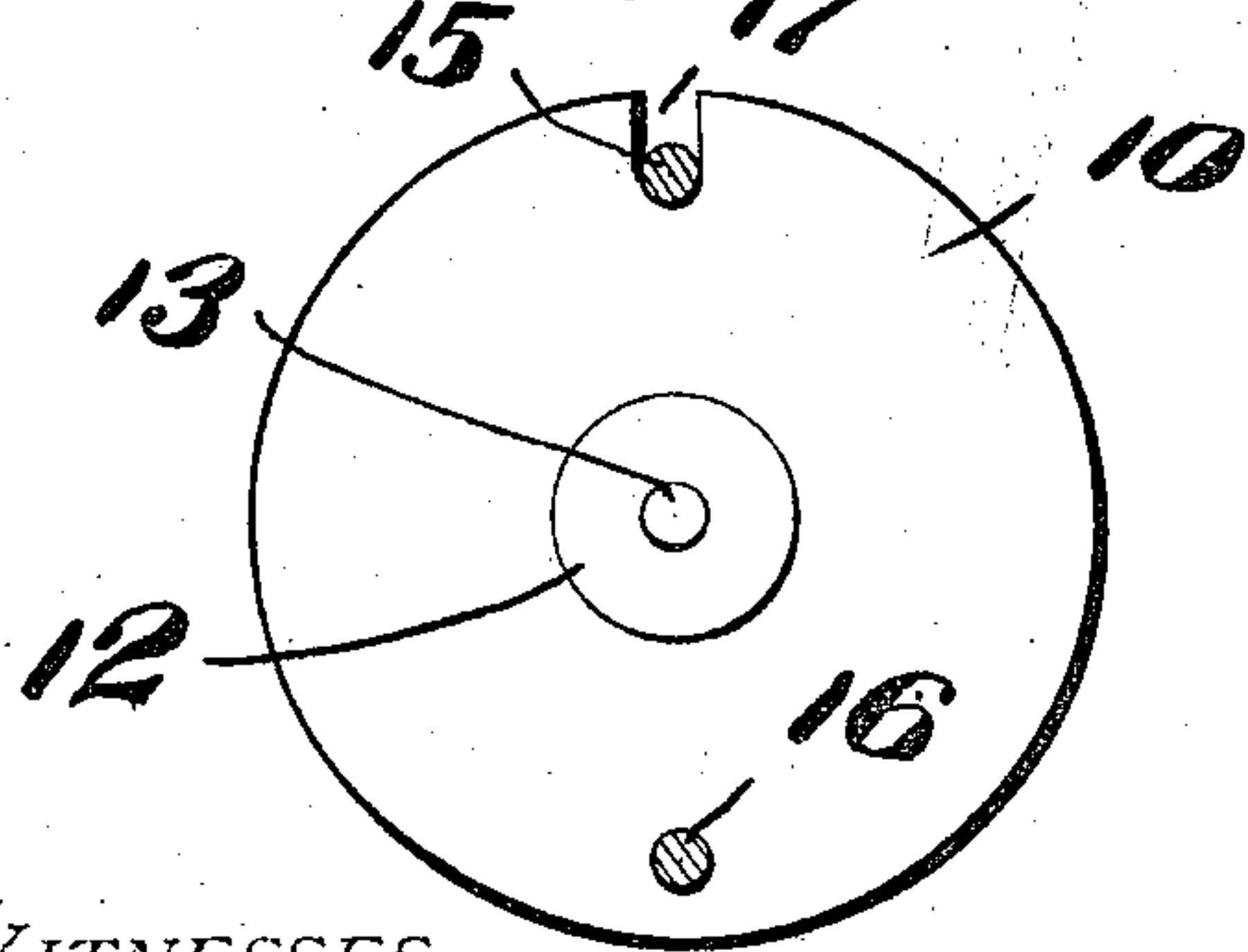
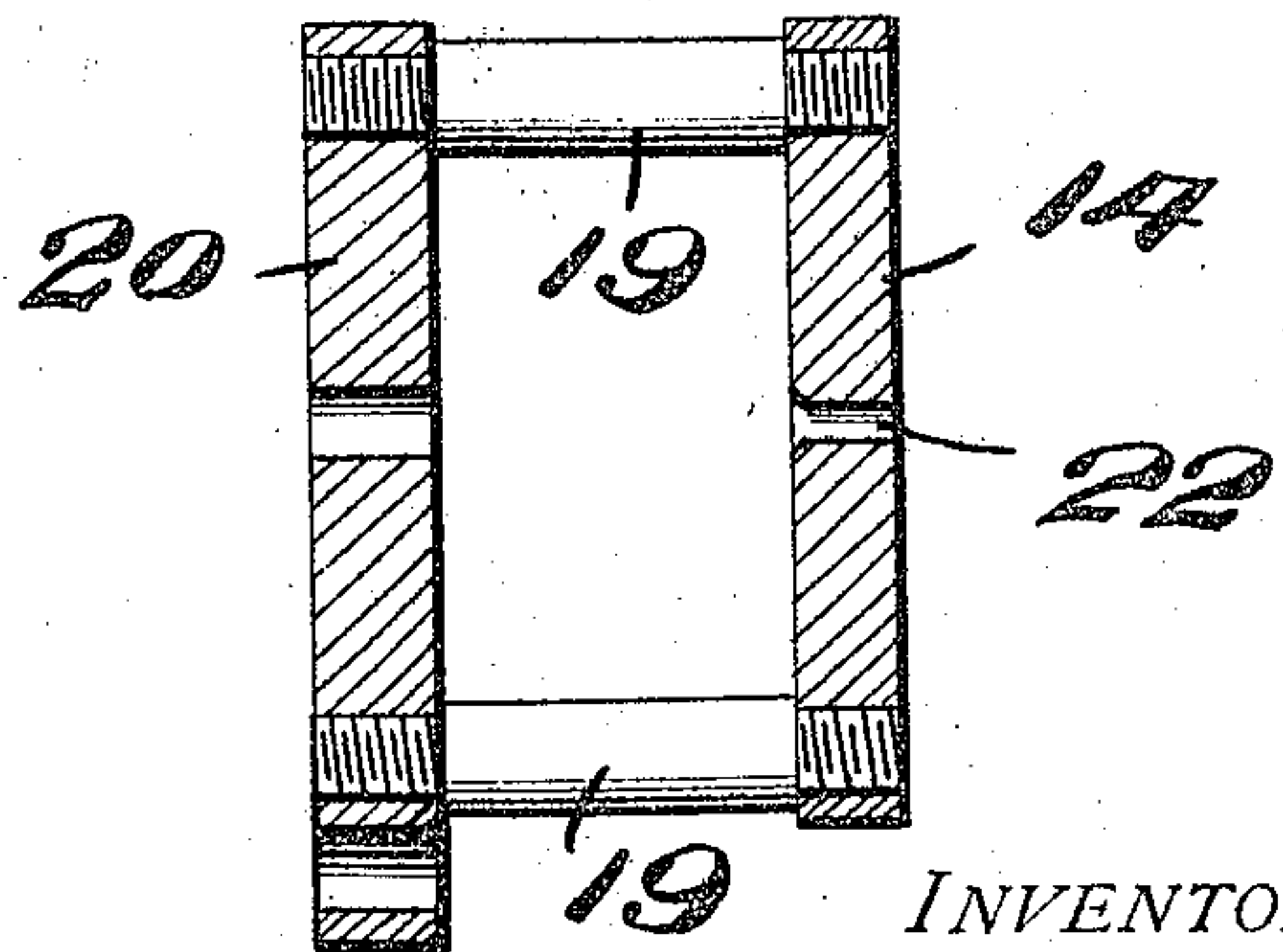


Fig. 7.



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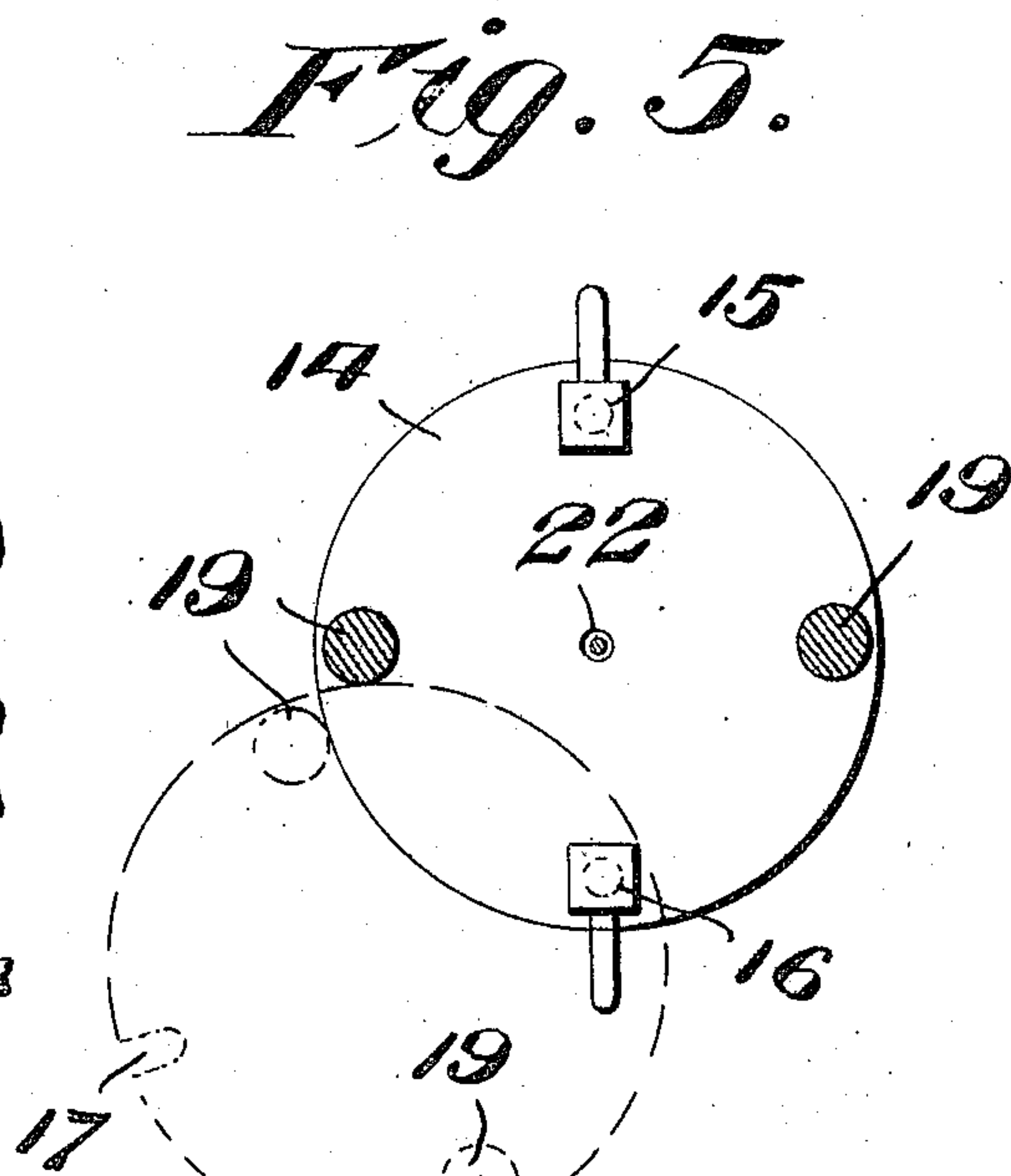
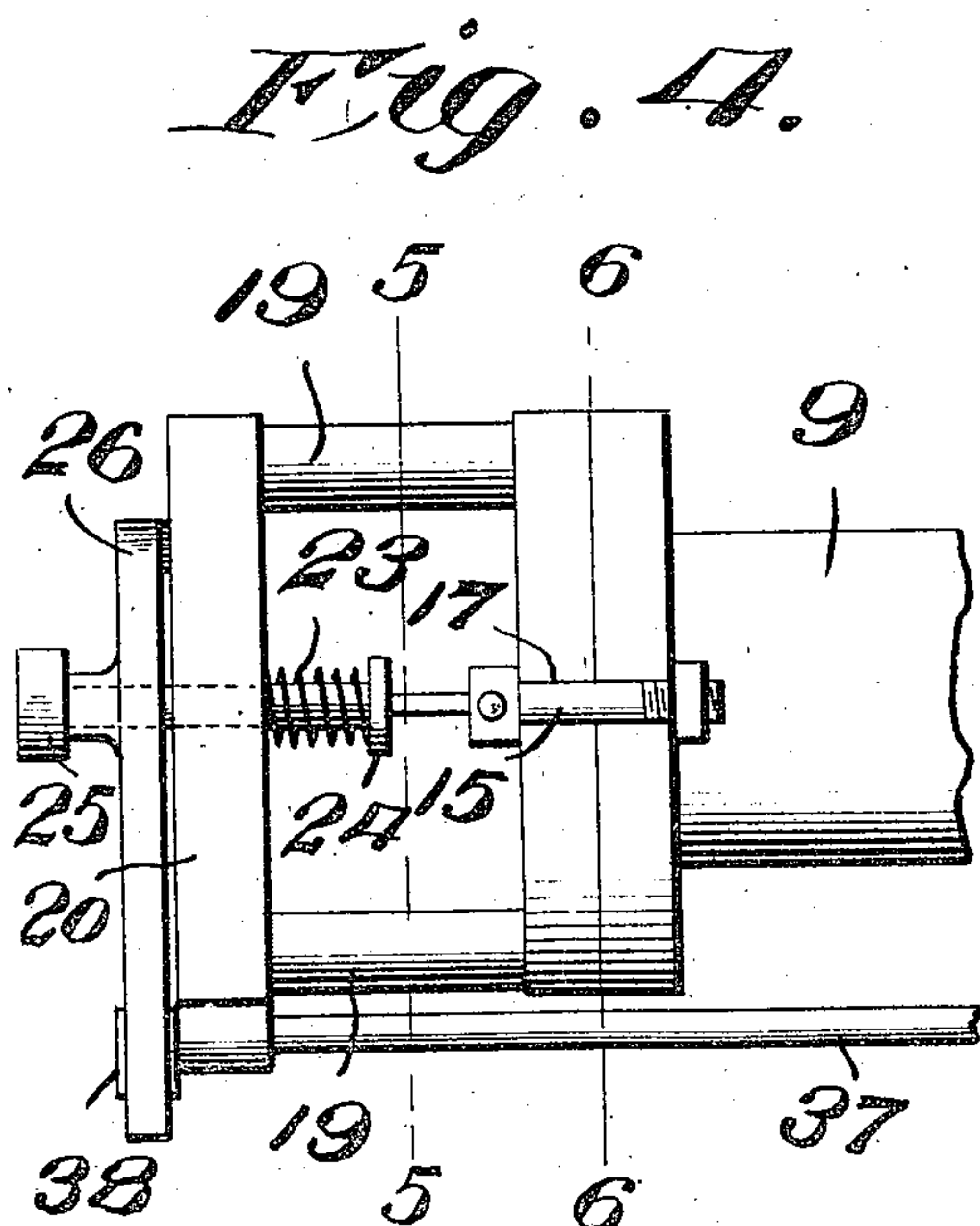
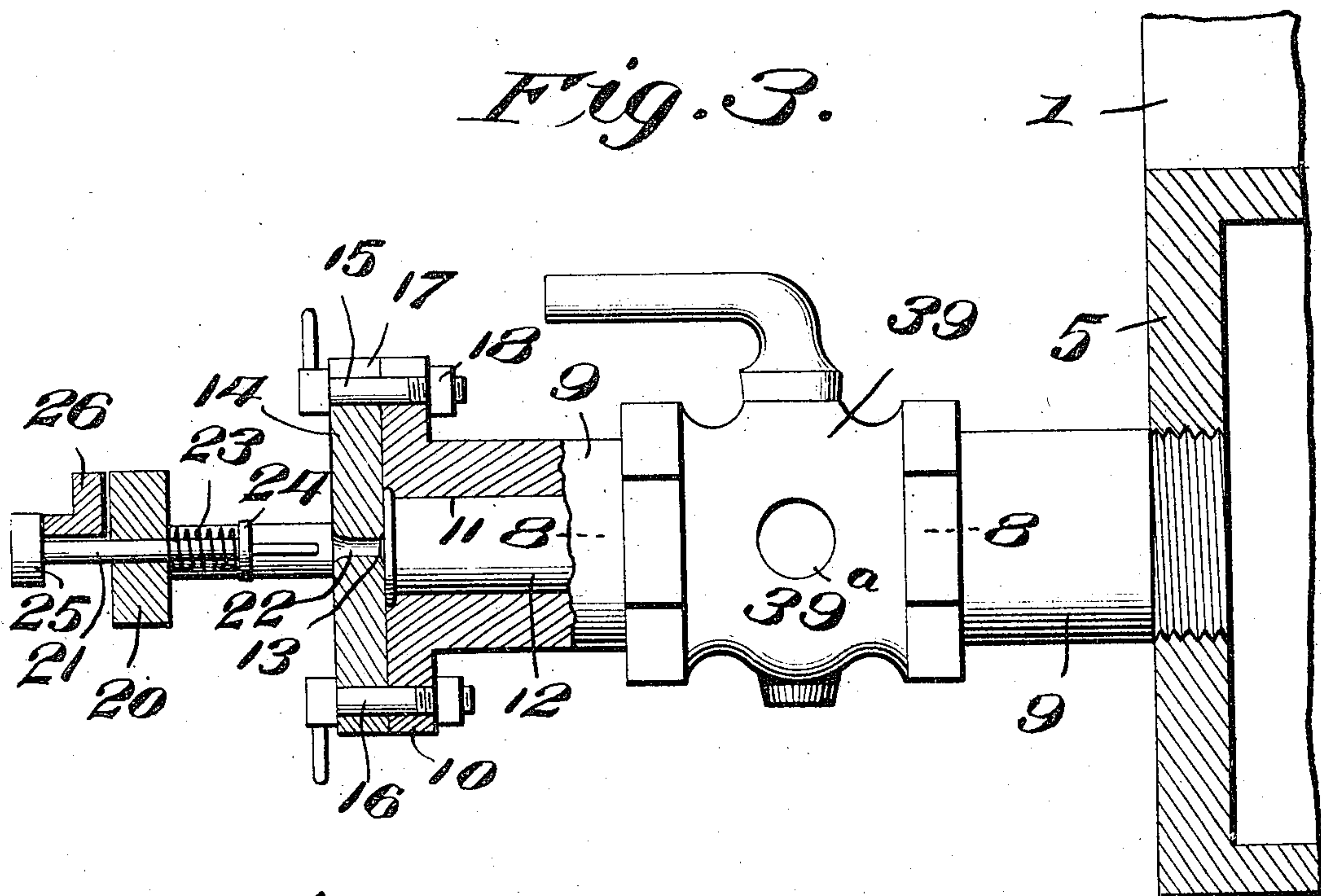
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UNITED STATES PATENT OFFICE.

LOUIS P. SCHLAMB, OF DULL, OHIO.

STARTER FOR ENGINES.

No. 876,240.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed March 8, 1907. Serial No. 361,380.

To all whom it may concern:

Be it known that I, LOUIS P. SCHLAMB, a citizen of the United States, residing at Dull, in the county of Van Wert and State of Ohio, have invented certain new and useful Improvements in Starters for Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to new and useful improvements in starters for engines and more particularly to that class adapted to be used in connection with gas or other engines using an explosive for propelling purposes, and my object is to provide means for discharging a powder or similar explosive material whereby the charge of gas in the engine will be exploded.

A further object is to provide means for automatically operating the discharging mechanism.

A still further object is to provide means for placing the powder in coöperative relation with the gas chamber.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the claims.

In the accompanying drawings which are made a part of this application, Figure 1 is a side elevation of a portion of an engine showing my improved starting mechanism secured thereto. Fig. 2 is an end elevation thereof. Fig. 3 is a side elevation partly in section of my improved starting mechanism. Fig. 4 is a top plan view thereof. Fig. 5 is a sectional view as seen on line 5—5 Fig. 4, and showing the position of parts therefor in dotted lines. Fig. 6 is a sectional view as seen on line 6—6 Fig. 4, Fig. 7 is a detail sectional view of a portion of the starting mechanism, and, Fig. 8 is a central horizontal sectional view as seen on line 8—8 Fig. 3.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates the cylinder of an engine which is of the usual or any preferred form and closed at one end while the opposite end thereof is open to receive a piston 2.

Located at a proper distance from the open end of the cylinder 1 is a driving shaft 3 to which is secured one end of a piston rod 4 while the opposite end of said rod is pivotally secured to the piston 2 so that when said pis-

ton is reciprocated in the cylinder, the driving shaft 3 will be rotated.

Located at one side of the cylinder 1 and at the closed end thereof is a combustion chamber 5 with which connects a mixing chamber 6, said mixing chamber in turn receiving a gas supply pipe 7 and an air pipe 8 and the object in directing the pipes 7 and 8 into the chamber 6 is to properly mix the air and gas before the same is directed into the combustion chamber.

In an engine of this class it is a common practice to employ a sparking plug for intermittently exploding the gas in the combustion chamber in order to drive the piston and it has been found an arduous task to start the engine or cause the first explosion and to this end I have provided my improved form of starter which consists in attaching to the combustion chamber 5, at any convenient point, a tube 9, the outer end of which is provided with a head 10. The opening 11 in the tube 9 is arranged to receive a charge of explosive material which is preferably incased in a shell or cartridge 12 so that said explosive material may be the more readily handled and inserted within the tube and in this connection I desire to state that it is my intention to use the usual form of shell employed in containing a charge of powder and shot as used in connection with fire arms, said shell being provided at one end with a percussion cap 13 so that when a blow is delivered upon said cap, the contents of the shell will be ignited which will result in exploding the charge of gas within the combustion chamber. The shell is retained within the tube 9 by means of a breech 14 which is secured to the head 10 by means of bolts 15 and 16, the bolt 16 entering a bore in the breech 14 and extending through a registering bore in the head 10, said bolt 16 forming a pivot point for the breech, while the bolt 15 is seated in registering slots 17 in the upper edge of the head and the breech, so that when it is desired to place a shell in the tube or remove the same therefrom, the nuts 18 on the bolts 15 and 16 are turned sufficiently to release the bolts when the bolt 15 may be readily lifted out of the slots and the breech 14 rotated on the bolt 16 which will result in removing the breech from over the opening 11 when the exploded shell may be readily removed from the tube and a new one inserted therein.

Extending forwardly from the breech 14

and preferably integral therewith are arms 19 to the outer ends of which is secured a block 20, said block having a cavity through the central portion thereof in which is mounted a firing pin 21, the inner end of which is adapted to enter a bore 22 extending through the breech 14 and in line with the cap 13 so that when said pin is directed through the bore 22 under pressure, the cap 13 will be exploded.

Surrounding the inner end of the pin 21 is a spring 23, one end of which rests against the block 20 while the opposite end thereof engages a collar 24 fixed to the pin 21, so that when the pin is drawn outwardly through the block 20 the spring will be contracted by the collar 24 so that when the pin is released, the spring will drive the inner end of the pin against the cap 13 with sufficient force to explode the same.

The outer end of the firing pin 21 is provided with a head 25 with which is adapted to engage a trigger 26, said trigger being pivotally secured at one end to the block 20 and adapted to rest between the head 25 and the block 20 when the firing pin 21 is moved outwardly to contact the spring 23 and by this construction it will be seen that said spring will be held in its contracted position as long as the trigger 26 remains between the head and the block. In order to automatically release the trigger 26 from the head 25 I mount upon the driving shaft 3, a gear wheel 27 with which is adapted to mesh a similar gear 28 mounted upon a stub-shaft 29, said shaft being rotatably mounted in any preferred manner upon the base 30 of the engine. A beveled gear 31 is also fixed to the shaft 29 with which meshes a beveled gear 32 carried by one end of a shaft 33, said shaft extending parallel with the cylinder of the engine and rotatably secured in position thereon by means of brackets 34. The outer end of the shaft 33 is provided with a crank 35 which is adapted to intermittently engage the lower end of an arm 36 which is fixed at its upper end to an auxiliary shaft 37, said auxiliary shaft being provided at its outer end with an eccentric 38 which is adapted to engage the projecting end of the trigger 26 and elevate the same sufficiently to release the head 25 when the auxiliary shaft 37 is partially rotated.

In operation a shell is first placed in the tube 9 and the firing pin moved outwardly and secured in position by means of the trigger 26, after which the piston 2 is moved outwardly in the cylinder 1 by rotating the shaft 3 a sufficient distance to draw a charge of gas into the cylinder and combustion chamber and when the piston 2 is moved inwardly by rotating the shaft 3 in the opposite direction, crank 35 will be directed into engagement with the arm 36 through the

medium of the gears 27, 28, 31 and 32, and by the time the piston has been moved inwardly sufficiently to compress the gas into the closed end of the cylinder, the crank 35 will have operated the auxiliary shaft 37 sufficiently to release the trigger 26 from the head 25, when the spring 23 will direct the firing pin into engagement with the cap 13 and explode the contents of the shell, which will in turn enter the combustion chamber 5 and explode the combustible material therein, which will result in driving the piston outwardly and starting the engine and after the same is once started it will be readily seen that the gas in the combustion chamber will be successively exploded through the medium of the usual form of sparking plug (not shown).

In order to prevent a premature starting of the engine, as by the accidental exploding of the shell in the tube 9, a three-way cock 39 is provided and located in the length of the tube 9 between the cartridge 12 and the combustion chamber 5, as best shown in Figs. 1, 3 and 8 of the drawings, and when the engine is not ready to be operated, the stem 39^b of the cock is turned in such manner as to direct the handle of the stem at right angles to the longitudinal axis of the tube, thereby closing the passage through the tube 9 into the combustion chamber 5 and registering the bores through the stem with that end of the opening 11 containing the cartridge and a passage 39^a in one wall of the cock, so that should the cartridge be accidentally discharged, the force of the explosion will pass through the passage 39^a, instead of into the combustion chamber 5, thereby avoiding the discharge of the propelling medium in the combustion chamber and at the same time preventing the destruction of the outer end of the tube 9 and parts carried thereby.

When the engine is ready to be started, the stem 39^b is turned to the position best shown in Fig. 8 of the drawing, the handle of the stem being parallel with the longitudinal axis of the tube 9, which will result in closing the passage 39^a and opening the passage from end to end of the tube 9, so that the charge from the cartridge will enter the combustion chamber 5 when the shell is exploded.

It will further be seen that if it is desired to place a new cartridge in the tube when the engine is running, the stem may be turned in position to close the passage through the tube 9, and thus preventing the gases or propelling medium from passing through the tube while a cartridge is being removed from, or placed in position in the outer end of the tube.

The shaft 3 may be readily, manually rotated to operate the piston 2 by grasping

the rim of the fly wheel 40. After the auxiliary shaft has been operated and the trigger released from the head 25, the arm 36 may be readily disposed out of the path of the crank 35 by swinging the arm 36 upwardly until the same rests across the tube 9 where the same may remain until such time as it is again desired to explode a shell in the tube, when said arm may be again lowered into the path of the crank.

It will thus be seen that I have provided a very cheap and economical means for producing the first explosion of gas within an engine so that the same may be readily started and it will be further seen that I have provided means for automatically operating the discharging mechanism for the explosive.

What I claim is:

1. In a device of the class described the combination with a cylinder, a combustion chamber therefor, a driving shaft, a piston in said cylinder and means connecting said piston with the driving shaft; of a tube secured to said combustion chamber, a cock extending through said tube and intersecting the bore therein, a head for one end of said tube, a breech secured to said head and means co-operatively secured to said shaft to ignite a charge of explosive material in said tube whereby the contents of the combustion chamber and cylinder will be exploded.

2. In a device of the class described the combination with an engine having a cylinder, a driving shaft and a combustion chamber on said cylinder; of a tube connected to said combustion chamber, a breech for one end of said tube having a bore through the central portion thereof, a cock extending through said tube midway between the combustion chamber and breech and intersecting the bore in the tube, a firing pin adapted to enter said bore, a spring on said pin, means to hold said spring under tension and releasing means for said pin extending from said pin to the shaft of the engine whereby when said shaft is rotated the pin will be released to explode a charge of combustible material in the tube.

3. In a device of the class described the combination with a cylinder having a combustion chamber thereon; of a tube secured to said combustion chamber and having a longitudinal opening therethrough, a head at one end of said tube, a breech for said tube, means to removably secure said breech to the head, arms on said breech, a block secured to said arms, a firing pin longitudinally movable in said block, a collar on said firing pin, a spring disposed between said collar and block, a trigger adapted to hold said firing pin in its outward position, and means to automatically release said trigger from the firing pin whereby the spring will direct the inner end of said firing pin through a bore in

the breech and into engagement with a shell having explosive material therein.

4. In a device of the class described the combination with a cylinder having a combustion chamber thereon; of a tube secured to said combustion chamber, means to secure a shell in said tube, a firing pin, means to direct said firing pin into engagement with said shell under pressure, whereby a cap on the shell will be discharged and the contents of the shell exploded a three-way cock intersecting said tube, whereby the discharge from the shell may be directed into the combustion chamber or through a passage in one side of the tube and additional means to automatically release the firing pin.

5. In a device of the class described the combination with a cylinder and a combustion chamber thereon; of a tube secured to said combustion chamber, means to retain a charge of explosive material in the outer end of said tube, means to automatically ignite said explosive material whereby the gas in the combustion chamber will be exploded, and means extending through said tube between the combustion chamber and explosive material to control the path of the charge in the tube when exploded.

6. In a device of the class described the combination with an engine having a cylinder, a combustion chamber thereon, a piston in said cylinder, a driving shaft, means to operatively connect said piston to the driving shaft; of a tube secured to said combustion chamber, means to retain an explosive in said tube, a firing pin adapted to ignite the explosive in the tube, a spring on said firing pin adapted to direct the same inwardly under pressure, a trigger adapted to hold the firing pin outwardly and compress the spring, an auxiliary shaft, an eccentric at one end of said auxiliary shaft adapted to raise the trigger when said shaft is partially rotated, an arm depending from and fixed to said auxiliary shaft, a shaft rotatably mounted on the engine, a crank on one end of said shaft adapted to engage said arm and operate the auxiliary shaft, a gear wheel on the driving shaft, a similar gear meshing therewith, a stub shaft for the second mentioned gear, a beveled gear fixed to said stub shaft and adapted to move with the second mentioned gear and a beveled gear on the inner end of the rotating shaft adapted to mesh with the first mentioned beveled gear and rotate the rotating shaft when the driving shaft is driven.

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

LOUIS P. SCHLAMB.

Witnesses:

EARL STETLER,
R. F. HALE.