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H. L. KEELER.

STATION INDICATOR.

APPLICATION FILED FEB. 3, 1909.

Patented Sept. 20, 1910.

4 SHEETS—SHEET 1.




Witnesses.

G. J. Mead

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4 SHEETS—SHEET 2.

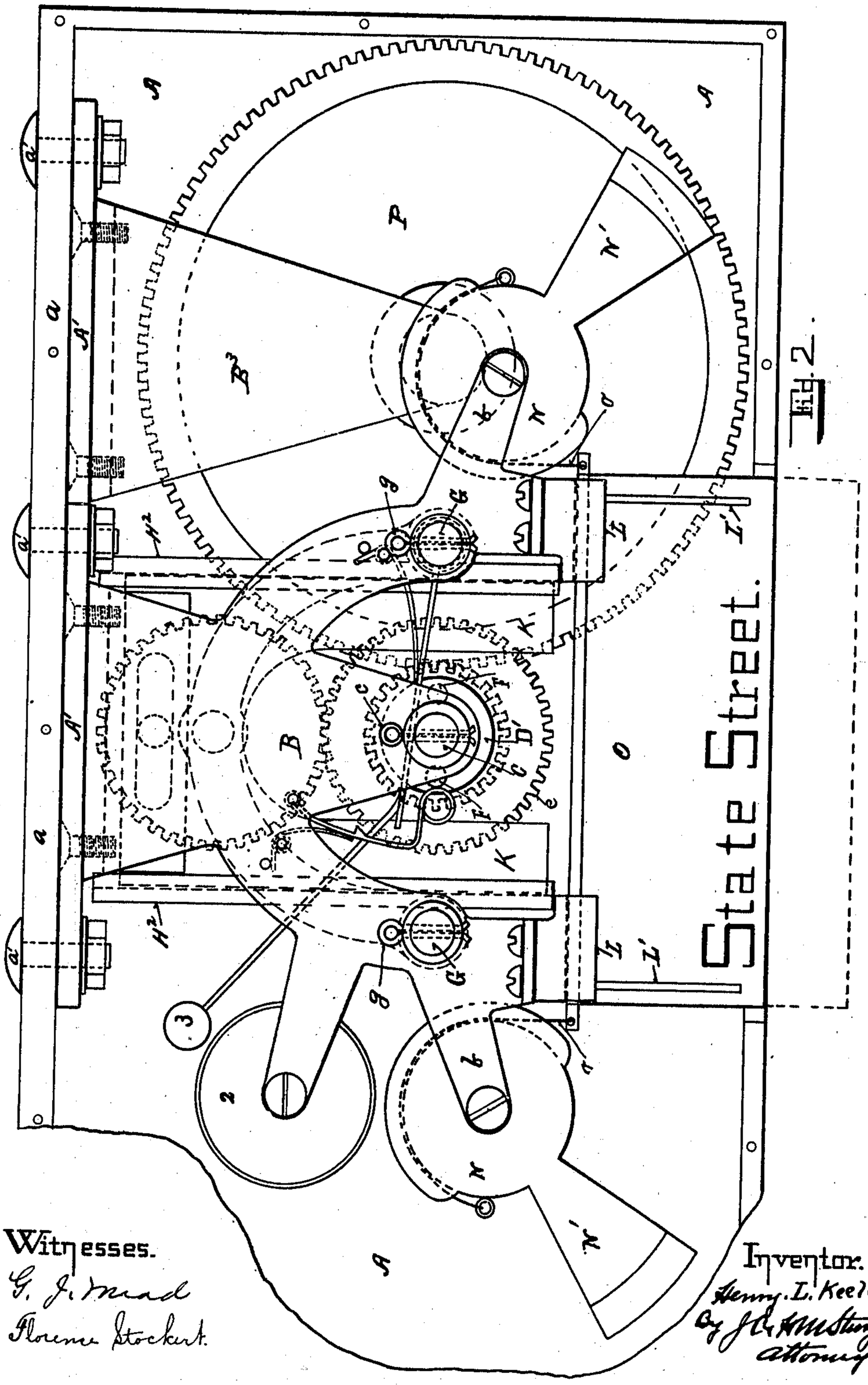


Fig. 2.

Witnesses.
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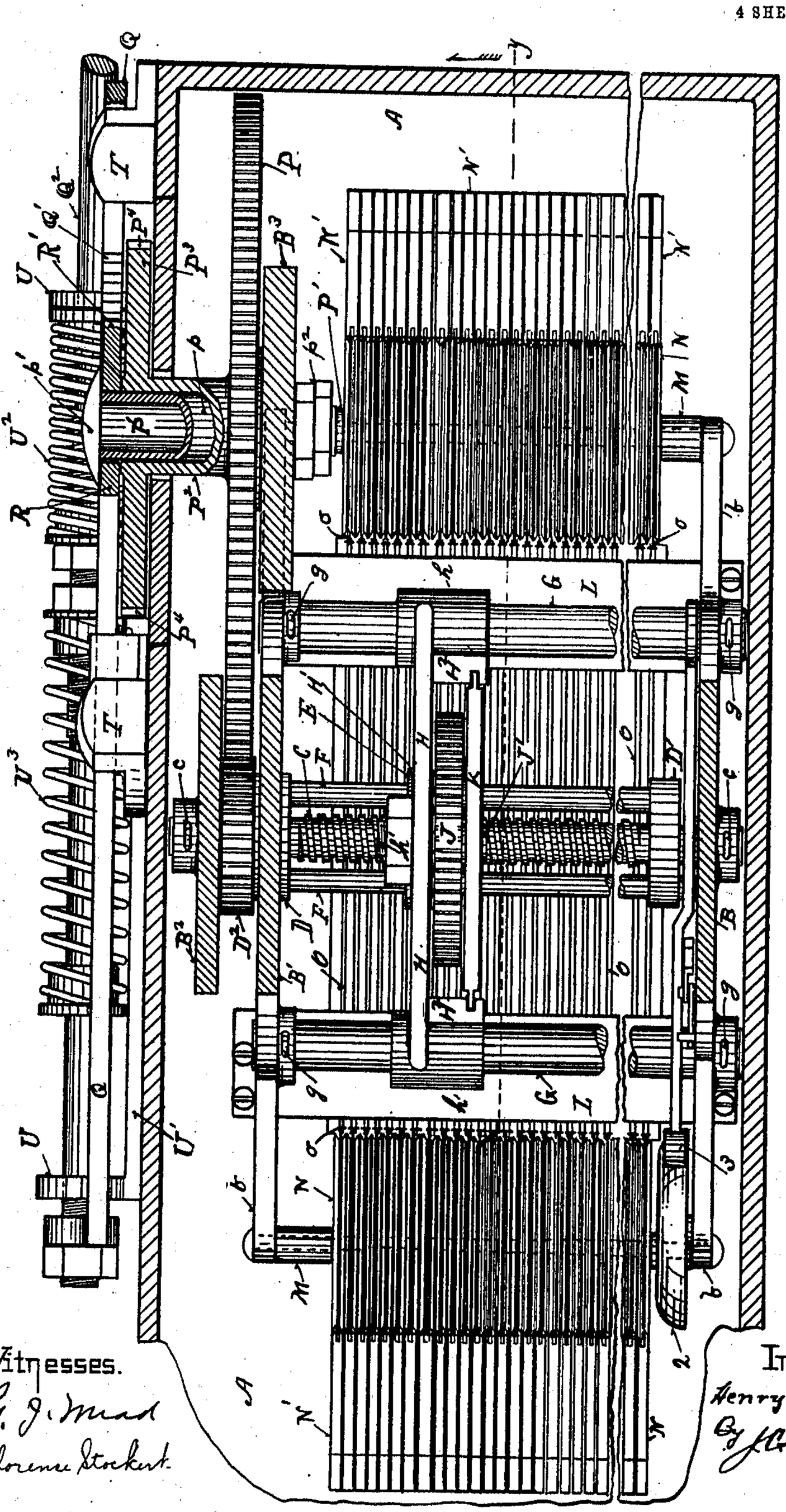

Fig. 3.

Witnesses.

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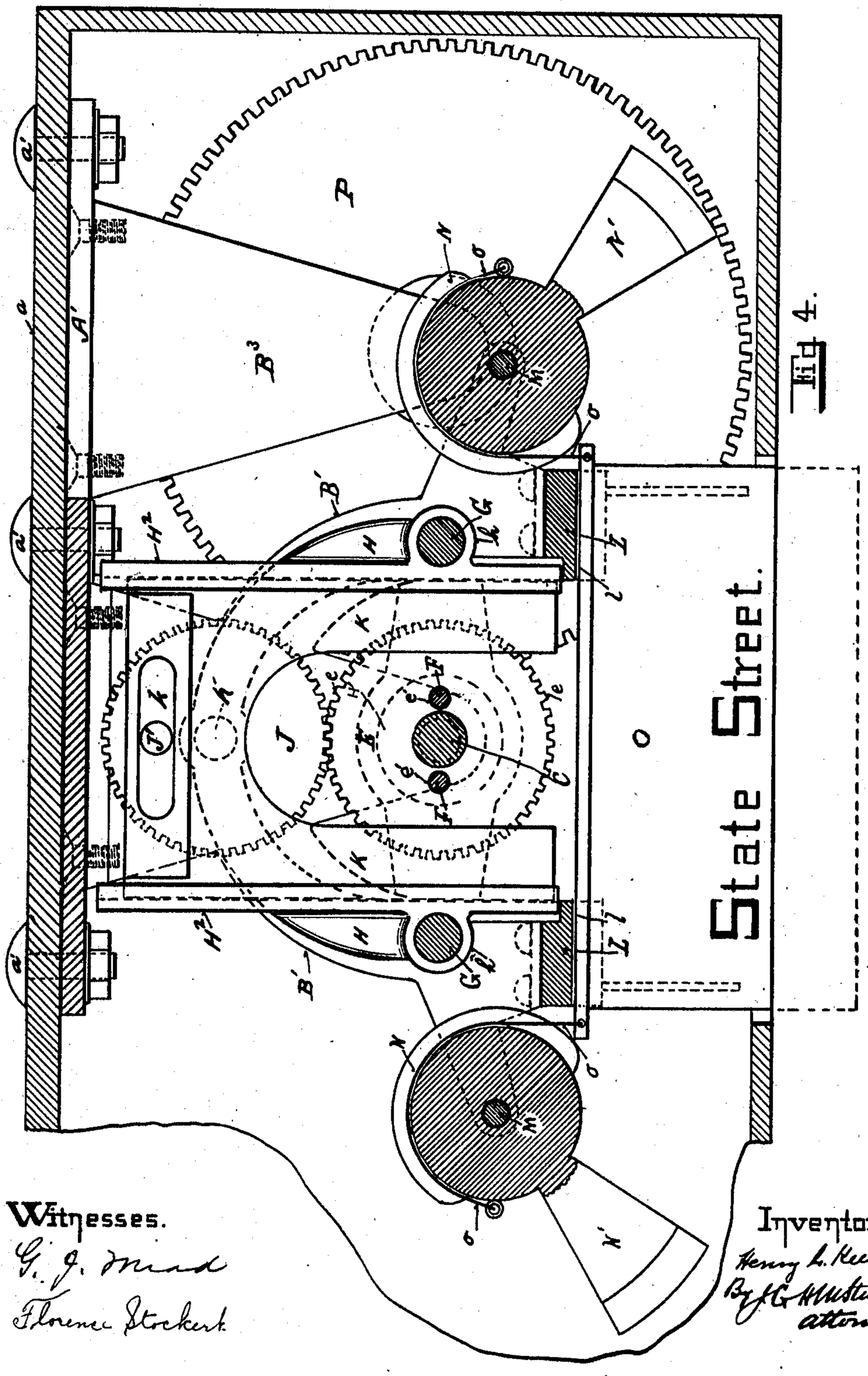


Fig 4.

Witnesses.

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# UNITED STATES PATENT OFFICE.

HENRY L. KEELER, OF LUNDYS LANE, PENNSYLVANIA.

## STATION-INDICATOR.

970,717. Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed February 3, 1909. Serial No. 475,888.

*To all whom it may concern:*

Be it known that I, HENRY L. KEELER, a citizen of the United States, residing at Lundys Lane, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Station-Indicators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to station indicators for railway or street cars, and has for its objects the construction of certain improvements in that type of station indicators shown and described in Letters-Patent of the United States No. 857,630 issued to me on the 25th day of June, 1907.

The features of my invention will appear hereinafter in the specification and claims, and are illustrated in the accompanying drawings in which:

Figure 1 is a front view in elevation of a station indicator embodying my invention. Fig. 2 is a view of the rear end of the same, with the side of the case removed. Fig. 3 is a horizontal section of the same on the line *x*—*x* in Fig. 1. Fig. 4 is a vertical section of the same on the line *y* in Fig. 3, looking in the direction of the arrow.

In these drawings illustrating my invention, A indicates the case of the station indicator, adapted to be secured in the upper part of a car-body. To the upper side *a* of the case A I suspend the main-plate A′ of the supporting frame of the operating mechanism of my improved indicator by means of bolts *a′* passing through said case top and said main plate and therein secured in the usual manner. To this main plate A′, I secure, by means of tap-screws (shown in broken lines in Fig. 2) the end frames B (shown in elevation in Fig. 2) and B′ and $B^2$, and the supporting bracket $B^3$ of the main drive wheel hereinafter more specifically referred to.

In the lower ends of the end frames B and $B^2$, I securely fasten the ends of a screw-shaft C, preferably by means of cotter-pins *c*, as shown in Fig. 2, so that said screw-shaft is non-rotatable in its supports B and $B^2$. Rotatably mounted on the ends of this screw-shaft C between its supports B $B^2$ and the screw-threads thereon, are collars D and D′, the collar D being provided with a spur-gear $D^2$ integral therewith. I place upon the screw C a circular nut E provided with gear teeth *e* around its periphery. Passing through holes *e′* in this circular nut E are rods F which are parallel with the screw-shaft C, the ends thereof being integrally secured to the collars D and D′. I have shown but two of these rods F, but it is evident that I can use a greater number if I desire, and thereby secure greater rigidity in case the large number of stations to be indicated requires an extra long screw-shaft.

In the end frames B′ and B I rigidly secure guides G, by means of cotter-pins *g g* preferably, but these guides may be fastened in any convenient manner. Upon the guides G I place a frame H, by means of sleeves *h*. This frame H is provided with a journal bearing H′ (see Fig. 3, and in broken lines in Fig. 4) on the lower part thereof, adapted to embrace a bearing surface around a shoulder on said nut E in such a manner as to be thereby forced forward and backward by said nut E as it travels longitudinally on the screw-shaft C.

In the upper part of the frame H directly above the screw-shaft C, I mount upon a suitable stud-pin *h′* a spur-gear J of the same diameter as the diameter of the gear-nut E (see Figs. 3 and 4), which wheel J is provided with a crank-pin J′.

Upon the horizontally movable frame H I secure vertical guides $H^2$ in which I place a slide K having in the upper part thereof a transverse slot *k* adapted to embrace the crank-pin J′.

Under the guides G at each side of the end frames B and B′, I secure bars L having a series of parallel transverse horizontal slots *l* cut therein, and depending from these bars L are guides L′, which are located between said slots on said bars. The end frames B and B′ are provided with arms *b*, and on a shaft M at each side of the machine extending between the arms *b* and supported thereby are a series of grooved pulleys N provided with weighted arms N′, and in the slots *l* between the guides L′ in the bars L, I place sign cards O bearing thereon the names of stations, and from each end of each of said cards O, a cord *o* extends up over and is secured to a grooved pulley N, and said sign card is therefore by reason of the weighted arm N′ on said pulley N re-

tained in a raised position directly under the screw-shaft C, and the pitch of said screw-shaft C is so constructed that one revolution of the nut E will cause the same to travel longitudinally on said screw a distance equal to the distance one of said sign cards O is from the cards on each side of it.

For causing the collar D and gear $D^2$ to rotate and thereby cause the collar D′ and circular nut E to rotate on the screw-shaft C, I provide a gear-wheel P of sufficient circumferential size so that a quarter turn thereof will cause the gear $D^2$, with which it intermeshes, to make one complete revolution. This gear wheel P is mounted upon a suitable bearing secured to the lower end of a bracket $B^3$ depending from the main plate A′, by any suitable means, but I prefer the form of journal fastening shown in Fig. 3, consisting of a bolt P′ having thereon a sleeve $p$ as long as is necessary for the journal bearing, so that it abuts against the head of the bolt P′ and the inside of the bracket $B^3$, which makes it possible to screw up the nuts $p^2$ tightly to rigidly secure the bearing in the bracket $B^3$. Integral with the wheel P is a sleeve $P^2$ which passes over the sleeve $p$ and extends beyond the case A of the machine, where it is provided with a disk $P^3$ having notches or studs $P^4$ on its periphery, and between the disk $P^3$ and the head $p'$ of the bolt P′ I place an operating lever R having on its lower end a segment of gear teeth R′ (see Fig. 1). Pivoted on the inner side of this lever R there is a double ratchet dog having ends S and S′ adapted to engage the notches or studs $P^4$ on the disk $P^3$. This dog is provided with spring mechanism (shown in broken lines in Fig. 1) adapted to retain either end S or S′ alternately in contact with the periphery of the disk $P^3$. To limit the movement of the operating lever R to one quarter of a turn, I secure stops T on the case A of the machine. To prevent the disk $P^3$ and gear wheel P from making more than a quarter turn by reason of the momentum thereof, I provide a brake-spring $P^5$ adapted to engage the studs $P^4$ when the lever R contacts with one of the stops T and thereby stop the rotation of said disk $P^3$ and wheel P. To return the lever R to contact with the opposite stop T after it has been operated, I provide a slide-bar Q having thereon a short rack of gear-teeth Q′ which intermesh with the segment of gear teeth R′ on the lever R. Secured to this bar Q there is a rod $Q^2$ which passes through holes in the ears U of the plate U′, which plate is slidably secured to the case A of the machine as hereinafter described. Adjustably to the middle portion of, and embracing the rod $Q^2$, I secure spiral springs $U^2$ and $U^3$, so that the spring $U^2$ is compressed when the lever R forces the bar Q forward as shown in Fig. 1, ready, when the lever is released, to force it over into contact with the opposite stop T. To reverse the action of the lever R, I have mounted the plate U′ slidably upon the case of the machine by means of the clip $u$, and the slots $u'$ through which screws $u^2$ pass. Pivoted to the lower edge of this plate U′ there is a double ended hook V having hooks $v'$ and $v^2$ adapted to engage a stud secured in the case of the machine frame. By grasping the handle $V^2$ on said double hook and pushing toward the disengaged hook ($v^2$) the hook $v'$ becomes disengaged from the stud W, and by continuing the pressure the plate U′ will slide endwise until the hook $v^2$ engages the stud W′, thus releasing the pressure on the spring $U^2$ and compressing the spring $U^3$. When the springs $U^2$ and $U^3$ are thus reversed, the end S′ of the double dog is pressed down by the hand of the operator until it springs into contact with the periphery of the disk $P^3$.

In operation Fig. 1 shows the operating lever as having just been pulled over to turn the disk $P^3$ and its connected gear wheel P a quarter of a turn in the direction of the arrow $w$ and when released the spring $U^2$ will cause the rod $Q^2$ and bar Q to move backward in the direction of the arrow $w'$, which will cause the lever R to move over in the direction of the arrow $w^2$ until it contacts with the opposite stop T and the dog end S has passed over and engaged the stud on that side of the disk $P^3$. This quarter turn of the wheel P causes the circular nut E on the screw-shaft C to make one complete revolution and carries the frame H and the vertical slide K ahead, and said slide K being operated by the crank-wheel J moves downward and contacts with the next succeeding station card O and pushes it downward into view as indicated by broken lines in Figs. 1, 2 and 3 and holds it in that position until the lever R is again operated when the slide K moves upward thereby permitting the weighted pulleys N—N′ to raise up that card and said slide travels on to the next card and pushes that one down in like manner, which operation is repeated as often as the lever R is operated or until the end of the string of cards is reached, when the dog S—S′ and hook V are reversed as hereinbefore described, and the lever R operated in the opposite direction.

I have also provided a gong 2 and mechanism 3 adapted to sound said gong at each revolution of the nut E around the screw-shaft C, so as to call attention to the change of station names.

Having thus described my invention so as to enable others to construct and utilize the same, what I claim as new and desire to secure by Letters-Patent is:

1. The combination in a station indicator, of a series of vertically movable sign cards,

weight mechanism adapted to normally retain each sign card in its uppermost position, a non-rotatable screw-shaft mounted transversely to said series of sign cards, a rotatable nut on said screw-shaft, vertical guides adapted to be moved horizontally by said nut, a vertically movable slide mounted in said guides, and adapted to contact with each successive sign card in said series at each reciprocation thereof, crank mechanism adapted to impart vertical movement to said slide at each revolution of said nut, and lever and gear mechanism adapted to impart intermittent revolutions to said nut, substantially as and for the purpose set forth.

2. The combination in a station indicator, of a series of vertically movable sign cards, weight mechanism adapted to normally retain each sign card in its uppermost position, a non-rotatable screw-shaft mounted transversely to said series of cards, a rotatable nut on said screw-shaft, gear teeth around the periphery of said nut, guides parallel with said screw-shaft, a vertical frame mounted on said guides and embracing said rotatable nut and adapted to receive horizontal movement therefrom, a spur-gear wheel mounted in the upper part of said frame, a crank-pin on said spur-gear wheel, vertical guides on said frame, a slide mounted in said vertical guides and adapted to be engaged by said crank-pin, gear mechanism adapted to intermittently transmit a complete rotation to said rotatable nut, substantially as and for the purpose set forth.

3. The combination in a station indicator, of a series of vertically movable sign cards, weight mechanism adapted to normally retain each sign card in its uppermost position, a non-rotatable screw-shaft mounted transversely to said series of sign cards, a rotatable nut upon said screw-shaft, vertical guides adapted to be moved horizontally by said nut, a vertically movable slide mounted in said guides and adapted to contact with each successive sign card in said series at each reciprocation thereof, crank mechanism adapted to impart vertical movement to said slide at each revolution of said nut, gear mechanism adapted to cause said rotatable nut to rotate, and lever and ratchet mechanism adapted to turn said gear mechanism a limited portion of a revolution, substantially as and for the purpose set forth.

4. The combination in a station indicator of a series of vertically movable sign cards, weight mechanism adapted to normally retain each sign card in its uppermost position, a non-rotatable screw-shaft mounted transversely to said series of sign cards, a rotatable nut upon said screw, vertical guides adapted to be moved horizontally by said nut, a vertically movable slide mounted in said guides and adapted to contact with each successive sign card in said series at each reciprocation thereof, crank mechanism adapted to impart vertical movement to said slide at each revolution of said nut, gear mechanism adapted to cause said nut to rotate around said screw-shaft, lever and ratchet mechanism adapted to turn said gear mechanism a limited portion of a revolution at each operation of said lever, and spring actuated mechanism adapted to return said lever and ratchet mechanism to its normal starting position after each operation thereof, substantially as and for the purpose set forth.

5. The combination in a station indicator of an indicator case, a machine frame secured therein, a series of vertically movable sign cards suspended from said frame, weight mechanism adapted to retain each of said cards in a normally raised position, a non-rotatable shaft secured in said frame transversely to said series of cards, screw-threads on the intermediate portion of said shaft, a rotatable nut having openings therethrough on said screw-threads, rotatable collars on said shaft at each end of the screw-threads thereon, one or more rods rigidly secured in said collars and passing through the openings in said rotatable nut, gear teeth on one of said collars, gear mechanism intermeshing therewith adapted to impart rotary motion to said collar, horizontal guides secured in the machine frame parallel with said non-rotatable screw-shaft, a frame mounted on said guides and adapted to be moved horizontally by the movement of the nut longitudinally of the screw-shaft, vertical guides on said horizontally movable frame, a slide in said guides, and crank mechanism operatable by said nut and adapted to cause said slide to reciprocate, substantially as and for the purpose set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

HENRY L. KEELER.

Witnesses:
ORRIN G. SEAMAN,
GEORGE W. LYON.