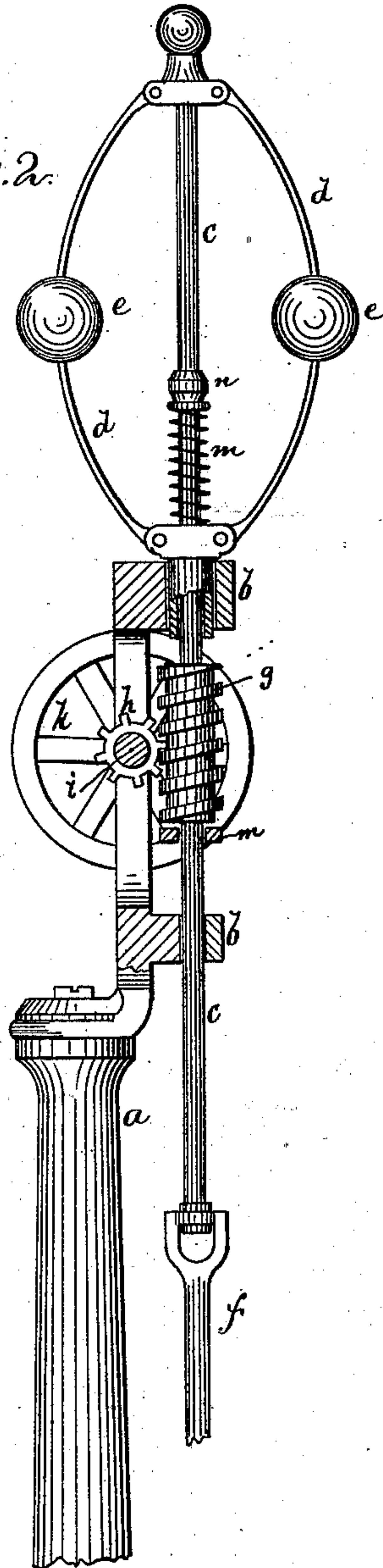
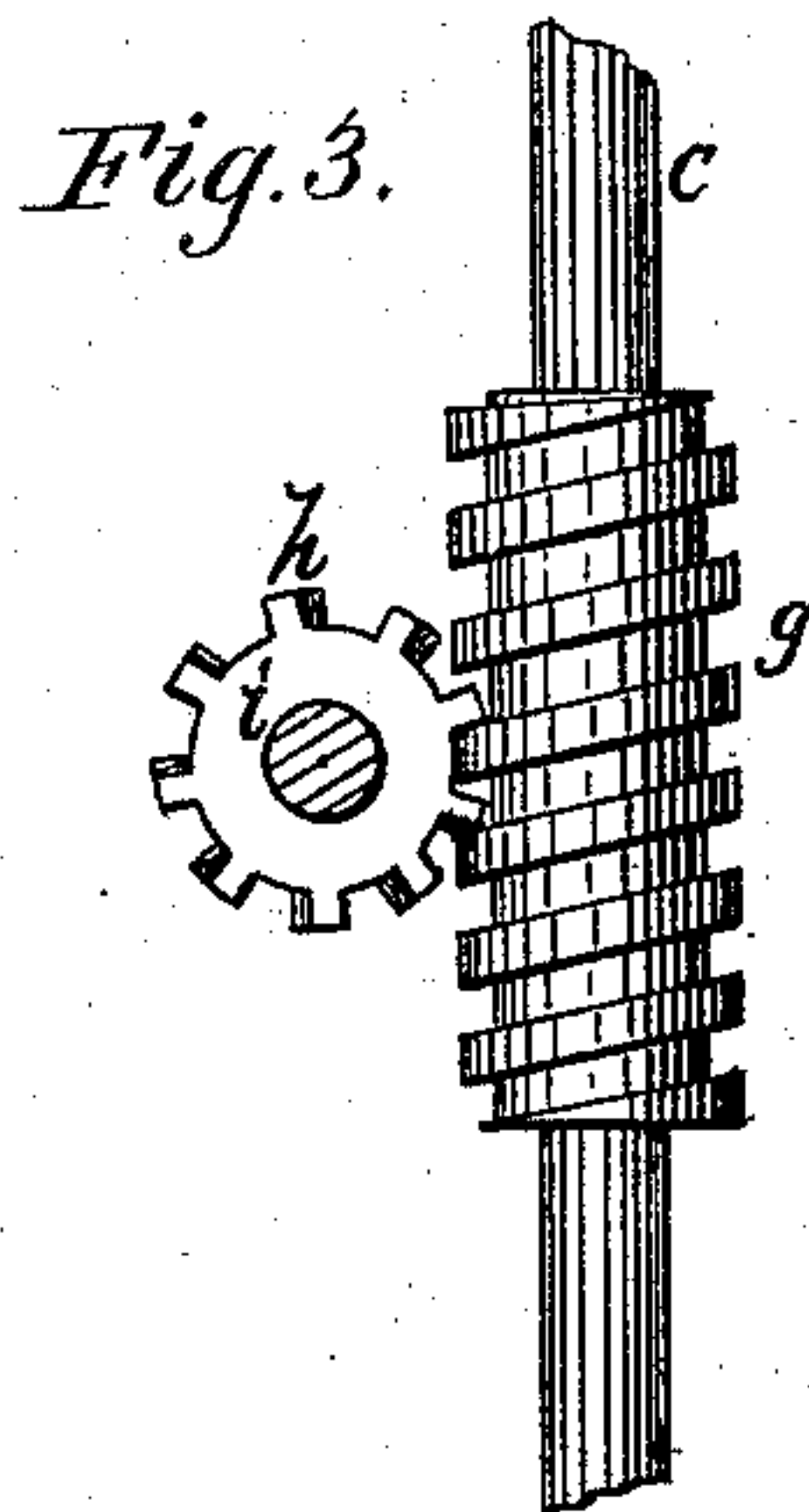
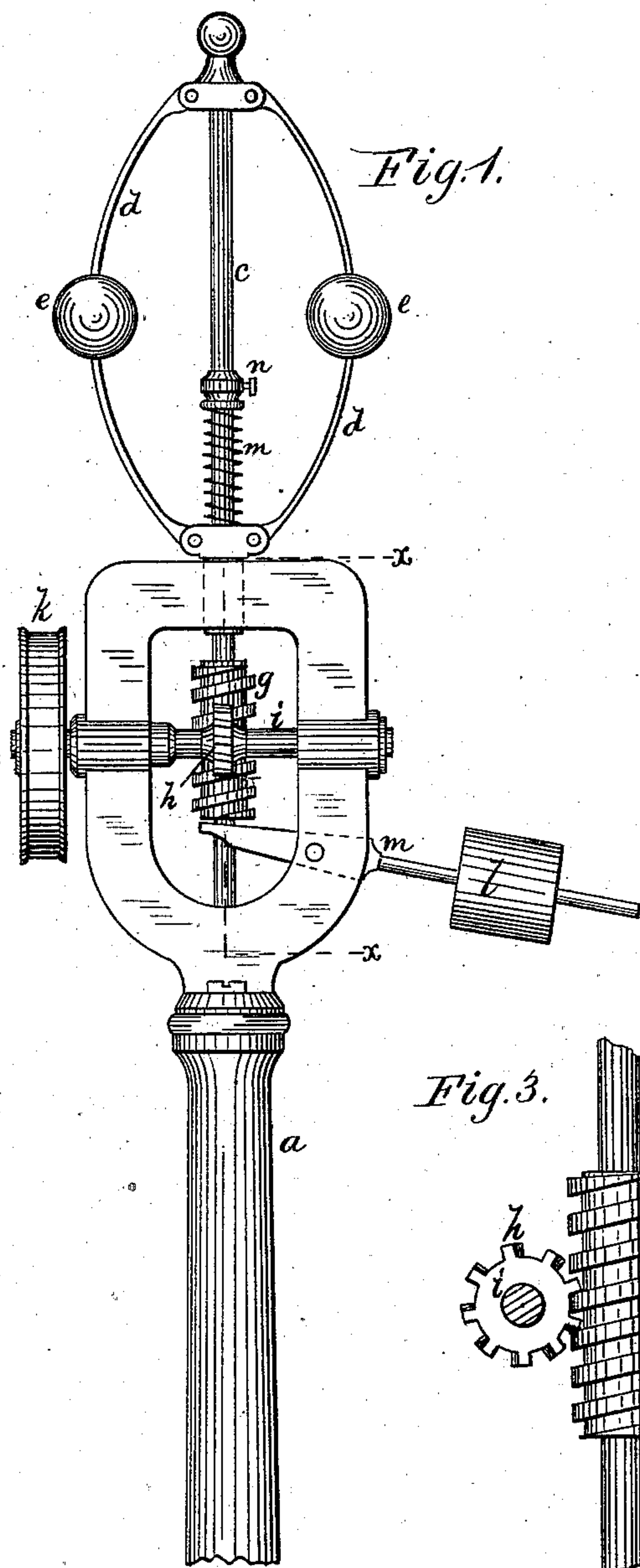


S. WHINERY.
Governor for Engines.

No. 216,922.

Patented June 24, 1879.



WITNESSES:

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UNITED STATES PATENT OFFICE.

SAMUEL WHINERY, OF WHEELER, ALABAMA.

IMPROVEMENT IN GOVERNORS FOR ENGINES.

Specification forming part of Letters Patent No. **216,922**, dated June 24, 1879; application filed April 23, 1879.

To all whom it may concern:

Be it known that I, SAMUEL WHINERY, of Wheeler, in the county of Lawrence and State of Alabama, have invented a new and useful Improvement in Governors for Engines, of which the following is a specification.

The object of my invention is to construct a governor for marine or other engines in which the usual variations of speed will be controlled by centrifugal balls, and any sudden increase or decrease of speed checked instantly by an independent movement of the same mechanism.

In the accompanying drawings my invention is shown in connection with a centrifugal governor.

Figure 1 is a front elevation. Fig. 2 is an elevation at right angles to Fig. 1. Fig. 3 is an elevation of the worm-gearing in larger size.

Similar letters of reference indicate corresponding parts.

Upon a standard, *a*, in bearings *b b* is fitted the vertical spindle *c* of a centrifugal governor. The spindle *c* passes loosely through bearings *b*, and carries upon its upper end the springs *d* and balls *e*, fitted to operate spindle *c* by centrifugal action, in the usual manner. The lower end of spindle *c* is connected by a swivel-joint to the rod *f*, that actuates the governing-valve of the steam or a variable cut-off device, as may be desired.

Upon the spindle *c*, below the upper bearing, *b*, is affixed a worm-gear, *g*, that meshes with an oblique-toothed or worm pinion, *h*, which is secured to a cross-shaft, *i*, journaled in boxes formed in the fixed frame of the governor. Upon shaft *i* is a driving-pulley, *k*, by which the governor will be driven.

l is an adjustable weight on a lever, *m*, that is fulcrumed on the governor-frame. The inner forked end of *l* takes beneath the gear *g*, to regulate the position of spindle *c*. Around the spindle *c*, above the bearing *b*, is a spiral spring, *m'*, preferably steel, and fitted for being compressed more or less by an adjustable nut and washer, *n*.

The action of the governor will be as follows: Motion being given to pinion *h* by pul-

ley *k*, the worm *g*, spindle *c*, with the attached springs and balls, are caused to revolve. The downward pressure of pinion *h* on worm *g* is counteracted by the spiral spring *m*, so that the balls are free to assume the position due to their centrifugal force and the reaction of their springs *d*.

The gradual variations in the motion of the engine will act upon the governor in the usual manner and the engine be controlled by the centrifugal action; but should the engine, from any cause, start suddenly with increased speed, the impulse would be communicated instantly to pinion *h*, which, not being capable of overcoming the inertia of the balls and increasing their velocity suddenly, will act on worm *g* in the manner of a rack and pinion, thereby forcing the worm and spindle *c* downward and cutting off the steam to the required extent. This downward motion of the spindle will at the same time force the balls outward and maintain them there until the equilibrium of the parts be restored.

Under reverse conditions, when the engine, by a suddenly-imposed load, is suddenly slackened in speed, the inertia of the balls would impel them for a time at the rate of speed previously acquired; but the rotation of pinion *h* being checked, the worm *g*, acting against the cogs of *h*, will carry spindle *c* upward and open the steam-valve, and at the same time draw the balls inward.

By adjusting counterpoise-weight *l* the parts may be regulated for the desired normal action.

By the above-described construction the governor will be rendered extremely sensitive and the movements nearly uniform. The sudden impulses of the engine will be checked before the jerk can have any effect.

It will be seen that the mechanism acting to check the sudden changes is between the engine and the usual governor, and does not act through the governor; but the steam is cut off before the impulse has acted upon the centrifugal governor.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. As an improvement in engine-governors, the combination, with the parts fitted for centrifugal action, substantially as described, of the worm-gear operated upon by the pinion, substantially as described, and for the purposes set forth.

2. The combination, with a centrifugal governor-rod carrying the worm *g*, driven by a

pinion, *h*, as set forth, of the spiral spring *m*, substantially as and for the purposes specified.

SAMUEL WHINERY.

Witnesses:

MARCUS B. LONG,
C. W. ROBINSON.