

No. 627,700.

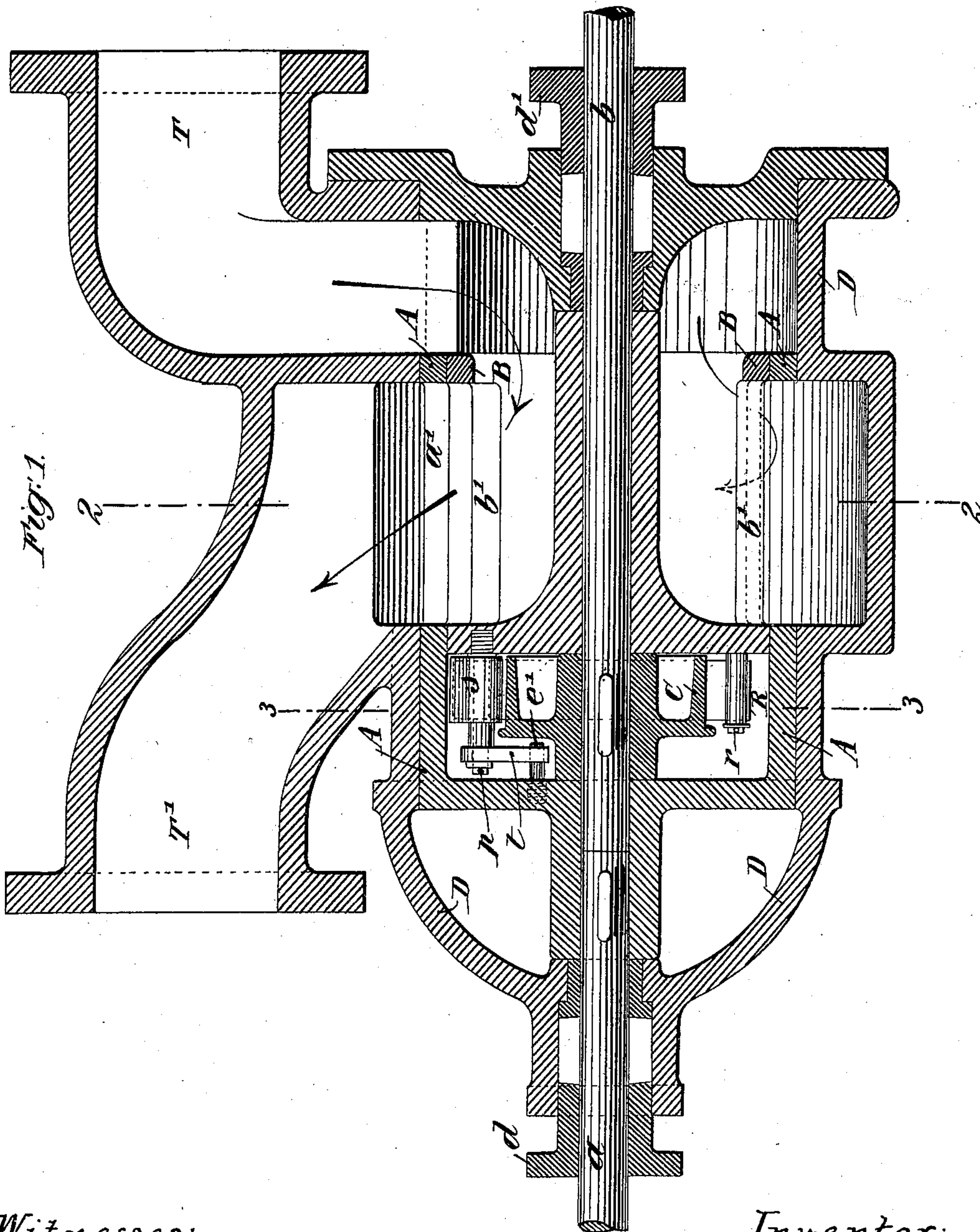
Patented June 27, 1899.

H. E. MENIER.
GOVERNOR FOR MOTOR ENGINES.

(Application filed Dec. 28, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
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Michael Lewis

Inventor:
Henri Emile Menier
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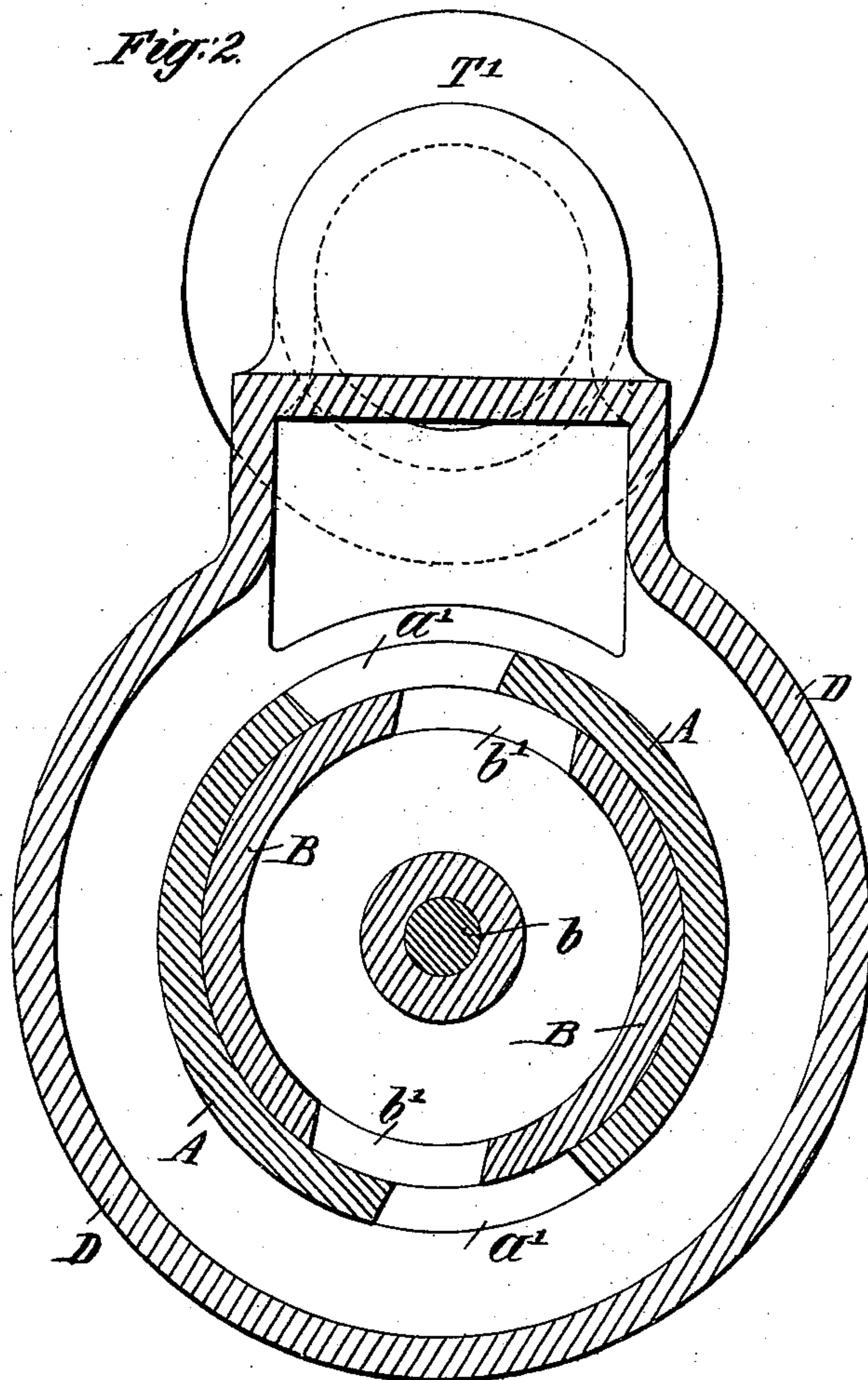
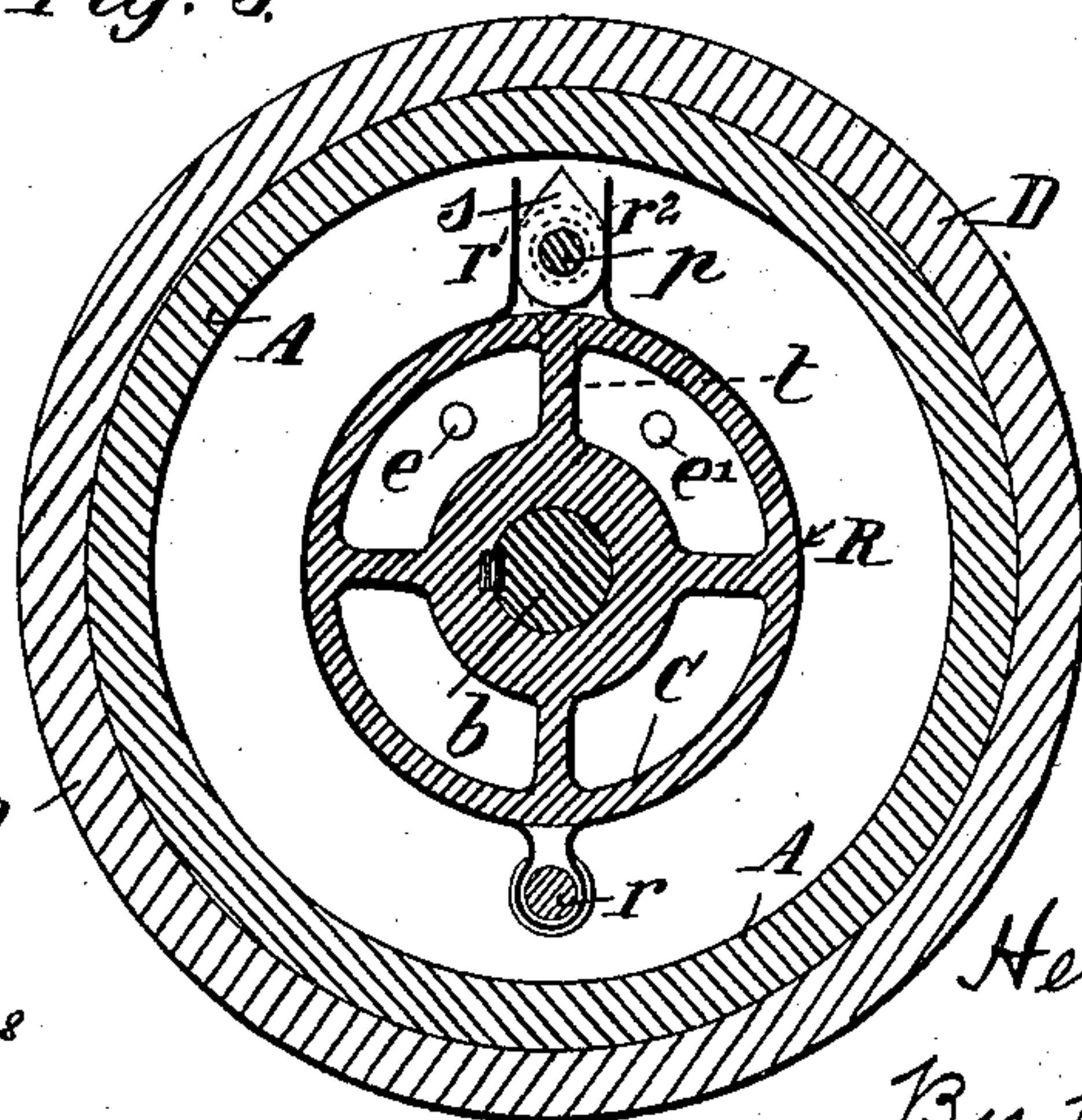


Fig. 3.



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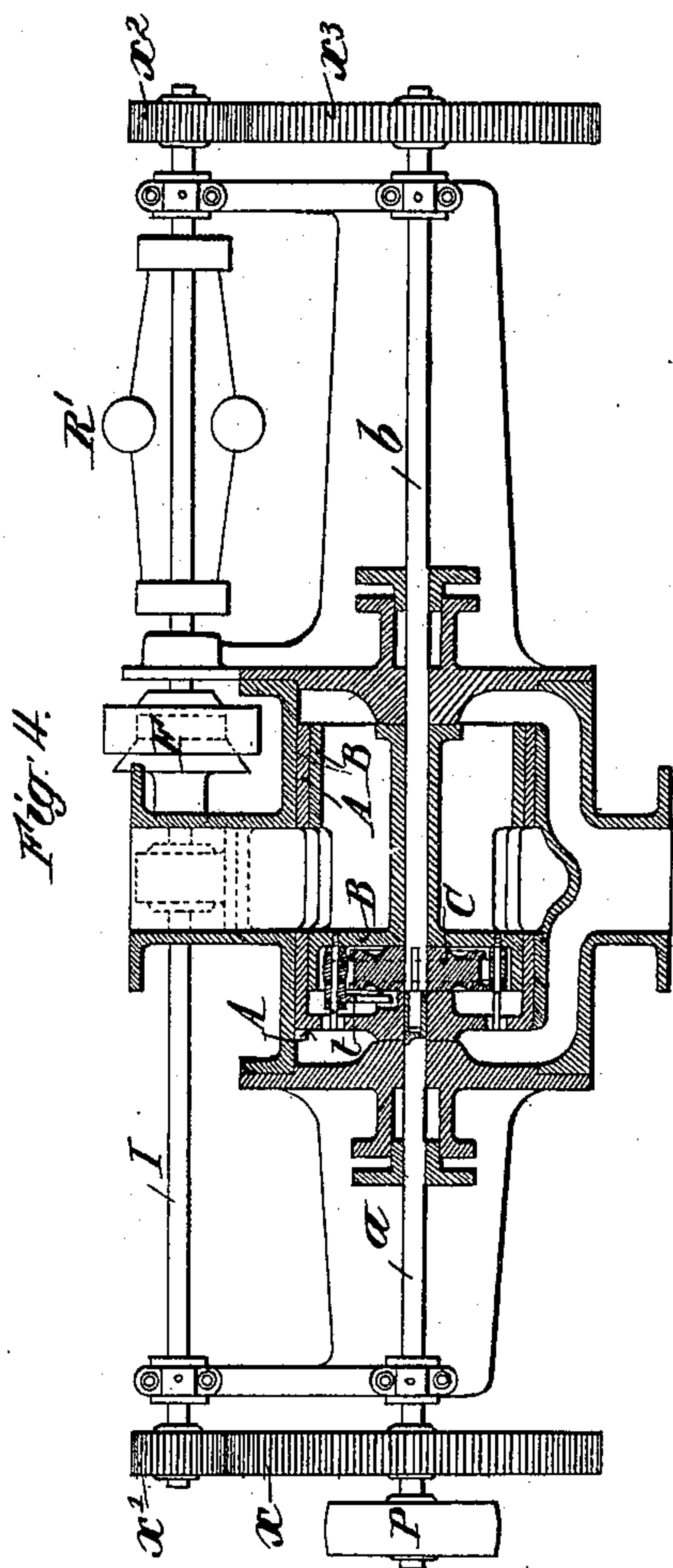
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UNITED STATES PATENT OFFICE.

HENRI EMILE MENIER, OF PARIS, FRANCE.

GOVERNOR FOR MOTOR-ENGINES.

SPECIFICATION forming part of Letters Patent No. 627,700, dated June 27, 1899.

Application filed December 28, 1898. Serial No. 700,545. (No model.)

To all whom it may concern:

Be it known that I, HENRI EMILE MENIER, manufacturer, a citizen of the Republic of France, residing in Paris, France, have invented certain new and useful Improvements in Governors for Motor-Engines, of which the following is a specification.

This invention relates to a new governor applicable to steam and other engines.

10 This improved governor comprises two rotary drums boxed one within the other and completely independent as regards their rotation. One of these drums, termed "motor-drum," is connected to the motor to be regulated, and consequently shares in or is affected by all variations of speed to which the motor is subjected. The other drum, termed "regulator-drum," revolves at a given speed by means of a mechanical, electrical, or other arrangement which allows it to revolve constantly at the same speed or which maintains it in such a state of equilibrium that it is always forced to revolve at or to return to this constant speed. The motor-drum and the
25 regulator-drum are both pierced with holes which exactly correspond when the said drums are in the determined position of equilibrium the one with regard to the other—that is, when they both rotate at the same angular velocity. When this latter becomes different, the motor-drum unwedges or unlocks itself to a greater or less extent from the regulator-drum, and the openings of these drums cover or uncover one another more or less, tending,
35 consequently, to reduce or increase the section of the efflux or passage of the motive fluid, the said fluid passing through the improved governor or regulator before reaching the engine or motor.

40 I have now set forth the principle of my invention, and in the following description I refer to the annexed drawings, on which—

Figure 1 is a longitudinal section of the improved governor mechanism. Fig. 2 is a cross-section on line 2 2 of Fig. 1. Fig. 3 is another cross-section on line 3 3 of Fig. 1. Fig. 4 is a general view of the whole, partly in section, showing one of the arrangements employed for the control of the regulator-drum, as well
50 as a slight modification of the working of the governor proper.

A is a drum fixed at the end of a shaft *a*,

driven by the engine or motor to be regulated, and consequently sharing in or affected by all fluctuation or variations in speed or working. 55 This drum is perforated with one or more holes or ports *a'*.

B is a drum adjusted or arranged with slight friction within the former, A, and driven by a shaft *b*, controlled or operated as hereinafter 60 described. This drum is also perforated with one or more holes or ports *b'* similar to those *a'* of the drum A.

The shafts *a* and *b* are alined upon the same axis and are journaled in the stuffing-boxes 65 *d d'*, secured to or upon a casing D, in which the drums A and B are inclosed. This casing D is furnished with an inlet and outlet T and T', between which are placed the drums A and B, through the ports *a'* and *b'* of which 70 the motive fluid is compelled to pass from the inlet T to the outlet T' before reaching the engine or motor.

From the foregoing it will be seen that so long as the drums A and B turn with the same 75 angular velocity the relative position of the ports *a'* and *b'* is unchanged, and consequently the motive fluid is always admitted under the same conditions. When, on the other hand, from any cause whatever the angular velocity 80 of the motor-drum A varies, this drum unwedges or unlocks itself more or less with regard to the regulator-drum B in such a manner that their respective ports *a'* and *b'* cover or uncover proportionally, thus altering or 85 varying the efflux or passage of the motive fluid supplying the engine until the latter regains its normal or objective speed. It is therefore sufficient to unwedge the two drums A and B for a fraction of a revolution, so that 90 the said efflux or passage may be at once affected or influenced. It will be seen that by means of these ports the supply of steam or other motive fluid may be throttled or varied. With two ports in each drum, for instance, 95 an "unlocking" action of a quarter of a turn will effect the complete closing or opening of the ports. The result is that the regulation is without limits, since it is possible to form as many holes or ports in the drums as may 100 be desired. The value or scope of the regulation is therefore indetermined.

To avoid in the case of very abrupt speed variations of the engine or motor the motor-

drum A presenting its ports to the corresponding and following ports of the regulator-drum B by reason of its unlocking itself, the drum B is mounted frictionally on its shaft *b*. A forward driver, spur, or projection *e* and a rear driver or projection *e'*, attached to the drum A, prevent, by abutting against and driving an arm *t* of the drum B, the unlocking action exceeding that sufficient to completely close or open the ports. In this case the engine drives the drum B in its position of being wholly opened or wholly closed. To effect this sliding and to facilitate it when the arm *t* of the drum B is touched by one or other of the drivers *e* or *e'*, (according to the direction of the unlocking action,) a spring-band R is fixed at *r* on the said drum B and incloses by its branches a pulley C, keyed on the shaft *b*. Between the bent ends *r'* *r''* of this spring R is a cam *s*, keyed to the axis *p*. This axis *p* is carried in the end of the drum B and has fixed to its outer end the above-mentioned arm *t*. The encounter with the arm *t* by one or the other of the drivers *e* or *e'* when the complete opening or closing of the orifices takes place imparts to the said arm a rocking motion which through the axis *p* is transmitted to the cam *s*, the function of which is to open the branches of the friction spring-band R, and thereby destroy the friction which normally binds the drum B to the pulley C, and consequently to the shaft *b*.

The speed of the regulator-drum can be obtained in various ways from any separate motor whose speed can be regulated according to need, so as to obtain a speed synchronal with that of the engine to be governed.

In case it is necessary to obtain a constant speed and instead of employing a separate motor it is possible to maintain constant the speed of the regulator-drum by making use of the engine itself by means of the following arrangement, which is illustrated on Fig. 4 of the drawings: A is the drum-motor to be regulated, and *a* is its shaft. B is the regulator-drum, and *b* its shaft. Upon shaft *a* is keyed a pulley P, working with the engine to be governed and which causes the drum A to follow all the speed variations of this engine. Upon the same shaft *a* is keyed a spur-wheel *x*, which drives an intermediate shaft T by means of a pinion *x'* at a speed a little higher than the speed of shaft *a*. This intermediate shaft is intercepted and is furnished at its end with a friction-clutch F. Upon the extended portion of the intermediate shaft I is arranged an ordinary centrifugal ball-governor R', which is fitted with the second part of the friction-clutch. At the end of the prolonged portion and beyond the ball-governor is a pinion *x''*, which drives the shaft *b*, carrying the regulator-drum B, by means of a spur-wheel *x'''*. The pinion *x''* is slightly larger in diameter than the pinion *x'* and the spur-wheel *x'''* slightly smaller in diameter than the spur-wheel *x*. When the ball-governor R' has not attained the speed to which it is ad-

justed, the friction-clutch is in engagement and drives the drum B at an increasing speed. As soon as the centrifugal ball-governor has attained its predetermined speed the clutch commences to slip or slide—*i. e.*, to be disengaged. The regulator-drum B is driven by the ball-governor R' at the speed of this latter, which is no longer dependent on the speed of the engine, the clutch only controlling the speed of shaft *b*. The speed of B and *b* is thus dependent on speed of R' or F. The higher speed given to the first portion of shaft I, as above stated, allows the slipping or disengagement of the clutch to take place.

When the regulator-drum B revolves at its normal rate, the regulation of the ports commences to a greater or to a lesser extent, according as the motor-drum A advances or is retarded upon the drum B.

To avoid the drum A in its speed variations after having opened or closed the ports continuing its way and unclosing the following port, the brake system or ratchet C serves as a coupling between drum B and shaft *b*. This brake or ratchet system acts during the whole time that the ports commence to be opened until they are fully unclosed. When these two limits are exceeded either forward or behind, the driver *e* or *e'*, acting on lever *t*, releases the brake or frees the ratchet, and the regulator-drum B, being free, is carried around by the drum A. The ports are then completely closed when the speed of the drum A has an angular advance and are completely unclosed when the drum A has an angular retardation on the drum B. When the two speeds become alike at the moment the regulation should take place, the ratchets or the brake will recommence to make the drum B solid with or fixed to its shaft *b*. By means of this arrangement when I put the engine into motion and when the governor has not yet effected the slipping motion by reason of the increase in speed given to the intermediary shaft I above that of the shaft *a* the ports of the two drums are fully open. They commence to be closed only when the centrifugal ball-governor R' begins to act.

The working of the parts of my improved regulator may be effected by any suitable means and the shapes and dimensions may of course vary from those illustrated. The improved governor can be applied to all kinds of motor-engines. It is particularly applicable to marine engines, inasmuch as the serious inconveniences which may arise when the screw is out of the water or when from any other reason the engine and its shaft begin to race are quite obviated.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a governor for steam or other engines, the combination of a motor-drum connected invariably to the engine to be regulated, and a regulator-drum, each of the said drums being provided with ports adapted to cover and uncover substantially as set forth, with means

for driving the regulator-drum at a given speed and means for disconnecting the regulator-drum from the said driving means when the relative displacement of the said drums exceeds that sufficient to completely close or open the said ports.

2. In a governor for steam or other engines, the combination of a motor-drum connected invariably to the engine to be regulated, and a regulator-drum, each of the said drums being provided with ports adapted to cover and uncover substantially as set forth, with means for driving the said regulator-drum at a given speed, and means for disconnecting the regulator-drum from the said driving means when the relative displacement of the said drums exceeds that sufficient to completely close or open the said ports, and to so connect the said drums that the regulator-drum is then driven with the motor-drum.

3. In a governor for steam or other engines, the combination of a motor-drum connected invariably to the engine to be regulated, and a regulator-drum, each of the said drums being provided with ports adapted to cover and uncover as set forth, with a shaft driven at a given speed, the said regulator-drum being normally connected to the said shaft by friction, and means for destroying the friction between the said regulator-drum and its shaft, substantially as described.

4. In a governor for steam or other engines, the combination of a motor-drum connected invariably to the engine to be regulated, and a regulator-drum, each of the said drums being provided with ports adapted to cover and

uncover as set forth, with a shaft driven at a given speed, a pulley fixed to the said shaft, a friction-band carried by the said regulator-drum and normally maintained in frictional contact with the said pulley, and means for destroying the friction between the said band and pulley when the relative displacement of the said drums exceeds certain limits.

5. In a governor for steam or other engines, the combination of a motor-drum connected invariably to the engine to be regulated, and a regulator-drum, each of the said drums being provided with ports, with means for driving the said regulator-drum at a constant speed by the engine being regulated.

6. In a governor for steam or other engines, the combination of a motor-drum connected invariably to the engine to be regulated, and a regulator-drum, each of the said drums being provided with ports, with a device for driving the said regulator-drum at a constant speed by the engine being regulated, the said device consisting of a centrifugal ball-governor and friction-gear, insuring a moment of equilibrium, always ready to be broken or to be formed, which may be such that the regulator-drum revolves at a constant speed, as above specified.

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

HENRI EMILE MENIER.

Witnesses:

EDWARD P. MACLEAN,
LEVIN FRANCKEN.