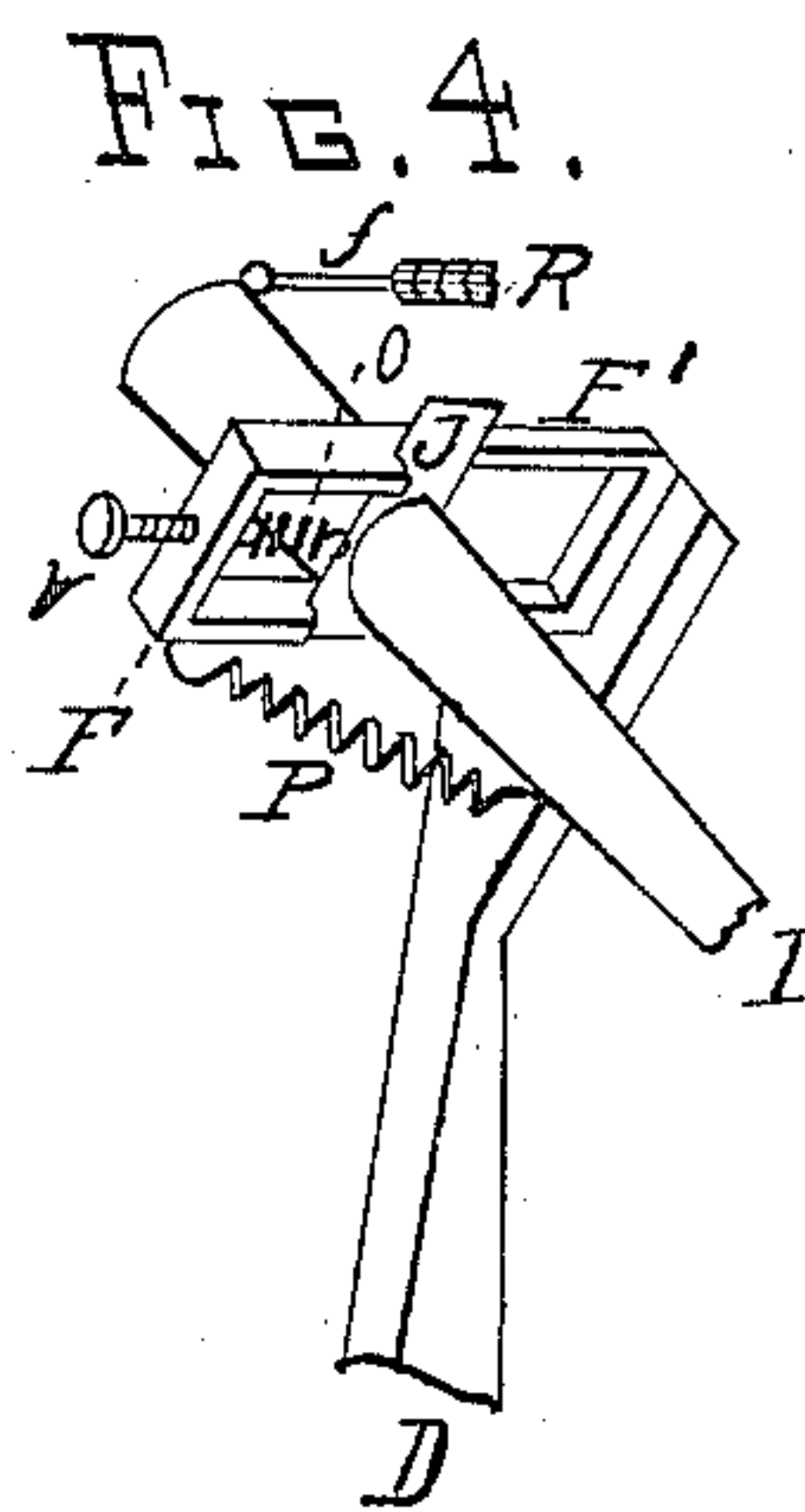
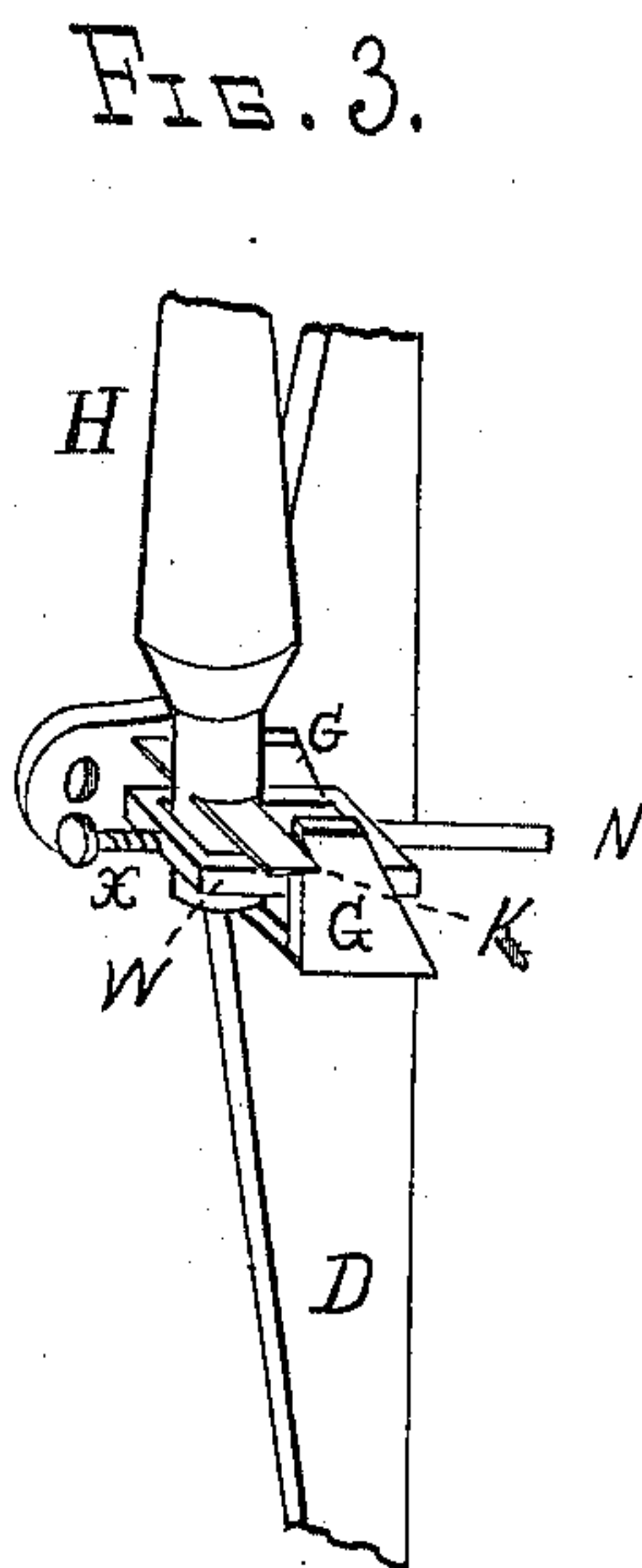
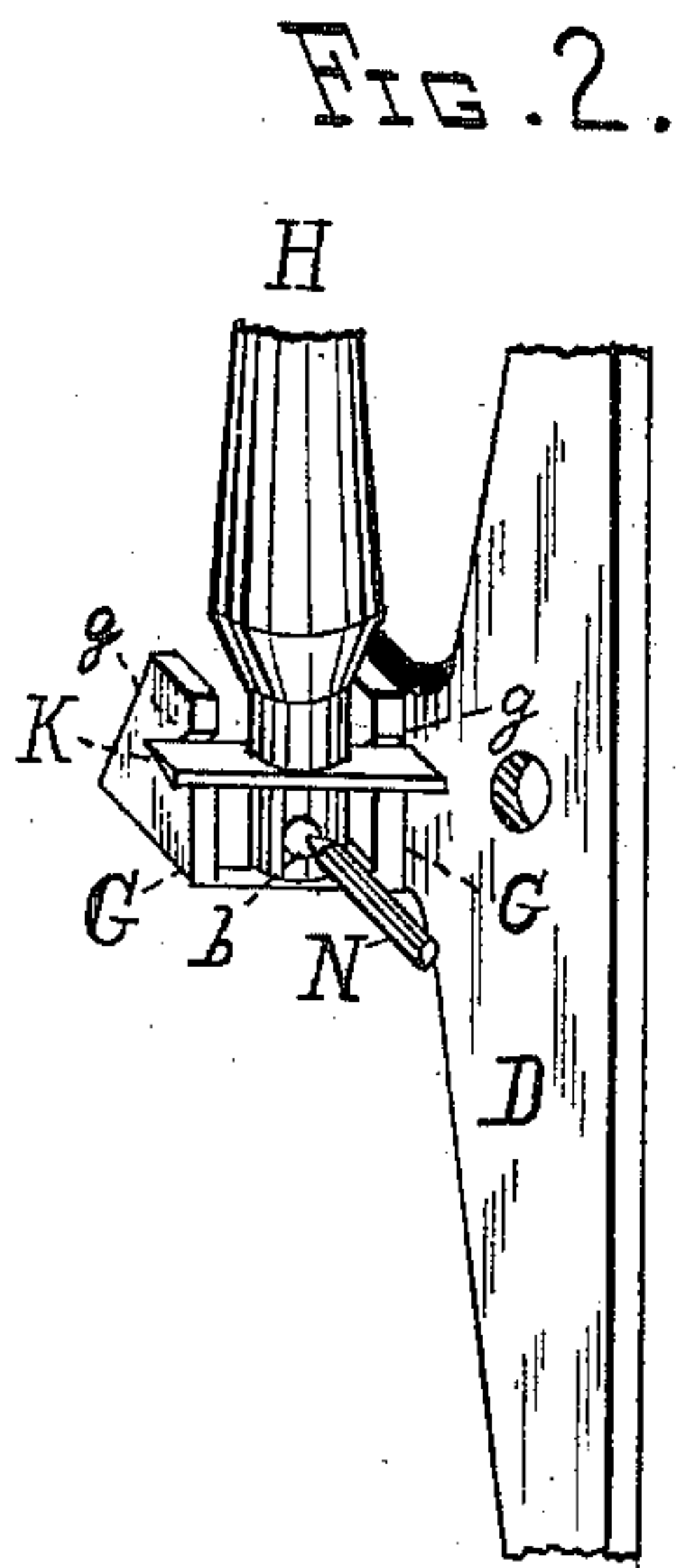
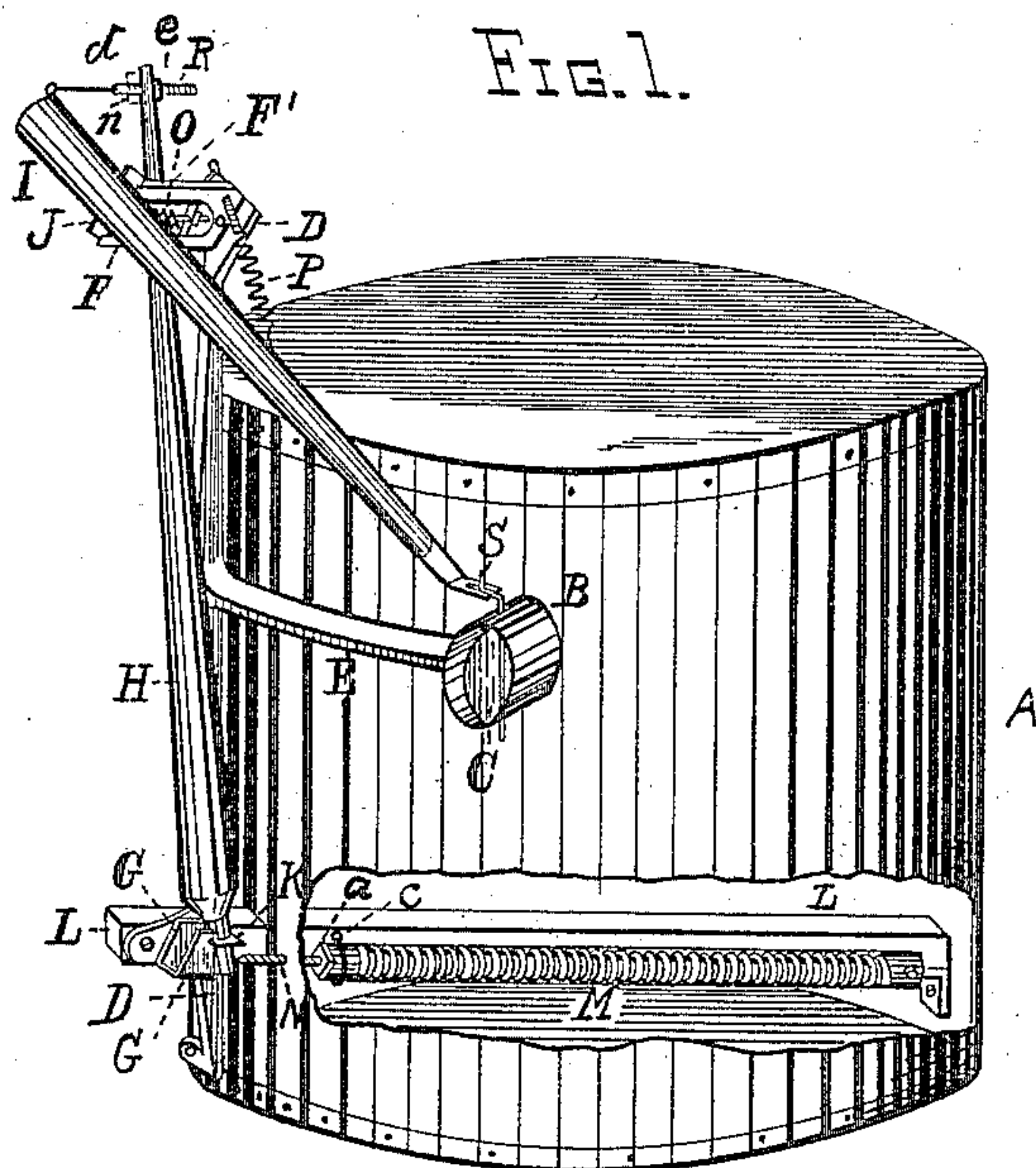


(No Model.)

H. W. AXFORD.
HEAT REGULATOR.

No. 309,183.

Patented Dec. 16, 1884.



WITNESSES:

A. J. Moten.
Wm. H. Keile

INVENTOR

Harris W. Axford.
BY
G. L. Chapin
ATTORNEY

UNITED STATES PATENT OFFICE.

HARRIS W. AXFORD, OF CHICAGO, ILLINOIS.

HEAT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 309,183, dated December 16, 1884.

Application filed February 27, 1884. (No model.)

To all whom it may concern:

Be it known that I, HARRIS W. AXFORD, of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Heat-Regulators, of which the following is a specification, reference being had to the accompanying drawings, illustrating the improvement, in which—

Figure 1 is a perspective representation of an incubator to which my improvement is attached; Fig. 2, a detached portion of the regulator, showing on a larger scale the construction; Fig. 3, a perspective representation of a modification of the lower mechanism to the regulator, whereby the device is operative by the contraction of certain parts instead of expansion; Fig. 4, a perspective representation of a modification of the upper portion of the mechanism used in connection with the mechanism shown at Fig. 3.

The present invention relates to an improved mechanism for regulating the temperature of rooms, but more especially the temperature of incubators.

The nature of the invention consists of novel mechanism whereby the expansive or contractile force of any suitable material may be utilized to operate a damper with more exactness and with less friction, and at the same time be adjustable, so as to be set to any point of expansion of the material to obviate lost motion, as the whole is hereinafter fully described and shown.

A represents the oven of an incubator, which may be round, oval, or have any other form suitable for the purpose. To the outside of this oven is attached a bracket, D, which supports the exterior portion of the regulator. The form shown for this bracket is simply suitable for the support of the bearing to the mechanism; therefore any other form which will serve that purpose may be substituted for the one shown. On the lower part of the bracket is formed a fulcrum-seat consisting of two lugs or ears, G, in the faces of which are formed notches *g g* to engage a blade, K, attached to a lever, H. Inside of the oven is secured, by means of support L, a vulcanized rubber pipe, M, which is corrugated on its periphery to attain a greater heating-surface, and which I have found to be suitable for the

purpose, both on account of its sensitiveness to temperatures and steady expansive and contractile properties. One end of this pipe is attached to the support L, and toward the opposite end it has a support on a bracket, *c*, attached to the support L, and on the free end is secured a nut, *a*, in which a screw, N, is turned and may be adjusted. On the end of this screw is formed a conical point, *b*, which serves to apply the expansive force of the rubber M to the lever H by means of a conical seat formed in the lever at a suitable distance below the blade. On the upper end of the bracket D is formed a fulcrum for the bearing of a second lever, I, and consists of jaws F F', which are notched in their ends for the purpose of engaging a knife, J, attached to the lever. The upper ends of the two levers are connected by means of an adjusting-screw, R, passing through the lever H and a flexible connection, *d*, a nut, *e*, serving to hold the parts where the adjustment is made. A centrally-located coil-spring, O, attached to the throat of the jaws F and to the lever I, serves to hold the latter to its fulcrum, and a spring, P, attached to the bracket D and to the lever I, serves to open the damper C, while lever I opens it by means of jaws on its lower end engaging the damper-crank S, passing through the ventilating-pipe B. In practice the principal adjustment is made by turning the screw N, after which a nicer adjustment is made by turning the nut *e* on the screw R. From this description it will be seen that the lever H is held wholly in place at its lower end by the rubber M, screw N, blade K, and fulcrum. This construction is important in simplicity and in attaining that degree of sensitiveness in the action of the parts which will insure a movement of the damper instantaneous with the expansion or contraction of the rubber M, and for these reasons I much prefer the construction shown to pivoting the lever H in a step at its bottom. Metal may be substituted for the rubber for regulating the heat in various compartments, but the rubber is the better for incubators, as has been proven by practical tests. That the levers H I may be light and non-flexible I prefer that they be made of light metal in conical form.

To open the damper C by the contraction

instead of the expansion of the part M, the plate K is placed on the opposite side of the lever H, the screw N is swiveled to a stirrup, W, which incloses the end of the lever and
 5 has tapped into its end a conical-pointed power-pivot, *x*, with a screw-thread thereon for adjustment. (Fig. 3.) At the top the fulcrum-blade J, as also on the opposite side of the lever I and the spring O on the opposite there-
 10 of, is fastened to a set-screw, *v*. The spring P is also on the opposite side, and at the upper end is attached to the closed jaws F' F. The device R *f* is non-flexible and pushes a nut, *n*, shown by dotted lines, Fig. 1, which
 15 must be employed for the pushing devices R *f*.

I claim as new and desire to secure by Letters Patent of the United States—

1. The screws N R, levers H I, springs O P, and a thermostat or bar, M, in combination with the damper C, as and for the purpose 20 set forth.

2. In heat-regulators, the expansive and contractile part M, placed in the oven, and the adjusting-screw passing through the oven, in combination with the levers H I, fulcrums K G 25 and F J, upper adjustable connections, R *d e*, the springs O P, and damper C, as and for the purpose specified.

HARRIS W. AXFORD.

Witnesses:

G. L. CHAPIN,
 A. G. MOREY.