

S. T. HARVEL.
RAILWAY SIGNAL.
APPLICATION FILED FEB. 4, 1908.

929,214.

Patented July 27, 1909.
2 SHEETS—SHEET 1.

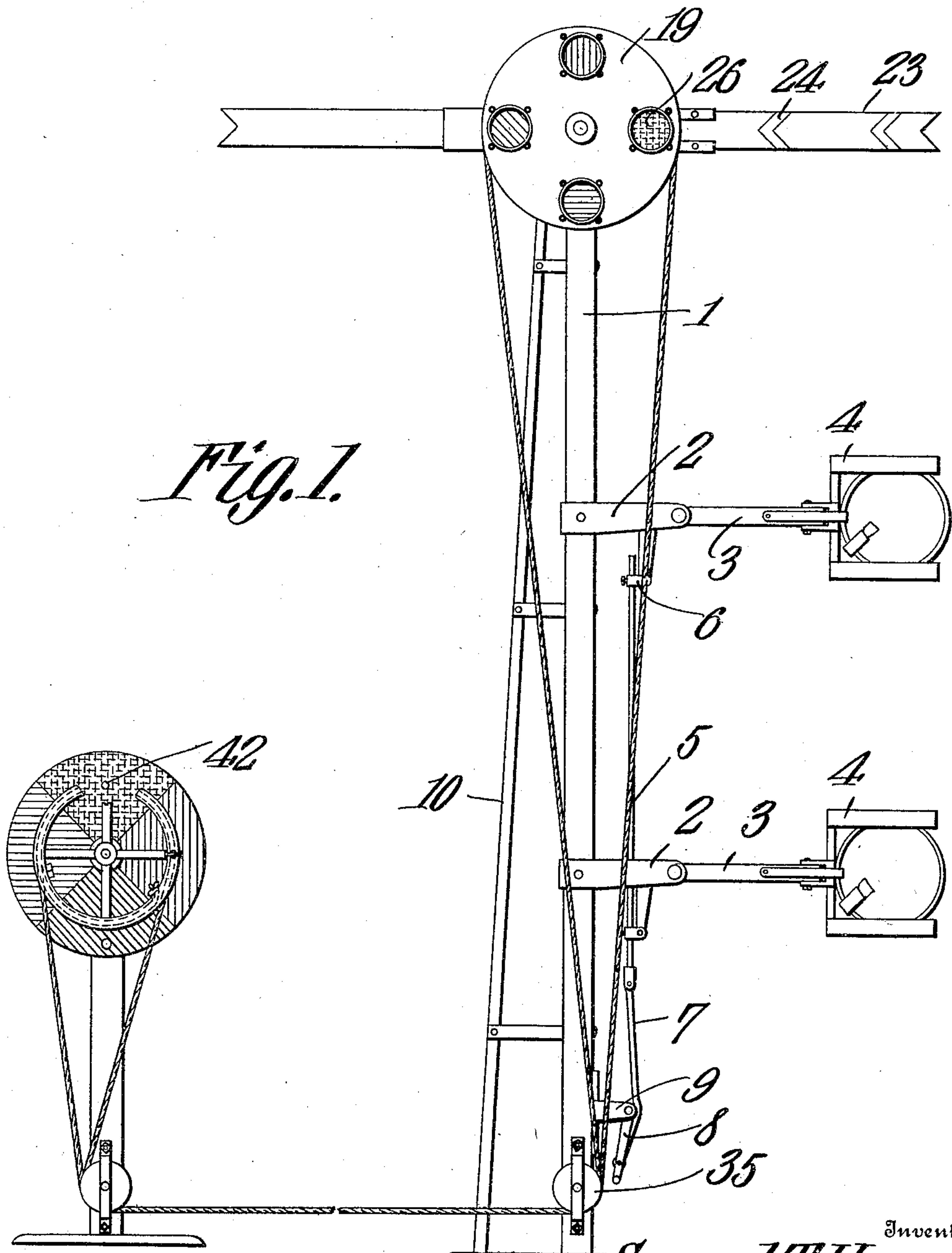


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

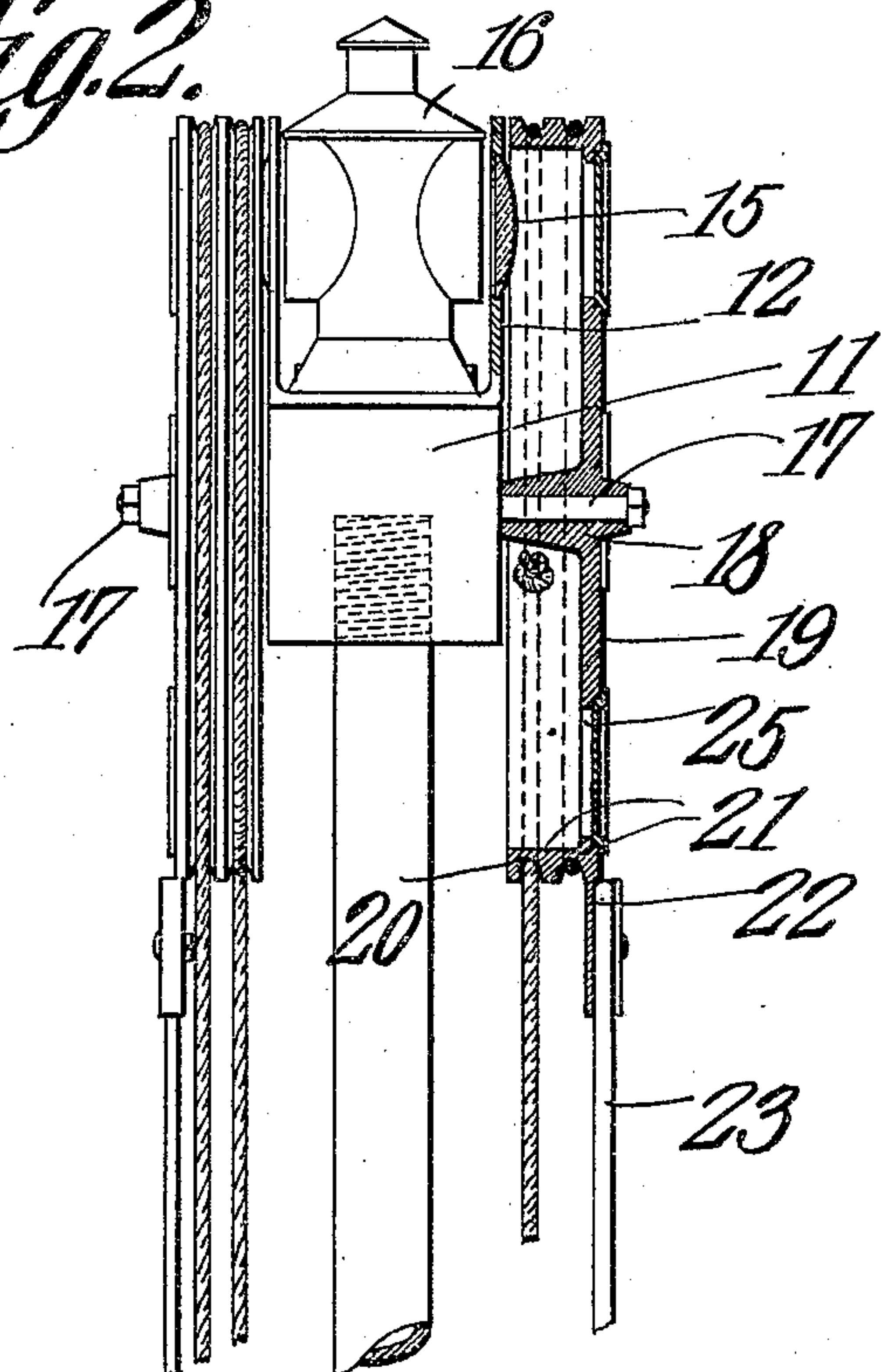


Fig. 3.

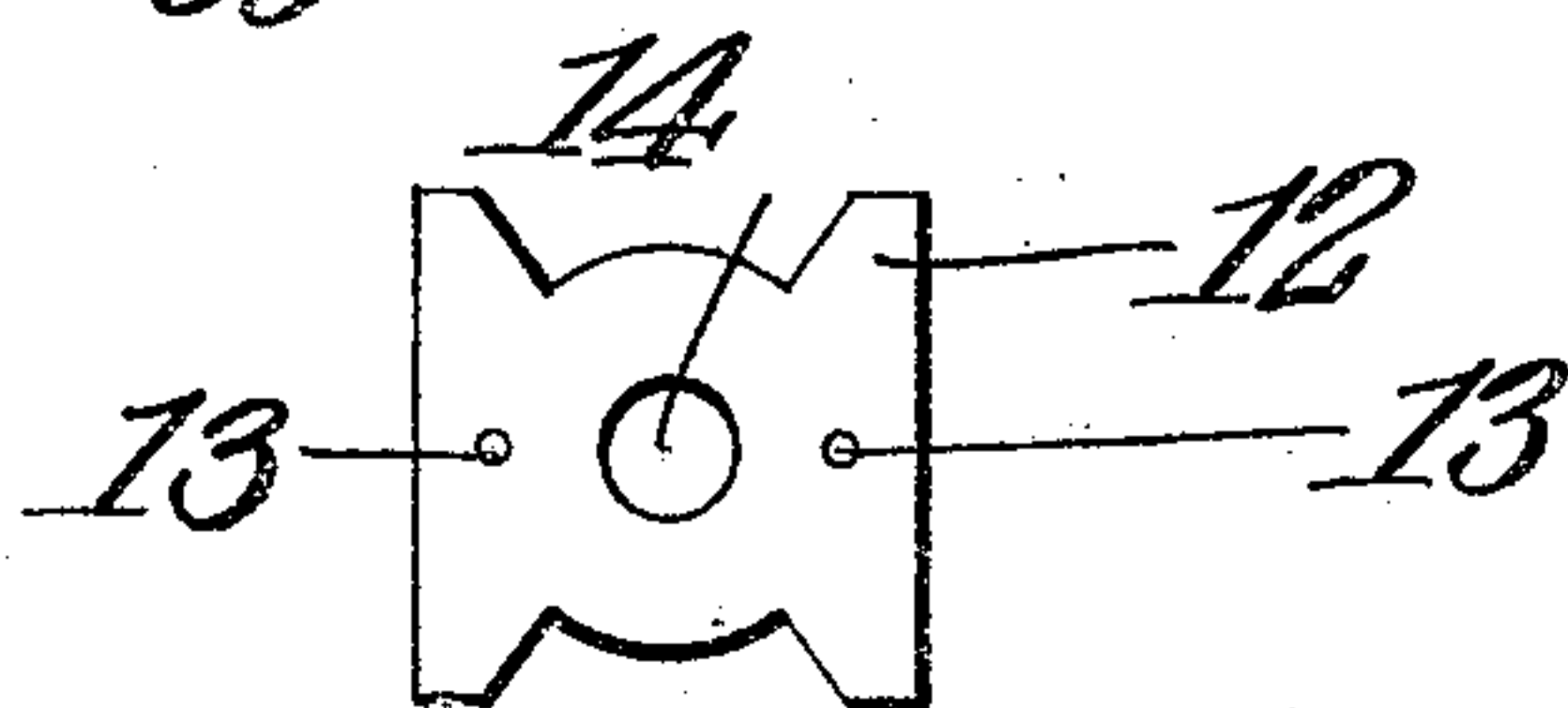
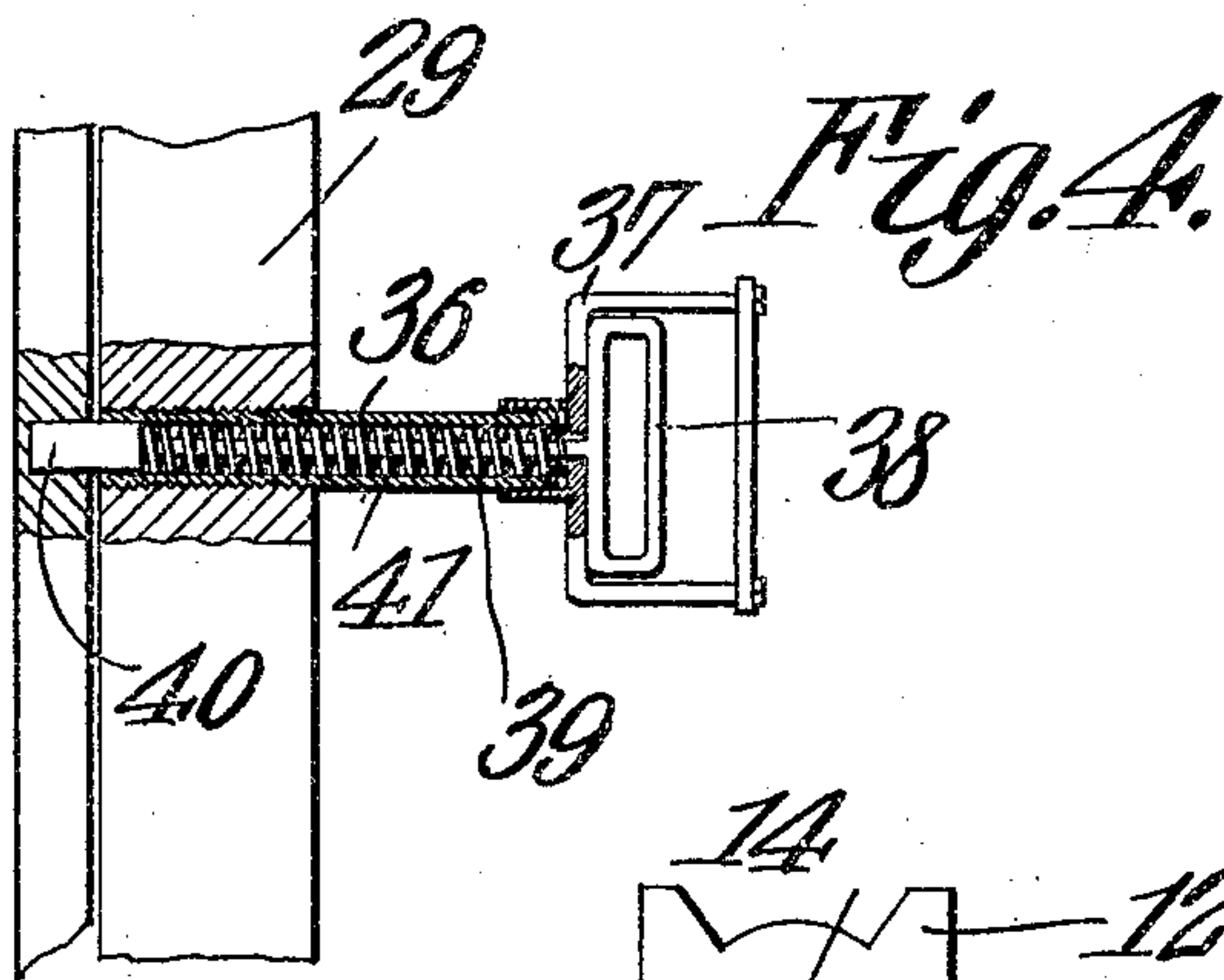
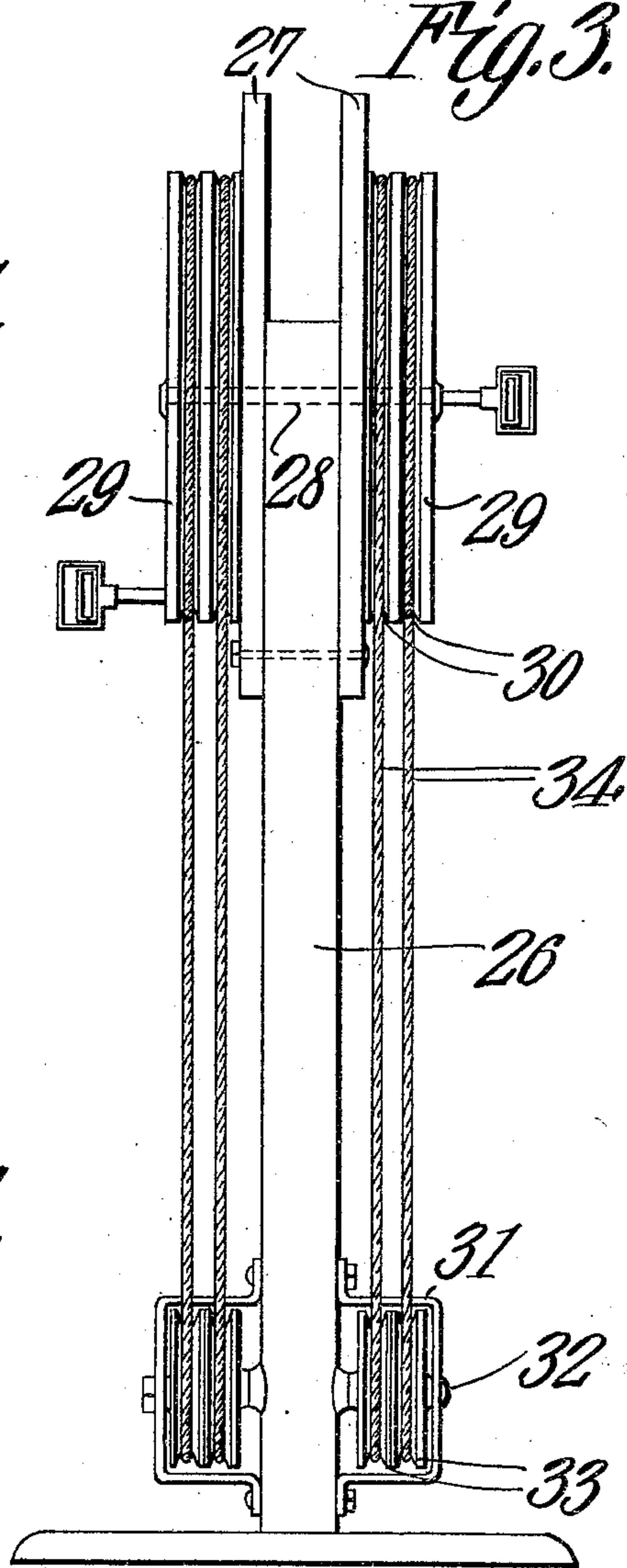


Fig. 5.

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UNITED STATES PATENT OFFICE.

SAMUEL THOMAS HARVEL, OF LAWRENCE, KANSAS, ASSIGNOR OF ONE-FOURTH TO THAD STEVENS AND ONE-FOURTH TO EDW. T. RILING, OF LAWRENCE, KANSAS.

RAILWAY-SIGNAL.

No. 929,214.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed February 4, 1908. Serial No. 414,219.

To all whom it may concern:

Be it known that I, SAMUEL THOMAS HARVEL, a citizen of the United States, residing at Lawrence, in the county of Douglas and State of Kansas, have invented a new and useful Railway-Signal, of which the following is a specification.

This invention has reference to improvements in railway signals, and its object is to provide means whereby the same signal devices may be used as block signal means for controlling the running of trains and at the same time may be utilized for the purpose of giving notice of and delivering train orders to both the engineman and conductor. For this purpose the usual semaphore arm or target is employed, but instead of providing for the display of "clear", "caution", and "stop" signals by the movement of the arm through an arc of about 90°, means are provided by this invention whereby the arm may pass through a complete or nearly complete circle. In this manner the several positions of the arms may be so distinctly different as to be unmistakable.

In accordance with the present invention the horizontal position of the arm on the track side of the target mast is maintained, and the pendent position of the arm for safety is also maintained. The caution position, however, is changed from the usual 45° pendent position to a position pointed toward the zenith, while a position diametrically opposite from the stop position, that is with the target arm pointing in a direction away from the track, indicates to the approaching train that orders are waiting ready to be caught by the appropriate mechanism on the train without bringing the train to a stand still so that the engineman may expect orders and be ready to receive them as the train passes the station.

The present invention comprises means whereby such signals may be displayed either by semaphore arms or targets, or if need be by disks for daylight signals and by appropriately colored lights for night signals.

The invention will be best understood by a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification, in which drawings,—

Figure 1 is an elevation of a structure capable of carrying out the invention. Fig. 2 is a side view with parts in section, of the

upper end of the signal mast. Fig. 3 is a side view of that portion of the structure contained within the signal tower or station, and Figs. 4 and 5 are detail views.

Referring to the drawings, there is shown a mast 1 which may be of the usual construction and needs no particular description. Fast to this mast at appropriate points are targets 2—2 carrying a bell-crank lever 3 at the free end of which there is an order carrier 4. This last-named structure, that is the order carrier as well as the bell-crank levers, may be the same as shown in my Letters-Patent #860,803, granted July 23, 1907, for train order deliverer, and consequently it is unnecessary to describe these parts in detail.

The arrangement of the mechanism for operating the order-carrying structures is slightly modified over that shown in Letters-Patent in that the bell-crank levers are both connected to a rod 5 through pivoted brackets 6, and this rod 5 at its lower end is connected to a link 7 controlled by a lever 8 on the track side of the mast, the lever being suitably pivoted in the bracket 9 so that when the order carriers are elevated the lever will lock them against accidental dropping. The structure of the patent is also otherwise modified in the placing of a ladder 10 on the side of the mast away from the track instead of as shown in the said patent.

The top of the mast may be as high above the order carriers as may be desired, and it there receives a block 11 which may be suitably threaded to receive the upper end of the mast, which latter is also threaded for the purpose of being secured into the block. Fast on top of the block is a U-shaped frame 12, the bottom of which is indicated in Fig. 5 where suitable perforations 13 and 14 are shown for the securing of the frame upon the top of the block. This frame is supplied on opposite sides with bull's eyes 15, and is of such size as to properly receive a suitable lantern 16.

Projecting from diametrically opposite sides of the block 11 are pintles 17, each receiving the hub 18 of a disk 19 provided at its periphery with an overhanging flange having the outer face formed with two annular grooves 21. Projecting radially from the disk 19 is a socket 22 to which is secured the inner end of a semaphore arm 23, one side of which may be painted an appropriate color,

say black, and the other side of which may be painted a distinctly different color, say, yellow or white with red stripes, indicated at 24. Any other arrangement of colors or tints may be used as desired. Coincident with the position of the semaphore arm and also disposed at points 90° apart about the disk, are openings 25 in which are set glass disks 26 of appropriate colors. For instance, when the semaphore arm is horizontal or in the stop position, then a red glass disk is coincident with the lantern. When the semaphore arm is pendent then the disk opposite the lantern is a green disk. When the semaphore arm points toward the zenith, then the disk opposite the lantern is a yellow disk, and when the semaphore arm is in the "order" position, that is in a horizontal position away from the track, then the glass disk opposite the lantern is a blue disk or any other color that may be chosen as distinctive from the other disks.

The disk 19 with its overhanging grooved periphery 20 constitutes a pulley, and there are two such pulleys on each mast arm where it is desirable to control the trains running in opposite directions either upon the same track or upon double track roads. However, these pulleys and their parts and functions being the same, the description may be limited to the action of one such pulley.

Located in the signal tower or in the railroad station or other appropriate point is a short post 26 carrying at its upper end two disks 27, and extending through these disks and beyond the same is a shaft 28 on each end of which is mounted a grooved pulley 29 having two peripheral grooves 30. Near the lower end of the post 26 on each side thereof, is a bracket 31 carrying the outer end of a pintle 32, the inner end of which is carried by the post 26, and on each pintle 32 are two independent pulleys 33. Fast to each pulley 29 are two ropes, cords, strands or cables 34. One of these ropes extends approximately all the way around the pulley in one direction and the other extends approximately all the way around the pulley in the other direction and are secured thereto in any appropriate manner. These ropes each pass around a respective pulley 33, thence to a corresponding pulley 35 on the lower end of the mast 1 and thence upward to a respective groove 21 in the periphery of the respective pulley 19 on the mast arm, one rope or cable extending around this last-named pulley in one direction and the other in the other direction. When one of the pulleys 29 is rotated in one direction one of the ropes 34 is wound thereon and is unwound from the pulley 19, thus causing the latter to rotate and wind up on it the other rope which at the same time is unwound from the pulley 29. In this manner the rotation of the proper one of the pulleys 29 will cause

the rotative movement of the proper pulley 19 and the movement of the semaphore arm in a corresponding direction.

In order to indicate to the operator the respective position of the pulley 19, each pulley 29 is provided with a latch handle, best shown in Fig. 4, where it will be seen that the body of the pulley 29 has passed through the same the threaded end of a sleeve 36, and on the outer end of this sleeve there is secured a handle 37 of such size as to readily receive the hand of the operator. Within the handle is a smaller hand hold 38 of such size as to be readily grasped by the fingers of the operator while the ball of the hand engages the outer handle 37. The hand hold 38 is fast on a stem 39 passing through the sleeve 36 and terminating in a latch bolt 40, and between the bolt 40 and the outer end of the sleeve 36 there is confined a helical spring 41. At appropriate points on each disk 27 are recesses 42 for the reception of the latch bolt.

The face of each disk 27 contiguous the pulley 29 is appropriately colored in segments to match the colored glasses of the corresponding disk 19 and thereby indicate the position of the semaphore arm. By the operator grasping the handle 37 and engaging the hand hold 38 with the fingers, the latch bolt 40 may be withdrawn from the socket in which it is seated and the pulley 29 may then be rotated to the desired position and there locked by the engagement of the latch 40 in a corresponding recess 42.

The normal position of the target is that shown in Fig. 1 displaying the target horizontally in the direction of the track as a stop signal, and at night this would show the usual red light. When the track is clear for an approaching train the operator moves the corresponding pulley 29 in a direction to match the green color on the disk 27 and the target is thereby caused to drop until it is pendent. Suppose, however, that the ordinary cautionary signal is to be displayed, then the disk 29 is rotated in either direction until its handle is opposite the yellow color on the disk, and this causes the semaphore arm to move to point toward the zenith, when a yellow light will be displayed at night. Assuming, however, the block signal operator has orders for the approaching train. He then moves the disk 29 until it is coincident with the blue color, if such be the chosen color, and the arm 23 is thereby moved to a horizontal position away from the track and covering the semaphore arm of the other disk 19, but because of the color on the visible face of the first-named arm the engineman is made aware that train orders are to be expected. Having set the target properly the operator then goes to the semaphore mast and inserts the orders in the carriers 4 and by a suitable manipulation of the

lever 9 elevates these carriers to a horizontal position. The engineman having been made aware of the fact that orders are awaiting him receives those orders as set forth in my aforesaid Letters-Patent and which need not be repeated here.

It is to be observed that the targets instead of being rotatable about an axis for a small portion of a complete rotation are to be rotated substantially all the way around a center in order to reach the several positions enumerated.

What is claimed is:—

1. In a railway signal system, a semaphore support and a semaphore or target having positions indicating stop, caution and clear, on one side of the vertical plane of the semaphore support, and another position indicating train orders, on the other side of the said vertical plane of the semaphore support.

2. In a railway signal system, a semaphore or target, a rotatable carrier therefor, and four differently colored transparent members on said carrier arranged in closed series and spaced 90° apart and capable of being brought into coincidence with a suitable light.

3. In a railway signal system, a semaphore or target, a rotatable carrier therefor having a number of different positions to represent train control and order conditions, a distantly located means for operating said semaphore or target, and an indicating member adjacent and mechanically connected to the operating mechanism for indicating the operative positions of the semaphore or target.

4. In a railway signal system, a semaphore mast, a rotatable semaphore carrier thereon and provided with a number of spaced colored transparent members, flexible connections engaging the carrier on opposite sides to rotate it in opposite directions, a distant rotatable member also joined to the flexible connections for moving them in opposite directions and having a range of movement equal to that of the semaphore carrier, an

indicating member adjacent to the distant rotatable member and provided with colored indications corresponding in relative position to the several positions of the semaphore carrier, and means for locating and locking the distant rotatable member in definite relation to the indicating member.

5. In a railway system, a semaphore mast, a support on the upper end thereof, double grooved disks on the said support, a lamp holder between the disks, colored members in the disk, a semaphore carried by each disk, means for rotating each disk in opposite directions to bring the colored members opposite the position of the lamp.

6. In a railway signal system, a semaphore carrier capable of rotation about a horizontal axis and movable to a number of operative positions, a distant rotatable member, connections between the same and the semaphore carrier, an indicating member adjacent to the distant operating member, and means for manipulating and locking the distant operating member comprising a handle on the operating member, and a longitudinally movable latch carried by the operating member and having a hand hold interior to the handle.

7. As a new article of manufacture, a signal appliance consisting of a circular spectacle case adapted to be supported on a central pivot and having a semaphore arm extending from its edge.

8. As a new article of manufacture, a signal appliance consisting of a circular spectacle case having openings circumferentially and symmetrically disposed around its edge, said spectacle case being adapted to be supported on a central pivot and having a semaphore arm extending from its edge.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

SAMUEL THOMAS HARVEL.

Witnesses:

EDW. T. RILING,
THAD STEVENS.