(No Model.) 2 Sheets—Sheet 1.

W. DAVES.

COMPENSATOR.

No. 518,488. Patented Apr. 17, 1894.

Fig. 1

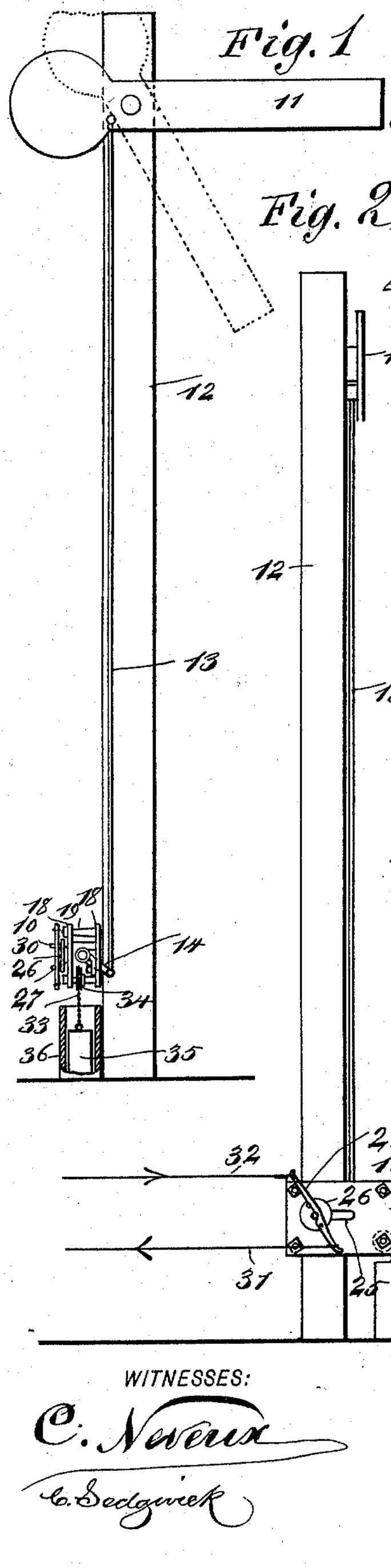


Fig. 2

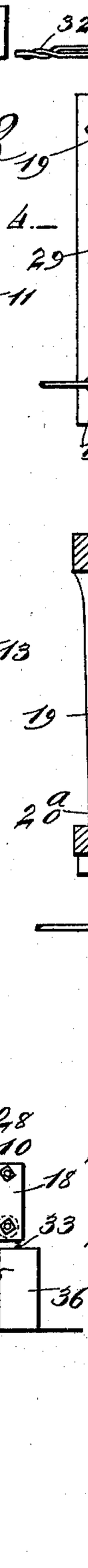


Fig. 3

Fig. 4

Fig. 5

WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR

W. Daves

BY

Munn & Co

ATTORNEYS.

THE NATIONAL LITHOGRAPH'NG COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

W. DAVES.

COMPENSATOR.

No. 518,488. Patented Apr. 17, 1894.

Fig. 6

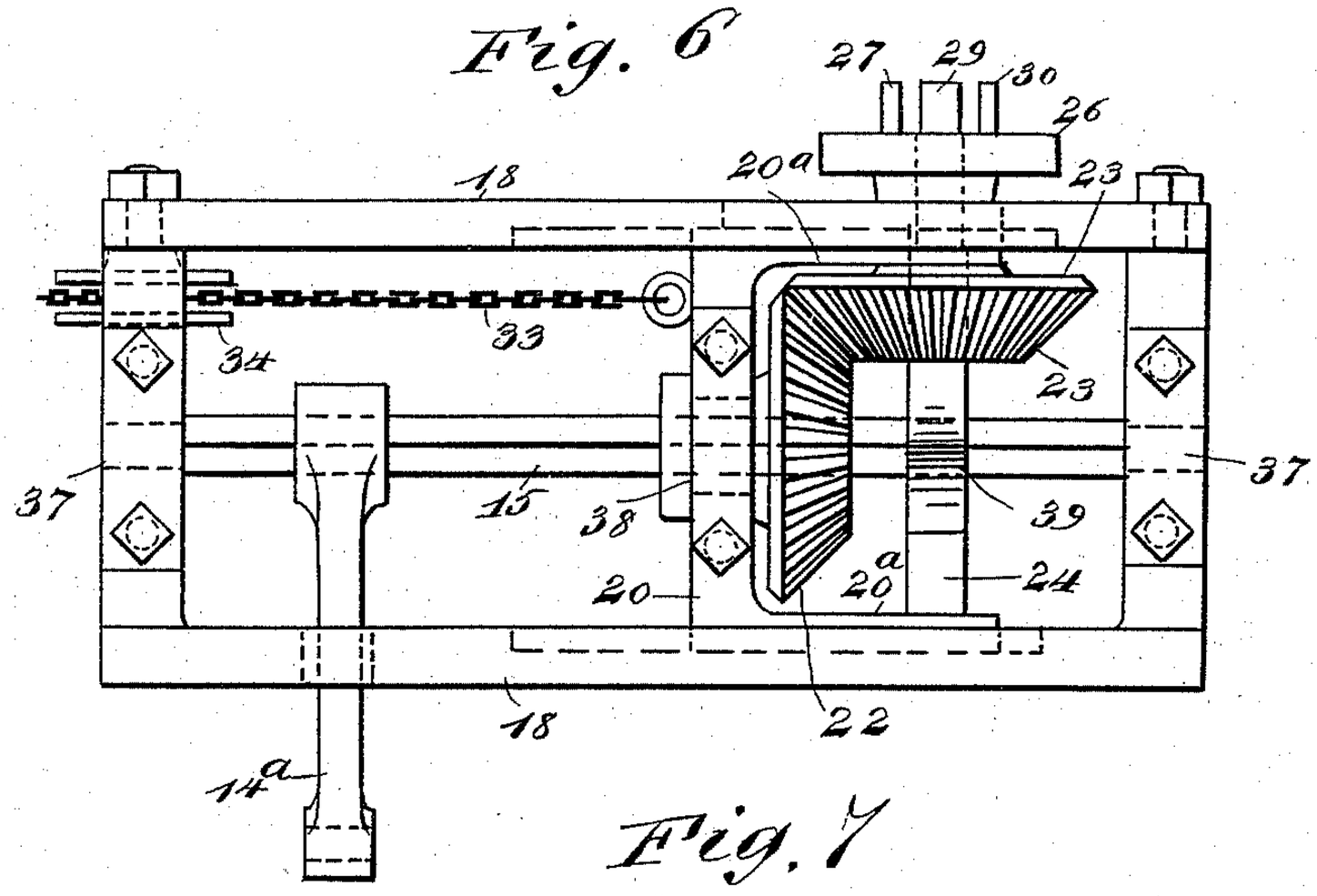


Fig. 7

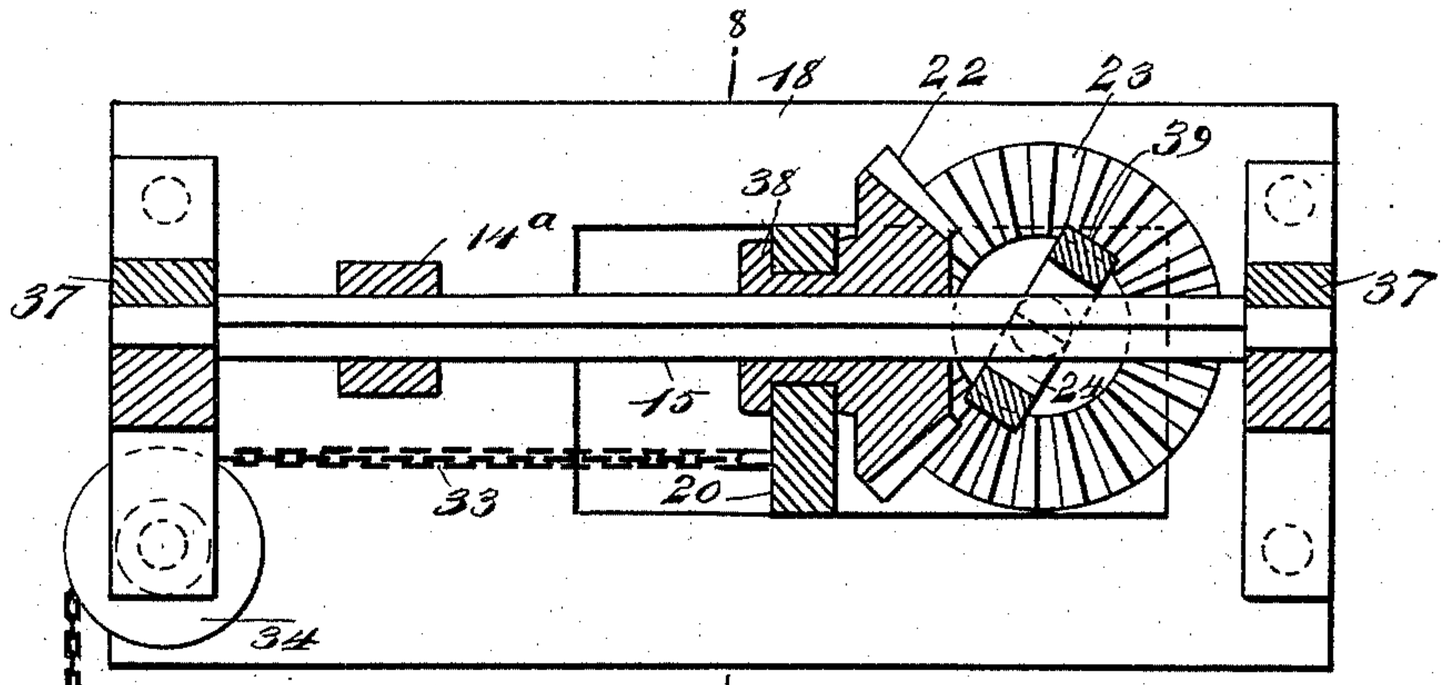
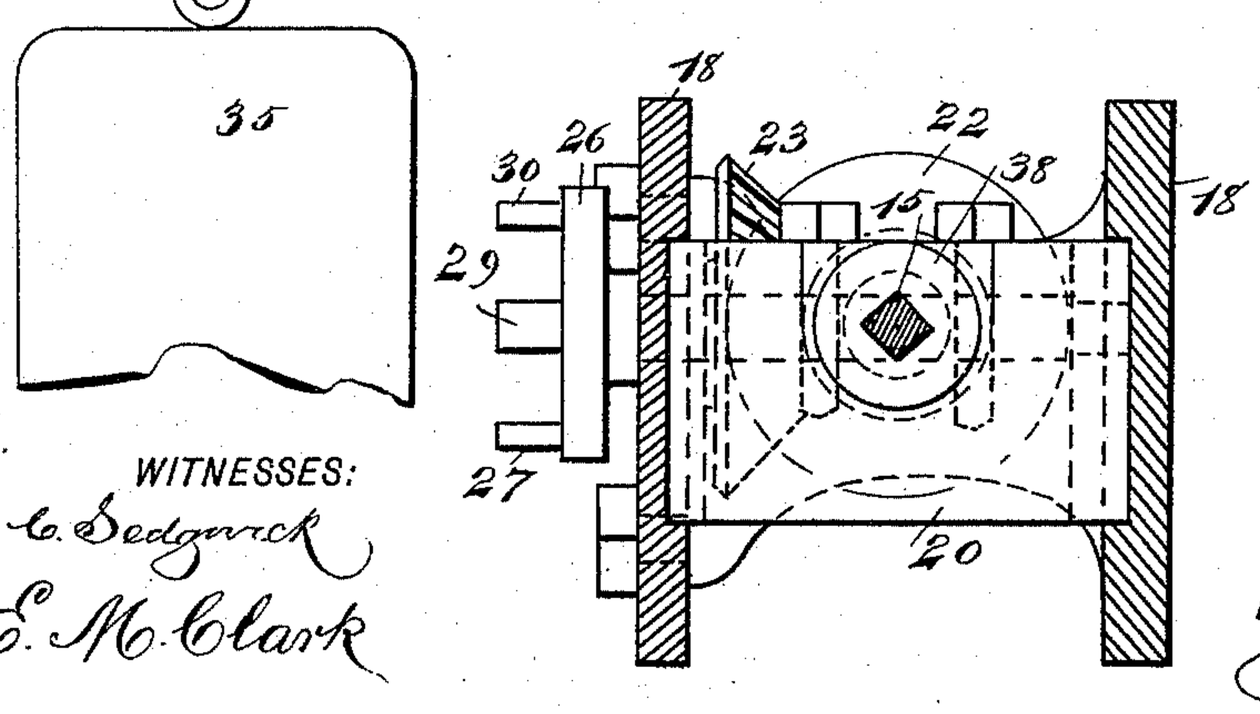


Fig. 8



WITNESSES:
C. Sedgwick
E. M. Clark

INVENTOR
W. Daves
BY Munn & Co
ATTORNEYS.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM DAVES, OF JERSEY CITY, NEW JERSEY.

COMPENSATOR.

SPECIFICATION forming part of Letters Patent No. 518,488, dated April 17, 1894.

Application filed November 13, 1893. Serial No. 490,809. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DAVES, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Compensator, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of devices known as compensators, which are used in connection with various signals and particularly railway signals, to take up the slack in the signal-working wires so as to compensate for the stretching of the wires and their varying lengths under temperature changes. These wires are usually arranged in pairs so as to operate a signal arm to swing it in opposite directions, and it frequently happens that the wires are so slack that it cannot be successfully operated.

The object of my invention is to produce a very cheap and simple compensator, in which the parts are arranged in such a manner that they cannot well get out of order, and also to construct the compensator in such a way that the wires for operating the signal will always be held taut.

A further object of my invention is to construct a compensator in such a way that if either of the operating wires break, the semaphore arm operated by the compensator will swing to a position of danger.

To these ends my invention consists of certain features of construction and combinations of parts as will be hereinafter described and claimed.

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

Figure 1 is a broken side elevation of an ordinary semaphore signal provided with my improved compensator. Fig. 2 is a view taken at right angles to that shown in Fig. 1, and illustrates the arrangement and connection of the operating wires with the compensator. Fig. 3 is an enlarged broken side elevation of the compensator. Fig. 4 is a sectional plan on the line 4—4 of Fig. 3. Fig. 5 is a broken end view of the compensator. Fig. 6 is a plan view of a modified form of the compensator. Fig. 7 is a central vertical longitudinal section of the modified form of compensator; and Fig. 8 is a cross section on the line 8—8 of Fig. 7.

The compensator 10 is used in connection with an ordinary semaphore signal arm 11, which is hung in the usual way on a signal post 12, and the compensator is fastened to the foot of the post or arranged adjacent to the foot of the post, and a rod 13 is pivoted to the semaphore arm and also to a crank 14 on the shaft 15 of the compensator, this shaft being adapted to turn in and slide through a support 16 in the compensator, and to enable it to do this it is mounted in collars 17 which turn in the support 16 and through which the shaft slides. The mechanism of the compensator is held in a suitable frame, comprising opposite side pieces 18 and connecting cross bolts 19, but any suitable frame or casing may be used.

The shaft 15 extends longitudinally in the frame and besides being held in the support 16, is also journaled in a slide 20 which extends transversely in the frame of the compensator and has parallel end portions 20^a which slide in the grooves or ways 21 of the plates or side pieces 18. The shaft 15 projects through the slide 20 and is provided with a beveled gear wheel 22, which meshes with a gear wheel 23 on a shaft 24, this shaft being arranged at right angles to the shaft 15 and being journaled in the parallel end portions 20^a of the slide 20.

The shaft 24 projects through one side of the compensator frame, being held to slide in a slot 25 in one of the plates or side pieces 18, so that the shaft will move with the slide 20; and on the outer end of the shaft 24 is a collar 26, which has on its side and near one edge a pin 27 on which is pivoted the lever 28 which lever extends transversely across the outer side of the collar, resting near the center on a projecting rounded end portion 29 of the shaft 24, and the lever also rests against a stud 30 on the collar, this stud being diametrically opposite the pin or stud 27.

The lever 28 projects from opposite sides of the collar and to its ends are secured the wires 31 and 32, which are worked by a lever mechanism in the ordinary way to operate the semaphore, the wire 31 being pulled to throw the semaphore to a position of safety and the wire 32 being released when the wire 31 is pulled. The wires 31 and 32 are held taut when operated, but the wire 32 is permitted to move in the opposite direction to the movement of the wire 31, consequently when the wire 31 is pulled, it tilts the lever 28, as shown

by dotted lines in Fig. 3, and the lever, acting on the collar 26 and shaft 24, turns the shaft, which, by means of the gears 23 and 22, turns the shaft 15 and the latter swings the crank 14 upward, thus raising one end of the semaphore arm 11 and lowering the other end into a position of safety as shown by dotted lines in Fig. 1. When the wires are moved in the opposite direction, the reverse action takes place, the crank 14 being swung downward thus pulling down one end of the semaphore arm 11 and swinging the other end into a position of danger as shown by full lines in Fig. 1.

It will be seen then from the above description that the semaphore arm may be manipulated by pulling the wires 31 and 32 precisely as when the ordinary mechanism is used. To hold the wires taut, a weight is used and a cable 33 is secured to the slide 20, as shown best in Figs. 3 and 4, the cable extending outward through one end of the compensator frame over a guide pulley 34 and having the weight 35 secured to its free end. The weight is preferably arranged to hang in a suitable housing 36, but this may be dispensed with if desired. It will also be understood that a spring may be substituted for the weight and cable, although the latter are preferably used.

It will be seen that the weight 35 hanging on the back of the slide 20 as it does, will pull the slide, the shaft 24 and the lever 28, back so as to keep the wires 31 and 32 taut, and if the latter contract they draw up the weight somewhat, so that the wires are taut without regard to the position of the shaft 24, and the signal may therefore, at all times, be readily operated.

In Figs. 6 to 8 I have shown a modified form of the apparatus in which the shaft 15 is held in stationary bearings, and the slide 20 moves on the shaft. As here illustrated, the shaft 15 extends the full length of the frame and its ends are journaled in suitable bearings therein, as shown clearly at 37 in Fig. 7. The shaft 15 is square, and the gear wheel 22, which is carried by the slide 20, is adapted to slide on the shaft, but of course turns therewith. The gear wheel 22 is journaled in the slide 20, as shown at 38, so that it moves with the slide and turns with the shaft 15.

The shaft 24 is widened and split in the center, as shown at 39, so that the shaft 15 may pass through it, and the hole in the shaft 24 is of sufficient size to permit the shaft and its gear wheel 23 to have enough movement to operate a signal, which movement is only about forty-five degrees. It will be seen that the slide 20 may move as freely in this form of machine as in the other, and that the two gear wheels will always be in mesh and in position to operate the signal.

The operating wires are connected with the shaft 24 exactly as described, but a crank 14^a is mounted on the shaft 15 and swings in a slot of the main frame, instead of being supported in a bracket 16 like the crank 14 described above. When either form of the device is used, if one of the wires 31 or 32 breaks while the semaphore signal is in the position of danger, the semaphore will, of course, remain in the said position, for the lever 28 will swing freely on the pivot 27 and the counterbalance of the semaphore will hold the latter in the danger position. If, on the other hand, either wire should be broken while the semaphore is in a position of safety, the lever 28 will swing out of operative position and the lessening of the tension of the wires will permit the counterbalance of the semaphore arm to swing the said arm into a position of danger.

I have shown and described a compensator provided with a single pair of shafts 15 and 24, adapted to operate a signal semaphore arm, but it will be understood that the slide 20 and the supporting frame may carry several sets of shafts and operating wires, so that a number of semaphore arms may be operated by the same machine.

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

1. A compensator, comprising a supporting frame, a slide mounted in the frame, gear wheels meshing with each other and carried by the said slide, a signal arm operatively connected with the shaft of one of said gear wheels, a lever operatively connected with the shaft of the other gear wheel and with the signal working wires, and means substantially as described for pulling the slide against the tension of the wires, as and for the purpose set forth.

2. A compensator, comprising a supporting frame, a slide mounted in the frame, a longitudinal shaft carried by the slide, a crank arm mounted on the shaft and operatively connected with a signal arm, a transverse shaft carried by the slide and geared to the longitudinal shaft, a lever operatively connected with the transverse shaft and with the signal wires, and means, as a weight, to pull the slide against the tension of the wires, substantially as described.

3. A compensator, comprising a supporting frame, a slide held to move longitudinally in the frame, a longitudinal shaft carried by the slide, a crank arm on the shaft arranged to have the shaft slide through it, a transverse shaft carried by the slide and geared to the longitudinal shaft, a collar on the transverse shaft, a lever pivoted on the collar and adapted to engage the end of the transverse shaft, the signal operating wires secured to the opposite ends of the lever, and means, as a weight, for moving the slide against the tension of the wires, substantially as described.

WILLIAM DAVES.

Witnesses:
WARREN B. HUTCHINSON,
EDGAR TATE.