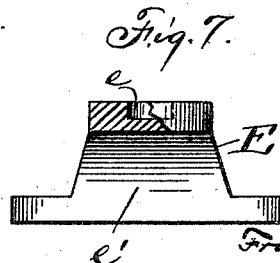
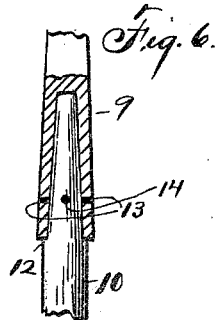
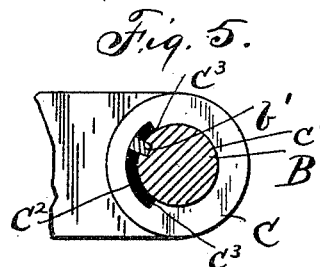
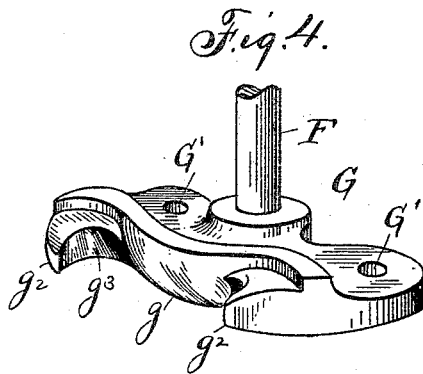
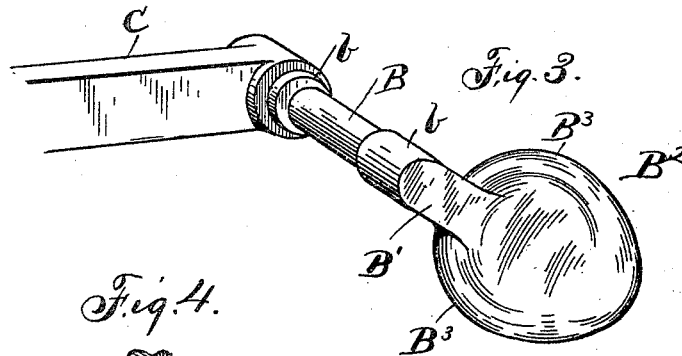
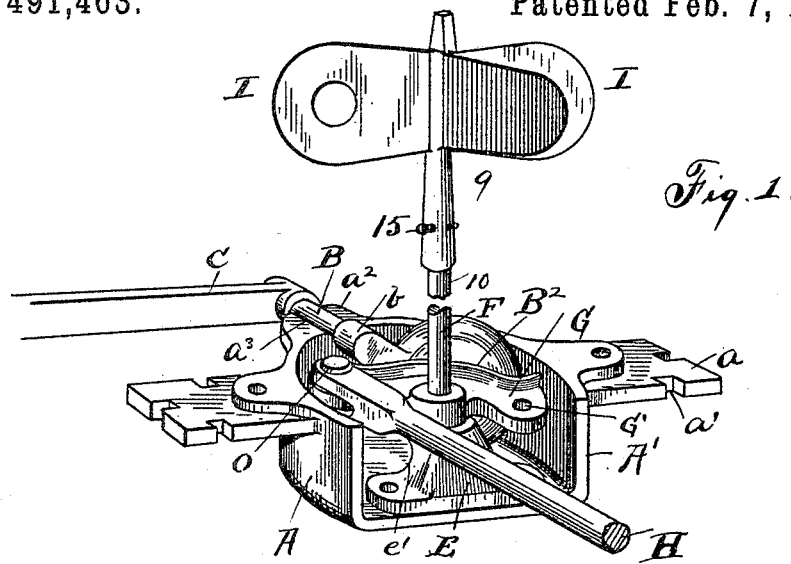


F. A. BEEMAN.
SWITCH STAND.

No. 491,463.

Patented Feb. 7, 1893.



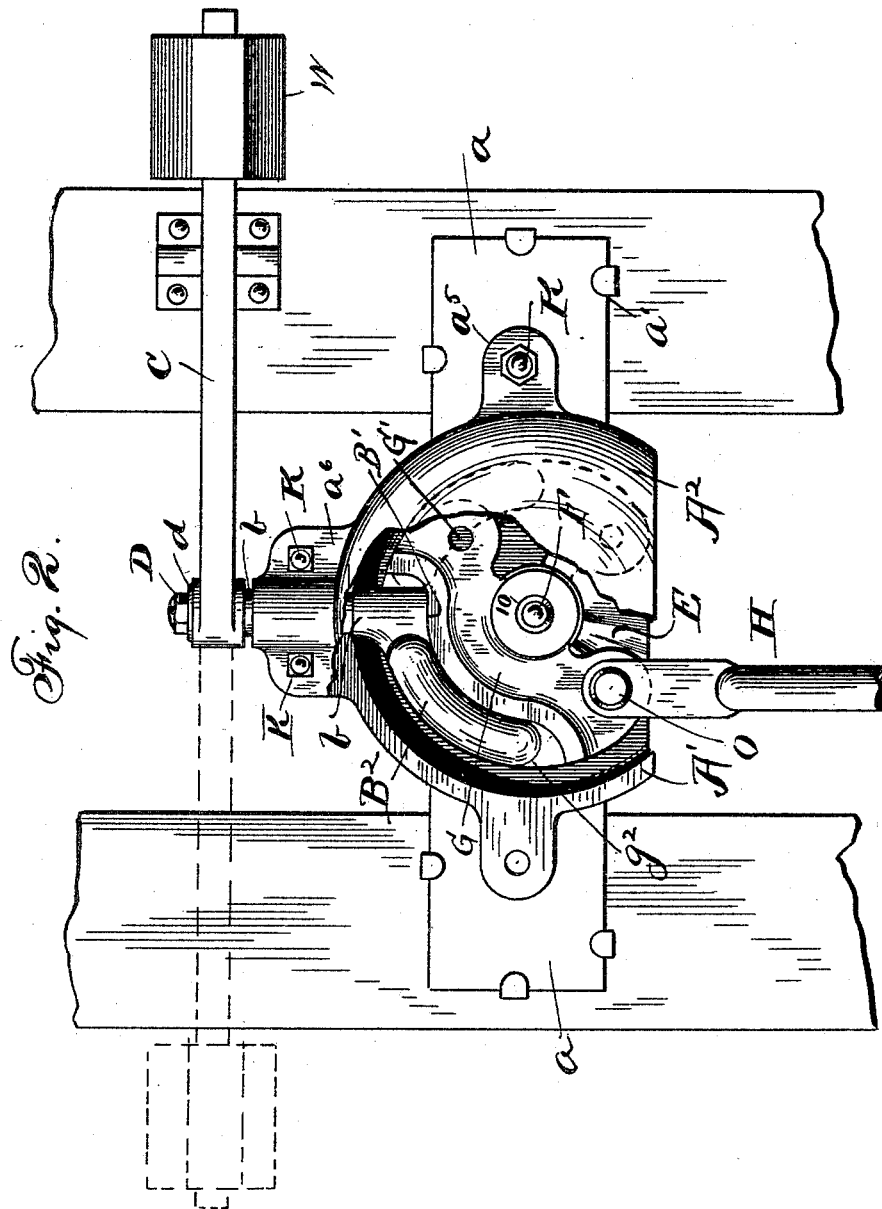
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[Signature]

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UNITED STATES PATENT OFFICE.

FRANK A. BEEMAN, OF CLEVELAND, OHIO, ASSIGNOR OF TWO-THIRDS TO
CLARENCE A. CARPENTER AND EDWARD A. HANDY, OF SAME PLACE.

SWITCH-STAND.

SPECIFICATION forming part of Letters Patent No. 491,463, dated February 7, 1893.

Application filed February 8, 1892. Serial No. 420,695. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. BEEMAN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and
5 useful Improvements in Mechanism for Operating Railway Switches and Attachments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in
10 the art to which it pertains to make and use the same.

My invention relates to improvements in switch-stands wherein the mechanism is adapted to be automatically operated by a
15 passing car, locomotive or train, and designed to be replaced by hand after the passage of the train, locomotive or car, and more especially to mechanism that is equally applicable to stub and split-switches and adapted to
20 simultaneously operate the switch and switch-signal.

My invention also relates to certain features of construction and in combination of parts hereinafter described and pointed out
25 in the claims.

In the accompanying drawings, Figure 1 is a view in perspective of my improved mechanism, portions being broken away or removed to reduce the size of the drawing and more
30 clearly show the construction. Fig. 2 is a plan of my improved mechanism secured to a pair of railway-ties with the signal and the upper portion of the signal-shaft removed and showing in solid and dotted lines, respectively, reverse positions of the mechanism.
35 Figs. 3, 4, 5, 6, and 7 are views in detail, Figs. 3 and 4 being in perspective, and Figs. 5 6 and 7 elevations partly in section.

A represents a metallic casing that, for the sake of economy, comprises preferably a cast-iron box circular in plan and horizontal section, and cut away and open on the side adjacent the track, as at A'.
40

Casing A is preferably adapted to fit between a pair of ties and at the upper end has laterally-projecting flanges, a , located preferably diametrically opposite and being notched or slotted at the edges, as at a' , for receiving
45 spikes for securing the casing to the ties.

Casing A, at the upper end, has also a laterally-projecting flange, as at a^2 , located preferably midway between and at right angles to flanges a , that is, parallel with the ties and at right angles to the track. Flange a^2 is grooved, as at a^3 , to afford bearing for a shaft, B, the latter being enlarged at either end of its bearing, as at b . Shaft B, at its outer end, has loosely mounted thereon a hand-lever, C, suitable means, however, being provided for preventing the hand-lever from moving end-
50 wise of and off the shaft, for instance, by the provision of a nut, D, mounted on the screw-threaded outer end of the shaft, with a washer, d , interposed between the nut and lever.

The inner and enlarged end of shaft B, that is located inside of casing, A, is provided with a laterally-projecting arm B', that, as shown, terminates in a cam, B², the latter being preferably circular and dish-shaped or concave as shown, and rounded at the edges, as at B³,
55 the cam projecting endwise as well as laterally of shaft B.

Integral with, or rigidly secured to, the bottom of casing A is a block, E. Block E, at the top and preferably at the central portion, has a socket, as at e , (see Fig. 7) affording
60 suitable bearing for the upright shaft F of the switch-signal, shafts F and B being at right angles, or approximately at right angles, to each other.

Shaft F has rigidly mounted thereon, preferably immediately above block E, a cam, G, that projects toward cam B², and the location and shape of cam G relative to cam B² is such that either cam G or cam B², according as the
65 switch is operated by hand, or by a passing engine or car, is adapted to be engaged and actuated by the other cam, and in opposite directions, cam G comprising a central portion, g , and projecting members, g^2 , at either
70 side of said central portion and equidistant from the axis of the cam, portion g of cam G being adapted to engage, or be engaged by, the dish-shaped or concave portion of cam B², and portions g^2 of cam G being adapted to
75 engage, respectively, or be engaged by, opposite edges of cam B², according as the latter is moved in the one direction or the other, the
80

surfaces of portions g^2 of cam G being rounded and preferably somewhat undercut, as at g^3 , and the surfaces of portion g being rounded and convex, as at g' ; that is, as aforesaid, the surfaces of cams B^2 and G adapted to engage each other are of such form as to render the wear of the parts as little as possible, and I would here remark that the cams are preferably made of steel. Block E is undercut, as at e' , to accommodate the travel of cam B^2 .

H represents a rod or link that connects cam G with the railway-switch, (not shown) the cam being provided with ears vertically perforated, as at G' , for the passage of pin or bolt O that pivotally secures the link or rod to the respective ear of the cam.

A sub-switch requires more throw than a split-switch and hence, as shown, cam G is provided at opposite sides of shaft F, with an ear having a pin or bolt-hole G' the two holes being so located relative to the axis of the cam that as link or rod H is connected with the cam at one pin or bolt-hole, or the other, the throw of said link or rod will be greater or less and the mechanism rendered applicable to either a split or stub-switch, as required.

The switch-signal comprises, as heretofore, four arms or boards, I, rigidly secured to the upper end of signal-shaft F, arms I being arranged radially about shaft F, adjacent arms being arranged at right angles to each other and bearing distinguishing marks or colors, preferably the latter, and opposite arms bearing the same marks or colors. To change signals, it will therefore be observed, shaft F is turned but a quarter of a revolution but to change the position of the switch, as shown in dotted and solid lines Fig. 2, a half revolution of lever C is made. Suitable mechanism is therefore provided whereby shafts B and F are turned but a quarter of a revolution during the full stroke of lever C. Referring to Fig. 5, that exhibits shaft B in cross-section with the adjacent end of lever C in elevation, it will be observed that shaft B is provided with a shoulder or stop, as at b' , and the adjacent end of lever C is perforated or chambered, as at C' for embracing shaft B, chamber C' having a lateral enlargement, as at C^2 , forming shoulders, as at C^3 , at either end of lateral chamber C^2 , said shoulders being adapted, respectively, to engage stop or shoulder b' on shaft B, according as the lever is moved in the one direction or the other, lateral chamber C^2 being of such size circumferentially of shaft B that link or rod H will be thrown the proper distance and shafts B and F will make a quarter of a revolution while lever C is changed from one to the other extreme of its movement shown in solid and dotted lines Fig. 2, lever C making solitarily a portion of its stroke, and the arrangement of parts is preferably such that this solitary movement of lever C will take

place during the first half of the stroke of said lever when the latter is operated by hand to replace the switch. Lever C is preferably weighted or poised, as at W.

A^2 represents a cover for casing A. Lateral flanges $a' a^2$ of casing A are perforated, respectively, and cover A^2 has lateral ears or flanges as at $a^5 a^6$ correspondingly perforated, with the perforations or holes registering with the perforations or holes in the flanges of casing A aforesaid for the reception of bolts, as at K, that securely fasten the parts together. Cover A^2 has a depending flange, (not shown) adapted to close the open side A' of casing A, and, cover A^2 , in shape is like the segment of a sphere, nicely covering the mechanism inside of the casing, flange a^6 of cover A^2 being grooved on the under side to form a cap for the journal-bearing of shaft B.

The signal-shaft F is made in two sections 9 and 10, the upper section 9 being adjustable circumferentially of the lower section 10, being preferably chambered longitudinally, as at 11, (see Fig. 6) for embracing the upper portion of the lower section 10, the latter having preferably a shoulder, as at 12, upon which the lower end of section 9 rests, and chamber 11 and upper portion of section 10 being preferably correspondingly tapering toward their upper end so that the parts will nicely fit each other, the chambered portion of section 9 having two or more lateral holes or perforations, 13, with adjacent holes at right angles or approximately at right angles to each other, that are adapted to register with a suitable hole, as at 14, in the upper portion of member 10, for the reception of a pin or other suitable means, as at 15, to lock the upper section 9 in its adjusted position.

With such construction it will be observed that the switch-signal can be manipulated independently of the other mechanism, a matter of no inconsiderable importance, for, by this provision, if it were found that the proper color or signal were not presented in any particular position or situation of the switch, the upper section of the signal-shaft could be readily adjusted to present the color or signal required.

My improved mechanism is not only very convenient, but is durable, and exceedingly simple in construction.

Although I prefer the construction shown, wherein lever C is loosely mounted on shaft B, said lever might be rigidly mounted on said shaft and the position and shape of cam B^2 and G altered to meet the requirements, without departing from the spirit and purpose of my invention.

What I claim is:—

1. In a switch-stand, in combination, two cams adapted to engage each other and having their axes at right angles or approximately at right angles to each other, suitable means for operatively connecting the one cam

with the railway switch, and a lever operatively connected with the other cam, substantially as set forth.

2. In a switch-stand, in combination, two shafts arranged at right angles or approximately at right angles to each other and a cam on each of said shafts, said cams being adapted to engage each other and communicate motion from the one shaft to the other, suitable means, comprising a link or rod, for operatively connecting the one cam with the railway-switch, and a lever operatively connected with the shaft carrying the other cam, substantially as set forth.

3. In a switch-stand, the combination with two shafts and a cam on each of said shafts, said cams being adapted to engage each other and communicate motion from the one cam to the other, of a link or rod for operatively connecting the one cam with the switch, said last-mentioned cam having two ears or members provided each with a vertical pin or bolt-hole so located that as said link or rod is pivotally secured at one or the other of said holes the throw of said link or rod will be greater or less as the case may be, substantially as set forth.

4. In a switch-stand, the combination with a casing having a lateral flange or member, a horizontal shaft having bearing in said lateral flange or member of the casing, a cam rigid with said shaft and a lever operatively connected with the shaft, of a block integral with or rigidly secured to the bottom of the casing, an upright shaft having bearing in said block and a cam rigid with said upright shaft and adapted to engage or be engaged by the cam on the horizontal shaft, and suitable means for operatively connecting the cam on the upright shaft with the switch, substantially as set forth.

5. In a switch-stand, the combination with a casing having a lateral flange or member, a horizontal shaft having bearing in said lateral flange or member of the casing, and a cam, as at B², rigid with said shaft inside of the casing, of a block integral with or rigidly secured to the casing and undercut to accommodate the movement of the cam aforesaid, an upright shaft having bearing in said block, a cam, as at G, rigid with said upright shaft, and suitable means for operatively connecting said cam G with the switch, the aforesaid cams being adapted to engage each other and communicate motion from the one to the other, substantially as set forth.

6. In a switch-stand, the combination with a switch-signal-bearing shaft and a cam rigid with said shaft, of a horizontal or approximately horizontal shaft, as at B, a cam, as at B², rigid with said shaft B, and a lever, as at C, operatively mounted on shaft B, cam B² being adapted to engage and communicate motion to the cam on the switch-signal-bearing shaft, substantially as set forth.

7. In a switch-stand, the combination with

a switch-signal-bearing shaft, and a cam rigid with said shaft and suitable means for operatively connecting said cam with the railway-switch, of a shaft, as at B, arranged at right angles or approximately at right angles to said switch-signal-bearing shaft, a cam rigid with shaft B, and a lever operatively connected with said last-mentioned shaft, the aforesaid cams being adapted to engage each other and communicate motion from the one to the other, substantially as and for the purpose set forth.

8. In a switch-stand, the combination with a casing having a lateral flange or member, a horizontal shaft having bearing in said lateral flange or member, a cam rigid with said shaft inside of the casing, and a lever, as at C, operatively connected with said shaft, of a block integral with or rigidly secured to the bottom of the casing, a switch-signal-bearing shaft having bearing in said block, a cam on said last-mentioned shaft and adapted to be engaged by the cam on the horizontal shaft, substantially as and for the purpose set forth.

9. In a switch-stand, the combination with a shaft, as at B, a cam on said shaft, as at B², said shaft being provided with a shoulder or stop, as at b', and a lever, as at C, provided with a chamber or perforation, as at C', embracing said shaft, said chamber or perforation having a lateral enlargement, as at C², forming shoulders, as at C³, at either end of said lateral enlargement, of a cam, whose axis is at right angles or approximately at right angles to the shaft aforesaid, and suitable means for operatively connecting said cam with the railway-switch, the arrangement of parts being substantially as shown and described.

10. In a switch-stand, the combination with an upright switch-signal-bearing shaft, a cam rigid with said shaft and suitable means for operatively connecting said cam with the railway-switch, of a horizontal or approximately horizontal shaft, as at B, a cam rigid with said shaft and adapted to engage or be engaged by the cam on the switch-signal-bearing shaft aforesaid, a lever operatively connected with said horizontal or approximately horizontal shaft, and suitable means whereby the signal-bearing shaft is caused to make a quarter or approximately a quarter revolution during the full stroke of the aforesaid lever, substantially as set forth.

11. In a switch-stand, the combination, horizontal and upright shafts, B and F, cams, B² and G, rigid with said shafts, respectively, a lever, C, operatively connected with shaft B, suitable means for operatively connecting cam G with the railway-switch, and means, substantially as indicated, for turning shaft F but a quarter or approximately a quarter revolution during the full stroke of the lever, the arrangement of parts being substantially as and for the purpose set forth.

12. In a switch stand, an upright signal

bearing shaft composed of two sections one
having a socket adapted to receive the other,
said socket section provided with one or
more lateral holes and the other section pro-
5 vided with a hole, and a pin or other suitable
device to enter the holes when they register
to lock the sections together, substantially as
set forth.

In testimony whereof I sign this specifica-
tion, in the presence of two subscribing wit-
nesses, this 23d day of December, 1891.

FRANK A. BEEMAN.

Witnesses:

C. H. DORER,
WARD HOOVER.