

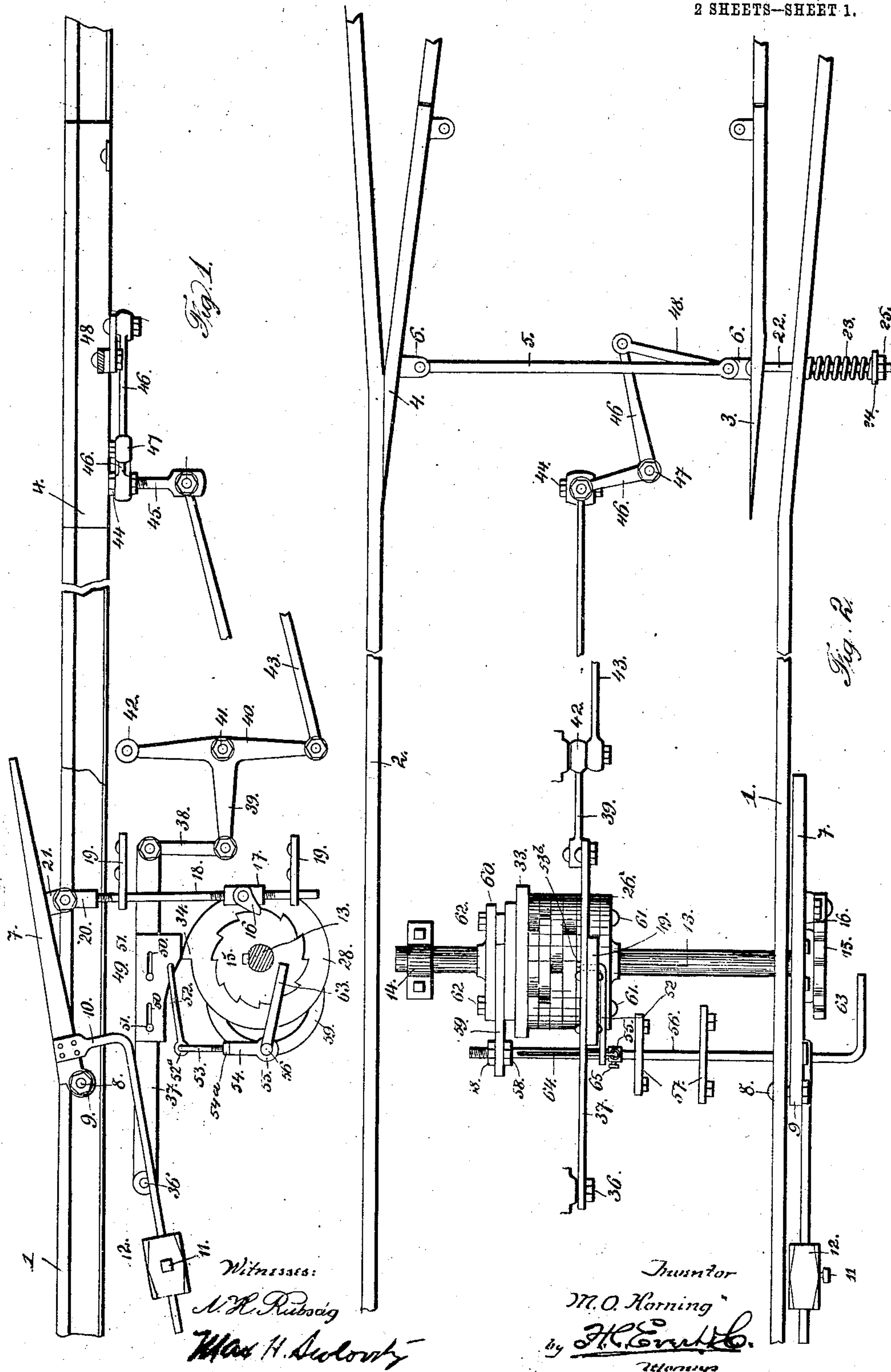
No. 842,667.

PATENTED JAN. 29, 1907.

M. O. HORNING.  
AUTOMATIC MINE CAR SWITCH.

APPLICATION FILED NOV. 1, 1906.

2 SHEETS—SHEET 1.



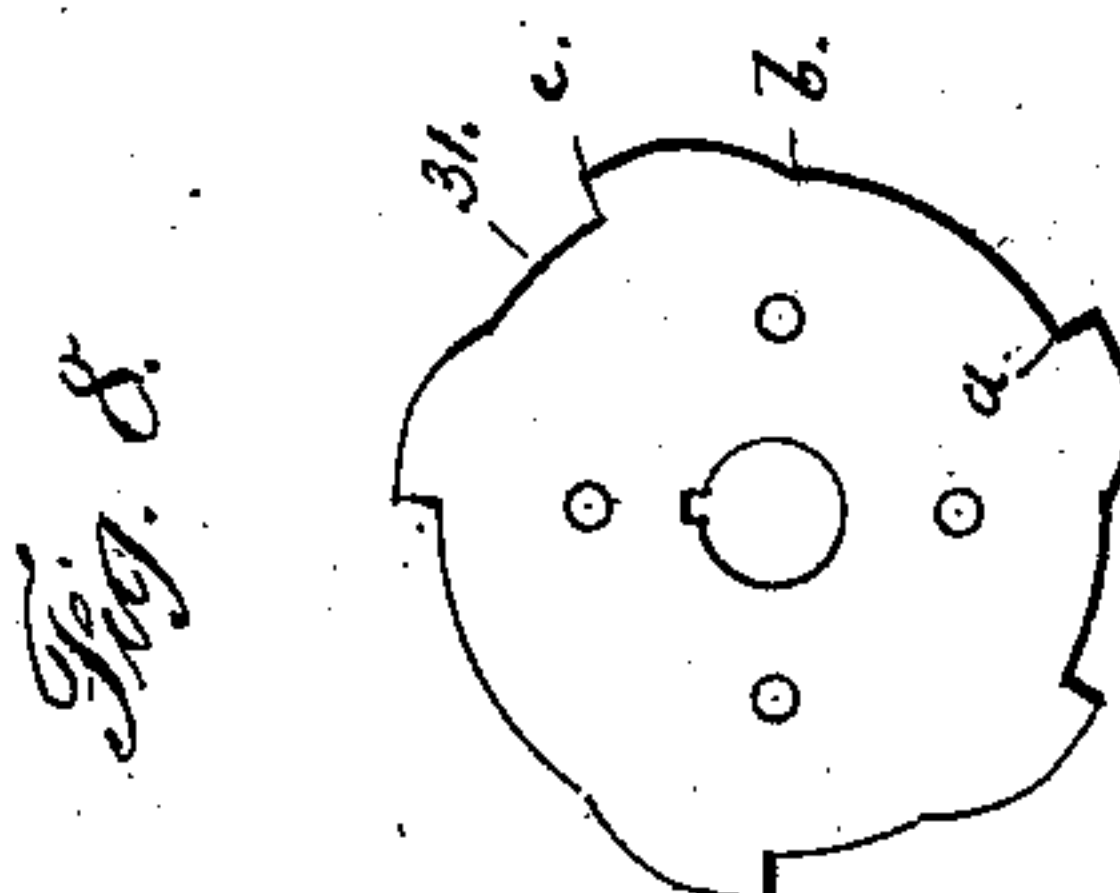
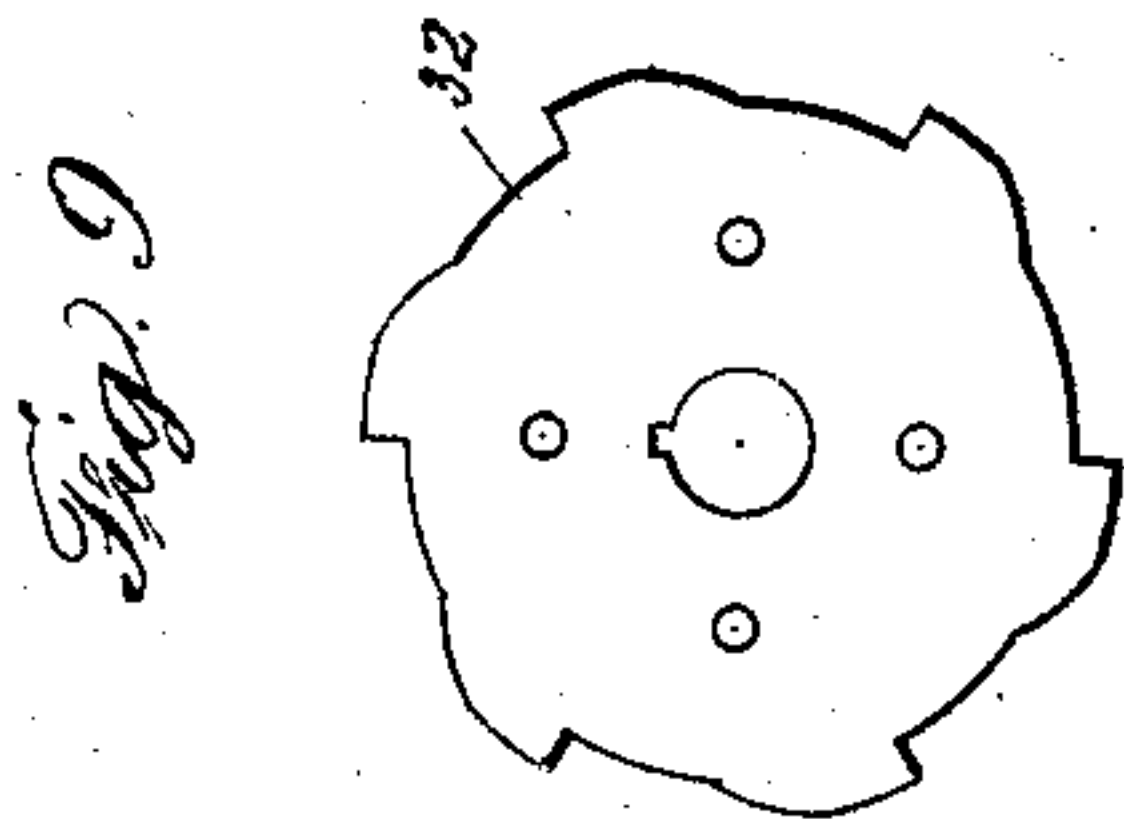
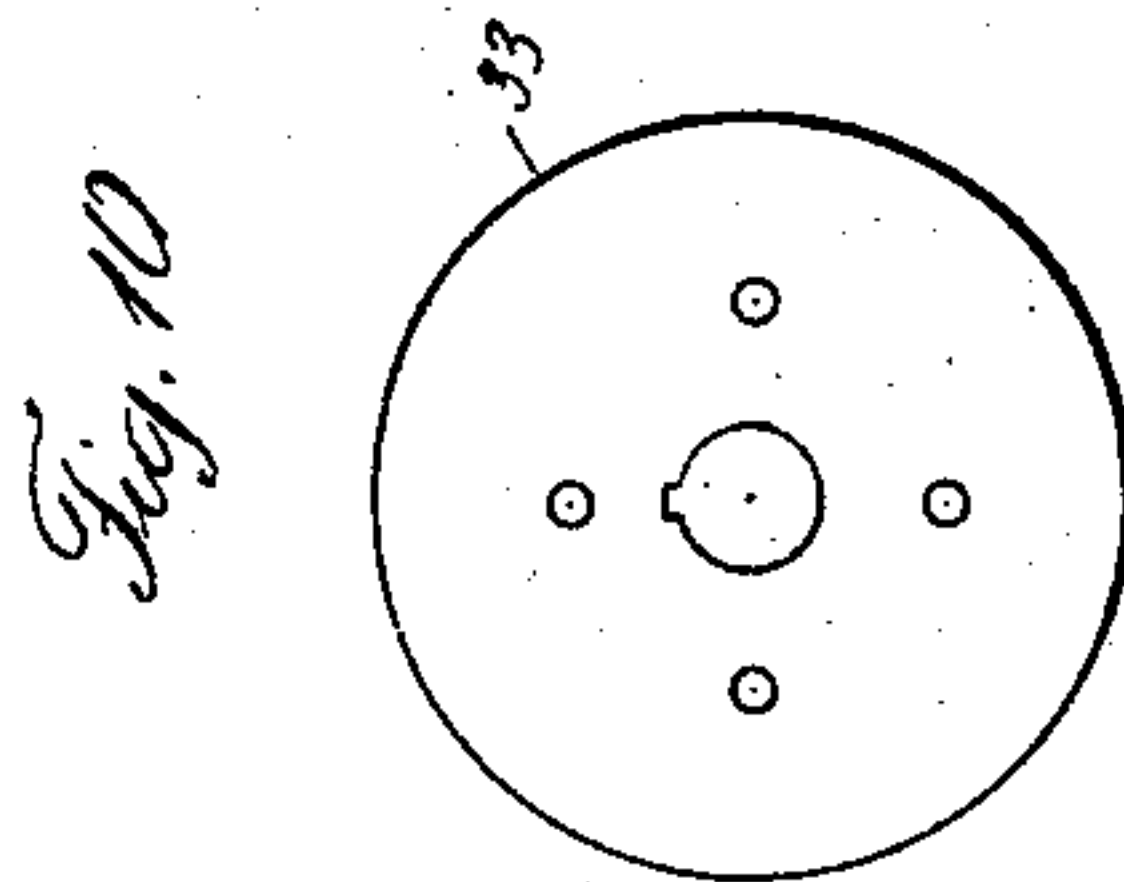
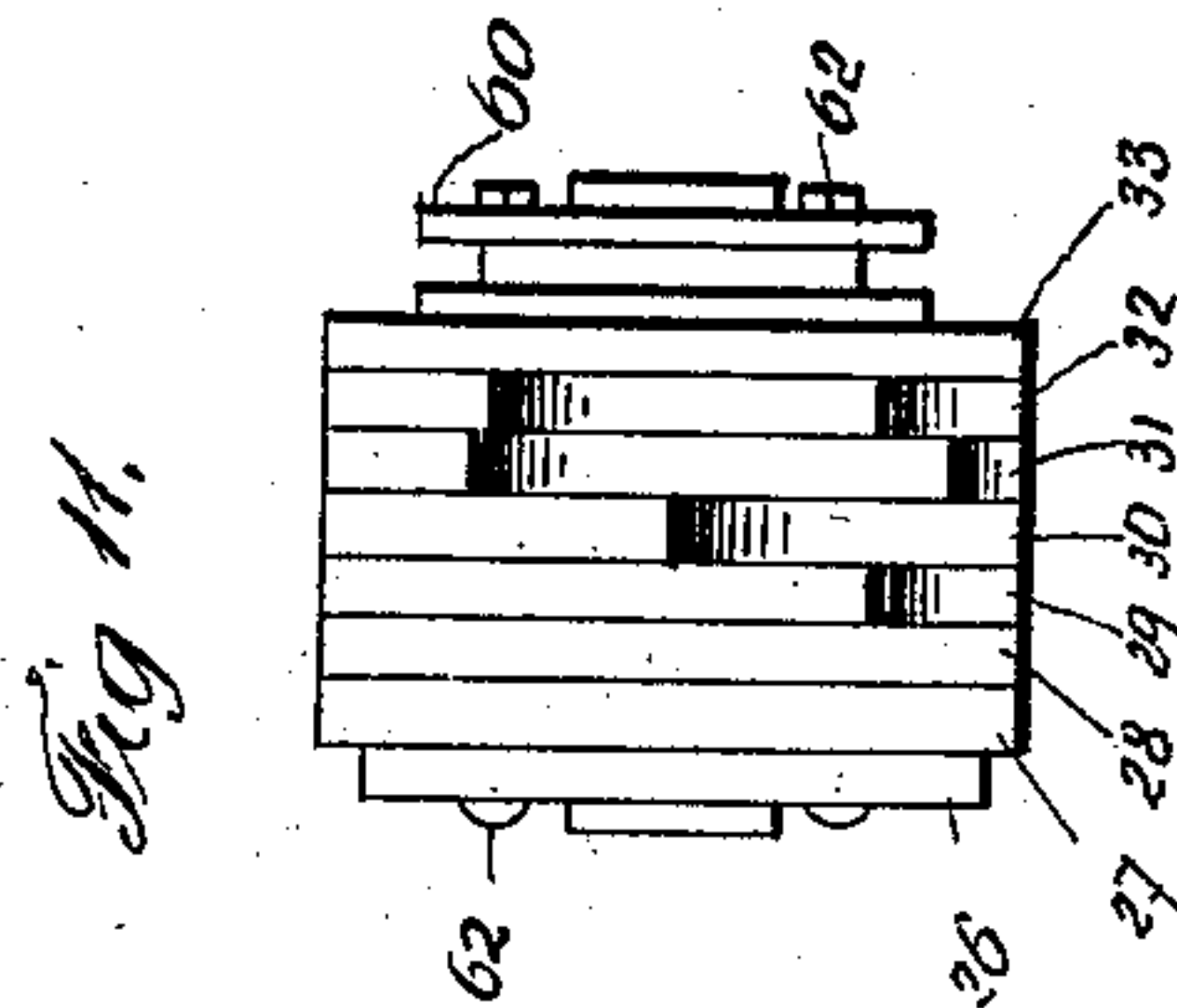
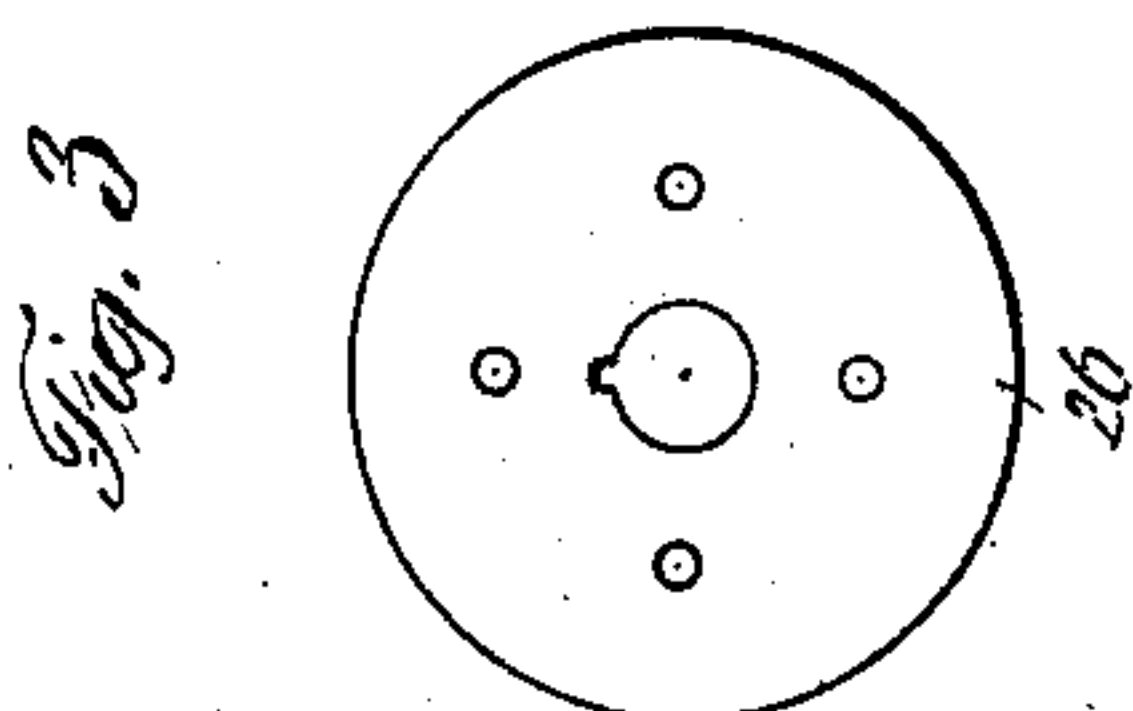
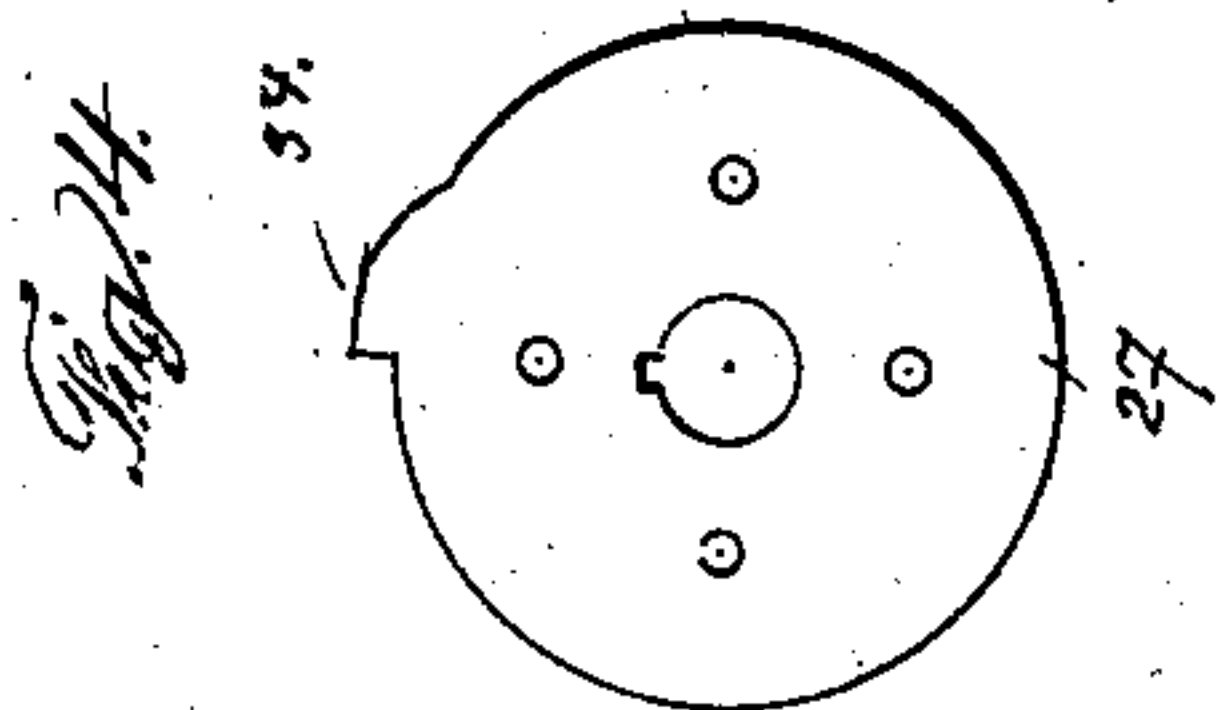
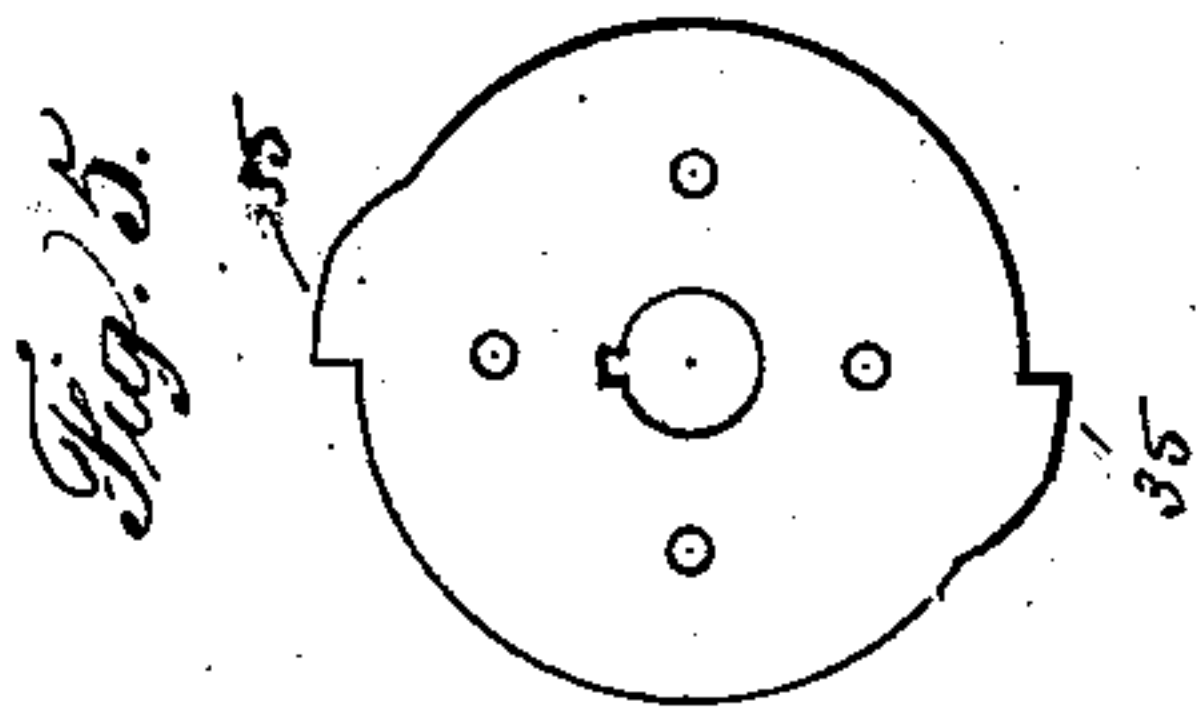
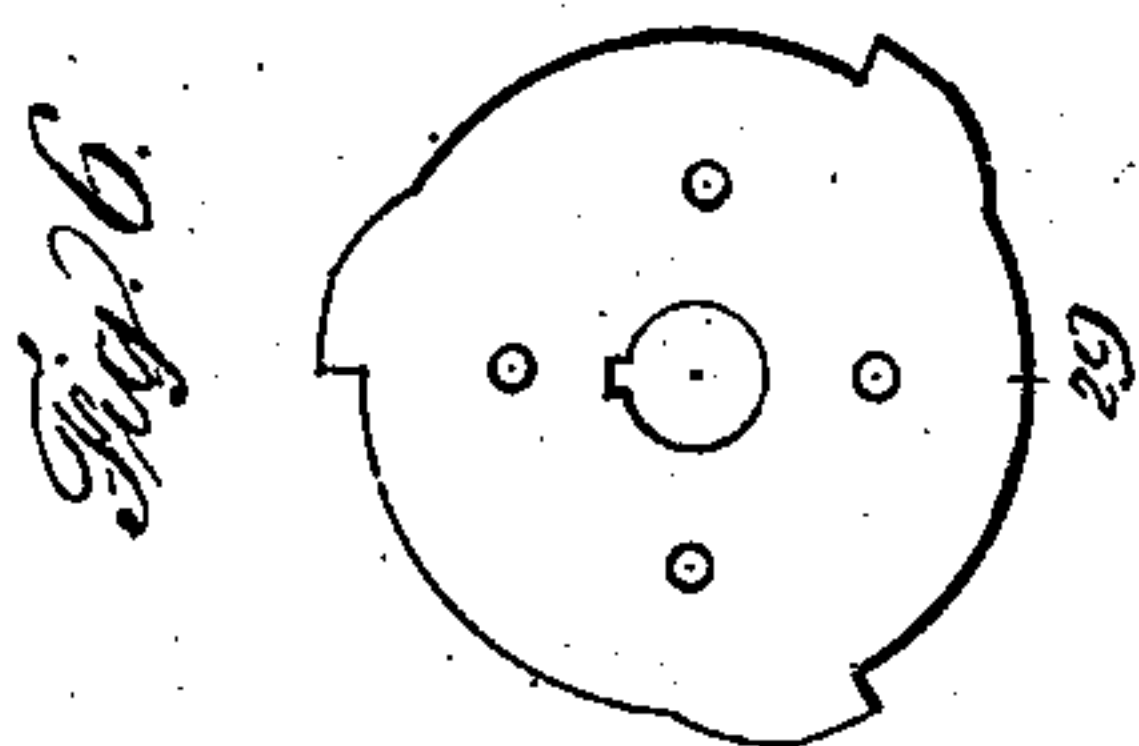
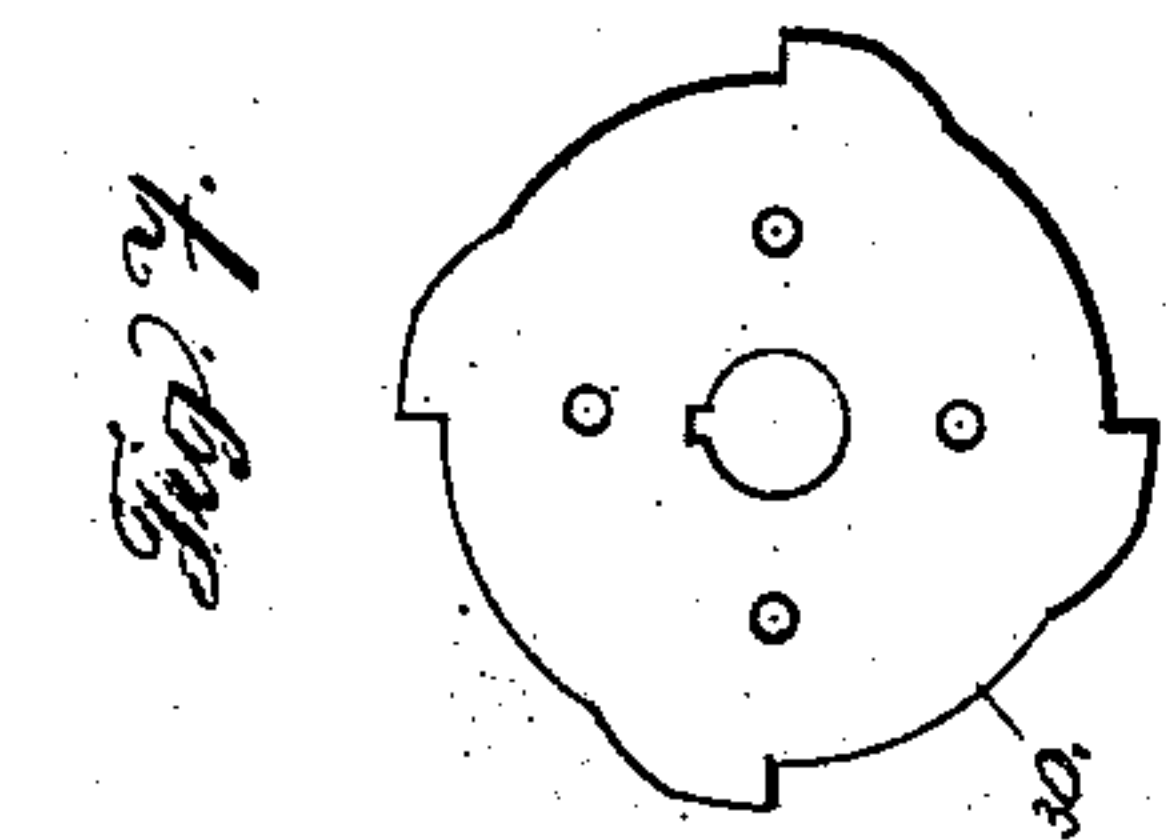
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

MAURICE OLIVER HORNING, OF BROUGHTON, PENNSYLVANIA.

## AUTOMATIC MINE-CAR SWITCH.

No 842,667.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed November 1, 1906. Serial No. 341,611.

*To all whom it may concern:*

Be it known that I, MAURICE OLIVER HORNING, a citizen of the United States of America, residing at Broughton, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Mine-Car Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to switch-throwing mechanism especially adapted for use in mines for automatically switching mine-cars.

The primary object of this invention is to provide automatic switch-throwing mechanism to direct mine-cars to one or another track, and thus obviate the necessity of employing a switch-tender.

The construction of the improvement will be fully described hereinafter in connection with the accompanying drawings, which form a part of this specification, and its novel features will be defined in the appended claims.

In the drawings, Figure 1 is a side elevation of a car-track with my improved switch-throwing mechanism applied thereto. Fig. 2 is a top plan of the same. Figs. 3 to 10 represent a side elevation of one of the series of disks employed; and Fig. 11 is an elevation of the disks in their assembled relation, together with the grooved disk for sliding the outer disks upon their shaft.

The reference-numerals 1 and 2 designate the main rails of a mine-car track, and 3 and 4 the switch-points thereof, the latter being connected by a cross-rod 5, pivotally connected to lugs 6, projecting from the inner sides of the switch-points.

A lever, is pivotally secured at one end upon a bolt 8 adjacent to the rail 1, said bolt extending through the rail and lever and being held by a nut 9. One end of an arm 10 is riveted to the lever 7 adjacent to its pivotal point, and upon the free end of this arm is adjustably secured by a set-screw 11 a counterweight 12.

A horizontal shaft 13 is supported below the rails 1 and 2 in suitable bearings 14, and one end of said shaft projects beyond the rail 1 and has mounted thereon a ratchet-wheel 15, adapted to be engaged by a spring-pawl 16, pivotally secured upon a sleeve 17, the latter being internally threaded to fit adjustably upon a vertically-disposed threaded rod 18 in openings formed in suitably-supported

guides 19. The rod 18 is threaded to receive the sleeve and is also threaded at its upper end to fit within an internally-threaded socket 20, pivotally secured to a bracket 21, depending from the under side of the lever 7.

The switch-point 3 is formed with an opening through which extends a headed rod 22, extending through the adjacent rail 1 and surrounded by a coil-spring 23, one end of which bears against the rail and the opposite end against a washer 24, held in place by a nut 25.

Upon the shaft 13 are supported a series of concentric disks adapted to revolve with the shaft, but movable longitudinally thereon, eight of said disks being here shown designated by the numerals 26 to 33, inclusive. The first disk 26 of the series has a circular periphery, the next one 27 has a single peripheral tooth or projection 34, the next one 28 two projecting teeth 35, the next one three teeth, the next four teeth, the next five, the next six, and the last disk 33 has its entire periphery projected to a diameter equal to the greatest diameter of the other toothed disks.

The circumference of the disk is divided into twelve equal parts to accord with the ratchet-wheel 15. The curved surfaces from one projection to another are not regular, as the curve follows the inner circumference from *a* to *b* and is then abruptly deflected to the point *c*. The corners at *b* and *c* are rounded, as shown.

Pivotally supported above the disks upon a pivotal support 36 is a bar 37, extending longitudinally of the track and pivotally connected at its forward end by a link 38 to the central arm 39 of a double bell-crank lever 40, fulcrumed upon a bolt 41 and provided at each of its ends with an eye or bearing 42 for the attachment thereto of a rod 43, the opposite end of which is pivotally connected by a bolt 44 to the depending arm 45 of a horizontally-disposed bell-crank lever 46, fulcrumed at the point 47 and connected by a link 48 to the bracket 6 of the switch-point 3.

Upon the bar 37 is slidably supported a tripping device comprising a plate 49, formed with elongated slots 50, through which extend pins 51, projecting from one side of the bar. This tripping-plate is loosely connected by a link 52 to a bent rod 53, threaded into a socket 54, projecting from a sleeve 55, secured upon a shaft 56, supported in suitable bearings 57 below the rails of the track.



Upon the inner end of the shaft 56 is secured, by means of jam-nuts 58, a forked arm 59, embracing a peripherally-grooved disk 60, slidably secured upon the shaft 13 and bolted to the disks 26 to 33 by bolts 61, secured by nuts 62.

The outer end of the shaft 56 is provided with a handle 63, by means of which said shaft may be oscillated to move the tripping-plate upon the bar 37 and also moved longitudinally to bring any one of the disks 26-33 into register with the tripping-plate.

The link 52 is formed at one end with an eye 52<sup>a</sup>, through which the horizontal arm 64 of the rod 53 extends. The opposite bent end of the link 52 extends through an opening in the plate 49 and is threaded to receive a nut 53<sup>b</sup>.

The depending portion of the rod 53 is threaded to fit within the socket 54 and is held rigid by a jam-nut 54<sup>a</sup>. The socket 54 is secured by a set-screw 65. When the shaft 56 is moved longitudinally, the arm 64 slides within the eye 52<sup>a</sup>.

The lever 7 is long enough to avoid being tripped twice by each car.

The operation of the mechanism constructed as thus described is as follows: When the tripping-plate 49 is in register with the disk 27, having a single tooth or projection, said tripping-plate will be raised to tilt the double bell-crank lever, and thus throw the switch when the lever 7 is depressed by the car-wheels. Thus one car out of a series of twelve (for which the mechanism here shown is adapted) will be switched from the main line. If the tripping-plate is in position above the disk having two teeth, the switch will be thrown twice at each revolution of the shaft 13, and so on. It will be obvious that if the tripping-plate is in alignment with the first disk, or the one without any projections, the depression of the lever 7 and the turning of the shaft 13 through the pawl-and-ratchet device will not elevate the bar 37, and consequently not throw the switch, and if the tripping-plate is above the last disk 33 all of the cars of the series will be switched.

It will of course be understood that any required number of disks may be employed, according to the number of cars comprising a full cycle or series. It will also be clear from the construction shown and described that the tripping-plate 49 may be moved backward out of operative position by reason of its connection with the shaft 56 when the latter is turned.

The plate 49 is moved back, for the reason that when the shaft 56 is moved longitudinally the plate would be liable to catch on one or more of the teeth on the disks. After the shaft and disks are adjusted to the desired position the plate 49 is returned to its working position.

The entire series of disks may be readily moved to adjust the desired one below the tripping-plate by moving the shaft 56 longitudinally.

The spring 23 holds the switch closed at all times except when the switch is thrown by the tripping-plate. Each car throws its own switch one way or the other, and the spring 23 assists the tripping-plate to drop to the inner diameter of the disk, as well as to hold the switch closed.

By detaching the rod 43 from the lower end of the bell-crank 40 and attaching it to the upper eye 42 thereof the switching moving will be reversed. For instance, when formerly two cars out of twelve were switched by this change ten out of twelve are switched, thus doubling the scope of the utility of the mechanism.

While the construction here shown and described is operative and constitutes a practical embodiment of the improvement, I would have it understood that the invention is not restricted to all of the details shown and described, but includes all such changes and modifications in construction as may be embraced within the scope of the claims.

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

1. In a switch-throwing device the combination with a lever fulcrumed adjacent to one of the rails of a track in position to be depressed by a car-wheel, of a shaft supported transversely of the track, a plurality of disks on said shaft, a pawl operated by said lever, a ratchet-wheel on said shaft adapted to be engaged by said pawl, a tripping device adapted to be engaged by peripheral projections on said disks, and connections between said tripping device and the switch-point of the track.

2. In a switch-throwing device, the combination with a lever fulcrumed adjacent to one rail of a track in position to be depressed by a car-wheel, of a shaft supported below the rails and transversely thereof, a plurality of disks mounted upon said shaft, a ratchet-wheel also mounted on said shaft, a vertical rod supported in guides below said lever and pivotally secured thereto, a pawl carried by said rod to engage the teeth of said ratchet-wheel, a tripping device adapted to engage said disks, a double bell-crank lever connected to said tripping device, and connections between said bell-crank lever and the switch-point.

3. In a switch-throwing device, the combination with a lever fulcrumed adjacent to one rail of a track, in position to be struck by a car-wheel, of a shaft supported below the rails and transversely thereof, a plurality of disks formed with projections, longitudinally-movable bar supported above said disks, a ratchet-wheel on said shaft, a pawl operated by said lever to engage the ratchet and partially re-



volve said shaft, means for shifting said bar, a tripping device on said bar, and connections between said bar and the switch-point.

4. In a switch-throwing device, the combination with a counterbalanced lever fulcrumed adjacent to a track in position to be depressed by a car-wheel, of a vertically-disposed rod supported in guides below the track, and pivotally secured at its upper end to said lever, a pawl pivoted upon said rod, a transverse shaft supported below the track, a ratchet-wheel on said shaft to be engaged by said pawl, a series of disks mounted on said shaft having varying peripheral projections, a longitudinally - movable bar extending above said disks, means for shifting said bar, a tripping device on said bar, and connections between said bar and switch-point.

5. In a switch-throwing device the combination with a counterbalanced lever, fulcrumed adjacent to a track in position to be depressed by a car-wheel, of a vertically-dis-

posed rod supported in guides below the track, and pivotally secured at its upper end to said lever, a pawl pivoted upon said rod, a transverse shaft supported below the track, a ratchet-wheel on said shaft to be engaged by said pawl, a series of disks mounted on said shaft having varying peripheral projections, a longitudinally - movable bar extending above said disks, means for shifting said bar, a tripping device on said bar, and connections between said bar and switch-point comprising a vertically-disposed double bell-crank lever, a link connecting said double lever to said bar, and a horizontally-supported bell-crank lever connected by links with said double lever, and the switch-point.

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

MAURICE OLIVER HORNING.

Witnesses:

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