No. 831,576. PATENTED SEPT. 25, 1906.

H. C. TEEL.

EXPLOSION ENGINE GOVERNOR.

APPLICATION FILED MAY 13, 1905.

3 SHEETS—SHEET 1.

Fig. 2.

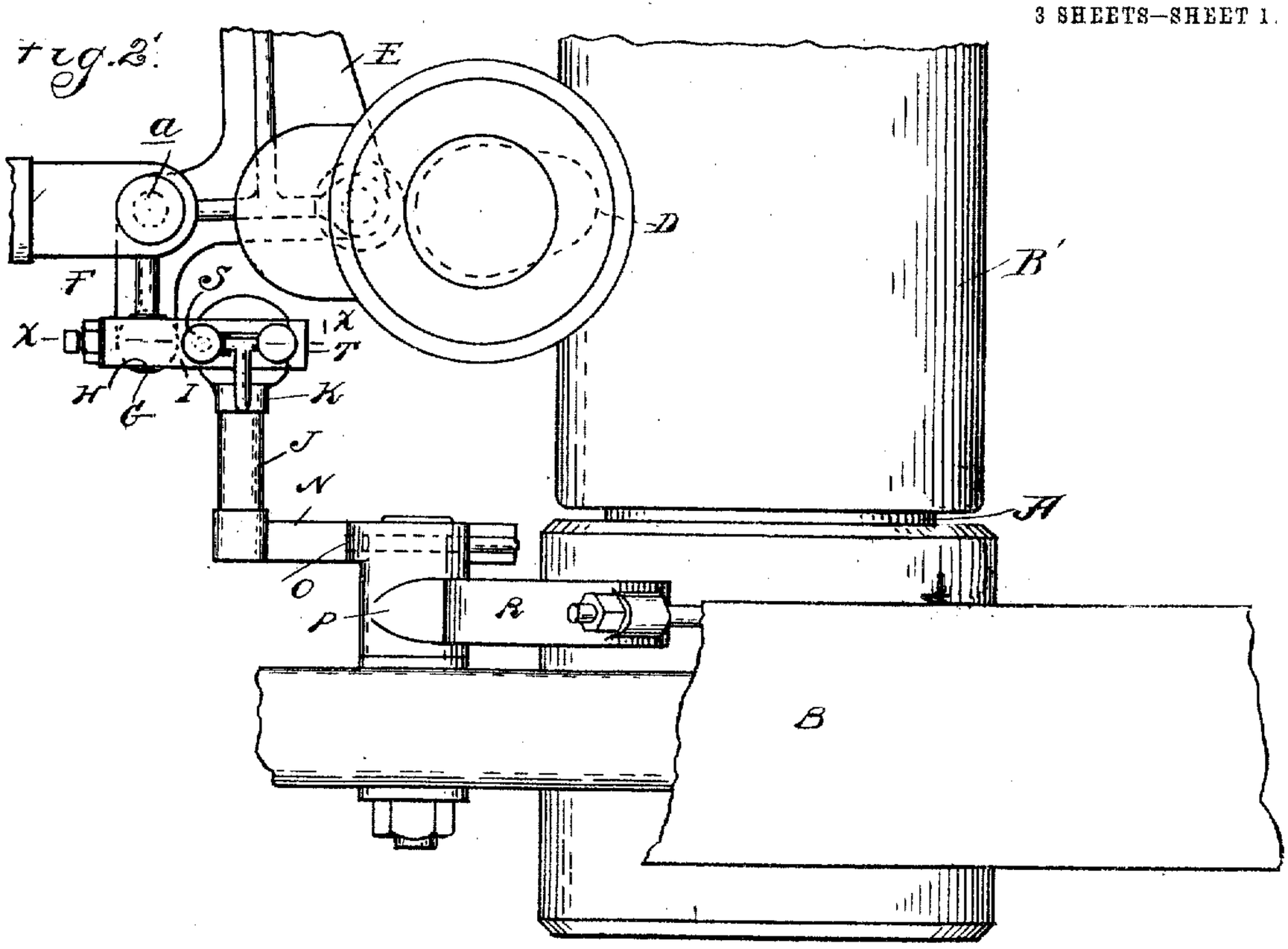

Fig. 1.

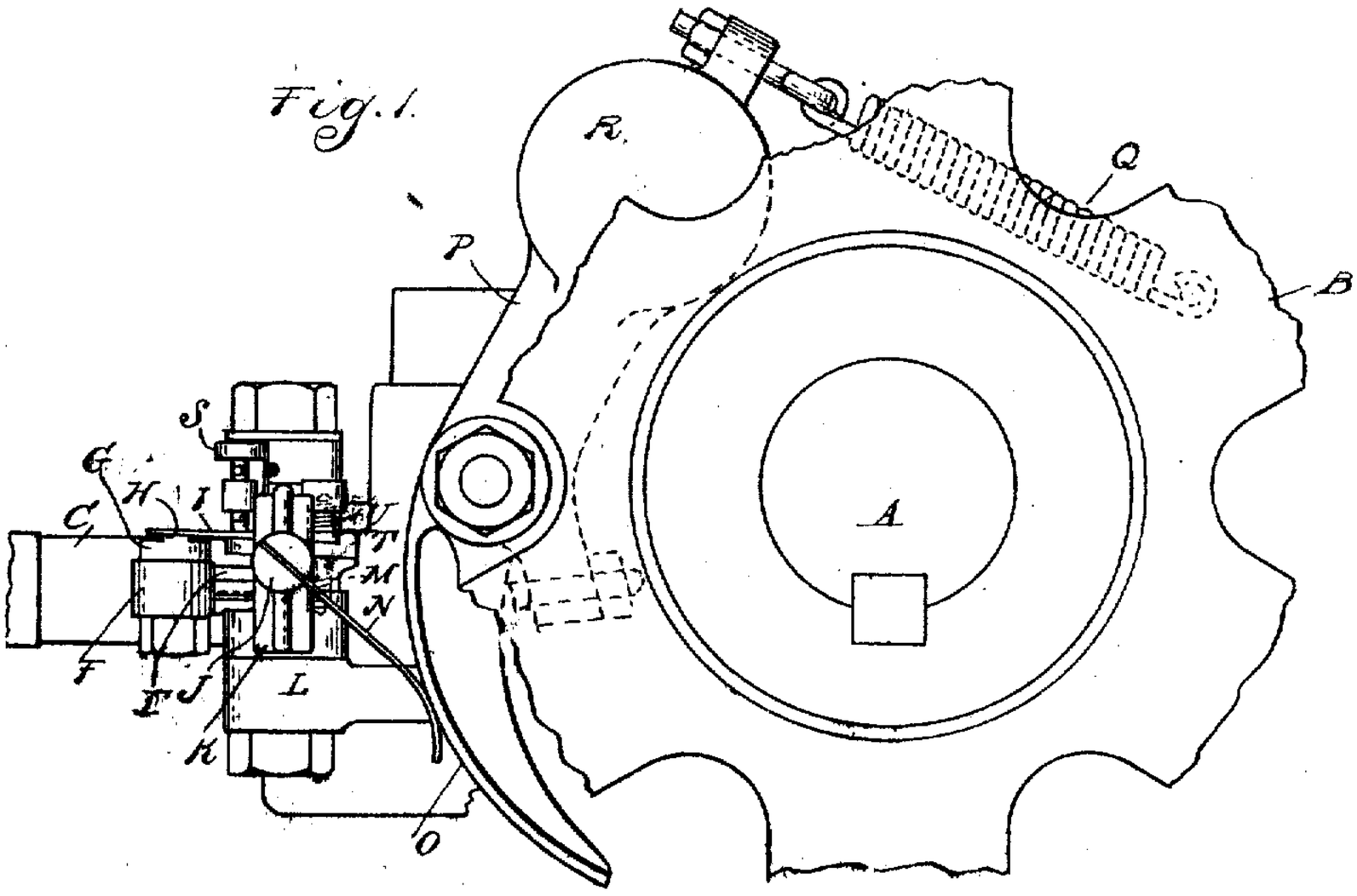

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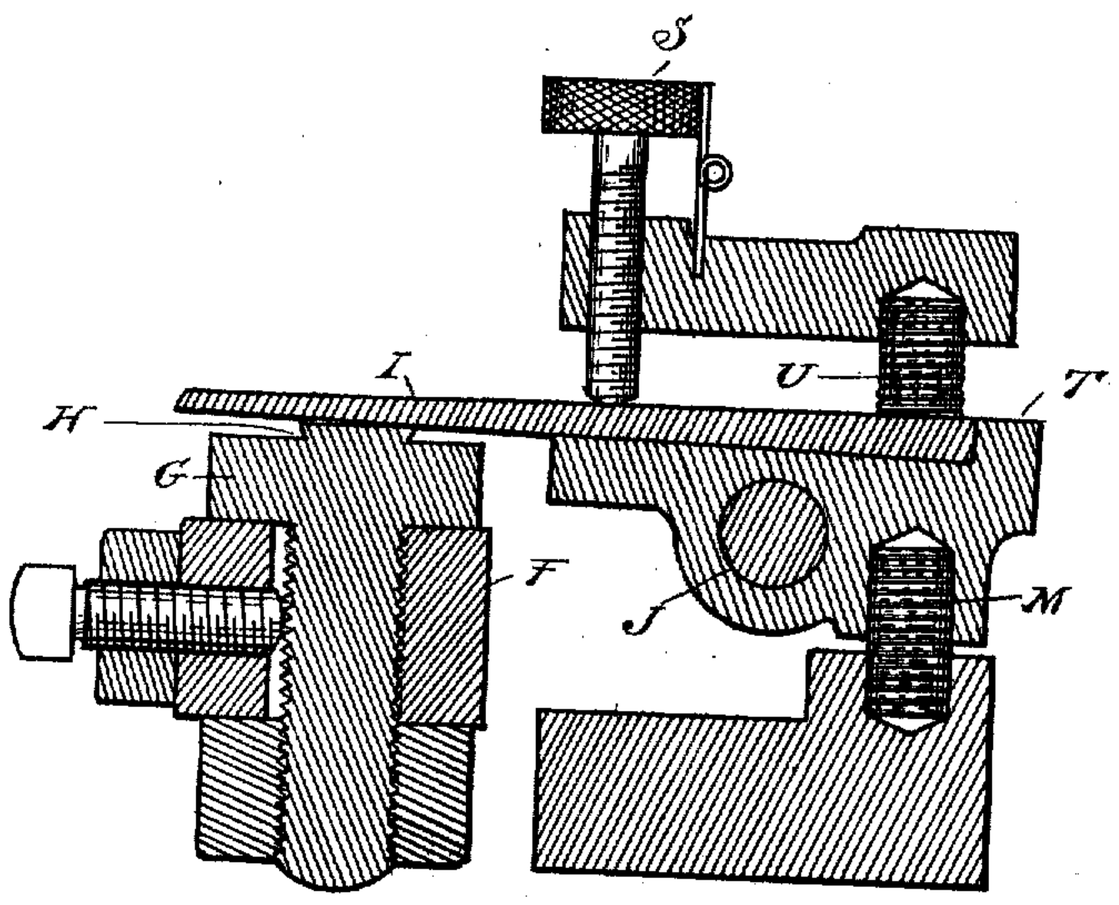
Fig. 3.



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3 SHEETS—SHEET 3.

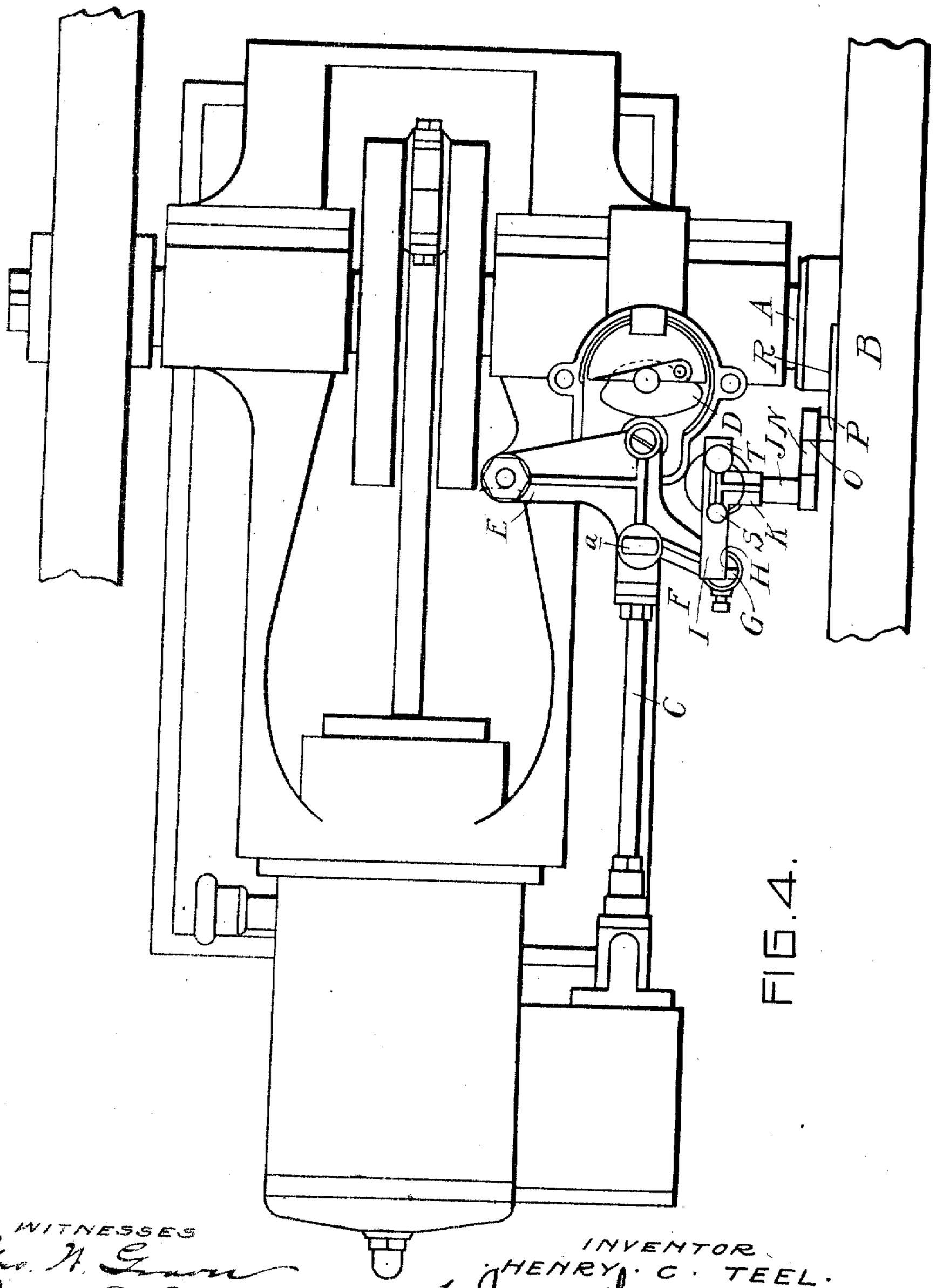

FIG. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

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EXPLOSION-ENGINE GOVERNOR.

No. 831,576. Specification of Letters Patent. Patented Sept. 25, 1906.

Application filed May 13, 1905. Serial No. 260,322.

To all whom it may concern:

Be it known that I, HENRY C. TEEL, a citizen of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented certain new and useful Improvements in Explosion-Engine Governors, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to governors, and is more particularly designed for use in connection with engines of the internal-combustion type.

In the present state of the art the common form of governor used in connection with explosion-engines is what is generally known as the "hit or miss," and which governs the speed of the engine by the prevention of explosions where the speed is excessive. With a certain class of governors this is accomplished by locking the valves of the engine, the locking being effected upon abnormal speed by the action of a centrifugal governor. An objection to such constructions is that if at any time the governor breaks or fails to operate the engine will race. With the present invention this defect is overcome by providing an automatic lock for the valves and means for releasing this lock upon the normal operation of the engine. Thus so long as the engine is in normal operation the lock is ineffective, but any abnormal speed will at once permit of the operation of the lock and will consequently control the engine.

In the drawings Figure 1 is a side elevation of the governing mechanism. Fig. 2 is a plan view thereof. Fig. 3 is an enlarged section on line *x x*, Fig 2; and Fig. 4 is a plan view of an engine, showing the location of the governing mechanism.

As shown, A is the engine-shaft; B', the bearing-box for the shaft; B, the fly-wheel of an explosion-engine, and C is the valve-operating rod which is driven from the engine-shaft A through the medium of suitable gearing operating the cam D. As shown, this cam actuates a rock-arm E, to which the end of the valve-rod C is secured. As the particular construction of the engine is immaterial to the invention I shall not further describe the same.

In the normal operation of the engine the cam D will cause the forward movement of the rock-arm E and the valve-rod C, connected thereto, the return movement being effected by the spring or any other suitable means. (Not shown.) When, however, an explosion is to be omitted, the valve-rod is prevented from return movement by a locking mechanism of the following construction:

F is an arm forming an extension of the rock-arm E beyond its pivotal connection *a* of the valve-rod C. G is a block secured to this arm F and provided on its upper face with an undercut shoulder H.

I is a latch-arm for engaging with the shoulder H, said latch-arm being connected to a rock-shaft J, which is journaled in a bracket K on a stationary arm L, forming a part of the engine-casing.

M is a spring rocking the shaft J, so as to throw the latch I into engagement with the shoulder H.

N is a rock-arm extending from the rock-shaft J into the path of a cam O, carried by the fly-wheel B. This cam at the end of the lever P is pivotally connected to the fly-wheel and is normally held in position to actuate the rock-arm N by a spring Q. The opposite end of the lever P is provided with a weight R, which is thrown outward by centrifugal action during the rotation of the fly-wheel, the arrangement being such that an excessive speed of the engine will cause the rocking of the lever P, so as to withdraw the cam O from the path of the rock-arm N.

With the arrangement just described the tension of the spring M will rock the shaft J so as to hold the latch I in the path of the shoulder H on the block G, and thus the engagement of this shoulder with the latch will arrest the movement of the arm F and prevent the return of the valve-rod C and its actuating-arm E. Such a result is, however, normally prevented by the operation of the cam O, which in each revolution of the fly-wheel actuates the rock-arm N so as to rock the shaft J and lift the latch I, and this operation is so timed as to occur in advance of the return movement of the rod C. Thus in the normal operation of the engine the latch I will not reëngage with the shoulder H and the movement of the rod C is permitted. On

the other hand, whenever the speed of the fly-wheel is abnormal centrifugal action will cause a further outward movement of the weight R, which will rock the lever P and withdraw the cam O from the path of the rock-arm N. When this occurs, the latch I will engage with the shoulder H, and the valve-rod C will remain locked until a decrease in the speed of the engine will again restore the operation of the cam O.

The rock-arm N is preferably formed of a spring-bar, so that the shock of the impact of the cam O will not be transmitted to the rock-shaft and latch. The amount of movement of this rock-arm is of course dependent upon the position of the cam O, which varies at different speeds of the engine, and the greatest throw of said cam is when the engine is running at lowest speed. To prevent excessive movement of the latch I, an adjustable stop S is preferably arranged as shown, and by means of this the sensitiveness of the governor and the speed at which it operates may be adjusted. The latch I is preferably connected to the rock-shaft by seating it upon a chair T, mounted on the rock-shaft J, and a spring U, bearing on the latch-surface to hold it to its seat.

It will be understood that any failure in the operation of the governor—such, for instance, as the breaking of the spring Q—will have the effect of immediately locking the valve-rod and stopping the engine.

What I claim as my invention is—

1. The combination with a valve-actuating reciprocatory rod, of a rock-arm to which said rod is connected, a latch for engaging said rock-arm to arrest movement thereof, a rock-shaft for tilting said latch and an actuating rock-arm for said rock-shaft, a lever pivoted to a rotating part of the engine, a cam on said lever for coöperating with said rock-arm and rock-shaft to tilt said latch, centrifugal actuating means for said lever, and a counteracting spring therefor.

2. In an engine, the combination with a valve-operating rod, a rock-arm secured thereto and a cam for actuating said rock-arm, of an extension on said rock-arm having a shoulder thereon, a rock-shaft, a latch mounted thereon, a spring adapted to move said latch into engagement with said shoulder, a spring-arm on said rock-shaft, a centrifugally-operated cam pivoted on a rotating part of the engine and arranged to engage said spring-arm to withdraw said latch from engagement with said shoulder, and a spring arranged to withdraw said cam from the path of said spring-arm, for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY C. TEEL.

Witnesses:

JAS. B. SEAGER,

WILL. G. THOMAS.