(No Model.)

J. J. TURNER.

DEVICE FOR ACTUATING RAILWAY SIGNALS.

No. 382,284. Patented May 1, 1888.

Fig. 3

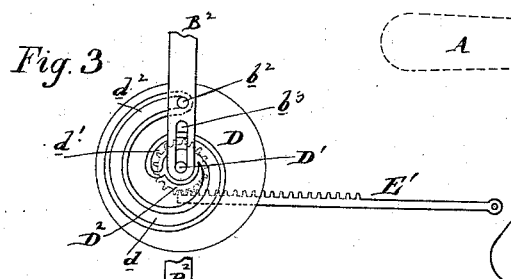


Fig. 4

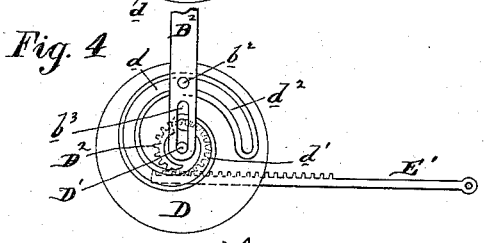


Fig. 5

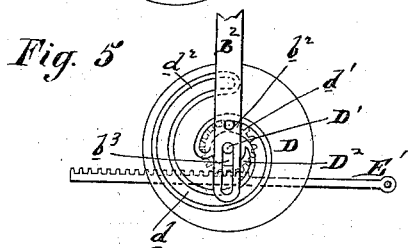


Fig. 6

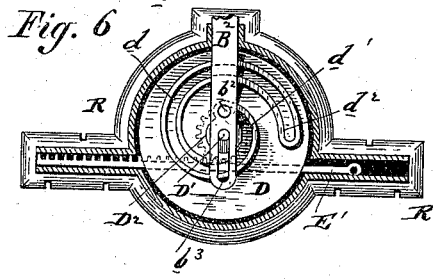


Fig. 1

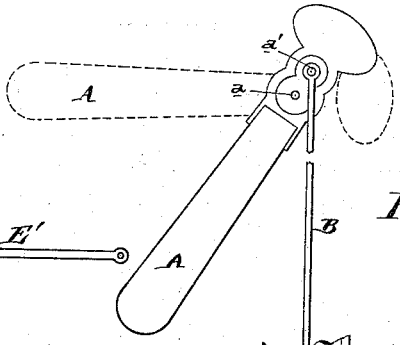
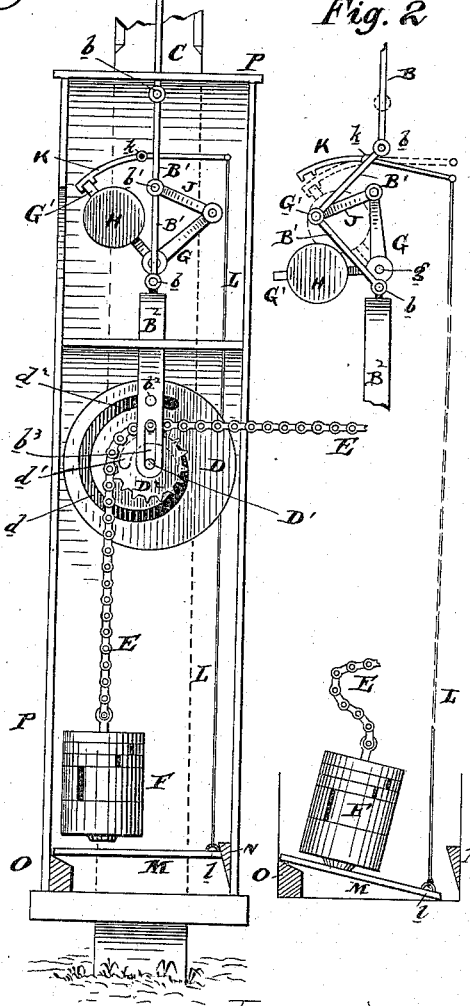


Fig. 2



Witnesses,
F. C. Hart Powell,
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.

DEVICE FOR ACTUATING RAILWAY-SIGNALS.

SPECIFICATION forming part of Letters Patent No. 382,284, dated May 1, 1888.

Application filed March 3, 1887. Serial No. 229,491. (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 Improvement in Devices for Actuating Railway-Signals and Compensating for Expansion or Contraction in the Actuating-Connection, of which the following is a true and exact description, due reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to devices for actuating the signals on railway-lines, and also for the similar uses of actuating the switches and switch-locks, and has for its object to improve the safety and efficiency of the connection to the signal or other movable element, to insure that the possible expansion and contraction of the connecting-line shall not prevent the correct setting of the signal or other element, and to provide for the setting of the signal to "danger" in case of the breaking of its actuating-connection.

A further object of my invention is to so connect a signal with its actuating-line, having an operating-lever on one end and a weight or spring on the other end, that the weight shall act on the signal to bring it to "safety," while the "danger" position is brought about by a pull on the lever against the weight. This is desirable, as in case of the sagging of the connecting-line from any cause the effect of the pull is to hold the signal to "danger," and is, besides, a construction easier to operate and more reliable than where the opposite plan is pursued, and I have provided against its chief danger by the device for causing the signal to go to "danger" in case of a breakage in its connecting-line.

Generally speaking, my invention consists, first, of the device of a pivoted disk grooved first circularly, then spirally, and again circularly, said groove or slot connecting in a novel way with a stud on the device giving motion to the signal or other device, and the disk being connected with and rotated by the signal-connection; second, in the arrangement of a signal-actuating line with a weight and a safety device attached to the signal-rod, so that in case of a breaking of the line the weight will trip the device and cause the signal to go to "danger;" and, lastly, in the particular devices hereinafter fully described, which I have found well adapted to fit my invention, to successful use in the particular arrangement shown in the drawings, in which—

Figure 1 is an elevation showing my improved actuating device and compensator attached to a signal, and showing also the safety-trip provided in case of the breaking of the signal-connection. Fig. 2 shows the safety-trip in operation. Figs. 3, 4, and 5 show my actuating device and compensator in different positions, illustrating its action, showing also a modification in its connection with the actuating-line; and Fig. 6 shows the device in another position, showing it also as incased in a frame well suited for it when laid upon the ground.

A is an ordinary semaphore-signal; B, the connecting-rod which operates it. B′ B′ are sections of the connecting-rod hinged at *b b* and *b′*; and B^2 is the end of the rod, having a stud, b^2, and slot b^3; C, the signal-post, cut away as unnecessary in the drawings.

D is the actuating and compensating disk which I employ, it having a centrally-placed pivot or journal, D′, and an attached driving-gear, D^2. (Shown in Fig. 1 as a sprocket-wheel and in the other figures as a spur-pinion.)

d′ d d^2 is the groove in disk D, the parts *d′* and d^2 being circular and concentric around the pivot D′, said parts being connected by part *d*, which is a spiral of easy ascent. The radial distance between *d′* and d^2 is equal to the extent of motion which it is designed the connecting-rod shall have, and the length of the circular parts *d′* d^2 of the groove being slightly in excess of any anticipated change in the length of the actuating-connection.

E is the actuating-connection, here in Fig. 1 shown as terminating in a drive-chain passing over the sprocket-wheel D^2, and in the other figures as terminating in a rack engaging with the pinion D^2.

F, Fig. 1, is a weight attached to the end of the chain E.

G, Fig. 1, is a bell-crank lever pivoted about in line with the rod B, and having a heavy weight, H, attached to one arm, and a connecting rod, J, pivoted to the end of the other

arm and to the joint b', formed at the union of the two hinged sections B' B' of rod B. At the opposite end, G', of lever G is engaged the catch-lever K, pivoted at k, and having its other end attached to a cord, L, which runs below the level of weight F, and is attached at l to the edge of the platform or bar M. The end l of this platform M is prevented from rising by the detent N, and its other end rests on a detent, O, or may be hinged.

P is a casing, as is also R of Fig. 6, each adapted for the use and position of my disk and connected mechanism.

The action of the disk in actuating a signal or other device is easily followed. The pin b^2 of the connecting-rod is engaged in the slot d' d d^2, and the rod is probably further guided by providing it with a slot, b^3, which passes over the end of pivot D'—a device which I believe novel and having advantages over the plans heretofore used.

The actuating-connection being geared with the wheel D^2, it is evident that any movement of said connection will cause the disk to revolve, and when the stud b^2 passes into the spiral part d of the slot the attached rod B is caused to move in one direction or the other, according to the direction of rotation.

It is also evident that so long as pin b^2 is in the circular slots d' or d^2 no movement of the rod B follows the rotation of the disk, and by making the length of these slots equal to the maximum variation of the actuating-line all such variations are compensated for and a positive connection between the operating-lever and signal insured.

Passing now to my safety device, it will be noticed that by putting the links B' B' in the connecting-rod B and pivoting the rod J at their center the up-and-down movement of rod B is not interfered with, the rod J oscillating on its pivotal connection with bell-crank G and the sections B' B' bending slightly as they go up and down.

In case of the breaking of the connection E the signal would, if connected as shown, be at once drawn to "safety;" but the fall of the weight F on platform M will press its end l down, and, acting through chord L upon lever K, disengage the weighted end G' of the bell-crank G, which immediately falls, as shown in Fig. 2, and through the rod J pulls the signal to "danger," and keeps it there independent of the position of its ordinary actuating device.

My safety-trip may evidently be used where other actuating devices than the disk D are used, and of course the disk may be operated by a positive connection as well as by the weighted line shown, and may be made reversed, so as to operate in the opposite direction to that shown. Instead of gear or sprocket wheels D^2, pulleys or any other actuating devices may be used to connect the disk with the actuating-line. All these uses are within my invention, the particular arrangement shown being given by me because I believe it to be the best.

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

1. As a device for actuating signals, switches, or switch-locks, the rotating disk D, having concentric circular slots d' d^2, and spiral slot d, in combination with a connecting-rod having a stud adapted to enter and be guided by said slots and a slot adapted to pass over a projection of the disk's pivot, all substantially as and for the purpose specified.

2. In combination with a device for actuating a signal, substantially as specified, the safety device consisting of hinged links B' B', interposed in the connecting-rod B, the bell-crank lever G, the connecting-rod J, pivoted to one end of the bell-crank and to the joint b' of links B' B', the weight H, secured on the other arm of the bell-crank, the detaining clutch-lever K, and platform M, united by cord L, all combined, substantially as specified, so that the dropping of the weight F, secured to the actuating-connection of the signal, will release the clutch and permit the weighted bell-crank lever to draw the signal to "danger."

3. The combination of disk D, having grooves d' d d^2, and sprocket-wheel D^2, the connecting-rod B, having stud b^2, and hinged links B' B', the drive-chain E, having weight F, and the safety device consisting of the weighted bell-crank lever G, link J, clutch-lever K, connecting-cord L, and platform M, all substantially as and for the purpose specified.

JAMES J. TURNER.

Witnesses:
LISLE STOKES,
JOSHUA MATLACK, Jr.