(No Model.)

J. A. HURDLE & A. W. STEIGER.

DYNAMOMETRICAL GOVERNOR.

No. 389,928. Patented Sept. 25, 1888.

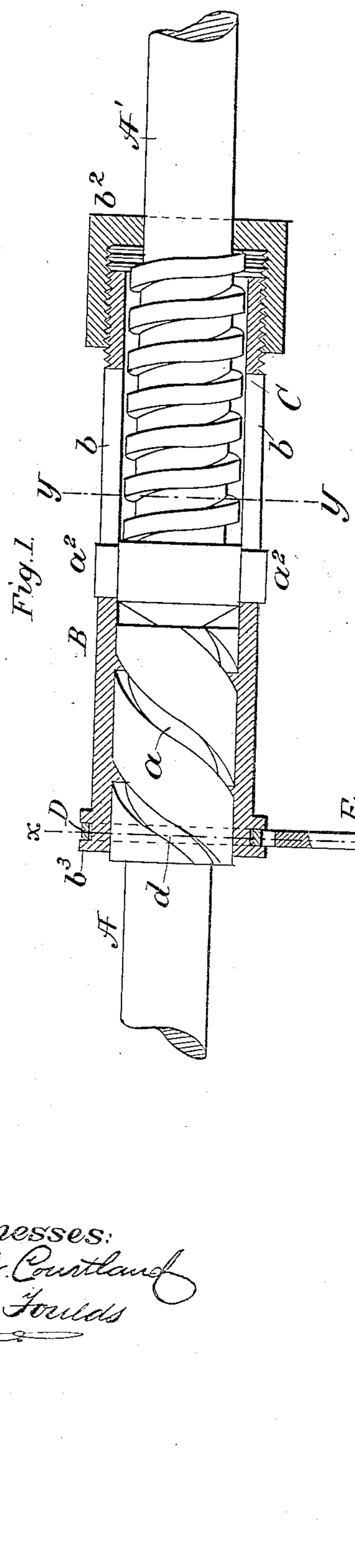

Fig. 1.

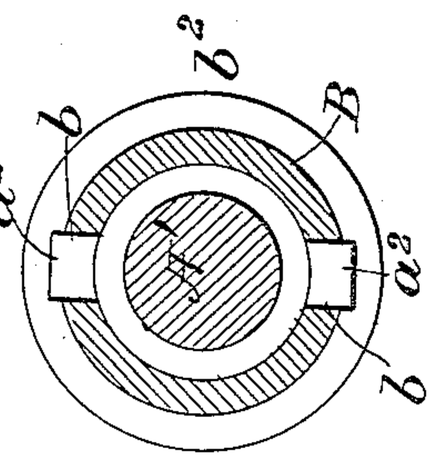

Fig. 3.

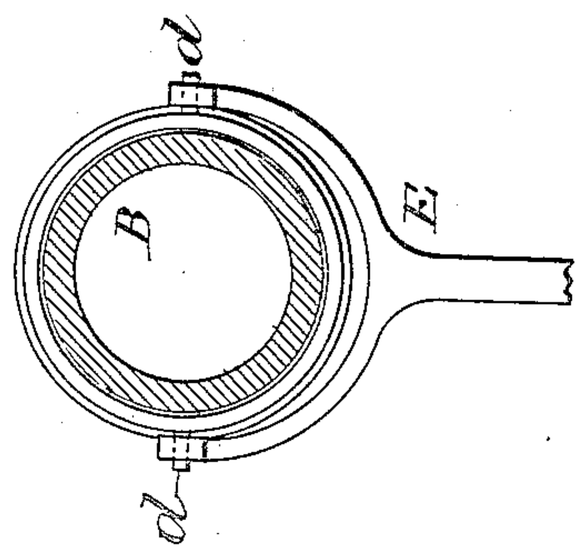

Fig. 2.

Witnesses:
W. A. Courtland
C. C. Foulds

Inventors:
J. A. Hurdle
Andrew W. Steiger.

UNITED STATES PATENT OFFICE.

JULIAN A. HURDLE AND ANDREW W. STEIGER, OF NEW YORK, N. Y.,
ASSIGNORS TO HELEN F. HURDLE, OF SAME PLACE.

DYNAMOMETRICAL GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 389,928, dated September 25, 1888.

Application filed April 7, 1888. Serial No. 270,135. (No model.)

To all whom it may concern:

Be it known that we, JULIAN A. HURDLE and ANDREW W. STEIGER, citizens of the United States, and residents of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Dynamometrical Governors, of which the following is a specification.

Our invention relates to an improved dynamometrical governor for steam-motors, the object being to provide mechanism which will automatically regulate the supply of steam admitted to the cylinder.

It consists in dividing the transmitting-shaft and coupling the two sections thereof together, end to end, by means of a sliding sleeve, as hereinafter described, so that the power will be transmitted from the one section to the other through a screw-thread upon the connecting-sleeve and act against a confined spiral spring, so that any increase in the load will compress the spring and slide the sleeve along upon the shafts, this sliding movement of the sleeve being utilized to operate a valve to regulate the steam-supply.

In the accompanying drawings, Figure 1 is a side elevation of our improved governor and its connections, partially in section. Figs. 2 and 3 are sections respectively on lines *x x* and *y y* of Fig. 1.

As will be seen, the shaft is divided into the two parts A A′, brought together end to end, and their abutting ends are preferably shaped to reduce the friction by making the one A′ conical, or partially so, as shown, to reduce the bearing-surface. At the end of the part A, and extending a portion of its length, is cut a spiral groove or screw-thread, *a*.

A cylindrical sleeve, B, is made to encircle the joint between the parts A A′ and to extend a short distance along the parts either way, and that portion of the sleeve embracing the part A has upon its inner surface a spiral thread, to correspond with and mesh into the spiral groove in said part A, so that a revolution of the shaft will cause the sleeve either to revolve therewith or be moved along longitudinally thereon.

Projecting pins or lugs a^2 a^2, forming a cross-head upon the end of the part A′ of the shaft, are made to project outward through longitudinal slots *b b* in the sleeve B, so as to allow a longitudinal movement of the sleeve upon said shaft but to prevent a rotary motion thereon. A spiral spring, C, is made to surround the part A′ of the shaft, preferably within the sleeve B, and is made to abut at one end against an annular ring, a^3, integral with said shaft and at the other end against a ring, b^2, secured to the sleeve B, and preferably made to form a screw-cap upon the end thereof, as shown. The tendency of this spring is to resist a longitudinal movement of the sleeve upon the shaft.

Let us now suppose the power to be applied to the part A of the shaft and the load arranged to retard the revolution of the part A′. It is evident that the part A, by revolving, will, by reason of the screw-thread *a*, slide the sleeve B along upon the shaft A′ and compress the spring C until its resistance is sufficient to overcome the resistance of the load upon the shaft A′, when both shafts will revolve together. If now the load should be lightened, the spring will expand until it is again adjusted to the load, and the sleeve, moving with it, will assume its new position upon the shaft. It is this longitudinal movement of the sleeve B which I propose to utilize to regulate the steam-supply by imparting its motion, through a suitable arrangement of levers, to the stem of a valve in the steam-supply pipe. I accomplish this, preferably as shown, by means of a ring, D, working loosely in a groove, b^3, formed upon the sleeve B, and having the pins *d* diametrically opposite the one to the other upon the ring D, said pins being engaged by the arms of a forked lever, E. The free end of the lever E is connected by means of a second fork, *e*, and ring F to a threaded nut, G, mounted upon the threaded stem H of a valve, I, included in the steam-supply pipe. The nut G is provided with a hand-wheel, to facilitate its adjustment. The lever E is pivoted at *e′* to the frame of the motor, or to a standard connected therewith, and at such a distance relatively from the sleeve B and the valve-stem H as to insure a proper relative motion of the two parts.

Having described our invention, what we claim is—

1. A dynamometrical steam-governor where-

in the driving-shaft of the engine is divided into two parts, which are coupled together by a slotted sleeve, said sleeve being connected to one part of the shaft by a screw-thread and to the other part by a cross-head thereon, the longitudinal movement of said sleeve being resisted by a confined spring, said sleeve being also connected by levers with the steam-supply valve, substantially as and for the purpose set forth.

2. In a steam-governor, the combination, with a divided driving-shaft, of a sliding sleeve, a screw-thread upon one part of said shaft engaging the sleeve, a cross-head upon the other part of the shaft also engaging the sleeve, and a confined spring adapted to resist a longitudinal motion of said sleeve, substantially as and for the purpose set forth.

Signed at New York, in the county of New York and State of New York, this 17th day of March, A. D. 1888.

JULIAN A. HURDLE.
ANDREW W. STEIGER.

Witnesses:
CHAS. E. FOULDS,
THEO. R. COOKE.