

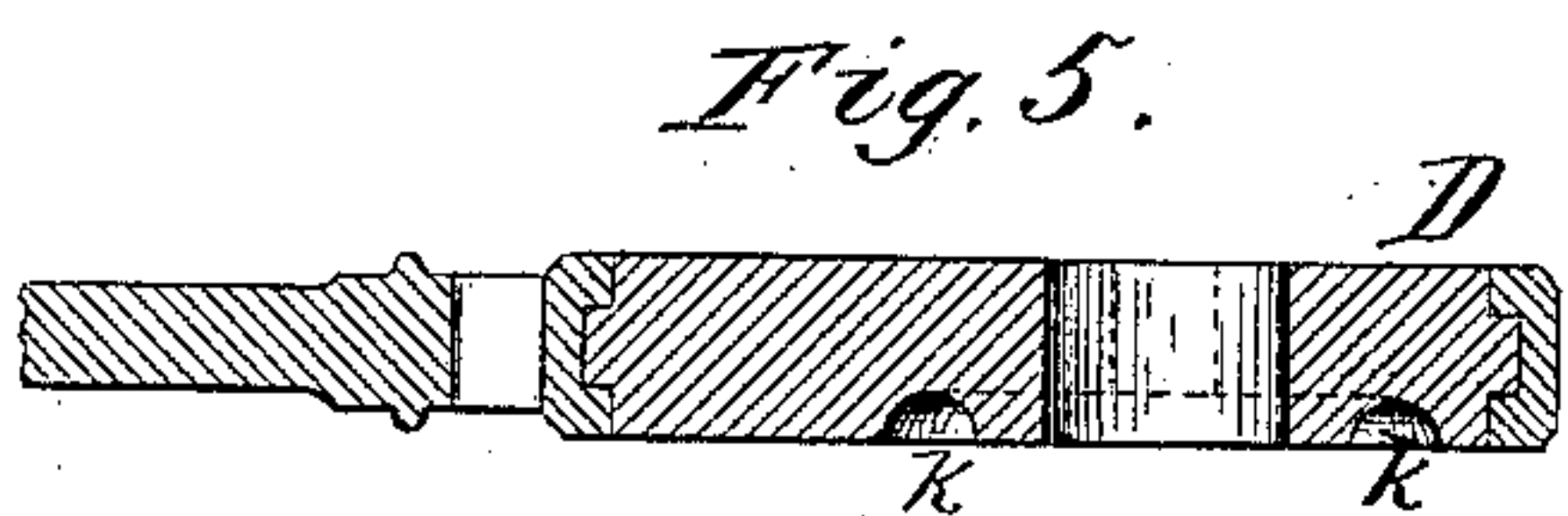
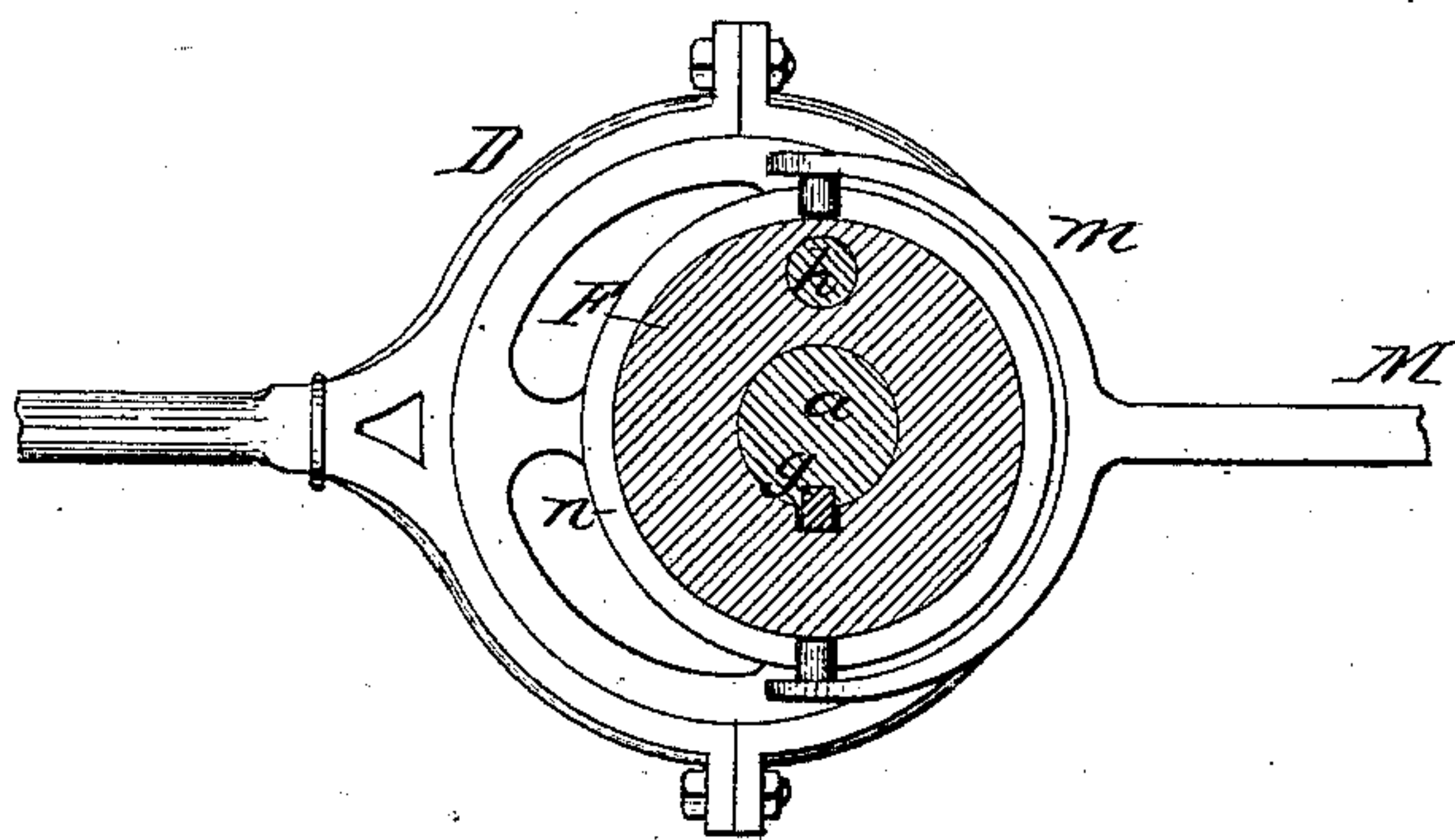
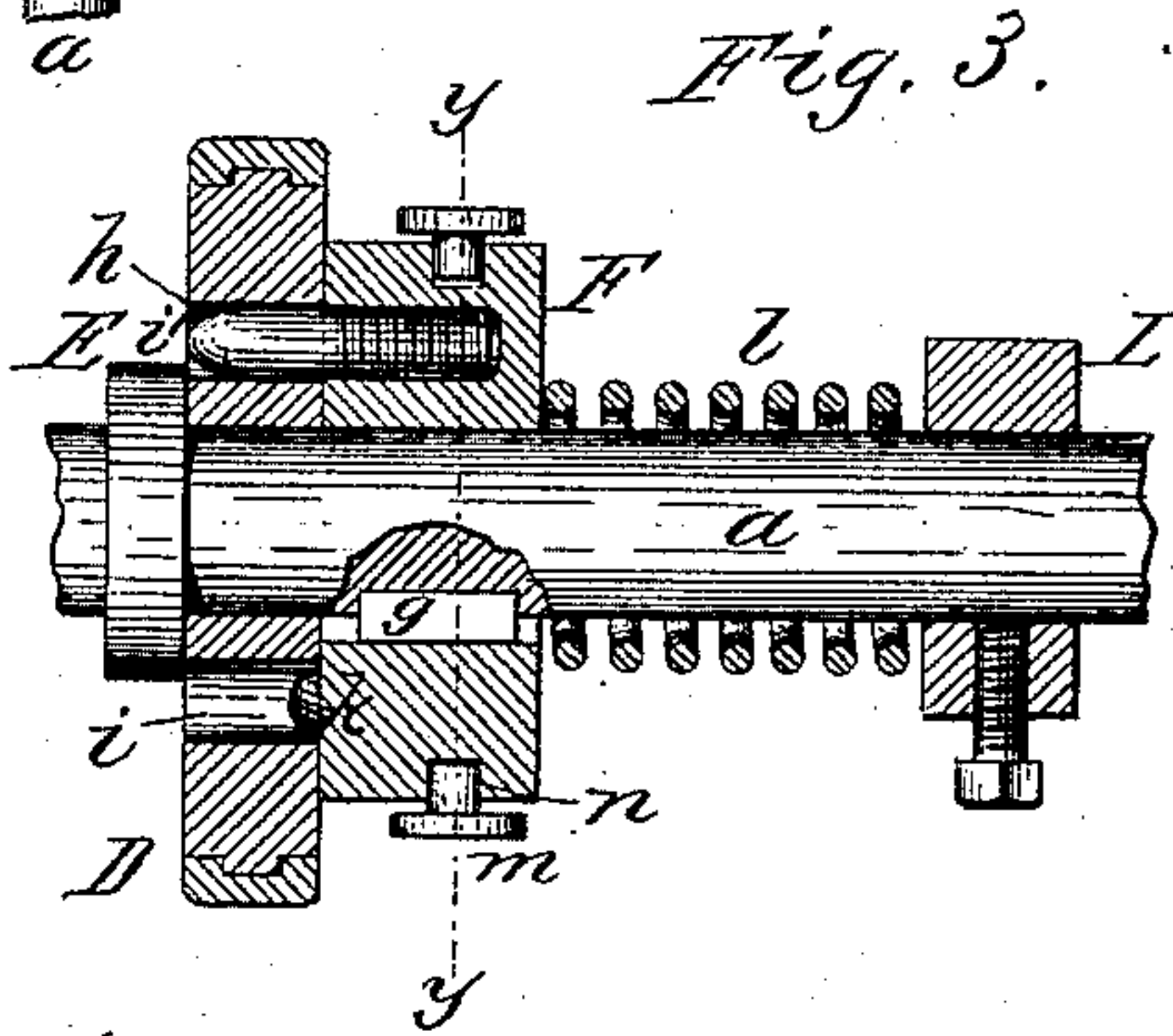
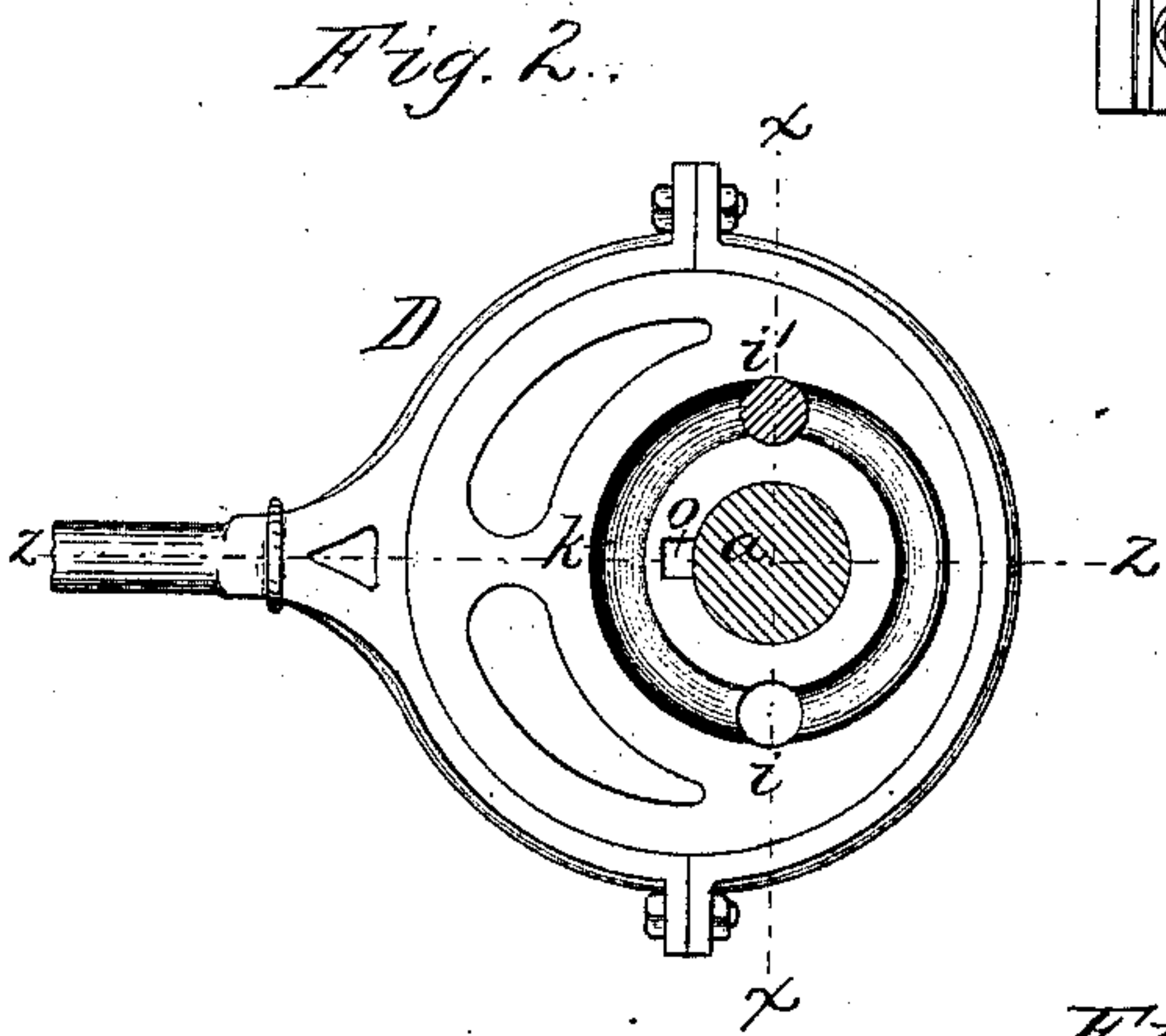
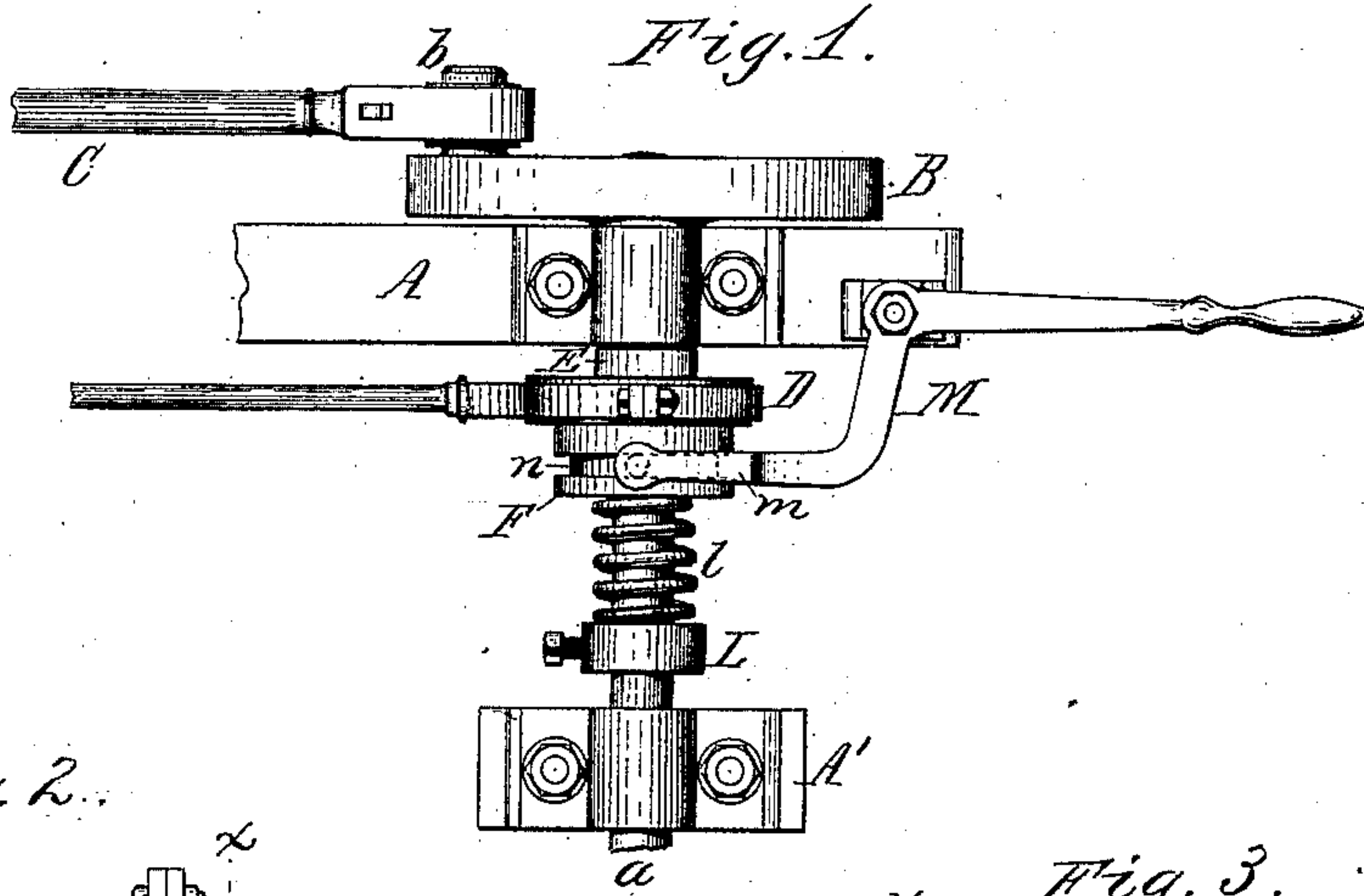
(No Model.)

R. W. AITKEN.

VALVE GEAR FOR REVERSIBLE ENGINES.

No. 310,113.

Patented Dec. 30, 1884.



Chas. J. Buchheit.
Edw. J. Brady } Witnesses.

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UNITED STATES PATENT OFFICE.

ROBERT W. AITKEN, OF BUFFALO, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO E. S. BROWN, RECEIVER OF THE NORTH WESTERN MANUFACTURING AND CAR COMPANY, OF STILLWATER, MINNESOTA.

VALVE-GEAR FOR REVERSIBLE ENGINES.

SPECIFICATION forming part of Letters Patent No. 310,113, dated December 30, 1884.

Application filed December 17, 1880. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. AITKEN, of the city of Buffalo, in the county of Erie and State of New York, have invented new and
5 useful Improvements in Valve-Gear for Reversible Steam-Engines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to the construction of
10 a valve-gear for reversible steam-engines; and it has for its object to produce a valve-gear which is simple in construction and easily operated.

My invention consists, principally, of a
15 valve-gear composed of an eccentric fitted loosely on the engine-shaft, a collar which rotates with the shaft, and to which is attached a pin or bolt, which can be engaged with the eccentric in two different positions, in one of
20 which the eccentric causes the engine-shaft to rotate forward and in the other position in a reverse direction; also, in providing the collar to which the pin is attached with mechanism whereby the pin is held in contact with
25 the eccentric; also, in constructing the eccentric with an annular groove which connects the two recesses of the eccentric and guides the pin to the same, and of the mechanism whereby the collar is disengaged from the ec-
30 centrics, as will be hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a top plan view of my improved valve-gear. Fig. 2 is a side elevation of the eccentric on an enlarged scale. Fig. 3 is a vertical section
35 in line *xx*, Fig. 2. Fig. 4 is a vertical section in line *yy*, Fig. 3. Fig. 5 is a horizontal section in line *zz*, Fig. 2.

Like letters of reference refer to like parts in the several figures.

40 *a* represents the engine-shaft, supported in bearings *A A'*; *B*, the crank-wheel; *b*, the crank-pin; and *C* the connecting-rod, all of ordinary and well-known construction.

D represents the eccentric by which the
45 steam-valve is operated. The eccentric turns loosely on the shaft *a* and rests against a fixed collar, *E*, which is formed with or secured to the shaft *a*.

F represents a movable collar, arranged on the shaft *a* on the opposite side of the eccen- 50 tric *D*, so as to turn with the shaft *a* while being movable toward and from the eccentric.

g represents a key, feather, or pin, secured to the shaft and projecting into a groove or recess formed in the movable collar *F*, whereby 55 the latter is connected with the shaft and at the same time permitted to move toward and from the eccentric.

h represents a pin or bolt, which is secured to the collar *F*, and projects laterally there- 60 from toward the eccentric *D*.

i i' represent two recesses or seats formed in the side of the eccentric *D* in such manner that when the eccentric is so placed on the shaft
65 *a* that its seat *i* will engage with the pin *h* the engine will turn in a forward direction, and that when the eccentric is turned on the shaft so that its seat *i'* will engage with the pin *h* the engine will turn in a reverse direction.

k is an annular groove formed in the side of 70 the eccentric, concentric with the shaft *a*, and connecting the two seats *i i'*.

l is a spring, which bears against the collar *F* and presses the same against the eccentric
75 *D*. The spring *l* rests against a collar, *L*, secured to the shaft *a*, or against some other fixed part of the engine.

M represents a hand-lever, which is pivoted to the engine-frame and engages with its bi-
80 furcated end *m* with the collar *F*, which latter is formed with a groove, *n*, in its face for the reception of the studs of the lever *M*. The eccentric *D* is provided with an opening, *o*, which permits the eccentric to be slipped over the feather in the shaft when the eccentric is
85 required to be removed. Assuming that the parts are in the position represented in Figs. 2, 3, and 4, the engine will turn backward. Upon moving the hand-lever *M* so as to dis-
90 engage the collar *F* and its pin *h* from the eccentric *D*, the latter is disconnected from the shaft, and stops, while the shaft and the collar *F* continue to turn backward, until the pin *h* arrives opposite the seat *i*, when the pin *h* enters the seat by reason of the pressure which
95 the spring *l* exerts against the collar. The ec-

centric D is now connected with the shaft *a* by means of the collar F and pin *h* in a position in which it causes the engine to turn forward, and the motion of the shaft is thereby reversed.

- 5 If the collar F and pin *h* are again disconnected from the eccentric by means of the lever M, the eccentric stops, while the shaft and collar F continue to turn forward until the pin *h* engages in the seat *i'*, when the motion of the engine is reversed. In this manner the reversing is accomplished by simply disengaging the collar F from the eccentric. The end of the pin *h* is guided in the groove *k* from one seat to the other. The collar F and pin *h* can be thrown in engagement with the eccentric by pressing the lever M in the proper direction; but the spring is preferably used, as it acts automatically and prevents the accidental disengagement of the parts while the engine is in motion.

I claim as my invention—

1. The combination, with an eccentric fitted loosely on the shaft and provided with two recesses or seats, *i i'*, one for the forward and one for the backward movement, of a collar turning with the shaft and made movable toward and from the eccentric, and a pin or bolt attached to the collar and adapted to engage in either of the seats of the loose eccentric, substantially as set forth.

2. The combination, with an eccentric fitted

loosely on the shaft, and provided with two recesses or seats, *i i'*, one for the forward and one for the backward movement, of a collar turning with the shaft and made movable toward and from the eccentric, a pin or bolt attached to the collar and adapted to engage in either of the seats of the loose eccentric, and mechanism, substantially as described, whereby the pin is held in its seat, as set forth.

3. The loose eccentric D, constructed with two seats, *i i'*, one for the forward and one for the backward movement, and an annular groove, *k*, connecting the seats *i i'*, substantially as set forth.

4. The combination, with the shaft *a*, loose eccentric D, provided with two seats, *i i'*, collar F, sliding on a key, *g*, and provided with pin *h*, and hand-lever M, engaging with the collar F, substantially as set forth.

5. The combination, with an eccentric fitted loosely on the shaft, of a collar which turns with the shaft, and a pin or bolt which connects the collar with the eccentric, and which can be engaged with either of two seats or recesses, one for the backward and one for the forward movement, substantially as set forth.

ROBERT W. AITKEN.

Witnesses:

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