No. 816,676. PATENTED APR. 3, 1906.

W. V. MOAK.

MECHANISM FOR OPERATING RAILWAY SIGNALS.

APPLICATION FILED JULY 13, 1905.

3 SHEETS—SHEET 1.

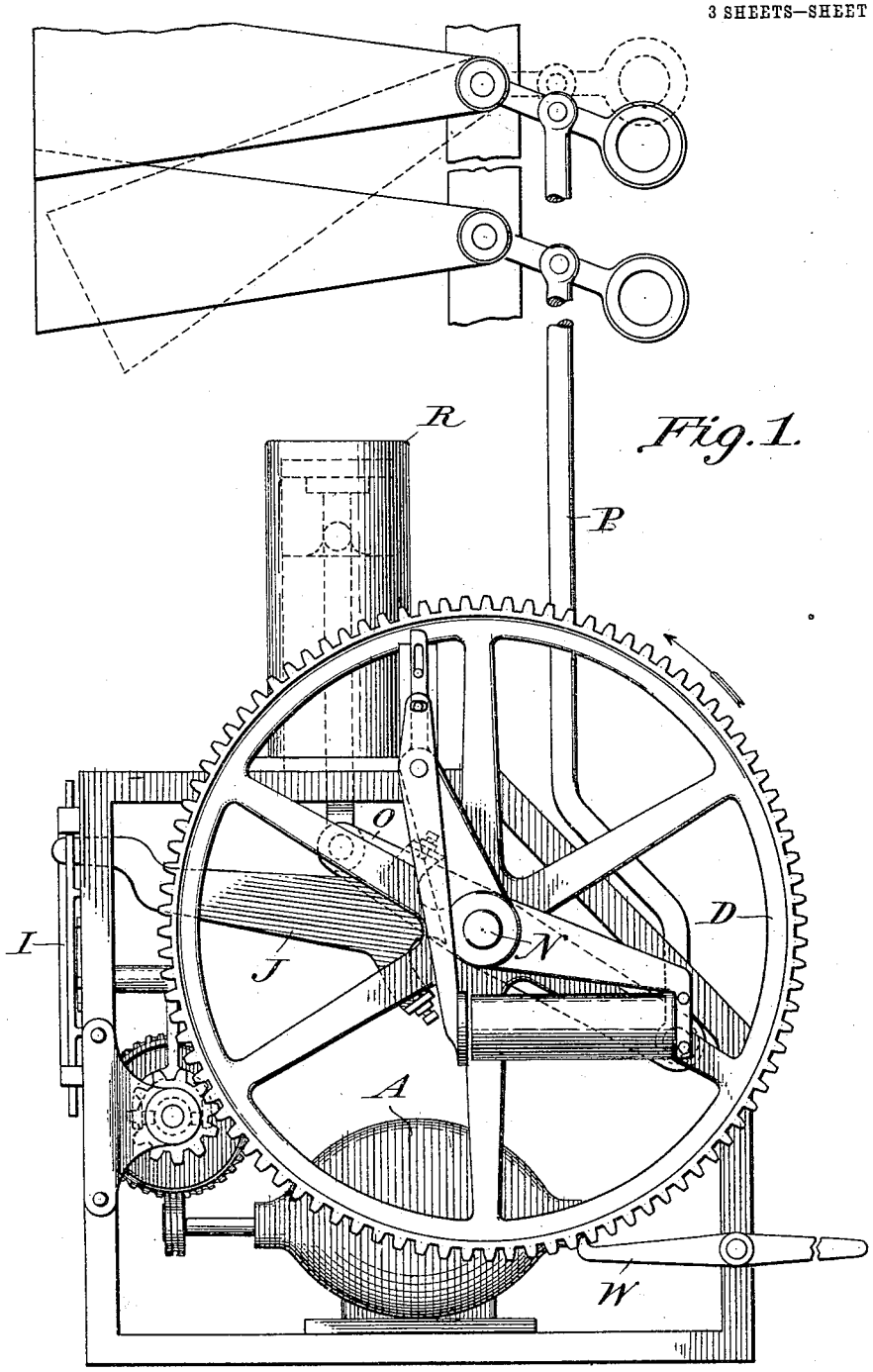

Fig. 1.

Witnesses:
Dudley B. Ward
Lucia A. Damarell

Inventor,
William V. Moak
By Ward & Cameron
his attorneys

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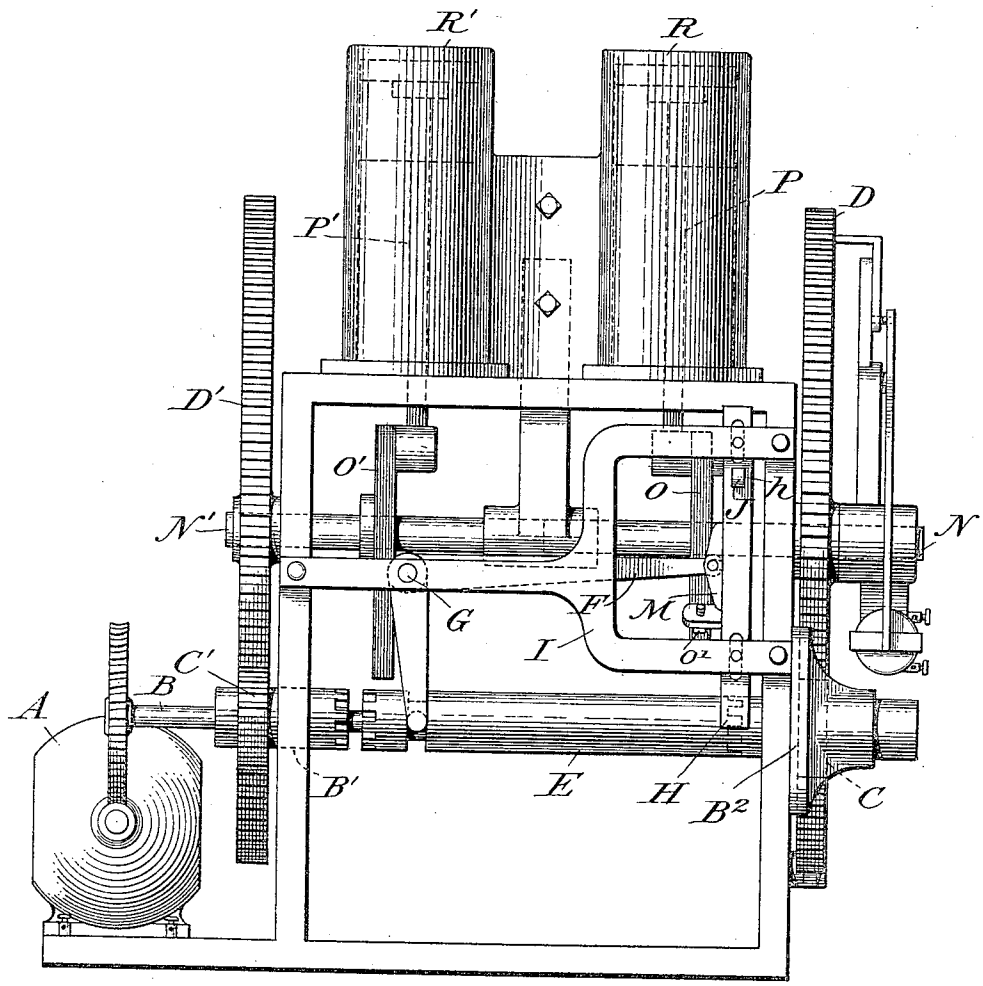

Fig. 2.

Witnesses:
Louis Dannell.

Inventor,
William V. Moak
By Ward & Cameron
his attorneys

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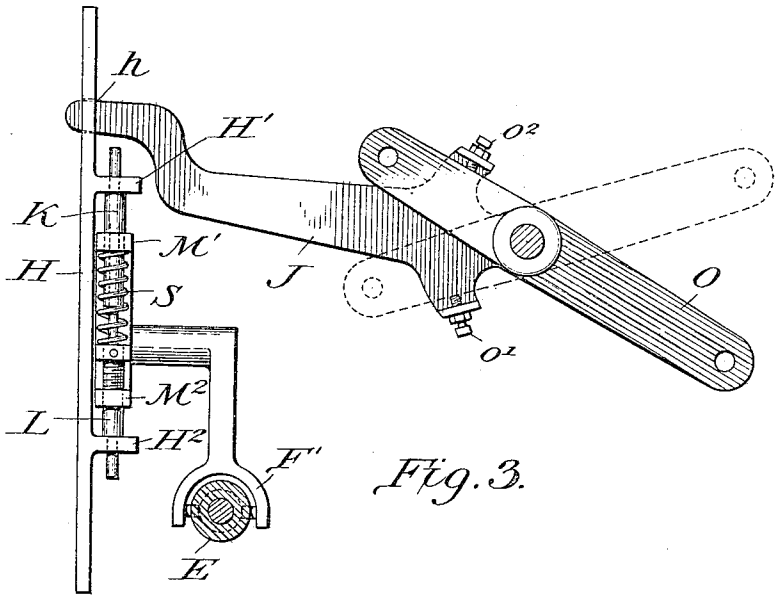

Fig. 3.

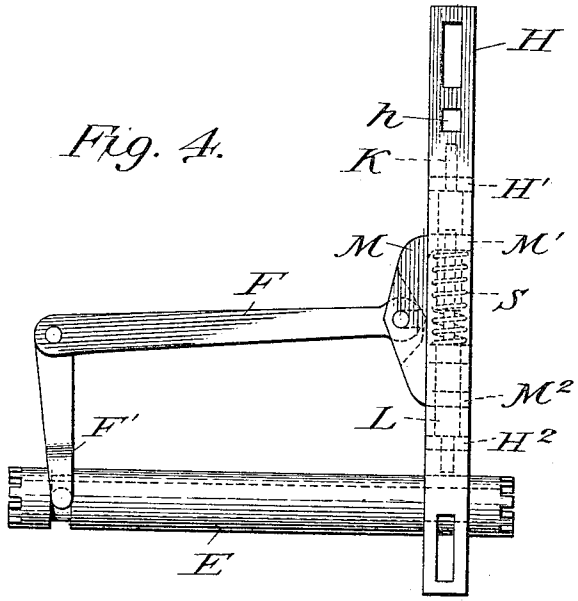

Fig. 4.

Witnesses:

Dudley B. Ward

Lincoln Damarell

Inventor,

William V. Moak

By Ward & Cameron

his attorneys

UNITED STATES PATENT OFFICE.

WILLIAM V. MOAK, OF UTICA, NEW YORK.

MECHANISM FOR OPERATING RAILWAY-SIGNALS.

No. 816,676. Specification of Letters Patent. Patented April 3, 1906.

Application filed July 13, 1905. Serial No. 269,469.

To all whom it may concern:

Be it known that I, WILLIAM V. MOAK, a citizen of the United States of America, and a resident of the city of Utica, county of Oneida, and State of New York, have invented certain new and useful Improvements in Mechanism for Operating Railway-Signals, of which the following is a specification.

My invention relates to railway-signals; and the objects of my invention are to operate both the danger-signal and caution-signal automatically by the same motor and the same operating machinery. I attain these objects by use of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of my invention. Fig. 2 is an end view of the same. Figs. 3 and 4 are detail views of the operating mechanism for shifting the power from one signal to the other.

Similar letters refer to similar parts throughout the several views.

It has been found desirable in operating railways to have both a danger-signal and a caution-signal at the entrance of each block. The danger-signal clears for that block upon which the train is entering and the caution-signal clears for the block beyond.

January 26, 1904, Letters Patent of the United States No. 750,296 were issued to me for an electric railway-signal. The invention described in said patent relates to a danger-signal, and my present invention is an improvement upon the invention shown in said patent and is designed to operate both a danger-signal and a caution-signal by substantially the same mechanism shown in said patent, except that the signals are operated from the bottom of the post upon which the signal-blades are mounted, as hereinafter described, instead of from the top of the posts, as shown in said patent.

Referring to the accompanying drawings, A represents a motor used to operate the driving-shaft B. The driving-shaft B extends entirely through the frame of the machine, having bearings B′ and B^2 on both sides of the frame.

C and C′ are cog-wheels mounted loosely upon the said driving-shaft, C being on the outside of the frame on the side operating the danger-signal and C′ upon the other side operating the caution-signal.

D and D′ are two wheels, D having cogs in its periphery meshing with the cogs on the wheel C and D′ having cogs in its periphery meshing with the cogs on the wheel C′.

E is a sleeve upon the driving-shaft B, constructed to turn positively with the driving-shaft B, but having a limited horizontal motion. Each end of the sleeve E is provided with notches and teeth adapted to mesh with similar notches and teeth on the adjacent sides of the wheels C and C′. The sleeve E is constructed of such length that it will not quite reach from the wheel C to the wheel C′, so that when held exactly between them the teeth in the ends of the sleeve E will not quite reach the teeth on either wheel C or C′ and when the teeth adjoining the wheel C mesh with the teeth in the wheel C the driving-shaft B, revolving, will turn the sleeve E, and thus turn the wheel C, which will turn the wheel D, and when the sleeve E is moved in the other direction, so that the notches and teeth in the end adjoining the wheel C′ mesh with the teeth in the wheel C′, the driving-shaft then will not turn the wheel C, but will turn the wheel C′, which will turn the wheel D′. The sleeve E is provided with a groove or recess, as shown in Figs. 2 and 4, extending all the way around it.

F is a lever turning on the pivot G. The lower arm of this lever F is provided with a clutch F′, which fits into the recess in the sleeve E, so that when the lever F rocks upon the pivot G the lower arm of the lever will move the sleeve E horizontally back and forth upon the shaft B, causing the teeth in the ends of the sleeve E to mesh with the teeth in either the wheels C or C′, determined by the position of the lever F. The lever F is operated by the sliding bar H, which is attached movably to the two arms of the bracket I. The sliding bar H is provided with slots near each end, which slide upon bolts or projections attached to the arms of the bracket I. The sliding bar H is also provided with a slot *h* near the upper end, into which the arm J, Fig. 3, extends, which moves the sliding bar up and down, as hereinafter described. The sliding bar H is also provided with two shoulders H′ and H^2. Between these shoulders are two pins K and L, the one pin being larger than the other and hollow and the smaller pin working into the larger one, the outer ends of the pins sliding in the shoulders H′ and H^2. Surrounding the pins K and L is the spring S, held in position on the pins by nuts, collars, or stop-pins. Attached to

the pins K and L is the bracket M, having two arms M′ and M². The pin L passes through one arm of the bracket M and the pin K through the other arm of the bracket M, and both arms of the bracket work against the collars or nuts holding the spring S upon said pins.

The bracket M moves vertically the horizontal arm of the lever F, so that when the bracket M moves toward the exterior end of the pin L it will move the pin K into the pin L and compress the spring S and when the bracket M is forced toward the exterior end of the pin K it will move the pin L over the pin K and compress the spring S.

The wheel D is loosely mounted upon the shaft N. Attached to the wheel D and also mounted upon the shaft N is the arm O, which turns on said shaft with the wheel D. Also mounted loosely upon the shaft N is the arm J, attached to which are two projections or set-screws o' and o^2. One end of the arm J fits into the slot h of the sliding bar H and is so arranged and constructed that the arm J will move the sliding bar H up and down as the arm J moves up and down, so that when the wheel D revolves part way around, as described in Patent No. 750,296, it will carry the arm O with it and will come into contact with the projection o' of the arm J and move the arm J downward, and the arm J will move the sliding bar H downward, which operates the lever F, which shifts the sleeve E. The arm O also has attached to it the rod P, extending upward from the arm O to the danger-signal blade mounted upon the top of the signal-post, and is attached to the said signal-blade, so that when the wheel D and the arm O revolve on the shaft N the arm O, descending, will draw the signal-blade from its normal position of danger to the downwardly-slanting position of clear, and when the magnet holding the signal in that position is demagnetized the signal-blade being returned into position by the weight of its counterbalance will force the rod P and the arm O into the normal position occupied by them before movement of the wheel D. In this backward or upward movement the set-screw or projection O^2 of the arm J will be struck by the arm O and forced upward to its normal position, thus in turn raising the sliding bar H, operating the lever F, and shifting the sleeve E into contact with the wheel C again.

R is a pneumatic-cushion tube to relieve the force of the jar when the connection is broken and the danger-signal blade is returned to danger position, and R′ is a like pneumatic tube to break the force of the jar when the caution-signal blade returns to caution position.

P′ is a rod similar to the rod P, extending to the caution-signal blade and operating it, being moved up or down by the arm O′, attached to the shaft N′, upon which the wheel D′ is mounted.

D′ is mounted upon the shaft N′ fixedly, the wheel having only a limited motion, and when the power is removed it is returned to position by the counterbalance of the caution-signal blade, returning that blade to its normal position of caution.

W is a dog operating upon the cogs upon the wheel D, the wheel D being loosely mounted upon the shaft N and revolving, as described in my former patent above mentioned, always in the one direction, and the dog W prevents any backward movement of that wheel.

The operation of my invention is as follows: When the train approaches the block guarded by the signal, if the block is clear the motor will operate the driving-shaft B and the teeth in the end of the sleeve E adjoining the wheel C meshing with the notches in the wheel C will turn the wheel C, which will turn the wheel D. The magnet being charged, the wheel B, revolving, will turn the shaft N, as described in my former patent. The shaft N will at the same time move the arms O and J. The arm O, carrying the rod P, will move the signal-blade to "clear," showing the block clear. At the same time the arm J will move the sliding bar H downward, which will move the horizontal arm on the lever F downward, and the lever F, turning upon the pivot G, will by its lower arm move the sleeve E horizontally from contact with the wheel C and toward contact with the wheel C′. The friction between the teeth of the sleeve E and the teeth of the wheel C is sufficient to cause sufficient resistance to the lever F to compress the spring S, so that by the time the teeth of the sleeve E disengage the teeth on the wheel C the spring S is compressed. The movement continuing, the teeth on the other end of the sleeve E reach the notches upon the wheel C′. The resiliency of the spring S forces the teeth in position to mesh with the teeth on the wheel C′. If the teeth on the sleeve E strike the end of the teeth on the wheel C′, the spring will hold them in contact until the sleeve E, revolving, brings the teeth of the sleeve E opposite the notches in the wheel C′, and the spring S forces them into the notches, making the contact. If the track in the second block is clear, the motor will continue to revolve the shaft B, and the sleeve E, continuing to revolve, will turn the wheel C′, which will lower the arm O′, which carries the rod P′, operating the caution-signal, and this signal will clear for the second block. When the train has passed the signal, so as to break the connection, the magnet upon the wheel C will release the compound trip-lever, as described in my former patent, and at the same time the motor will stop and the counterweights upon the back ends of the two signal-

blades will return them to position. The wheel D will not turn back; but the wheel D′, being mounted fixedly upon the shaft N′, when the power is removed and the signal-blade returned to position by gravity it will turn the wheel back to the starting-point.

Constructed in this way, but one motor is required and one magnet for the operation of both signals. Both signals may show "clear," or both may show "danger" at the same time. Also the danger-signal may show "clear," while the caution-signal shows "caution;" but it is impossible for the caution-signal to show "clear" unless the danger-signal also shows "clear" at the same time.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Mechanism for operating two railway-signals, blades consisting of a single motor, a driving-shaft operated by said motor, two driving-wheels mounted loosely upon said shaft, a sleeve mounted upon said shaft between said wheels, said sleeve turning positively with said shaft and having a limited movement upon said shaft parallel with its axis, means for gearing one end of said sleeve with one of said wheels and the other end of said sleeve with the other wheel, said sleeve not being of sufficient length to be geared to both wheels at the same time, means for shifting said sleeve from contact with one wheel to contact with the other wheel, in combination with two signal-blades and means for operating one signal-blade from one wheel and the other signal-blade from the other wheel, substantially as described.

2. In an operating mechanism for railway-signals, a motor, a driving-shaft operated by said motor, two driving-wheels mounted loosely upon said shaft, a sleeve mounted upon said shaft between said wheels, notches and teeth on each end of said sleeve, notches and teeth on each of said driving-wheels adjoining the ends of said sleeve and adapted to mesh with the notches and teeth on the adjacent ends of said sleeve, said sleeve attached to said driving-shaft so as to turn positively with said shaft but to be capable of a limited movement upon said shaft parallel with its axis, said shaft being less in length than the distance between said driving-wheels, two other wheels mounted upon shafts adapted to turn with said wheels one of which wheels being adapted to be turned by one of said driving-wheels and the other of said wheels being adapted to be turned by the other of said driving-wheels, arms mounted on each of said shafts, two rods one attached to one of said arms mounted on one shaft and the other rod to the arm mounted on the other shaft, two signal-blades mounted upon a post, one of said rods attached to one blade and the other rod attached to the other blade and adapted to operate said signal-blades as said arms are raised and lowered, together with means for shifting said sleeve from contact with one driving-wheel into contact with the other driving-wheel, substantially as described.

3. A mechanism for operating two railway-signals from one motor, consisting of a motor, a driving-shaft, two driving-wheels mounted loosely upon said shaft, a sleeve mounted upon said shaft between said wheels of less length than the distance between said wheels, notches and teeth on each end of said sleeve, notches and teeth on each of said driving-wheels adjacent to and adapted to mesh with the notches and teeth on the ends of said shaft, said sleeve attached to said shaft and revolving positively with said shaft and at the same time capable of a limited movement upon the shaft back and forth parallel with its axis, two other wheels mounted upon separate shafts each adapted to turn with its wheel, one of which wheels being adapted to be turned by one of said driving-wheels and the other of said wheels adapted to be turned by the other driving-wheel, a bracket fixedly attached to the frame of the machine, a lever pivoted upon said bracket, one arm of said lever in contact with said sleeve and adapted to shift said sleeve back and forth upon the driving-shaft from contact with one driving-wheel to contact with the other driving-wheel as the lever is rocked upon its pivot, the other arm of said lever being attached to a sliding bar mounted movably upon said bracket, an arm extending from the shaft of one of said wheels, connecting with and adapted to move said sliding bar up and down as the said shaft of said wheel turns partly around and returns to its original position thereby rocking said lever on its pivot and shifting said sleeve, in combination with two signal-blades and means for operating them, one from one of said wheels and the other from the other wheel, substantially as described.

Signed at Albany, New York, this 10th day of July, 1905.

WILLIAM V. MOAK.

Witnesses:
FRANCIS B. HARRINGTON,
F. HISGAND.