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A. S. HAWKS.
ENGINE STOP.
APPLICATION FILED JULY 8, 1910.

Patented Aug. 8, 1911.
2 SHEETS—SHEET 1.

Fig. 1.

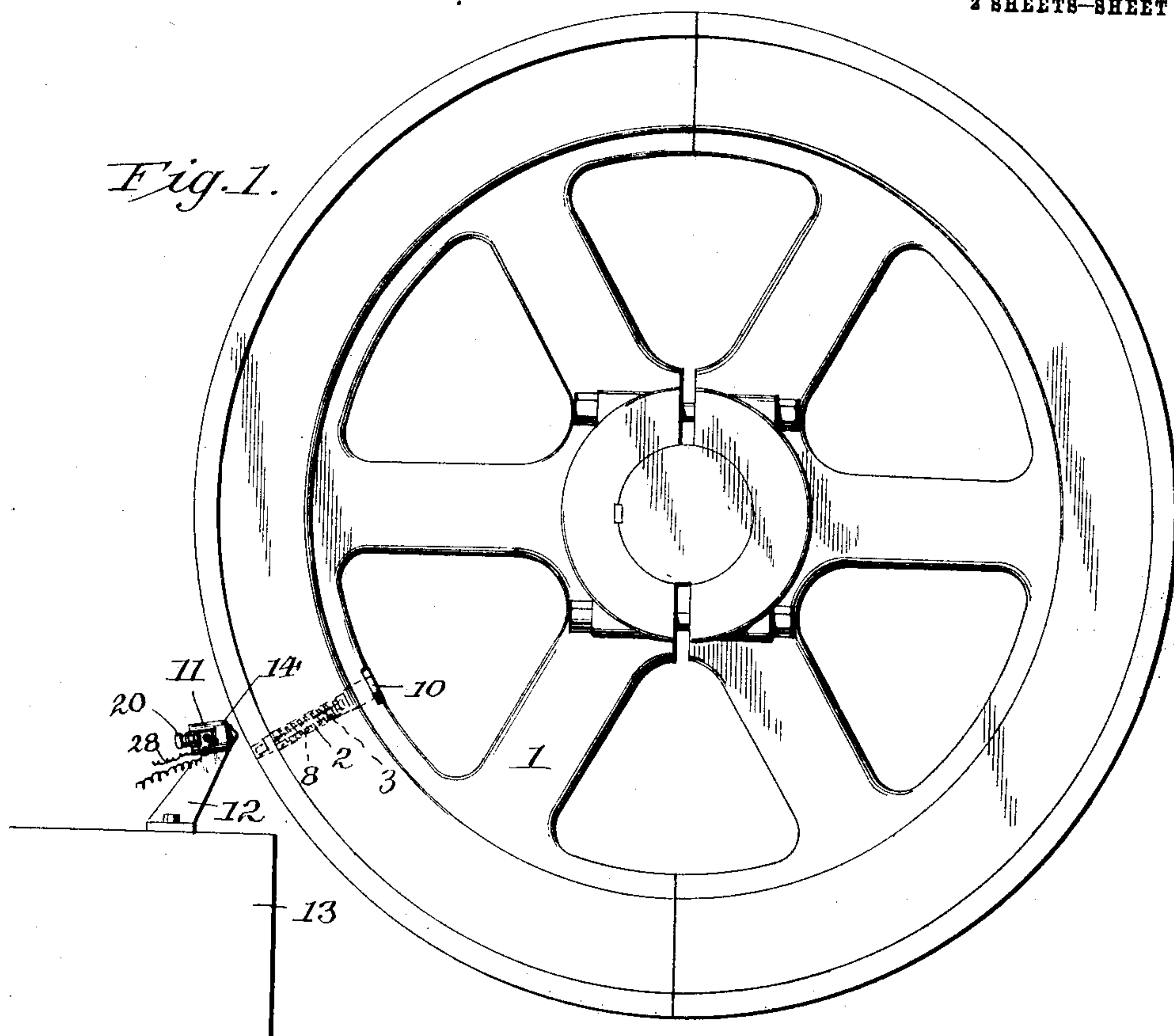
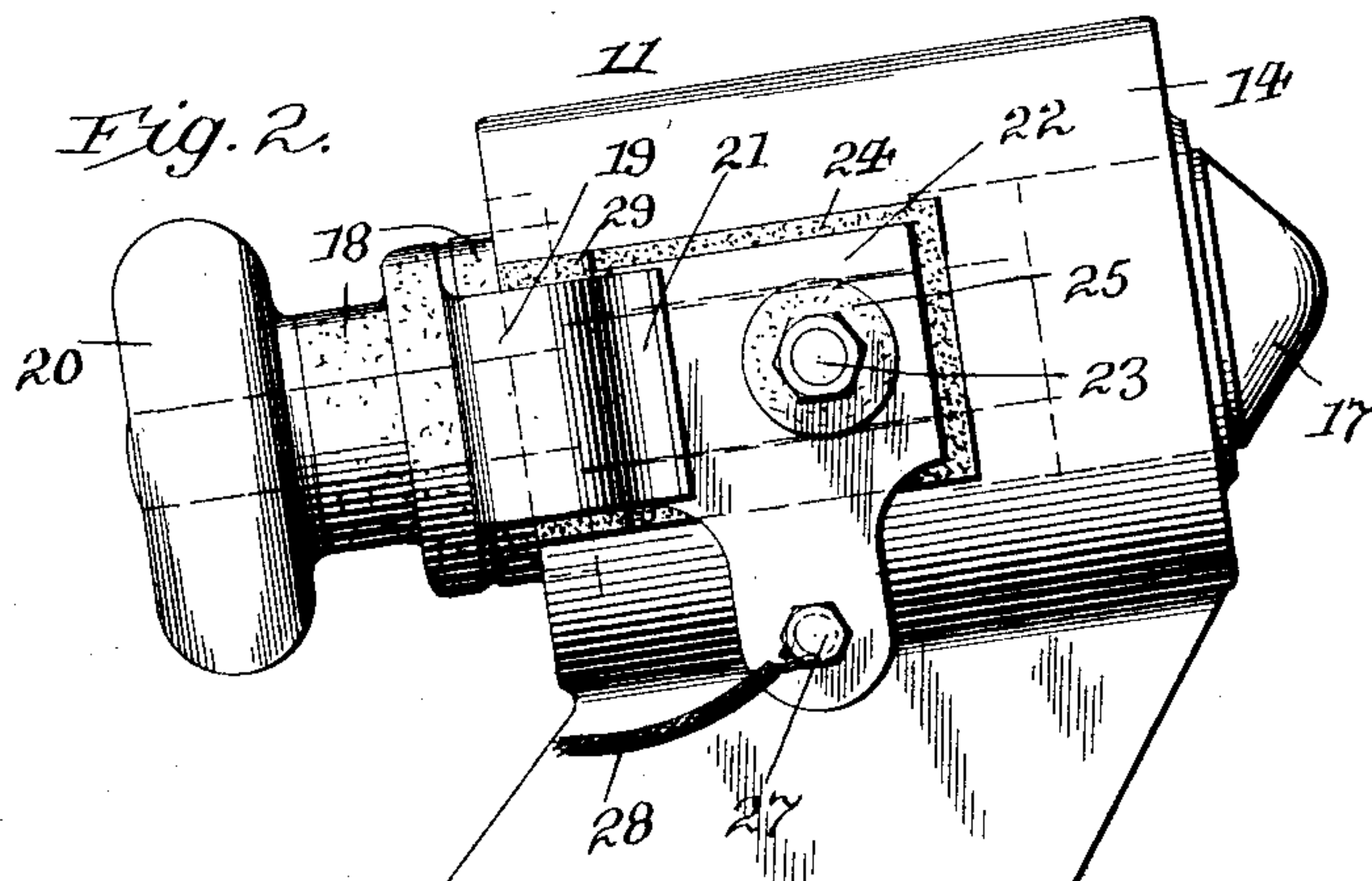


Fig. 2.



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2 SHEETS—SHEET 2.

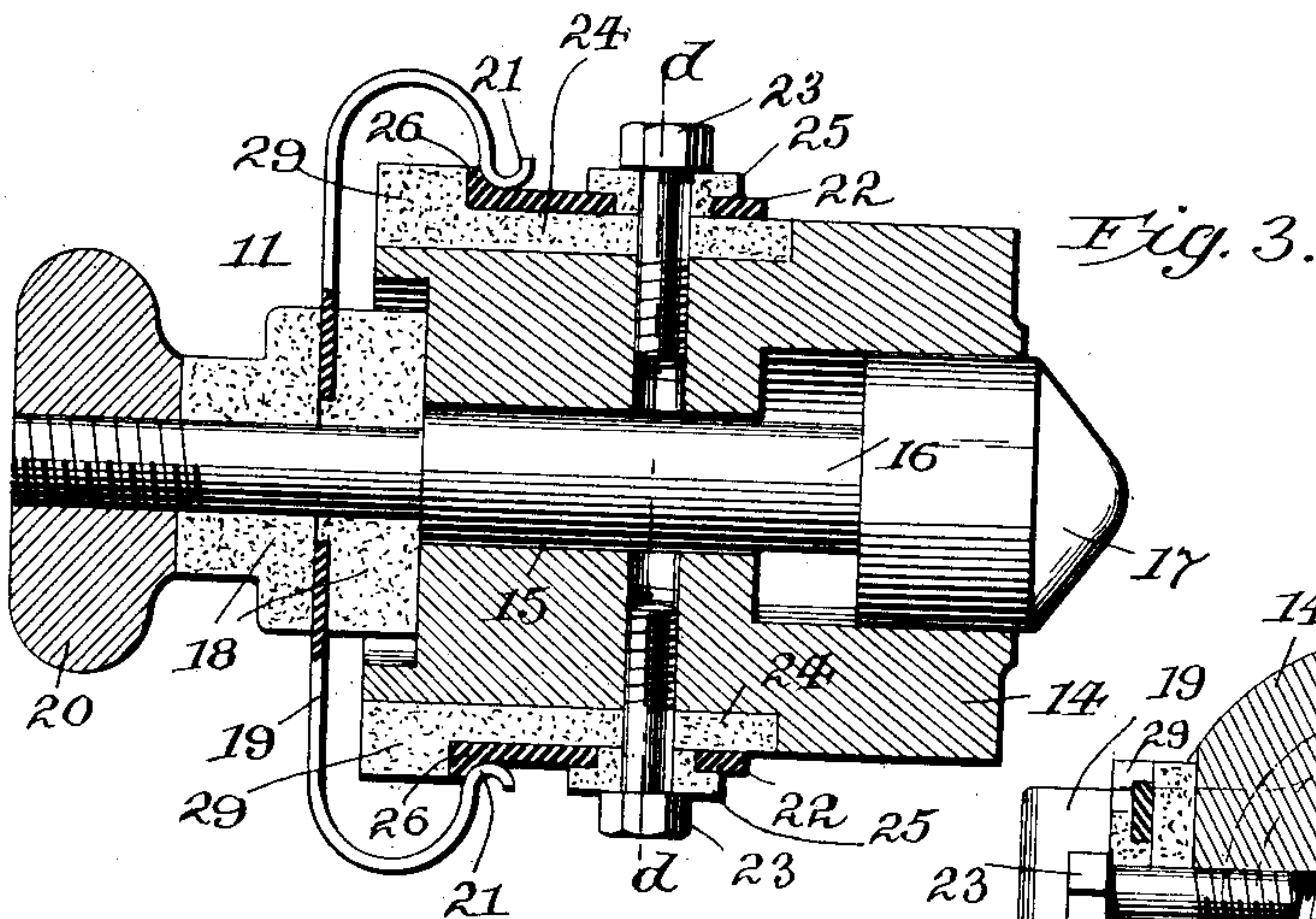


Fig. 3.

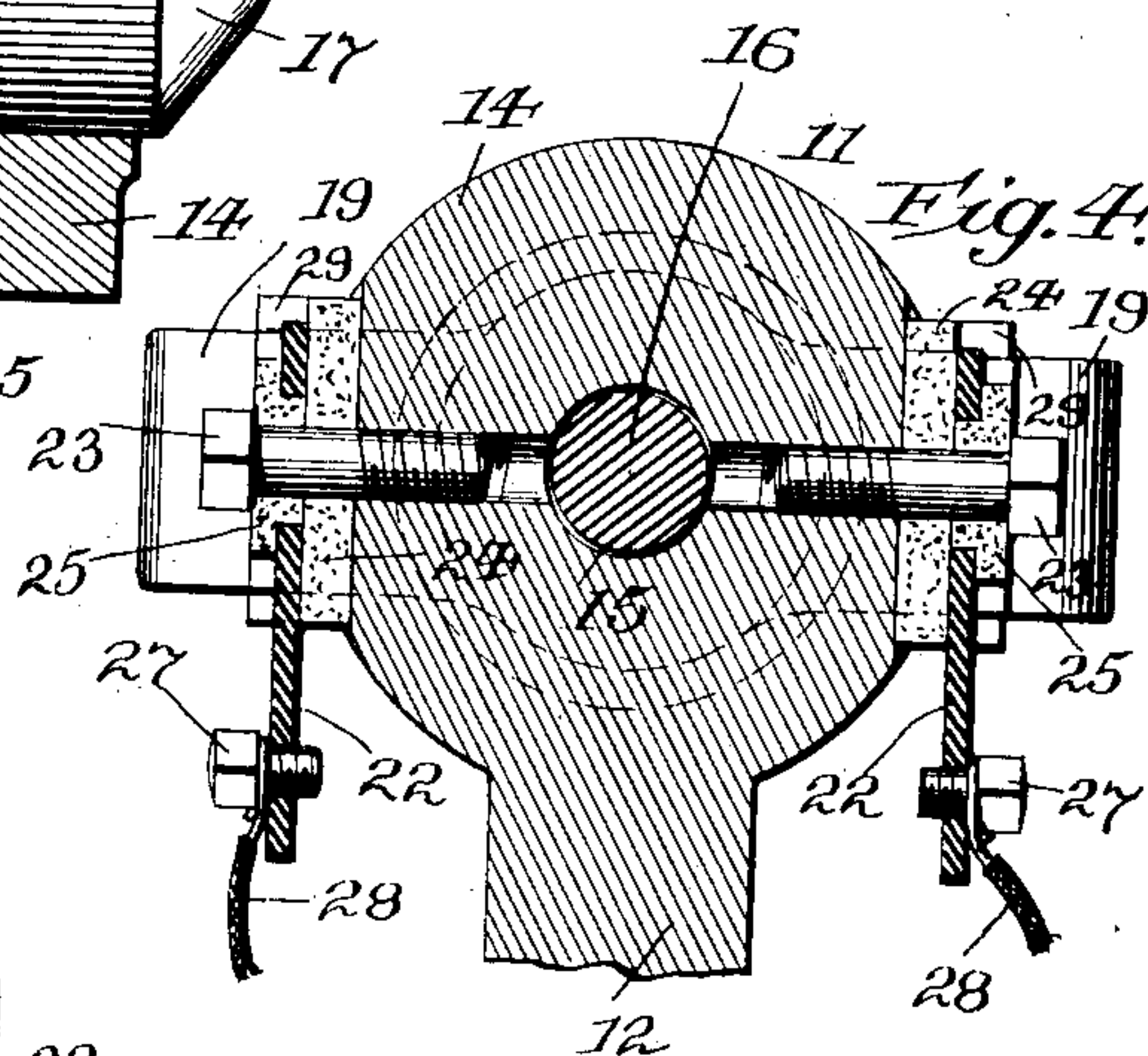


Fig. 4.

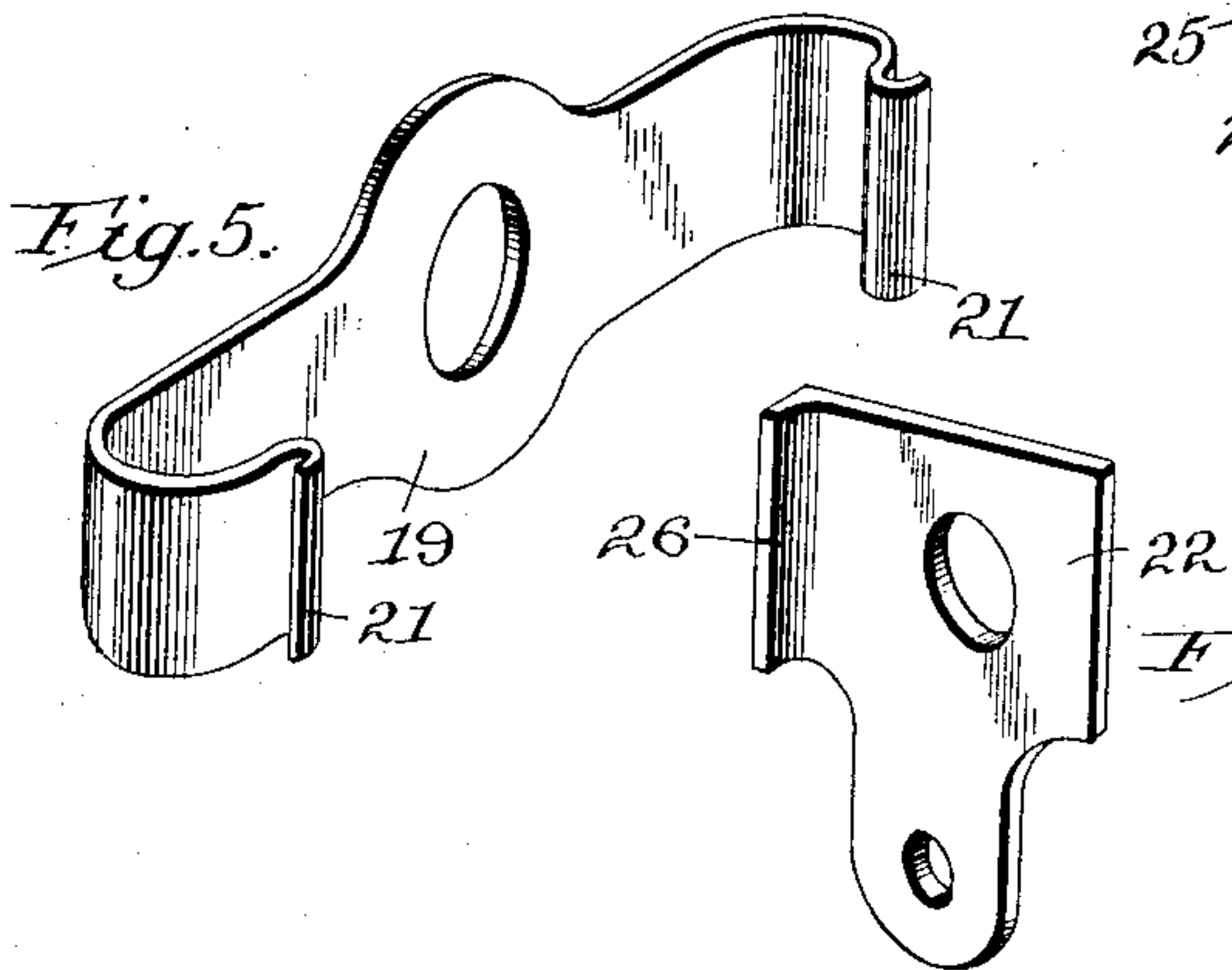
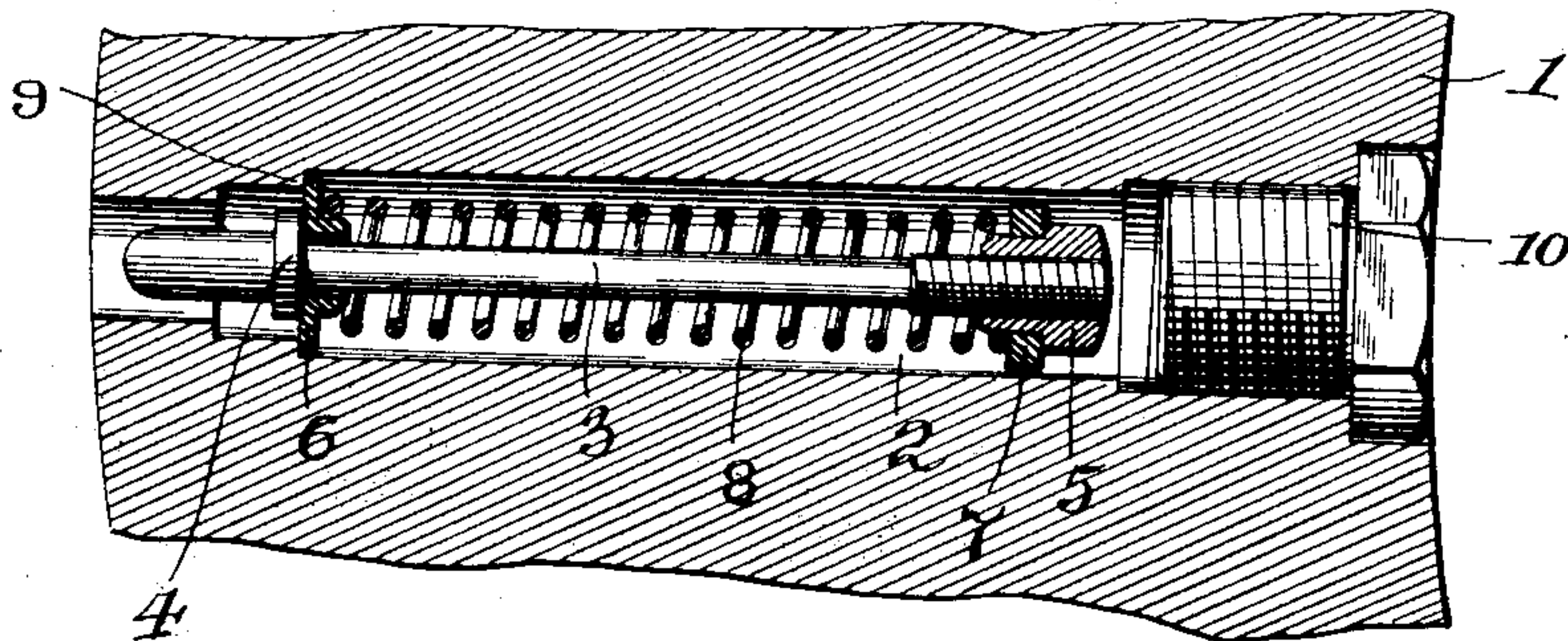


Fig. 5.

Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

ARTHUR S. HAWKS, OF BETHLEHEM, PENNSYLVANIA.

ENGINE-STOP.

999,994.

Specification of Letters Patent.

Patented Aug. 8, 1911.

Application filed July 8, 1910. Serial No. 570,975.

To all whom it may concern:

Be it known that I, ARTHUR S. HAWKS, a citizen of the United States, residing at Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Engine-Stops, of which the following is a specification.

This invention relates to an engine safety stop primarily intended for gas or other internal combustion engines but capable of use in connection with any engine in which the interruption of an electric circuit will secure the stoppage of the engine.

The invention resides in a peculiar form of switch operated by centrifugal force and embodying simplicity of construction and certainty of operation.

The invention will be described in connection with the accompanying drawings, in which:—

Figure 1 is an elevation of a fly-wheel and a portion of the engine setting showing the device attached; Fig. 2 is a side elevation of the circuit breaking switch; Fig. 3 is a longitudinal section of the same; Fig. 4 is a transverse section on the line $d-d$ of Fig. 3; Fig. 5 is a perspective view of a movable contact member; Fig. 6 is a perspective view of one of the contact plates; and Fig. 7 is a section through the rim of the fly wheel showing the centrifugal striking pin assembled, the plane of section being taken transverse to the axis of the fly wheel.

The device comprises two essential parts, a striking pin carried by the fly wheel and adapted to be projected from the face thereof by centrifugal force, and a switch member mounted upon a portion of the engine setting and adapted to be actuated by the plunger when projected from the rim of the wheel.

Referring to Figs. 1 and 7, 1 represents a fly wheel which is provided with a radial hole 2. Assembled in this hole 2 is a plunger 3 having a flange 4 near its outer or forward end, and a nut 5 screwed on its inner end. Retained on the plunger 3 between the flange 4 and nut 5 are the washers 6 and 7, the washer 6 being arranged to slide upon the shank of the plunger. A helical spring 8 is coiled around the plunger and is compressed between the washers 6 and 7. The washer 6 bears against a shoulder 9 formed in the hole 2, and thus

as the wheel revolves the centrifugal tendency of the plunger 3 will hold the washer 6 in contact with the shoulder 9 and the spring 8 will then be partially compressed to allow the plunger 3 to move outwardly radially a distance proportional to the centrifugal tendency of the plunger. By turning the nut 5 the tension on the spring may be so adjusted that the plunger 3 will protrude from the hole 2 sufficiently far to actuate the circuit breaking switch, later to be described, when the engine exceeds the desired limiting speed.

The plunger together with its spring, washers, etc., is assembled as a unit and may be removed from the opening 2 as it is retained therein merely by a threaded plug 10 screwed into the inner end of the opening 2. In this way the plunger may be removed conveniently at any time for the adjustment of the spring.

The switch mechanism which is indicated in Fig. 1 by the numeral 11 is carried upon a standard 12 which in turn is bolted to a portion of the engine setting 13. This switch mechanism 11 consists of a main casting 14, having a longitudinal aperture 15 in which is slidably mounted a plunger 16 having a conical head 17 which normally protrudes beyond the face of the casting 14, and is designed to be struck and moved rearwardly by the plunger 3 when this protrudes sufficiently beyond the rim of the fly wheel. Upon the rear end of the plunger 16 are mounted blocks 18 of some insulating material, between which is clamped a movable or sliding contact plate 19 of the bow form clearly shown in Fig. 5. A rounded nut 20 threaded on the end of the plunger 16 serves to retain the blocks 18 in position and also acts as a handle for returning the switch to circuit closing position. The movable contact plate 19 is provided with rounded end portions forming contact fingers 21 which bear upon contact plates 22 carried on the sides of the casting 14 and insulated therefrom and from the screws 23 which hold the plates 22 in place, by insulating blocks 24 and 25. The plates 22 have shoulders engaging the fingers 21 of the contact plate 19 to prevent accidental displacement thereof. To these contact plates 22 are connected by binding screws 27 wires 28 which are parts of the main ignition circuit in the case of gas engines. When the engine exceeds the desired limiting speed the plunger

3 will protrude beyond the fly wheel 1 sufficiently far to strike the head 17 of the plunger 16, forcing the plunger rearwardly and thereby drawing the ends 21 of the movable
 5 contact 19 off contact plates 22 and on a shouldered portion 29 of the insulating blocks 24, thus breaking the circuit which in the case of gas engines is the ignition circuit as already stated. To prepare the en-
 10 gine for starting it is necessary merely to strike the handle 20 thus moving the contact fingers 21 again into contact with the plates 22.

By my particular construction I provide
 15 a safety stop peculiarly simple in design, certain in operation, strong in construction. Also, being entirely independent of the regular governor mechanism, it avoids needless complication of such mechanism and is op-
 20 erative even should the governor mechanism become deranged. It is capable of application to the fly wheel of any gas engine, requiring merely the drilling of a relatively small hole in the rim of the fly wheel.

25 Having thus described my invention, what I claim is:—

1. The combination of a rotating element; a member mounted to move in said rotating element under the influence of centrifugal
 30 force; resilient means opposing such movement; a support adjacent the rotating element; a plunger slidably mounted in the support and having a portion adapted to be engaged by the movable member when
 35 moved by centrifugal force, to move the plunger; a pair of shouldered contacts insulated from each other; suitable electric connections to the contacts; and a resilient conducting member movable by the plunger
 40 into and out of bridging relation with the contacts and adapted to coact with the shoulders upon the contacts to retain the conducting member impositively thereon.

2. The combination of a rotating element;
 45 a support adjacent said rotating element; a plunger movably mounted in the support; contact plates mounted on opposite sides of the support; insulating members between the support and contact plates; insulating
 50 blocks clamped on the plunger; a bow-

shaped contact member held by said insulating blocks, bridging the contact plates and adapted to be moved off said plates by the movement of the plunger; binding screws
 55 on the contact plates; and a mechanism carried by the rotating element and adapted to be brought into operative relation with the plunger by the excessive speed of the rotating element, to move the plunger.

3. The combination of a fly wheel; an
 60 electric switch mounted adjacent the fly wheel; a plunger operatively connected to the switch and adapted to open the latter when the plunger is moved; a pin carried in
 65 a shouldered radial hole in the fly wheel and arranged to be moved outward by centrifugal force to engage and move the plunger; a flange on the pin; a nut threaded on the pin; washers on the pin between said
 70 flange and nut and one washer bearing against the shoulder in the hole; a spring interposed between the washers; and a retaining plug in the inner end of the hole.

4. The combination of a rotating element;
 75 a member mounted in said rotating element, so as to be moved outwardly by centrifugal force; resilient means opposing such movement; a support mounted adjacent the rotating element; a plunger slidably mounted
 80 in said support and having a conical head adapted to be engaged and moved by said member when in its outward position; a pair of shouldered contact plates insulated from each other and from the support and
 85 located on opposite sides of the support; binding screws on said contact plates; a bow shaped metallic member bridging said contact plates and engaging the shoulders thereon; and connections between the bow shaped
 90 member and the plunger whereby the movement of the latter moves the former out of contact with the contact plates.

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

ARTHUR S. HAWKS.

Witnesses:

J. R. HEINE,

B. A. BRENNAN.