(No Model.)

# W. GRAVIT.

## MECHANISM FOR OPERATING DERAILING SWITCHES AND SEMAPHORES.

No. 383,947. Patented June 5, 1888.

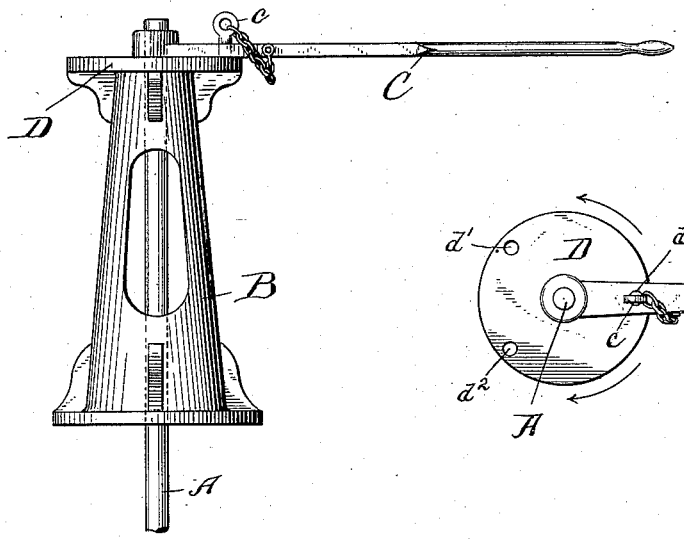
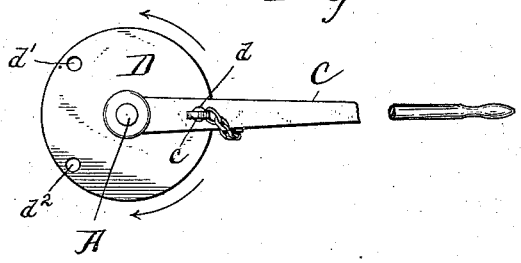



Fig. 1.

Fig. 3.



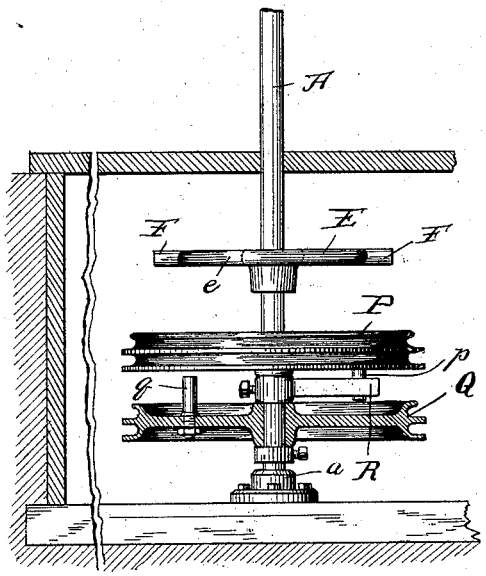
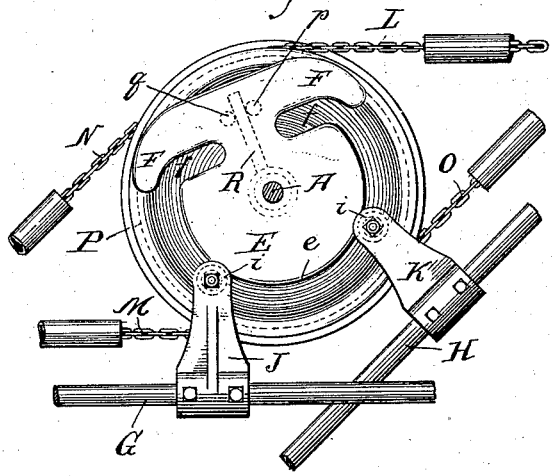




Fig. 2.




Witnesses-
Arthur Johnson.
W. M. Munday.

Inventor.
William Gravit.

By his Attorneys
Munday, Evarts & Adcock.

# UNITED STATES PATENT OFFICE.

WILLIAM GRAVIT, OF ELKHART, INDIANA.

## MECHANISM FOR OPERATING DERAILING-SWITCHES AND SEMAPHORES.

SPECIFICATION forming part of Letters Patent No. 383,947, dated June 5, 1888.

Application filed February 24, 1888. Serial No. 265,129. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM GRAVIT, a citizen of the United States, residing in Elkhart, in the county of Elkhart and State of Indiana, have invented a new and useful Improvement in Mechanism for Operating Derailing-Switches and Semaphores, of which the following is a specification.

This invention relates to mechanism for operating the derailing-switches and semaphores employed at railroad-junctions; and my object therein has been to devise a single apparatus which, while it is connected to and controls the switches and semaphores of both the crossing lines of railroad, is however capable of moving the switches and semaphores of one road without disturbing those of the other. To this end I mount upon a rotatable vertical shaft a cam-wheel, of the description hereinafter set forth, for operating the switch-connections of both lines, and two loose pulleys, each connected to the semaphores of one of the lines and each separably operable by an arm fixed to the shaft according to the direction in which the latter is turned.

In the drawings, Figure 1 is an elevation, partly in section, of the actuating parts of my invention. Fig. 2 is a horizontal section of the apparatus, showing the connections to the various switches and semaphores. Fig. 3 is a plan view.

In said drawings, A represents the rotatable shaft stepped at its bottom in the bearing *a* and at its top in a hollow or other suitable standard, B. Ordinarily the bearing *a* will be located below ground and the standard B in an elevated observatory or tower. Said shaft is turned by the operator through the medium of lever C, and is located in its three positions by the removable pin *c*, passing through the lever into the openings *d d' d²* in the top plate, D, of the standard B. At the lower end the shaft carries the cam-wheel E. This cam-wheel is provided with a portion, *e*, concentric with its axis, and at either end of such concentric portion with a hook, F, and inward slot, *f*. The rod-connections to the derailing-switches are shown at G and H, and each supposedly extends to switches located at either side of the junction. Each rod is also provided with an arm, J or K, carrying an anti-friction pulley, *i*, in constant contact with the periphery of the cam-wheel. When the operator turns his lever in the direction of the upper arrow, Fig. 3, the cam-wheel will be turned to the left, when the hook F will engage with the arm J. The roller of the latter is now compelled to enter the slot *f*, with the result that said arm and its rod G are carried along to the right by the cam-hook a sufficient distance to close the switches on the line to which the rod G belongs. When this position is reached, the operator's lever is locked in the opening *d'*. One road is thus opened to travel; but it will be noticed that the switches of the other road have not been disturbed, the arm K being all the time in contact with the concentric part of the cam-wheel. As soon as the train for which the switches were closed has passed the operator moves his lever back to the position shown in Fig. 3, and the cam-wheel in this return movement carries the arm J and the rod G back to their first position, again blocking the road.

The operation is the same with the other road and its switch-actuating arm K and rod H, except that the shaft is turned in the opposite direction when they are to be actuated.

The chains extending to the semaphores are shown at L M and N O, the two former being attached to the upper pulley, P, and the two latter, to the pulley Q. Both said pulleys are loosely mounted on shaft A and both are operated by the arm R, rigidly secured to the shaft A, in connection with the studs *p* and *q*—that is to say, when the shaft is moved in one direction from "block" the arm engages the stud belonging to the pulley P and turns the latter, drawing upon the chains L and M. If the shaft be turned in the other direction from block, the arm will engage stud *q* and turn pulley Q, thereby drawing on chains N and O. The semaphores, being automatic in returning to their normal positions, operate to turn the pulleys back when the shaft is moved to the blocking position. The blocked position of the arm and studs is illustrated at Fig. 2 by the broken lines, the position being changed in Fig. 1 for convenience and clearness of illustration.

It will be noticed from the construction de-

scribed that while the operator is able to open either one of the lines crossing at junction by a single movement of his lever, such movement closing the switches and changing the signals from "danger" to "open;" and while he is able by the return movement of his lever to open the switches and change back the signal to "danger," yet during all the time either line is open the other line is blocked, and both lines cannot be open at the same time.

I claim—

1. The combination, with the derailing-switches of crossing railroad-lines, of a cam-wheel mechanically connected to said switches, and separately closing those of either line, substantially as set forth.

2. The combination, with the derailing-switches of crossing railroad-lines, of a cam-wheel mechanically connected to said switches and acting to close the switches of either line by a single movement and to open them by its return movement, substantially as set forth.

3. The combination, with the derailing-switches of crossing railroad-lines, of a single cam-wheel having the hooks F, the switches being mechanically connected to the wheel by the rods and arms, substantially as specified.

4. The combination, with the derailing-switches and semaphores of crossing railroad-lines, of a single shaft, a cam-wheel for operating the switches, and pulleys for operating the semaphores, said wheel and pulleys being all mounted upon said shaft, substantially as set forth.

5. In apparatus for operating derailing-switches, the shaft A and the cam-wheel having a concentric portion and the hooks F, in combination with the arms J and K, in contact with said wheel, and the rods G and H, extending to the switches, substantially as specified.

6. In apparatus for operating derailing-switches and semaphores, the cam-wheel, the pulleys P and Q, having studs *p* and *q*, and the arm R, all combined and operating substantially as specified.

7. In apparatus for operating derailing-switches and semaphores, the shaft A and the operator's lever, the latter having the three positions described, in combination with the cam and pulleys on said shaft and the mechanical connections to the switches and semaphores, substantially as set forth.

WILLIAM GRAVIT.

Witnesses:
H. M. MUNDAY,
R. H. MUNDAY.