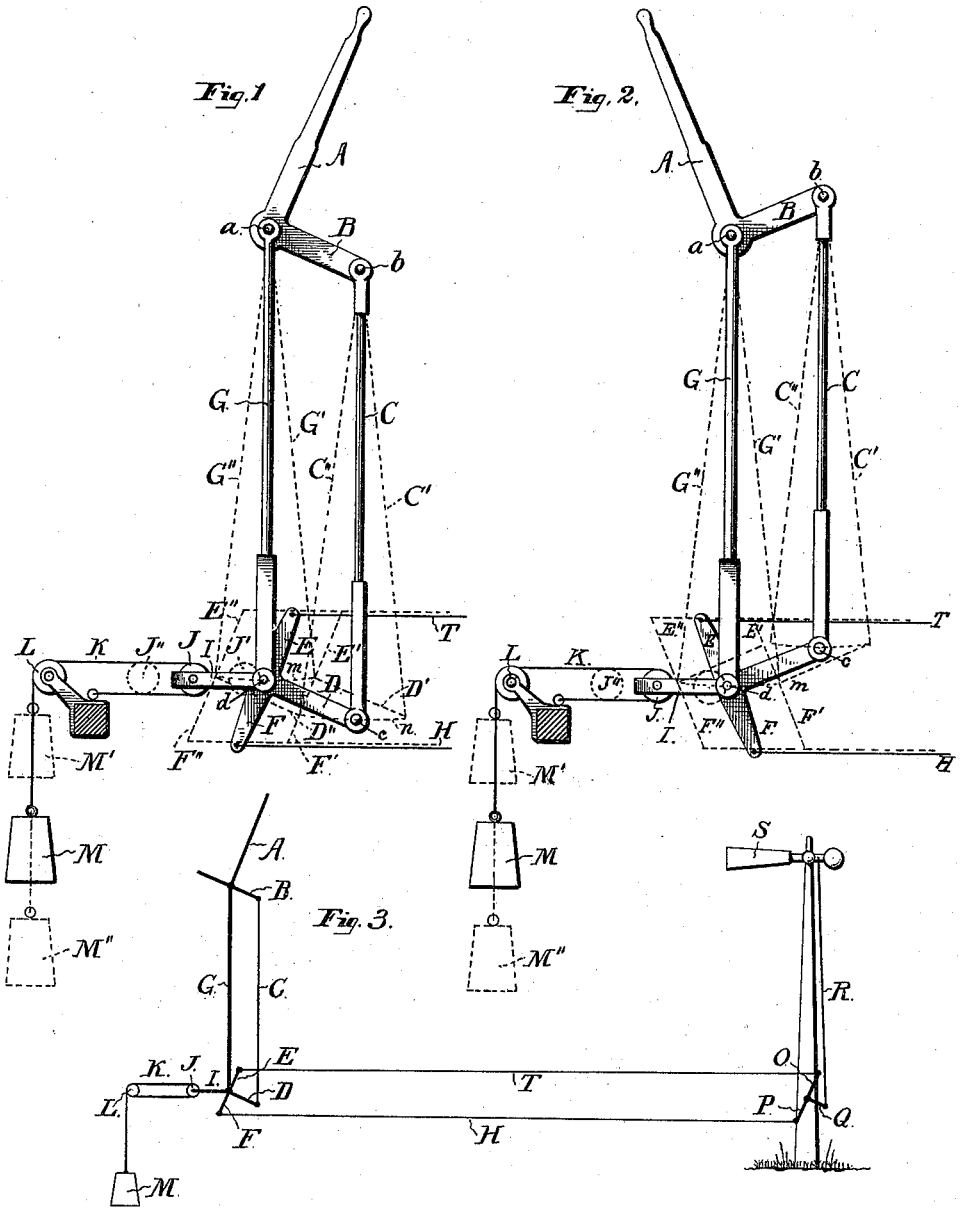
(No Model.) 2 Sheets—Sheet 1.

J. J. TURNER.

SIGNAL COMPENSATOR.

No. 385,025. Patented June 26, 1888.



WITNESSES:

Isaac Norris Wm

Joshua Wallack, Jr.

INVENTOR.

James J. Turner

by his attorney,

Francis T. Chambers

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

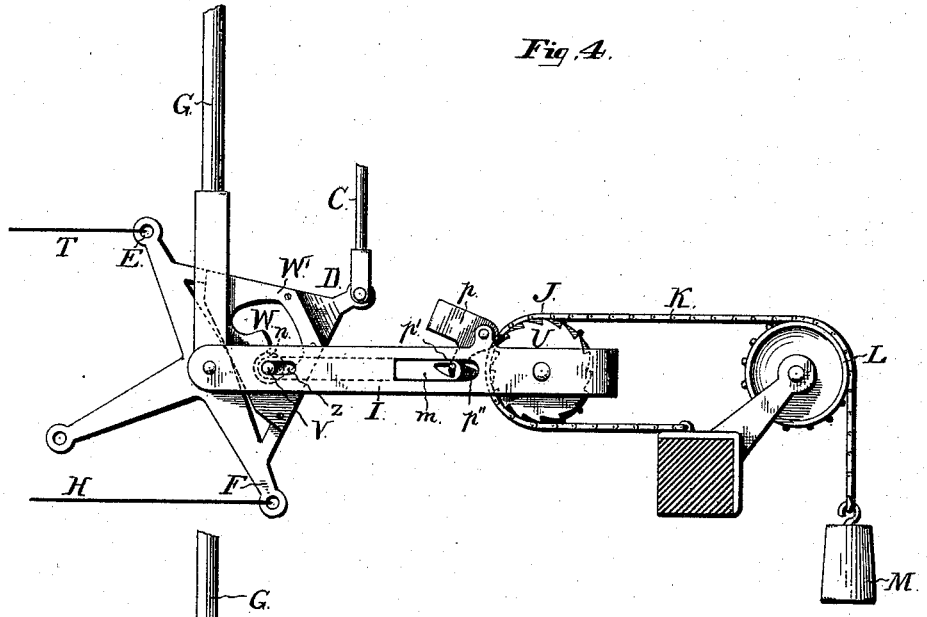


Fig. 5.

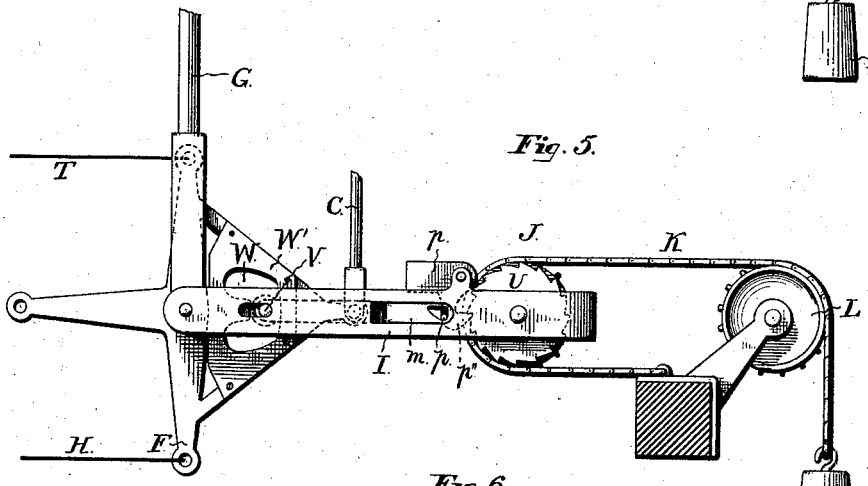
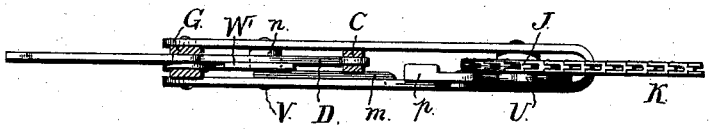


Fig. 6.



WITNESSES:

Isaac Voris 3d

Joshua Wallack, Jr.

INVENTOR,

James J. Turner,

by his attorney,

Francis T. Chambers.

UNITED STATES PATENT OFFICE.

JAMES J. TURNER, OF RICHMOND, INDIANA, ASSIGNOR TO HIMSELF AND JOHN F. MILLER, OF SAME PLACE.

SIGNAL-COMPENSATOR.

SPECIFICATION forming part of Letters Patent No. 385,025, dated June 26, 1888.

Application filed January 24, 1888. Serial No. 261,810. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. TURNER, of Richmond, county of Wayne, State of Indiana, have invented a new and useful Improved Compensator for Railway Signal and Switch Connections, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

Many devices have been used for counteracting the effect of the changes of length which are constantly taking place in connecting-lines between the operating-levers and the switches, signals, or locks which they actuate.

My object is to provide a compensator of greater simplicity and certainty of action than those with which I am familiar; and my invention consists of the arrangements and combinations of parts, hereinafter described, and which are illustrated in the drawings, in which—

Figure 1 is an elevation of my improved compensator; Fig. 2, a similar view showing the lever in a different position; Fig. 3, a diagram showing the connection between my compensator and a signal; Fig. 4, an elevation of the lower part of my device, illustrating a safety device which I prefer to use in connection with it. Fig. 5 illustrates the parts shown in Fig. 4 in the position they occupy during a portion of the movement of the actuating-lever, and Fig. 6 is a plan view of the construction shown in Figs. 4 and 5.

A B indicate two arms of a lever pivoted at *a* to any stationary frame or support.

G and C are rods suspended, respectively, from the pivot *a* and a point, *b*, on the end of arm B.

D E F is a double-bell-crank lever, the central arm, D, of which is pivoted at *d* and *c* to the ends of the rods G and C. To the ends of the arms E and F are attached the signal-connections T and H, which are secured at their other ends to the arms O and P of a bell-crank lever, Q O P, the signal being directly connected with and operated by the arm Q. (See Fig. 3, in which the semaphore S is connected with arm Q by a wire, R.)

I is a strap pivoted to the bell-crank lever D E F at *d*, and forming the bearings for a pulley, J.

L is a stationary pulley secured on the frame or some fixed base.

K is a cord or chain secured to a fixed point at one end, thence passing around pulleys J and L, and having a weight, M, attached to its other end. These elements, as combined in Figs. 1, 2, and 3, constitute the main feature and basis of my invention. The bars G and C and the lever-arms B and D are so connected as to form a parallelogram, from which it follows that, while the lever D E F can swing backward and forward, its arms cannot change their angular position so long as the lever A B is stationary. Hence the ends of arms E and F will always move together and to the same distance as the bars G and C swing on lever A B.

The arms E F and O P are also arranged to form a parallelogram with the connecting-wires T H. The weight M, acting through cord K on the center of lever D E F, keeps the connecting-wires T H pulled tight, taking up any expansion and yielding to any contraction of the wires without in any way altering the inclination of the lever-arms E F and O P. The dotted lines in Figs. 1 and 2 indicate the difference in position of the movable parts arising from temperatures, D′, E′, F′, and J′ representing their position when the wires T H are contracted by cold, and D″, E″, F″, and J″ their position when the wires are expanded by heat.

When it is desired to move signal S, the lever A B is turned on its pivot *a*. The arm D of course moves to the same angular position as arm B, and the arms E and F turn on their pivot *d*, which remains stationary, and, acting through the wires T H, they turn the arms O P to a similar position and the arm Q through an equal angle.

In case the wire through which the lever D E F pulls upon the lever Q O P should be jammed or bound to such an extent that it would offer a resistance greater than the pull of the weight M, the bars G C, instead of remaining fixed, would, when lever A B was turned, swing forward, in which case the motion of the lever A B would not be transmitted to lever Q O P, and through it to the signal R. To avoid this danger, I have devised the safety-catch illustrated in Figs. 4, 5, and 6, in which the arm D of lever D E F is shown

as broadened out into a plate, W′, in which is formed a curved guide-slot, W. In this slot is inserted a pin, V, attached to a bar, *m*, which is secured along one side of the strap I, so as to move longitudinally. Preferably a friction wheel or sheave, *n*, should be used around pin V, so as to diminish friction with the slot W. At its other end, *p*′, the bar *m* is attached to a pawl, *p*″, preferably secured on a pivot and provided with a counter-weight, *p*, as shown.

U is a ratchet-wheel secured on one side of pulley J. When the lever D E F is in the position shown in Fig. 4, the pawl *p* is drawn back out of contact with the ratchet-wheel U and the weight sustains the parts of the connection; but as the lever is moved into the position shown in Fig. 5 the slot W pushes the bar *m* forward and allows the pawl to engage the ratchet-wheel, which results in locking the pulley J so that it cannot turn, and it is thus made impossible for any resistance in the wires T or H to pull the lever D E F forward, especially so where the pulley J is a sprocket-wheel and the cord K a chain, as shown.

The weight M can of course be made to act directly on the pivot of the bell-crank lever D E F without the intervention of the pulley J. This pulley is highly advantageous, however, especially when the locking device which I have described is to be used.

The essential features of the locking device are the ratchet-wheel, the pawl, and the connecting device between the pawl and the bell-crank lever, by which the motion of the lever will engage and disengage the pawl with the ratchet. The connecting device shown is a simple and efficient one, but is of course, like all similar devices, subject to a great number of modifications.

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

1. In a compensator, the combination of a pivoted operating-lever, rods of equal length suspended, respectively, from the pivot and the extremity of one arm of said lever, a double-bell-crank lever having its central arm of equal length to the arm of the operating-lever, from which the rods depend, said bell-crank being suspended centrally on the rod depending from the pivot of the operating-lever and at the end of its central arm on the other rod, a weight arranged to connect with the center of the bell crank and pull it in the direction opposite to that of its attached connections, and parallel signal-connections attached to the outer arms of the bell-crank.

2. In a compensator, the combination of a pivoted operating-lever, rods of equal length suspended, respectively, from the pivot and the extremity of one arm of said lever, a double-bell-crank lever having its central arm of equal length to the arm of the operating-lever, from which the rods depend, said bell-crank being suspended centrally on the rod depending from the pivot of the operating-lever and at the end of its central arm on the other rod, a strap pivoted at the center of the bell-crank lever and forming bearings for a pulley, a ratchet-wheel secured on one side of said pulley, a pawl arranged to engage the ratchet-wheel and secured to a connecting device, whereby said pawl will be engaged with and disengaged from the ratchet-wheel, according to the position of the bell-crank lever, a weight arranged to draw on the bell-crank by means of a cord passing over the pulley aforesaid, and signal-connections attached to the outer arms of the bell-crank and running in a direction opposite to the pull of the weight.

3. In a compensator, the combination of a pivoted operating-lever, rods of equal length suspended, respectively, from the pivot and the extremity of one arm of said lever, a double-bell-crank lever having its central arm of equal length to the arm of the operating-lever, from which the rods depend, said bell-crank being suspended centrally on the rod depending from the pivot of the operating-lever and at the end of its central arm on the other rod, a strap pivoted at the center of the bell-crank lever and forming bearings for a sprocket-pulley, a ratchet-wheel secured on one side of said pulley, a pawl arranged to engage the ratchet-wheel and secured to a connecting device, whereby said pawl will be engaged with and disengaged from the ratchet-wheel, according to the position of the bell-crank lever, a sprocket-chain passing over the sprocket-pulley, a weight attached to said chain, and parallel signal-connections attached to the outer arms of the bell-crank lever and extending in a direction opposite to the pull of the weight.

JAMES J. TURNER.

Witnesses:
W. W. RICHARDSON,
E. P. HUTTON.