

(No Model.)

2 Sheets—Sheet 2.

J. H. FRISCHEN.
SEMAPHORE OPERATING DEVICE.

No. 513,562.

Patented Jan. 30, 1894.

Fig: 3.

Fig: 2.

WITNESSES:

John A. Rennie
John H. Deemer

INVENTOR

INVENTOR
Johann Heinrich Fritschen

BY

BY *Geo H Benjamin*
ATTORNEY

ATTORNEY

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHANN HEINRICH FRISCHEN, OF BERLIN, GERMANY, ASSIGNOR TO SIEMENS
& HALSKE, OF SAME PLACE.

SEMAPHORE-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 513,562, dated January 30, 1894.

Application filed February 8, 1893. Serial No. 461,540. (No model.) Patented in Switzerland January 12, 1892, No. 4,602.

To all whom it may concern:

Be it known that I, JOHANN HEINRICH FRISCHEN, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented new and useful Improvements in Semaphore-Operating Devices, (for which I have obtained Letters Patent in Switzerland, No. 4,602, dated January 12, 1892,) of which the following is a specification.

My invention relates to railway signaling semaphores and devices for actuating them, and has for its object to promote smooth and easy operation of a twin- semaphore signal and thus avoid injurious jars or shocks to the mechanism.

A further object is to provide for automatic setting of the "danger" or "stop" semaphore, should the wire connections which normally actuate the semaphores break.

The invention will first be described and then will be particularly defined in claims hereinafter set forth.

Reference is to be had to the accompanying drawings, forming a part of this specification, and in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1, is a front elevation of my improved twin- semaphore signal, with the "danger" or "stop" semaphore set. Fig. 2, is a detail front view illustrating the automatic adjustments of the semaphore wing actuating mechanism when the pull wire or connection breaks, and Fig. 3, is a side or edge elevation of the devices occupying the same positions as in Fig. 1.

To any suitable post or standard A, set at the side of a railway track is fixed a shaft or arm B, on which are journaled the inner ends of the twin semaphores C, D, which for more convenient operation are provided respectively with projecting arms *c*, *d*, to which are pivoted the upper ends of actuating rods E, F, which are connected at their lower ends at *e*, *f*, respectively to a rocking plate G, journaled to a shaft or arm H, set into the post A. The connecting rod F, of the semaphore signal D, is provided with two collars *f'*, *f''*, which form stops limiting the reverse motions of both semaphores by contact with a slotted arm I, which also guides the rod F.

The semaphore C, which is marked "red"

in the drawings, is the "danger" or stop signal, and the semaphore D, marked "white" in the drawings, is the "all clear" or safety signal. These parts C, D, may be painted red and white respectively and may carry correspondingly colored lights to adapt them for both day and night service.

The semaphore D, is provided with an adjustable counterweight D', which operates in conjunction with the counterweighted lever-carrying rocking plate G, as presently described. Two levers K, L, are fulcrumed at *k*, *l*, respectively, to the rocking plate G, at opposite sides of the pivot shaft or fulcrum H, of said plate, and to the free ends of these levers is hung preferably by rigid tie rods *m*, *m'*, a counterpoise or weight M, which will not out-weigh or overbalance the safety semaphore D, and its counterpoise D', during certain movements of the parts. The lever K, overlies the pivot shaft H, and the lever L, underlies it and at times both levers bear on and move around said shaft. The free end of the lever L, rests upon the short arm of the other lever K, with which it has any suitable easily tripped latch connection which will allow the levers to unlatch, should the wire pull connections break, and as hereinafter more fully explained. The latch connection of the levers shown in the drawings is effected by entering the extremity of the lever K, into a notch formed in the intumed end of the other lever L. Pull wires N, O, are connected respectively to the levers L, K, and are led over or along suitable guide pulleys *n*, *o*, to actuating levers or mechanism at a distant signal tower, and which may have any approved form and arrangement, not necessary to show or describe.

The operation is as follows:—When the semaphore C, is set to indicate "danger" the mechanism will have relative positions shown by full lines in Fig. 1, of the drawings. To reverse the positions of the semaphores and thus bring the one D, to position indicating "all clear" or safety, the wire N, will be pulled to swing the lever L, and as this lever overlies the lever K, and also bears on the fulcrum shaft H, both levers will turn together around the shaft H, and will carry the rocking plate G, with them. During the first

part of this movement the counterpoise M, which originally hung vertically with the rod *m*, from the lever L, will by gravity assist the motion and until the levers approach or reach a practically horizontal position, at which time the counterpoise M, will be sustained equally by both of the latched levers K, L. Further movement causes the counterpoise M, to be lifted to counteract the downswing of the counterpoised semaphore D, which falls as the other semaphore C, rises. The overhanging weight of the semaphore D, is somewhat greater than that of the now rising counterpoise M, which latter, while not preventing downswing of the semaphore D, will partly balance or counteract its movement and exert a force contrary to that resulting from the pull of the wire. Hence the semaphore D, will take a signaling position easily or without imparting injurious jars or shocks to the mechanism. When the movement is fully completed and has been limited by contact of the rod collar *f'*, with the post, stud or arm I, the rod *m*, will hang vertically from the lever K, and sustain the counterpoise M, in the raised position indicated by the dotted lines in Fig. 1, of the drawings, and ready to assist a pull given the wire O, during the first part of the reverse adjustment of the semaphores to return them to the first described positions, it being understood that during the latter part of the return movements the rising counterpoise M, will again oppose the semaphores and particularly the falling one C, to prevent jars or shocks to the mechanism. When the "all clear" or safety signal D, is displayed or set horizontally and is so held by the pull of the wire N, the adjusting mechanism has the positions indicated by dotted lines in Fig. 1, of the drawings, and the counterpoise M, has a constant tendency to re-set the "danger" signal C. If with the parts adjusted as in dotted lines, the retaining wire N, should break, the recoil of the wire O, aided by the falling tendency of the counterpoise M will bring the latched levers K, L to approximate intermediate horizontal positions, and if the recoil of wire O be sufficient to lift the counterpoise, the latched levers will take the full line positions of Fig. 1 of the drawings, and in either case the "danger" signal C would be set. If on the other hand, the wire O should break while the signals were set to "safety" and while the latched levers K, L have the dotted positions of Fig. 1, the recoil of wire N will draw down lever L and pull its inturned end over and clear of the end of lever K, thus unlatching the levers, whereupon the counterpoise then would draw the levers to positions shown in Fig. 2; while the lever K by bearing on the shaft H, as a temporary fulcrum, will by its connection at *k*, with the rocking plate G, turn said plate and thereby reverse the positions of the two semaphores and bring the one C, down to signal "danger." After unlatching of the levers they assume by grav-

ity the positions shown in Fig. 2, of the drawings, with the counterpoise M, hanging from them and exerting its full weight to hold or lock the apparatus with the "danger" semaphore C, displayed until the broken pull or retaining wire is repaired, whereupon the levers K, L, may easily be latched together by hand and all is then ready to again set the "all clear" or safety signal C, in the manner above explained. It is obvious that with this apparatus reversely swinging twin semaphores are actuated by a connected rocking plate and counterpoised latched levers in a manner causing the counterpoise to first assist the movements of the semaphores, and then to retard them in order to economize power and avoid injurious shocks to the mechanism, while providing for display of the "danger" signal should the actuating wires break.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with two semaphores, a rocking plate, and connections between them, of two levers fulcrumed to the plate and adapted to latch together and unlatch, a counterpoise hung from said levers, and pull connections for operating the levers and rocking plate, substantially as described.

2. The combination with two semaphores, a rocking plate, and connections between them, of two levers fulcrumed to the plate at opposite sides of its pivot and adapted to latch together and unlatch, a counterpoise hung from said levers, and pull connections for operating the levers and rocking plate, substantially as described.

3. The combination with two semaphores, one of them counterweighted, a rocking plate and connections between them, of two levers fulcrumed to the plate and adapted to latch together and unlatch, a counterpoise hung from said levers, and pull connections for operating the levers and rocking plate, substantially as described.

4. The combination with two semaphores having the same fulcrum, a rocking plate and connections between the semaphores and rocking plate, of two levers fulcrumed to the plate at opposite sides of its pivot and adapted to latch together and unlatch, a counterpoise hung from said levers, and pull connections for operating the levers and rocking plate, substantially as described.

5. The combination with two semaphores, one of them counterweighted and both having the same fulcrum, a rocking plate and connections between the semaphores and rocking plate, of two levers fulcrumed to the plate at opposite sides of its pivot and adapted to latch together and unlatch, a counterpoise hung from said levers, and pull connections for operating the levers and rocking plate, substantially as described.

6. The combination with two semaphores, a rocking plate and connections between the semaphores and rocking plate attached to the

latter at one side of its pivot, of two levers fulcrumed to the plate at opposite sides of its pivot and adapted to latch together and unlatch with said plate pivot between them, a counterpoise hung from said levers, and pull connections for operating the levers and rocking plate, substantially as described.

7. The combination with two semaphores, one of them counterweighted and both having the same fulcrum, a rocking plate and rigid connections between the semaphores and plate attached to the latter at one side of its pivot, of two levers fulcrumed to the plate at opposite sides of its pivot and adapted to latch together and unlatch with said plate pivot between them, a counterpoise hung from said levers, and pull connections for operating the levers and rocking plate, substantially as described.

8. The combination with a post or support, of two semaphores C, D, fulcrumed thereto, a rocking plate G, pivoted at H, to the post, rods E, F, connecting the semaphores and rocking plate, levers K, L, fulcrumed at *k, l*, to said plate and adapted to latch together and unlatch with the pivot H, between them, a counterpoise M, hung by rods *m, m'*, from the levers, and pull connections N, O, to the levers, substantially as described.

9. The combination with a post or support, of two semaphores C, D, fulcrumed thereto, one being counterweighted, a rocking plate G, pivoted at H, to the post, rods E, F, connecting the semaphores and rocking plate, levers K, L, fulcrumed at *k, l*, to said plate and adapted to latch together and unlatch with the pivot H, between them, a counterpoise M, hung by rods *m, m'* from the levers, and pull connections N, O, to the levers, substantially as described.

10. The combination with a post or support, of two semaphores C, D, fulcrumed thereto, one being counterweighted, a rocking plate G, pivoted at N, to the post, rods E, F, connecting the semaphores and rocking plate, a slotted guide stud I, on the post, stops *f, f'* on the rod F, two levers K, L, fulcrumed at *k, l*, to the plate G, and adapted to latch together and unlatch with the pivot H, between them, a counterpoise M, hung by rods *m, m'* from the levers, and pull connections N, O, to the levers, substantially as described.

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

JOHANN HEINRICH FRISCHEN.

Witnesses:

MAX WAGNER,
GEO. H. BENJAMIN.