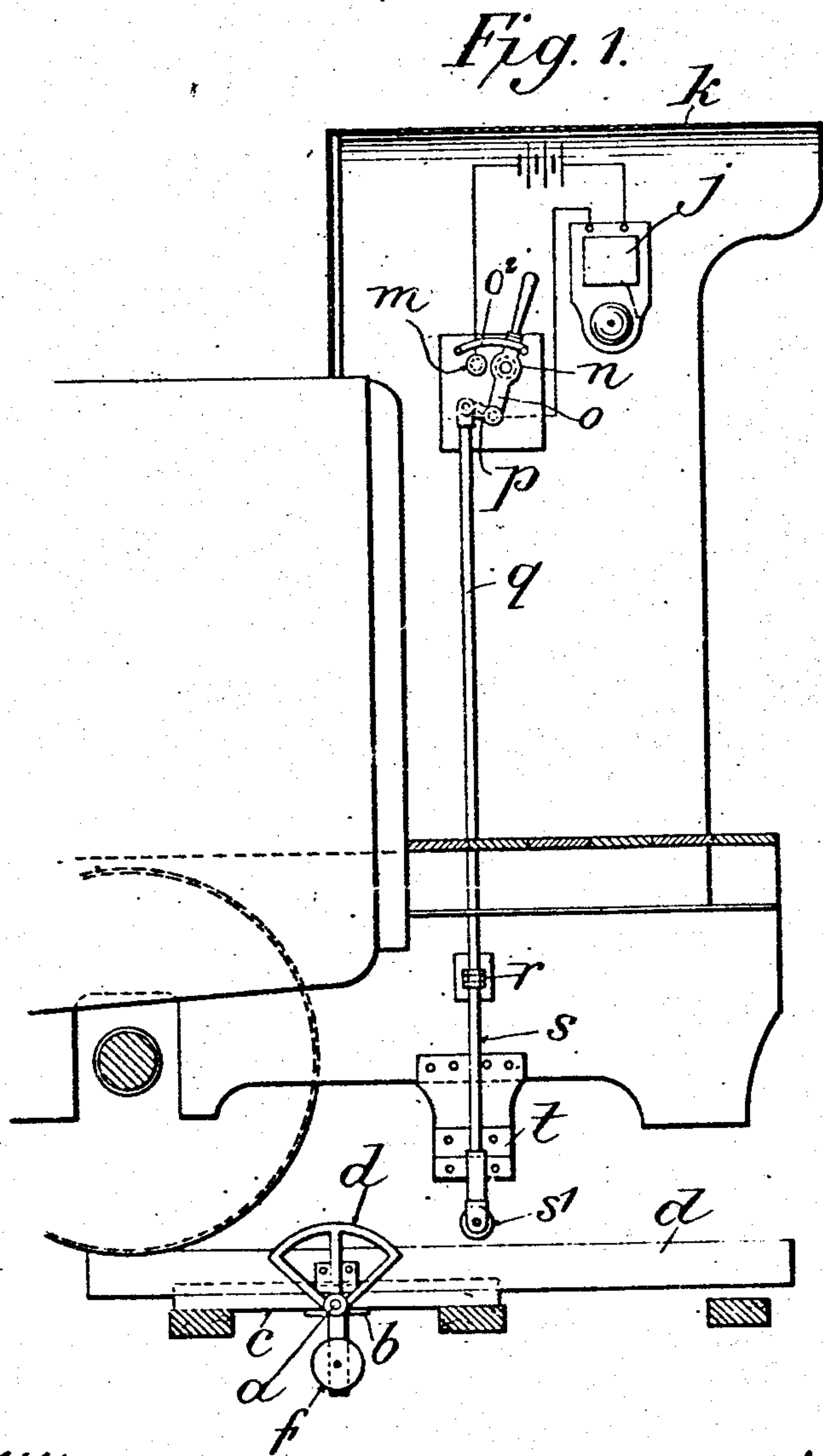


R. J. MARSHALL & W. H. PENMAN.  
RAILWAY SIGNALING MEANS.  
APPLICATION FILED APR. 18, 1908.

917,632.

Patented Apr. 6, 1909.  
6 SHEETS—SHEET 1.



Witnesses:  
E. R. Peck  
A. V. Emling

Inventors:  
R. J. Marshall  
W. H. Penman

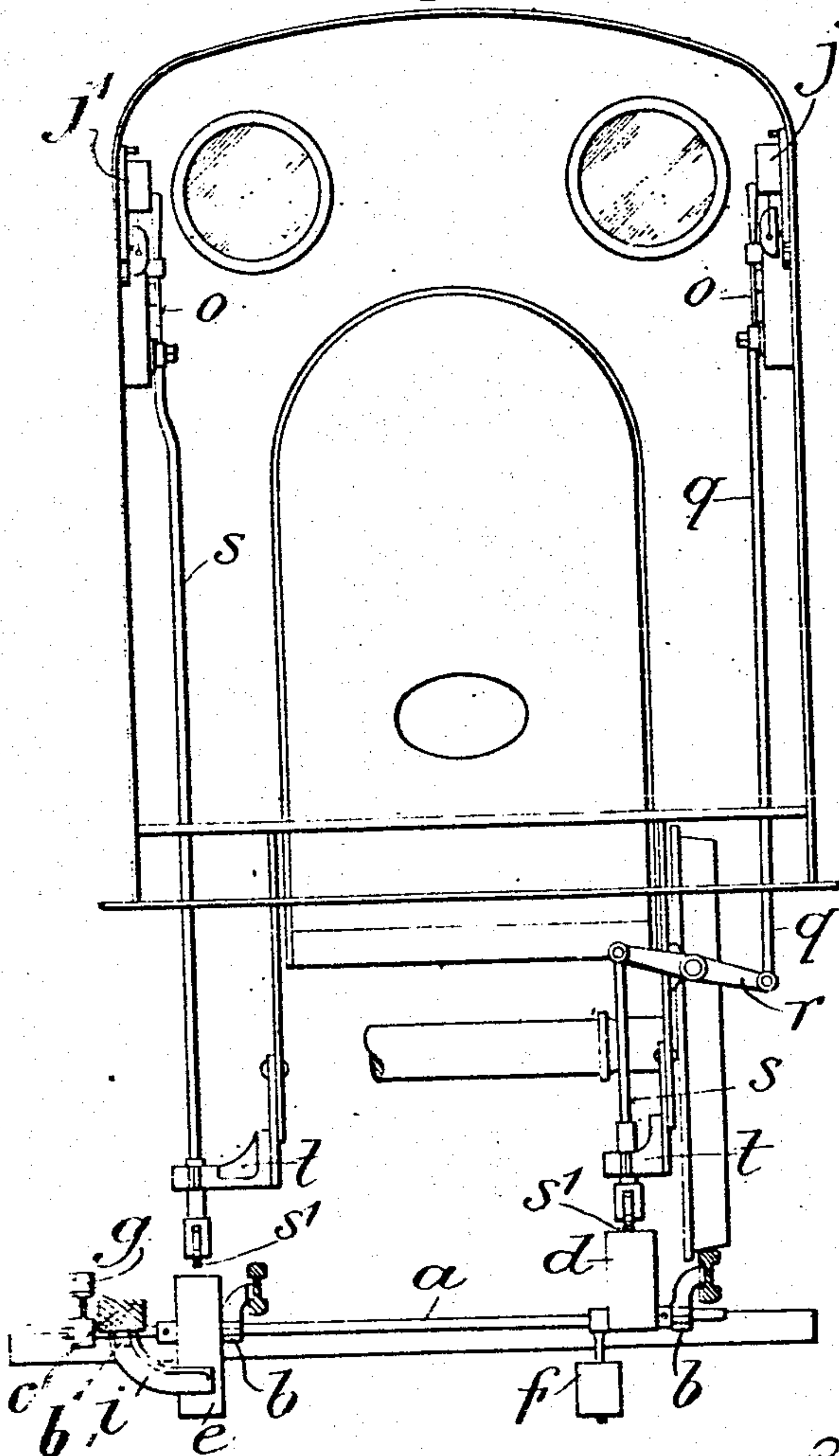
by *Hubert Peck*  
att'y

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Fig. 2



Witnesses:  
E. R. Peck  
A. V. E. Channing

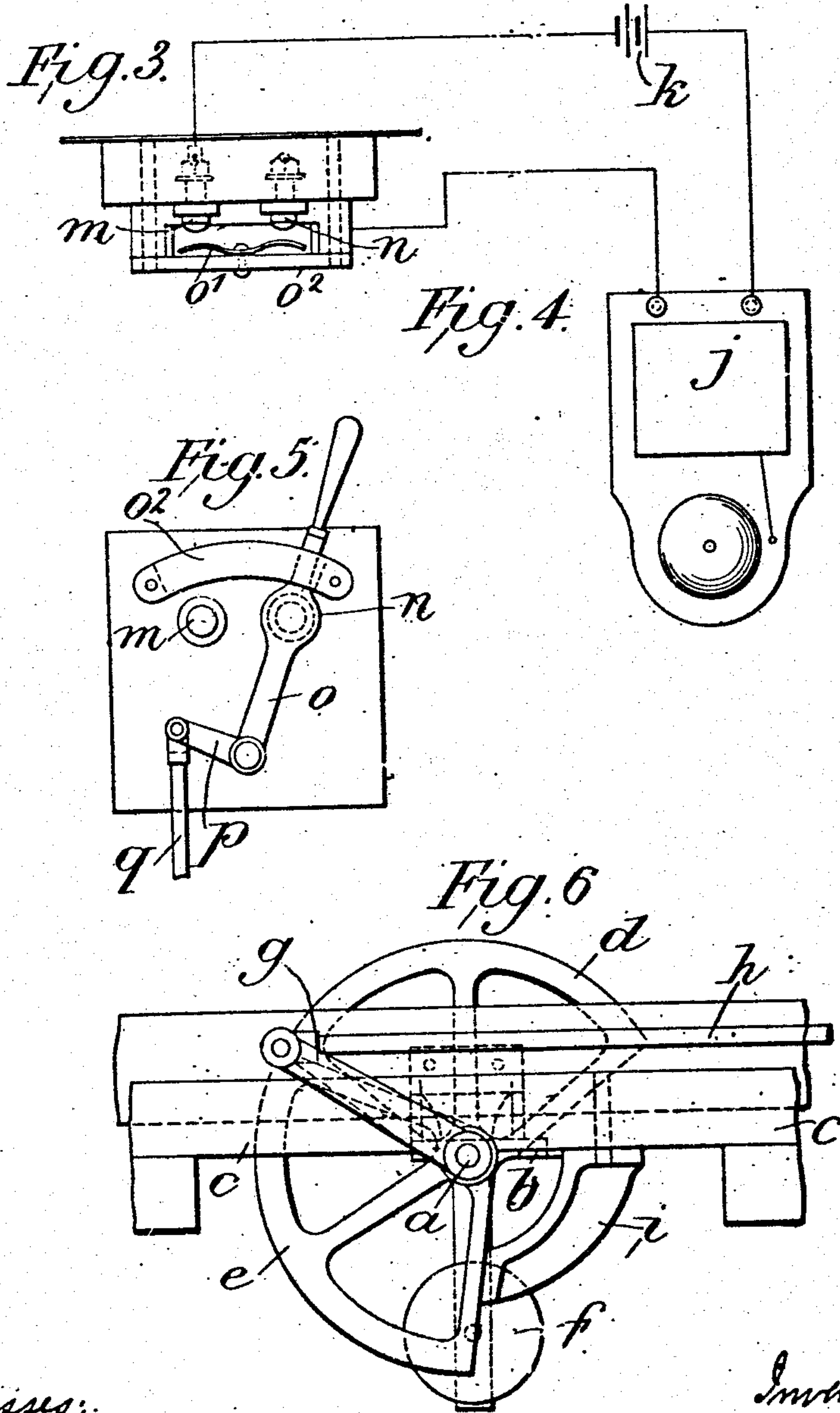
Inventors:  
R. J. Marshall  
W. H. Penman

By Robert E. Peck  
att'y

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Witnesses:  
E. R. Peck  
A. W. E. Lumburg

Inventors.  
R. J. Marshall  
W. H. Penman

by Robert Peck  
att'y

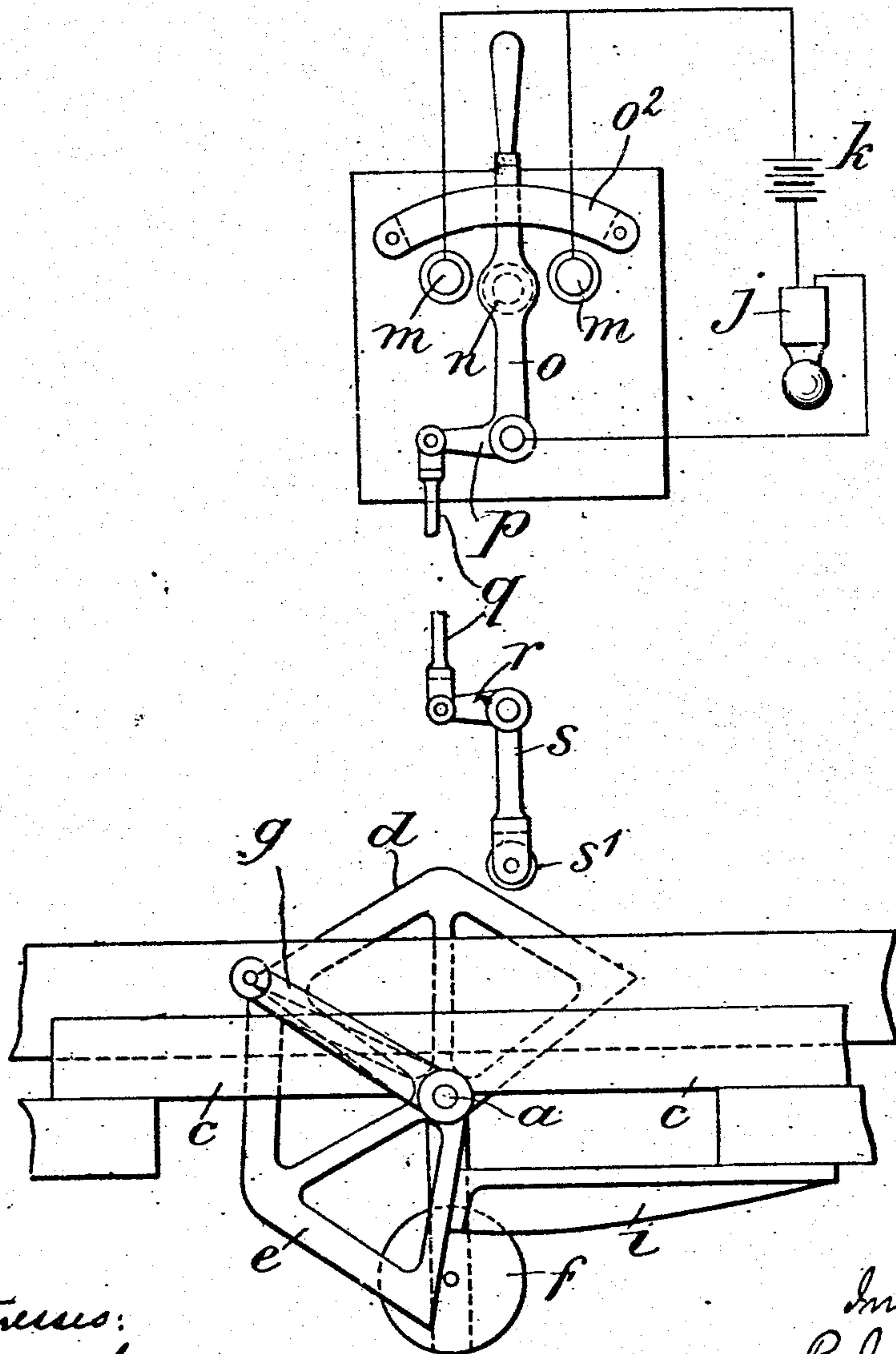


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Fig. 4.



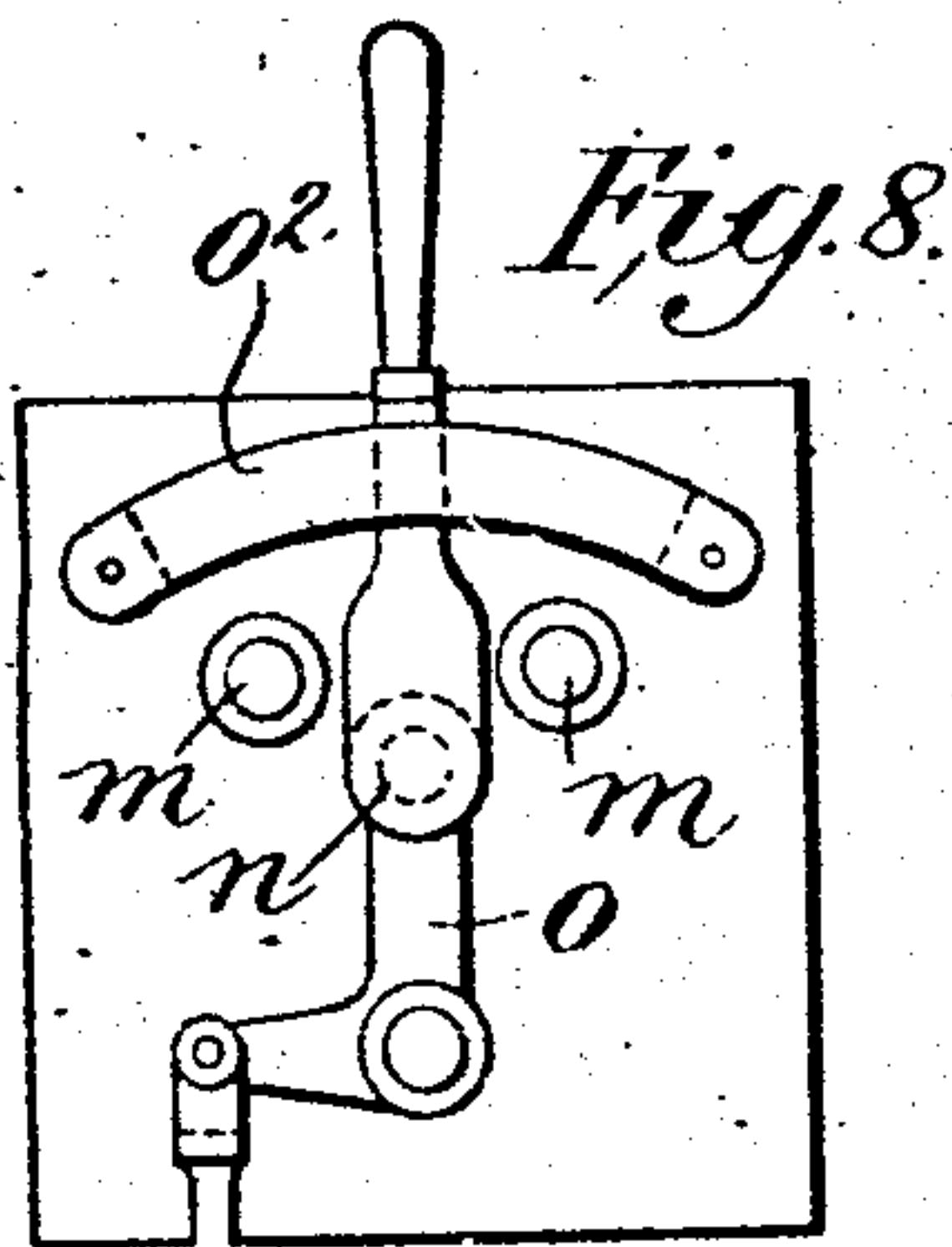
Witnesses:  
E. R. Pick  
A. W. E. Luning.

Inventors:  
R. J. Marshall  
W. H. Penman

by Hubert & Pick  
attys

APPLICATION FILED APR. 18, 1908.

6 SHEETS—SHEET 5.



A. H. E. L. L. L.

Dr. H. Perman

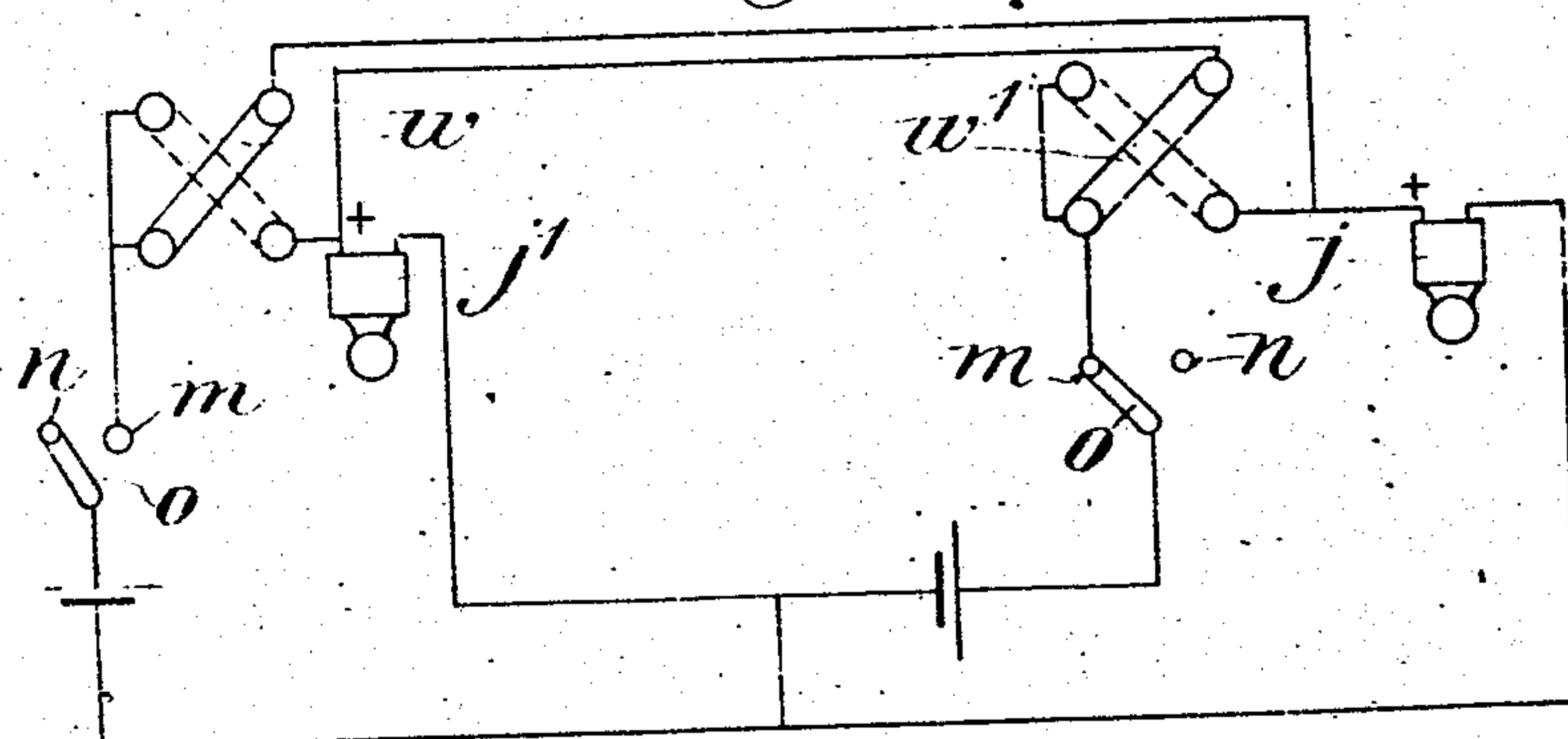
by Robert E. Risk  
atty

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6 SHEETS—SHEET 6.

*Fig. 9.*



Witnesses:  
E. R. Peck  
A. W. Edmunds

Inventors:  
R. J. Marshall  
W. H. Penman

by *E. R. Peck*  
att'y



# UNITED STATES PATENT OFFICE.

RALPH JOSEPH MARSHALL, OF NEWCASTLE-UPON-TYNE, AND WILLIAM HENRY PENMAN,  
OF GATESHEAD-UPON-TYNE, ENGLAND.

## RAILWAY SIGNALING MEANS.

No. 917,632.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed April 18, 1908. Serial No. 427,934.

*To all whom it may concern:*

Be it known that we, RALPH JOSEPH MARSHALL and WILLIAM HENRY PENMAN, subjects of the King of Great Britain and Ireland, residing, respectively, at Newcastle-upon-Tyne and Gateshead-upon-Tyne, in the county of Durham, England, have invented Improvements in Railway Signaling Means, of which the following is a specification.

10 This invention relates to means for indicating to the driver or guards of a train, or to both, the condition of the various line signals which are passed; being more especially intended for use in foggy weather.

15 As is now well known various schemes have been devised embodying track devices operated in conjunction with the signals and adapted, when set for the purpose, to actuate devices that are carried by the locomotive  
20 or other vehicle, thereby directly or indirectly operating a warning device or devices, but none of these arrangements have been universally adopted for various reasons.

Now the object of the present invention is to provide arrangements of the kind referred to embodying elements of a very simple character not liable to easy derangement, and which will operate to maintain the warning given until such time as it is positively removed by the individual to whom  
30 it is given and which will operate equally well irrespective of the direction of travel of the locomotive or train or of the end of the locomotive or vehicle which is running foremost.

35 According to the invention an electric bell is utilized to indicate danger and a separate electric bell to indicate line clear; each bell is operated by a separate track device, the electric circuit for each of such bells being closed by a separate switch the handle of which when moved to circuit closing position remains there until manually moved to open the circuit. In order, however, that  
45 the invention may be more readily understood, it will now be described with reference to the accompanying drawings, whereof—

Figure 1 is a sectional side elevation, for the most part diagrammatic, of a locomotive  
50 showing the improved arrangement applied thereto. Fig. 2 is a rear elevation of the same. Figs. 3, 4, 5 and 6 are views to a larger scale of details embodied in Figs. 1 and 2. Figs. 7, 8 and 9 are diagrammatic  
55 views illustrative of modifications.

As shown in Figs. 1 to 6, a track device is employed comprising a rock shaft *a* disposed transversely of the track and mounted in bearings *b*, two of which are shown in Fig. 2 as supported by the rails while a third is carried from the sleepers by a bearing block *c*.  
60 Upon this rock shaft *a* are secured two segmental track devices *d*, *e*, one disposed between the rails and the other outside the rails. These track devices *d*, *e* are angularly displaced upon the shaft *a* so that while one is in the operative position the other is in the inoperative position. The shaft *a* is shown as provided with a balance weight *f* which is necessary to return the parts to the normal  
70 position illustrated when displaced by flexible connections and may be advantageously adopted even when the displacement is effected by rigid connections such as the lever *g* and rod *h* shown. *i* is a bracket attached  
75 to the bearing block *c* to act as a stop against which the track device *e* abuts. Within the cab, at the right hand side of the locomotive, is arranged an electric bell *j*, battery *k* and switch, comprising a live stud  
80 *m*, a dead stud *n* and a pivoted switch arm *o*. This bell is intended to give the danger signal and a similar bell *j'*, battery and switch is arranged in the cab, at the left hand side of the locomotive to give the line clear signal.  
85 The operation of the switch may be variously effected. For example the switch arm *o* pertaining to the danger signal bell *j* is formed with a crank arm *p* connected by a rod *q* and lever *r* to a rod *s* movable vertically within a guide carried by a bracket *t*, this arrangement being possibly desirable in some cases where other fittings may prevent the said bracket being arranged to the outside of the engine framing such as is shown at  
90 the left hand side of Fig. 2, where the rod *s* is extended for direct connection to the crank arm *p* of the switch of the line clear signal. To facilitate the raising of the rod *s* by its corresponding track device a roller *s'* is  
100 fitted to the extremity of the said rod.

Normally the switch arm *o* of each bell is in engagement with the dead stud *n* as seen in Fig. 1: the parts being retained in such condition by the action of a spring *o'* Fig. 3  
105 secured within a guide *o''* for the switch arm *o* and acting upon such arm. As the train proceeds, either a line clear or danger track device will be encountered by a corresponding rod *s* to move the switch arm *o* on to the



live stud *m*, Fig. 2 representing the danger signal as being thus influenced. The spring *o'* then again acts, to hold the parts in the circuit-closed position until the driver moves the arm *o* back on to the dead stud *n* to remove the warning given.

With this described arrangement the mechanism will operate without alteration when a train or locomotive is traveling in reverse directions on the same track. If, however, it be desired to run the engine tender foremost it will be necessary to modify the arrangement. For example, this may be effected by duplicating the track devices *d* and *e* unless it is permissible to arrange a central device between the rails for one signal bell in which case it will only be necessary to duplicate the device for the other signal bell so that both devices are either between or outside of the rails in a manner which will be readily understood without illustration. Or the equivalent effect may be secured, when the track devices occupy the same relative positions with respect to the rails, by providing two switches such as are shown at *w* in the diagram Fig. 9 whereby the danger signal bell *j* can be interchanged with the line clear signal bell *j'*. With the switch arms *w'* in the positions indicated by full lines, the bells are interchanged but by moving the arms *w'* to the position indicated by dotted lines each bell will be operated by its corresponding switch arm *o*. In some instances, both bells *j j'* may be arranged to be connected to act as danger signal bells. As will be obvious, such parts as require insulation may be insulated in any appropriate fashion.

A modification, suitable also for traveling in opposite directions, is shown in Fig. 7 where the switch arm *o* moves in opposite directions in accordance with reversal in direction of travel of the locomotive. In this case therefore two live studs *m* are employed with a single intermediate dead stud *n* upon which a switch arm *o* normally bears. Both of the studs *m* are connected to one pole of the battery *k*. If desired in lieu of track devices such as *d* and *e* simple tripping arms *d'*, *e'* as shown in Fig. 8 may be adopted, the said arms being furnished with strengthening webs *d''*, *e''*. The track devices may be actuated independently of the line signals or conjointly therewith, in which case the connections leading from the semaphore and track devices will be united to the means operated from the signal cabin. The same or a similar arrangement to any of the foregoing is or may be fitted to the guard's van or each guard's van, in which case the warning automatically afforded is removed by the guard or each guard.

What we claim is:—

1. Railway signaling apparatus, comprising two separate electric indicators on the railway vehicle, separate circuit closing

switches for said indicators, switch operating means extending toward the track and connected to the switches, separate track devices arranged to be operated simultaneously to alternatively actuate said switch operating means, means for simultaneously maintaining the switch which is closed in closed position, and preventing return of the switch operating means, and hand actuated means adapted to positively return the switch and switch operating means to normal switch open position.

2. Railway signaling apparatus, comprising two separate electric indicators on the railway vehicle, separate circuit closing switches for said indicators, switch operating means extending toward the track, separate track devices arranged to be operated simultaneously so that while one is in operative position the other is in inoperative position to alternatively actuate the switch operating means, and means for interchanging said indicators.

3. Railway signaling apparatus, comprising two separate electric indicators on the railway vehicle, separate circuit closing switches for said indicators, switch operating means extending toward the track, separate track devices arranged to be operated simultaneously to alternatively actuate said switch operating means, means for interchanging such indicators and means for maintaining the switch which is closed in closed position until opened by hand.

4. Railway signaling apparatus comprising two separate electric indicators on the railway vehicle, separate sources of electricity therefor, separate circuits connecting said indicators with the sources of electricity, separate switches in said circuit, switch operating means extending toward the track, separate track devices arranged to be operated simultaneously so that while one is in operative position the other is in inoperative position to alternatively actuate the switch operating means, and means for interchanging said indicators.

5. Railway signaling apparatus, comprising two separate electric indicators on the vehicle, a separate battery and switch for each such indicator, switch operating means extending toward the track, connected to and movable with the said switch, means for holding the switch operating means and switch in different positions after being moved, a shaft mounted on the track transversely thereof, contact devices angularly displaced on said shaft, means for rocking the shaft to move one of the contact devices into operative position with respect to one of the switch operating means and simultaneously move the other contact device into inoperative position with respect to the other switch operating means, and manually actuated means for positively returning the



switch and switch operating means to normal switch open position.

6. Railway signaling apparatus, comprising two separate electric indicators on the 5 railway vehicle, separate circuit closing switches for said indicators, switch operating means extending toward the track, separate track devices arranged to be operated simultaneously to alternatively actuate said 10 switch operating means, means for interchanging such indicators and means for maintaining the switch which is closed in closed position until opened by hand.

7. Railway signaling apparatus, comprising two separate electric indicators on the 15 vehicle, a separate electric battery and circuit for each indicator, a switch arm normally co-acting with a dead stud centrally disposed between two live studs, cranked 20 connections attached to the switch arm and

extending toward the track, a shaft mounted on the track transversely thereof, contact devices angularly displaced on said shaft and means for rocking the shaft to move one of the contact devices into operative position 25 and the other into inoperative position so that the cranked connections will be actuated by the device which is in operative position relatively thereto to move the switch arm from the dead stud to one of the 30 live studs depending upon the direction of travel of the vehicle.

Signed at Newcastle-upon-Tyne, England, this seventh day of April 1908.

RALPH JOSEPH MARSHALL.  
WILLIAM HENRY PENMAN.

Witnesses:

T. C. GOSSEKE,  
ISAAC BODDY.