

(No Model.)

A. P. KINNEY.
SAFETY VALVE.

No. 485,699.

Patented Nov. 8, 1892.

FIG. 2.

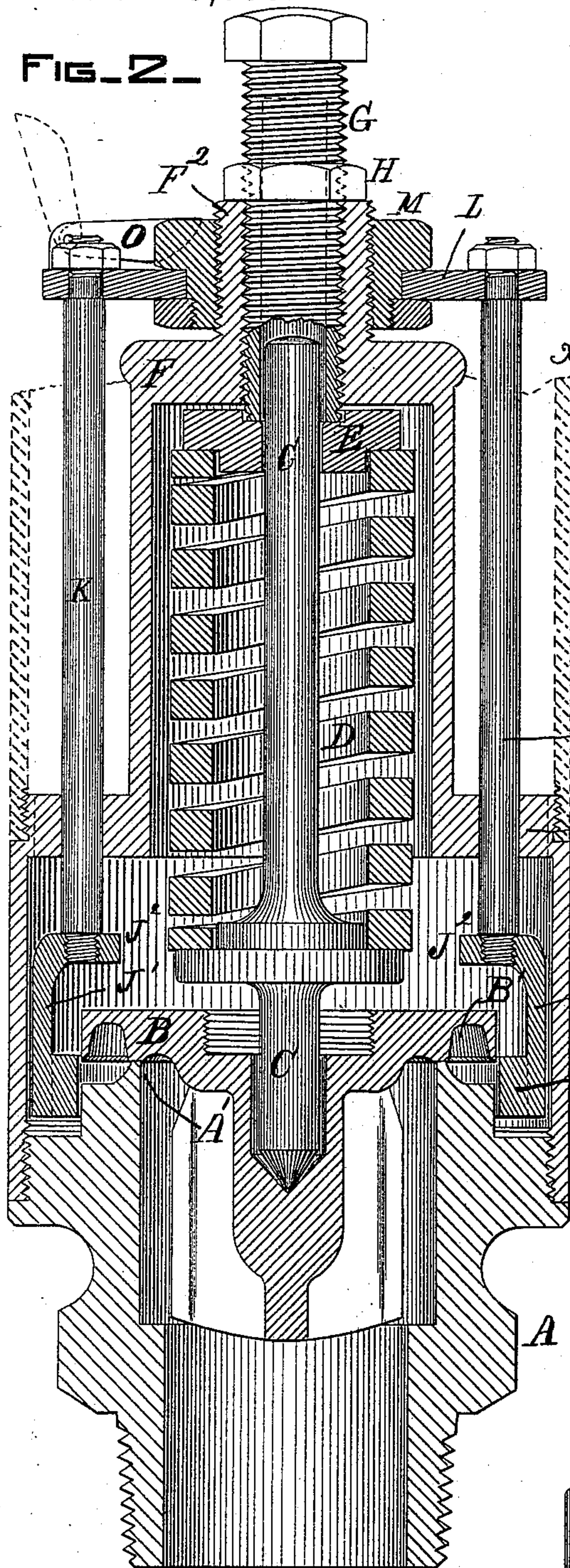


FIG. 1.

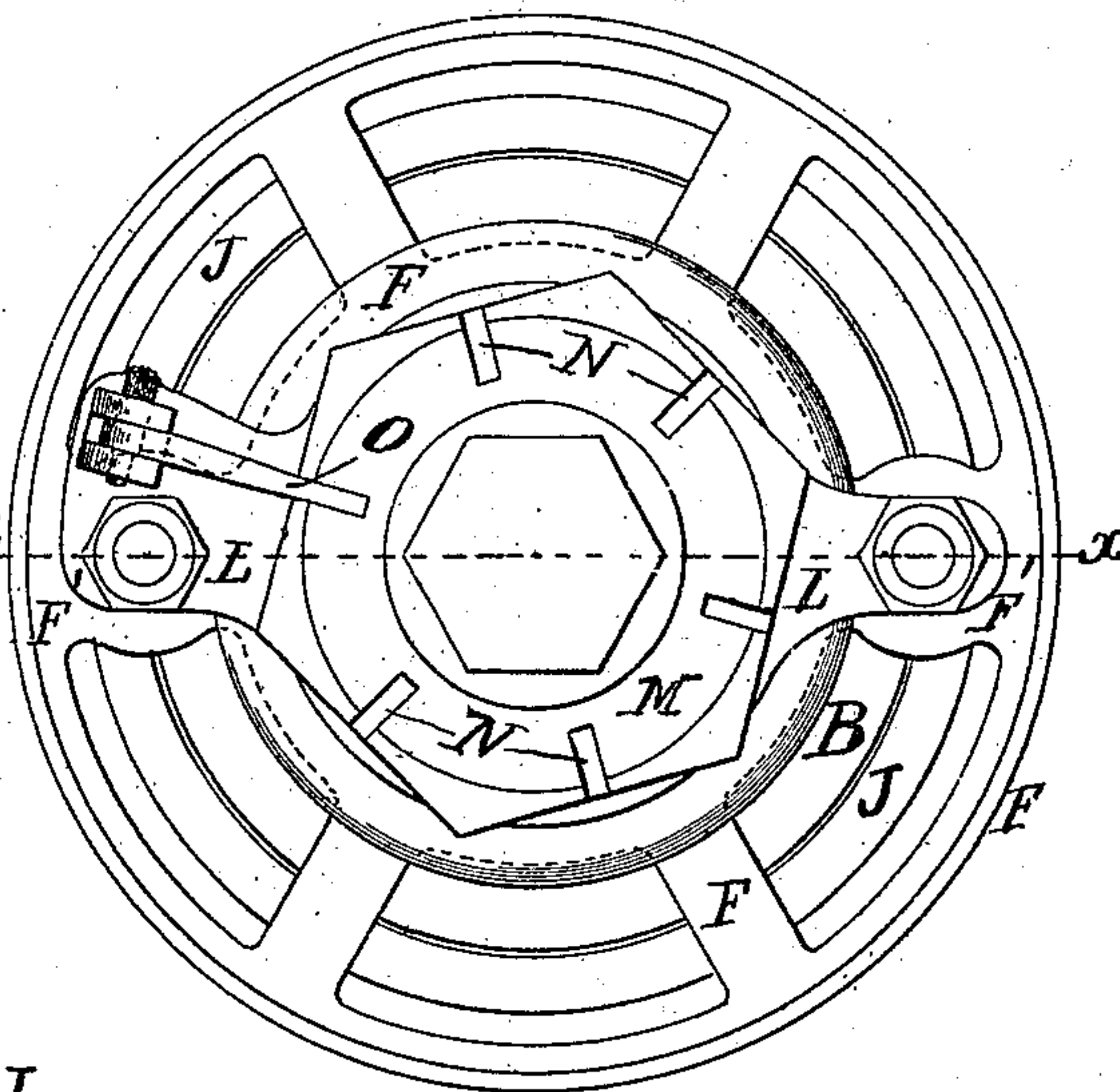
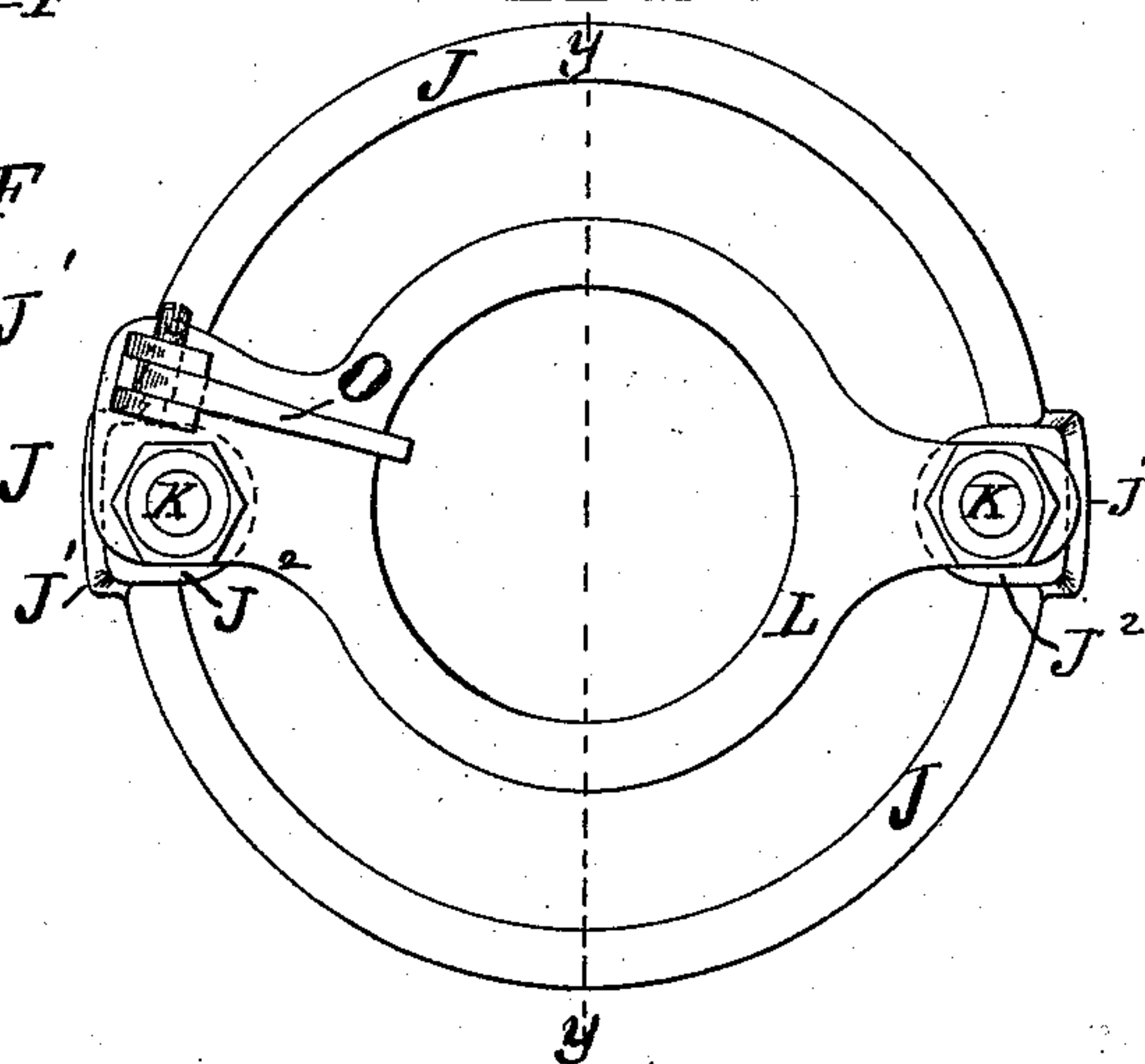


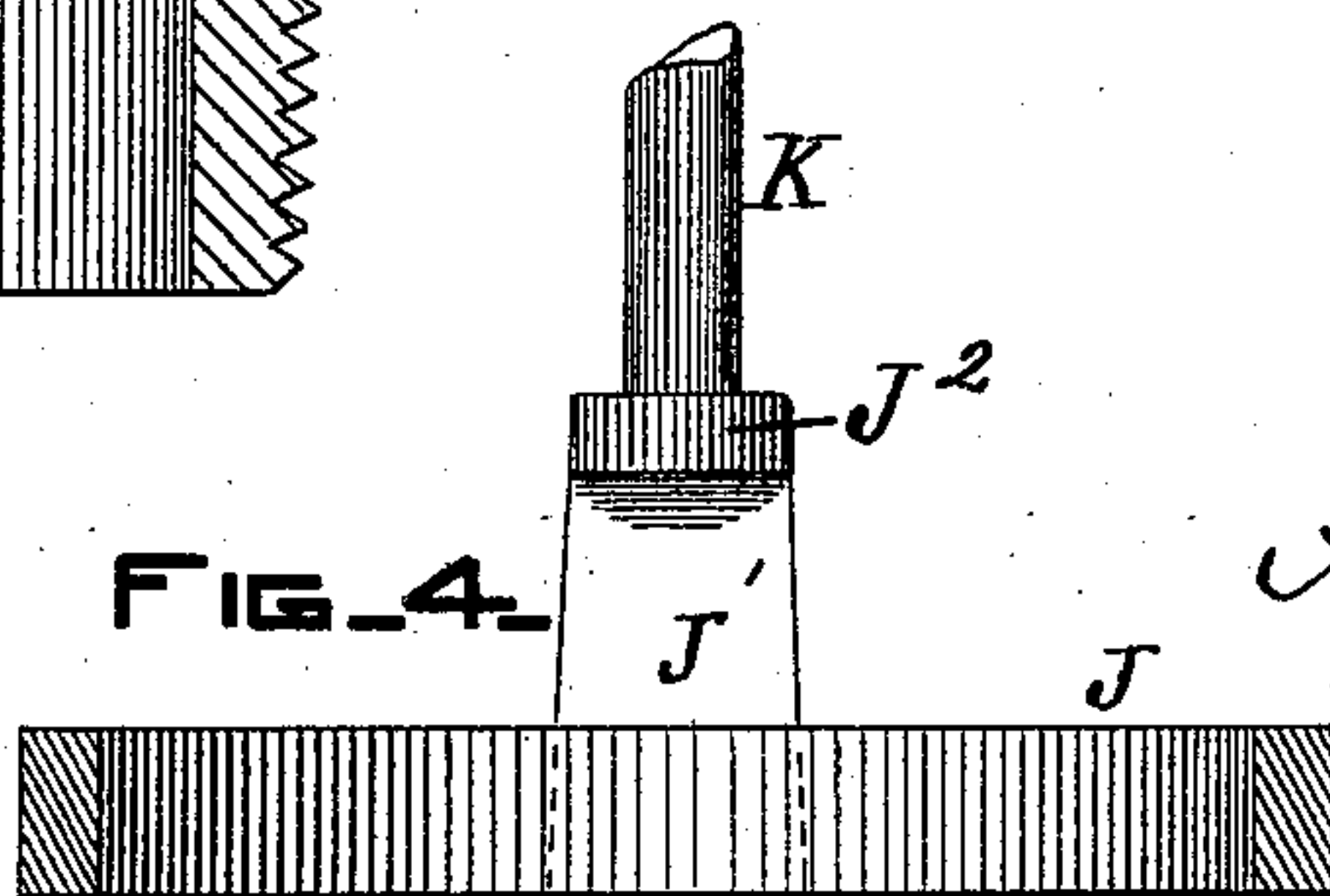
FIG. 3.



WITNESSES

A. P. Kinney
H. E. Lombard

FIG. 4.



INVENTOR

A. P. Kinney
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UNITED STATES PATENT OFFICE.

AMOS P. KINNEY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE AMERICAN STEAM GAUGE COMPANY, OF SAME PLACE.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 485,699, dated November 8, 1892.

Application filed August 4, 1892. Serial No. 442,196. (No model.)

To all whom it may concern:

Be it known that I, AMOS P. KINNEY, of Boston, in the county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Safety-Valves, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to safety-valves for steam-boilers, particularly locomotive-boilers, and especially to the devices employed in such valves for regulating the escape of steam after the valve is lifted for the purpose of securing prompt reaction and closing of the valve without undue waste of steam in relieving the boiler.

The object of my invention is the production of a regulating device which shall be readily accessible and adjustable from the outside of the valve casing or shell, effective in its operation, simple in construction, and not liable to get out of order; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings, and to the claims hereinafter contained, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a plan of a locomotive safety-valve illustrating my invention with the muffler removed. Fig. 2 is a vertical section on line *xx* on Fig. 1, and showing a portion of the muffler-casing in dotted lines. Fig. 3 is a plan of the regulating-ring, its lifting-rods and yoke or cross-head; and Fig. 4 is a section of said ring on line *yy* on Fig. 3, and showing one of its upwardly-projecting ears and a portion of one of its lifting-rods in elevation.

In the drawings, A is the base having formed thereon the valve-seat A', B is the valve, C is the spindle, D the spring, E the follower, F the main casing, G the tubular set-screw for adjusting the tension of the spring D, H the check-nut for securing said set-screw in adjusted position, and I represents a portion of the muffler-casing shown in dotted lines, all of which parts are of well-known construction, and individually form no part of my present invention, and hence need not be further described here.

In order to regulate the escape of steam when the valve is lifted by the pressure of steam beneath it against the tension of the spring D, the valve B has formed in its under side outside of the valve-seat an annular groove B', and a metal ring J, having an interior diameter slightly greater than the diameter of the valve B, is placed around said valve in such a manner that it may be adjusted vertically to vary the opening through which the steam can escape after the valve is lifted. So far the apparatus described is old and not of my invention.

Several different ways have been devised for adjusting the ring J to vary the size of the opening for the escape of the steam, and thus regulate the closing of the valve, all of which are to a greater or less extent effective for the purpose, but are more or less objectionable because of its being necessary to remove the casing, which involves shutting off the steam and disarranging the parts of the mechanism in order to adjust the ring or because of the complex construction of the parts or the lack of ability to adjust said ring by a single operation at one point. To obviate these objections, I connect the ring J to two parallel vertical rods K K, fitted to bearings in the horizontal portion F' of the main casing F, so as to be movable vertically therein, and connect the upper ends of said rods to opposite ends of the cross-head L, the center of which surrounds the central portion of the nut M, made in two parts screwed together, with an annular groove between their outer portions to receive said cross-head, said nut being fitted to the threaded outer periphery of the upwardly-projecting hub F² of the casing F.

The nut M has formed in its outer edge a plurality of any desired number of radial slots N, with which the latch O, pivoted to the cross-head L, engages when the ring has been properly adjusted to lock the said nut against accidental displacement and the consequent disarrangement of the regulating-ring. By this construction of the adjusting mechanism the adjustment of the ring J may be very readily and easily made without shutting off the steam or disturbing any part of the safety-valve apparatus, except to remove the muffler,

which can be done at any time while the valve is under steam-pressure, it being only necessary after removing the muffler to raise the latch O, as indicated in dotted lines in Fig. 2, and apply a wrench to the nut M and turn it in one direction or the other, according as to whether it is desired to move said ring J up or down. The nut M, being above the top of the casing F, is in the best possible position for being operated by means of a wrench, as there is nothing in the way of a free operation of the wrench. These features are of special advantage in connection with locomotive safety-valves.

I have shown the ring J as provided with uprights J', each having an inwardly-projecting ear J², into which the rods K K are screwed; but the uprights J' and ears J² are not essential, and may be dispensed with, and the rods K be screwed directly into the ring J.

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

1. The combination, in a safety-valve, of a base provided with a valve-seat, a valve provided with an annular groove in its under side and outside of the valve-seat, means for pressing said valve to its seat against the pressure of steam beneath it, a ring surrounding said valve, a main casing inclosing said ring and valve, a pair of parallel vertical rods connected to said ring on opposite sides of said valve and extending upward therefrom through bearings in said main casing, a yoke or cross-head connecting the upper ends of said parallel rods, and a screw-threaded adjusting device connecting said cross-head to said main casing.

2. The combination, in a safety-valve, of a base provided with a valve-seat, a valve provided with an annular groove in its under side outside of said valve-seat, means having provision for pressing said valve to its seat against the pressure of steam beneath it, a ring surrounding said valve, a main casing inclosing said ring and valve, a pair of parallel vertical rods connected to said ring and extending upward therefrom through bear-

ings in said main casing, a nut threaded upon an upwardly-projecting hub of said casing and provided with a peripheral groove, and a yoke or cross-head embracing the grooved portion of said nut and secured at its ends to the upper ends of said parallel rods.

3. The combination, in a safety-valve, of a base provided with a valve-seat, a valve having an annular groove formed in its under side outside of said valve-seat, a ring surrounding said valve, a main casing inclosing said ring and valve, means having provision for pressing said valve to its seat against the pressure of steam beneath it, a pair of parallel vertical rods connected to said ring on opposite sides of said valve and extending upward through bearings in said main casing, a nut threaded upon an upwardly-projecting hub of said casing and provided with a peripheral groove, a cross-head embracing the grooved portion of said nut and secured at its ends to the upper ends of said parallel rods, and a locking device for securing said nut against accidental displacement when it has been adjusted to the desired position.

4. The combination of the base A, seat A', the valve B, the spring D, means for adjusting the tension of said spring, the ring J, the main casing F, provided with the threaded hub F², the two parallel rods K K, connected to said ring and extending upward through bearings in said main casing, the nut M, provided with a peripheral groove and a series of radial slots N, the cross-head L, connecting the upper ends of said rods K and the nut M, and the pivoted latch O, constructed and arranged to engage either of said radial slots to lock said nut in position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 28th day of July, A. D. 1892.

AMOS P. KINNEY.

Witnesses:

N. C. LOMBARD,
JAMES T. MURRAY.