

(No Model.)

2 Sheets—Sheet 1.

J. H. FRISCHEN.
SEMAPHORE OPERATING DEVICE.

No. 501,062.

Patented July 11, 1893.

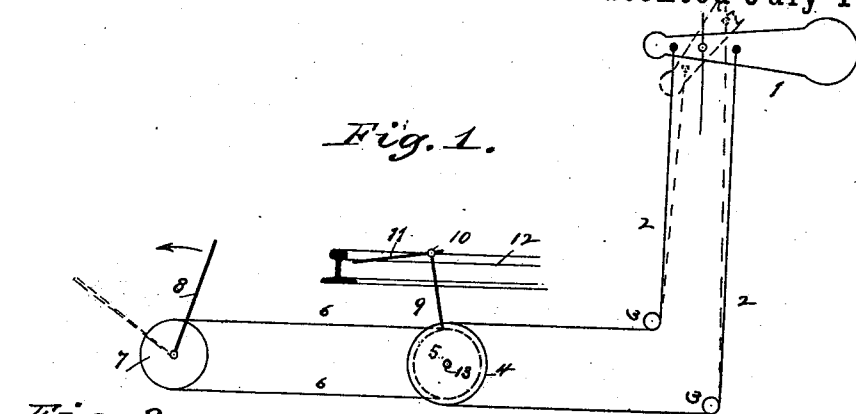


Fig. 2.

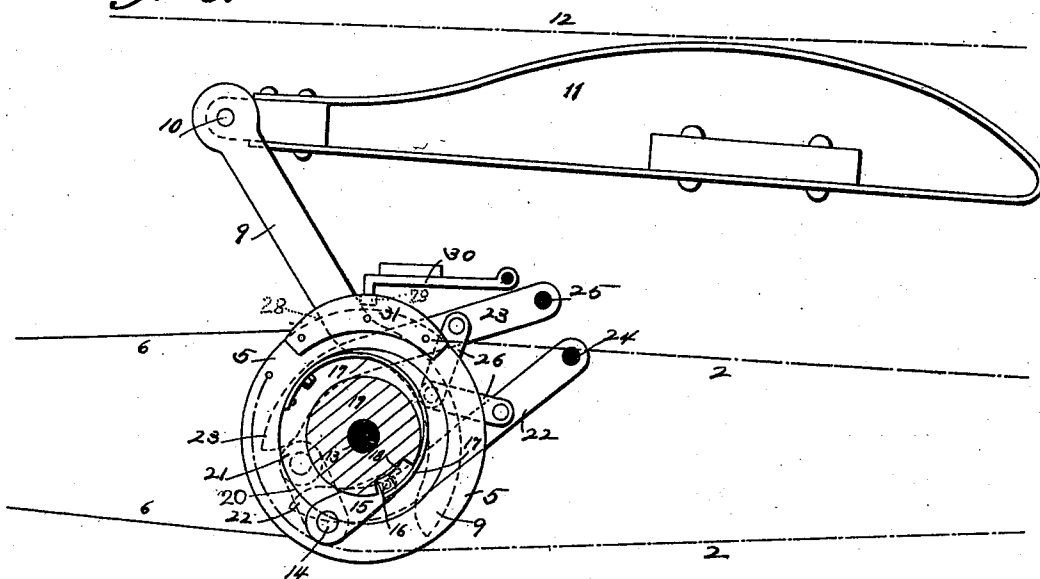
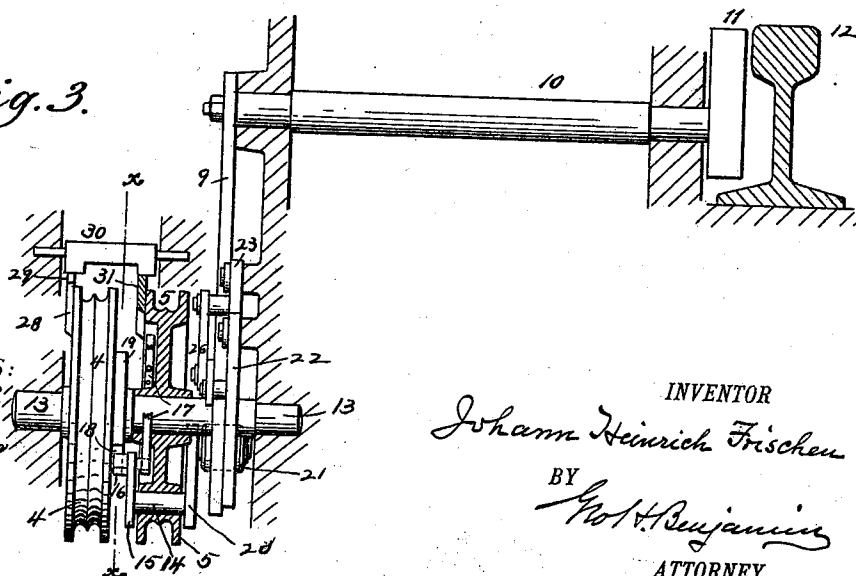


Fig. 3.



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2 Sheets—Sheet 2.

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Fig. 4.

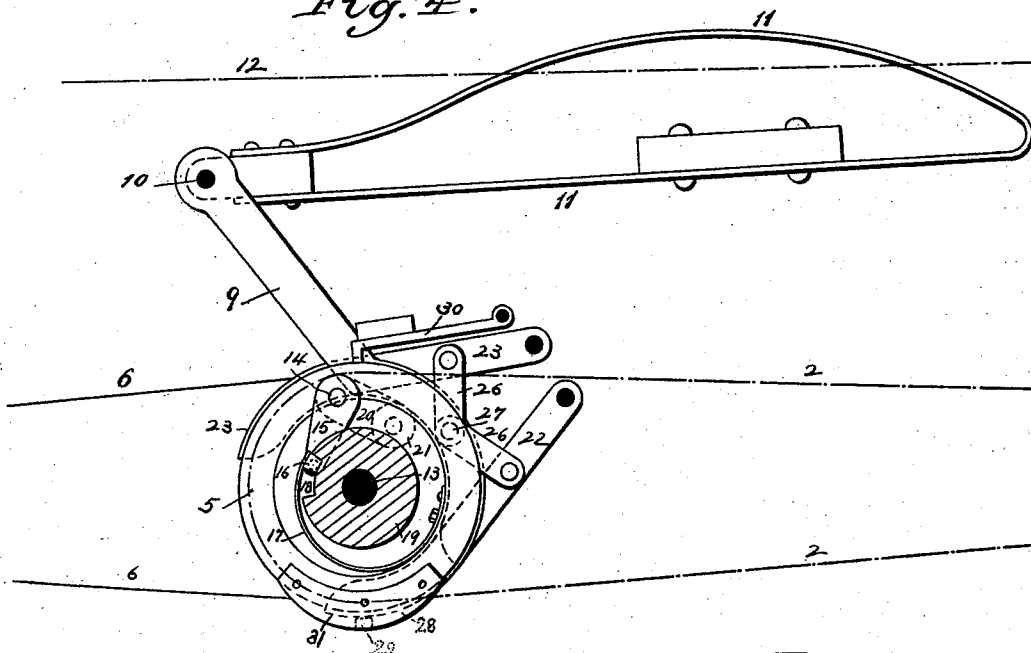
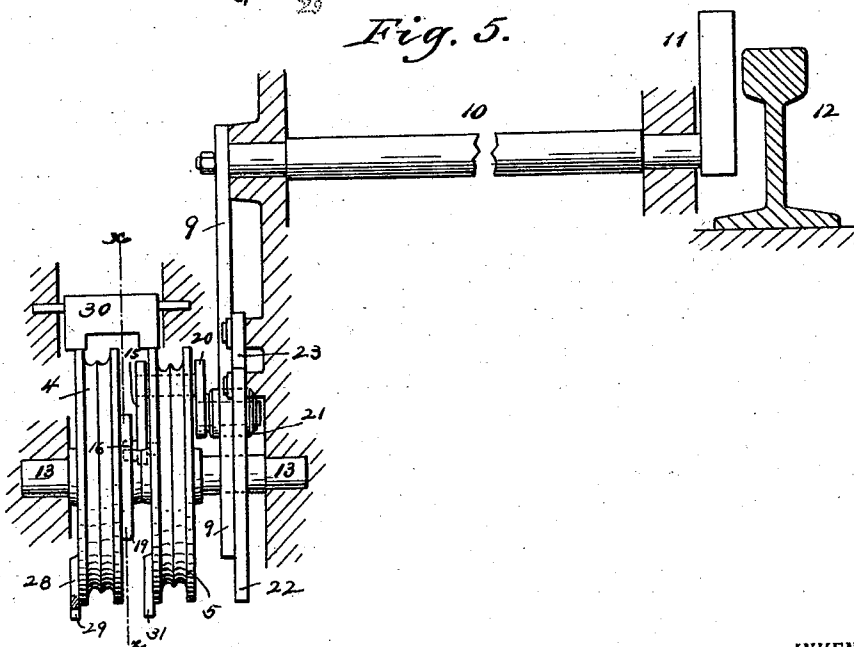


Fig. 5.



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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. 501,062, dated July 11, 1893.

Application filed March 13, 1893. Serial No. 465,748. (No model.) Patented in Germany November 2, 1890, No. 56,847; in Switzerland January 16, 1891, No. 3,412; in Austria-Hungary January 24, 1891, No. 5,428 and No. 28,315, and in Belgium February 20, 1891, No. 93,836.

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 as follows: In Germany, No. 56,847, dated November 2, 1890; in Austria-Hungary, No. 5,428 and No. 28,315, dated January 24, 1891; in Belgium, No. 93,836, dated February 20, 1891, and in Switzerland, No. 3,412, dated January 16, 1891,) of which the following is a specification.

My invention relates to devices or apparatus for operating semaphore signals of railways, and has for its object to provide improved devices of this character, which after being set to the "all clear" position, will be automatically adjusted to the "danger" position by the passage of a train.

The invention consists in adapting two pulleys, one connected to the semaphore, and the other to the operating lever, to couple with and uncouple from each other, and in employing intermediate mechanism controlled by a track pedal to effect uncoupling of the pulleys to allow the semaphore to take the "danger" position.

The invention also includes latch devices locking the semaphore in "danger" position, and releasing it as the pulleys are again coupled together.

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 like numerals indicate similar parts in the several views.

Figure 1, is a diagrammatic view illustrating the operation of the semaphore signal. Fig. 2, is a side elevation showing the track pedal depressed. Fig. 3, is a transverse vertical sectional elevation, with the parts adjusted as in Fig. 2. Fig. 4, is a vertical sectional side view showing adjustment of parts when the semaphore is in the "all clear" position, ready to be set to the "danger" position by a passing train, and Fig. 5, is a trans-

verse vertical sectional elevation, with parts adjusted as in Fig. 4. Figs. 2 and 4 show the hub of the loose pulley 4 in section on the lines x, x , in Figs. 3 and 5.

In the diagrammatic view, Fig. 1 of the drawings, the numeral 1 indicates the semaphore signal and 2, 2 are suitable wires, chains or cords connected thereto and leading over suitable guide pulleys 3, 3 to an operating pulley 4, which, as hereinafter explained, is adapted to couple with or uncouple from a pulley 5 mounted on the same shaft and connected by wires 6, 6 with a third pulley 7 having a hand lever 8 by means of which the semaphore is at times actuated. A lever 9, having other lever and toggle connections presently described, is fixed to a transverse shaft 10, which fixedly carries a pedal device 11 which is adapted for depression by a train running on the adjacent rail 12 of a railway track.

Referring now more especially to Figs. 2 to 5, inclusive, of the drawings, it will appear that the pulleys 4, 5 are mounted on the same shaft 13, the one 5 directly connected with the lever 8, being fast thereon, and the one 4, connected with the signal, being loose thereon. The pulley 5 carries an elbow lever having a shaft 14 journaled transversely in the pulley and carrying at one end a fixed arm 15, provided at its extremity with a stud or catch 16 which is normally pressed by a spring 17 held to the pulley 5 into a recess 18 of the hub 19 of the pulley 4. The other arm 20 of the elbow lever which projects from the lever shaft or fulcrum 14, about at right angles to the arm 15, carries a stud preferably having mounted thereon an anti-friction roller 21, which, when the pulleys are turned when coupled together, engages the system of levers 22, 9, 23. The two levers 22, 23 are fulcrumed at 24, 25, respectively, to a suitable stationary support and are coupled with toggle links or bars 26, 26, which at their inner ends are coupled by a pin 27 to the lever 9 which carries the track pedal 11. The inner edges or faces of the levers 22, 9, 23, with which the roller 21 successively comes in contact in certain adjustments of the parts, are curved to

provide a guide for the roller as it is turned by and with the coupled pulleys 4, 5, while the levers are being actuated to lift the pedal 11 above the head of the rail 12. The pulley 4 carries a plate 28, the projecting outer edge of which is curved on or from a shorter radius than that of the pulley, and has a central notch 29 with which a gravitating or spring pressed latch 30 is adapted to engage; and a similarly curved plate 31, which is not provided with a notch and is fixed to the other pulley 5, is adapted to lift the latch 30 from notch 29 of pulley 4. The notch of plate 28 is indicated by dotted lines on the plate 31 in Figs. 2 and 4 of the drawings.

The operation is as follows: With the parts having relative positions shown in full lines in Fig. 1 of the drawings, the semaphore 1 has just fallen to the "danger" position and the lever 8 has just been actuated to cause the two pulleys 5, 4 to couple together again, thus leaving the parts relatively disposed, as shown in Figs. 2 and 3 of the drawings, and with the track pedal 11 depressed into the position it had been brought by the last train which had passed over the rails 12, and by the influence of which the pulleys 5, 4 had been uncoupled to allow the semaphore to assume the "danger" position. After the train had passed by the pedal and the lever 8 had been thrown over to the full line position to couple the two pulleys, as aforesaid, the signal man or attendant will at proper subsequent time throw the lever 8 over to the dotted position, which will partially rotate both coupled pulleys 5, 4, and thus carry the semaphore back to the dotted "all clear" position shown in Fig. 1 of the drawings, and thereby also carry the elbow lever 14, 15, 20 around to the position shown in Figs. 4 and 5 of the drawings. During this partial rotary movement of the elbow lever with the two pulleys, the stud or roller 21 had first struck the end of the lever 22, and by so doing had caused the toggles 26, 26 to act on levers 23, 9, to move the curved inner edges of the levers outward and make room for the travel of the stud or roller 21 in the curved path described by the inner edges of all three levers 22, 9, 23, and thus hold the stud 16 of the lever arm 15 into proper engagement with the notch 18 of the hub 19 of the pulley 5, and when this movement is completed the conjoint operation of the system of levers will have lifted the pedal 11 above the rail 12 and into position to be struck by the wheels of the next following train. At this time the parts have relative positions shown in Figs. 4 and 5 of the drawings, and the lever 8 has the dotted position shown in Fig. 1. If the pedal 11 now be depressed by a passing train, the lever 9 will be pressed onto the stud or roller 21 of the elbow lever carried by the pulley 5, whereby the stud 16 will be lifted from the recess 18 of the hub of pulley 4, thus uncoupling the pulleys 5, 4, whereupon the gravity of, or spring or weight action upon, the semaphore

1 will cause it to take the horizontal "danger" position shown in full lines in Fig. 1, as the released or uncoupled pulley 4 turns half way around and brings its recess 29 opposite the latch 30 which then enters the notch and locks the semaphore in the "danger" position; meanwhile, the lever 8 has retained its dotted position. It is obvious that in order to again set the semaphore to the "all clear" position, it is necessary to first shift the lever 8 back to the full line position, which movement will turn the pulley 5 half way around again until its plate 31 strikes the latch 30 and lifts it from the notch 29 of pulley 4, thereby unlocking the semaphore, and as this is done the recess 18 again comes opposite the stud 16 of the elbow lever of pulley 5 and the spring 17 presses the stud into the recess, thereby again coupling the two pulleys as the lever 8 resumes the full line position shown in Fig. 1, and all is now ready for setting the semaphore to "all clear" position by subsequent operation of the lever 8, as will readily be understood.

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

1. In semaphore operating devices, the combination with a semaphore and means for operating the same, of two interposed pulleys or disks adapted to couple together, and a track pedal and intermediate mechanism effecting uncoupling of the pulleys by a passing train, substantially as described.

2. In semaphore operating devices, the combination with a semaphore, a pulley adapted to actuate it, and two intermediate pulleys adapted to couple together, one connected to the semaphore and the other to the actuating pulley, of track pedal and lever mechanism effecting uncoupling of the pulleys by a passing train, substantially as described.

3. In semaphore operating devices, the combination with a semaphore and means for operating the same, of two interposed disks or pulleys, one having a recess and the other having an elbow lever carrying a catch adapted to said recess, of a system of levers guiding the elbow lever, a shaft carrying one of the levers of the system, and a track pedal on said shaft operated by a passing train and uncoupling the intermediate pulleys, substantially as described.

4. In semaphore operating devices, the combination with the intermediate pulleys connected respectively to the semaphore and the actuating pulley and means for actuating the same, and adapted to couple and uncouple as specified, of a latch device and two plates, one on each intermediate pulley, one of said plates having a notch to which the latch is adapted, substantially as described.

5. In semaphore operating devices, the combination with the semaphore 1, pulleys 4, 5, 7, and pull connections 2, 6, said pulley 5, carrying an elbow lever 14, 15, 16, 20, 21 and a spring 17, and the pulley 4 having a notch 18, of a shaft 10, a track pedal 11 thereon, a

lever 9 on the shaft and levers 22, 23 coupled to each other and to lever 9 by toggle links 26, all adapted for operation substantially as described.

5 6. In semaphore operating devices, the combination with the semaphore 1, pulleys 4, 5, 7, and pull connections 2, 6, said pulley 5 carrying an elbow lever 14, 15, 16, 20, 21 and a spring 17, and the pulley 4 having a notch
10 18, of a shaft 10, a track pedal 11 thereon, a lever 9 on the shaft, levers 22, 23 coupled to each other and to lever 9 by toggle links 26,

and plates 28, 31 on the pulleys 4, 5 respectively, one plate having a notch 29, and a latch 30 adapted to said notch and to be disengaged 15 therefrom by the other plate, substantially as described, for the purposes set forth.

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

JOHANN HEINRICH FRISCHEN.

Witnesses:

MAX WAGNER,
GEO. H. BENJAMIN.