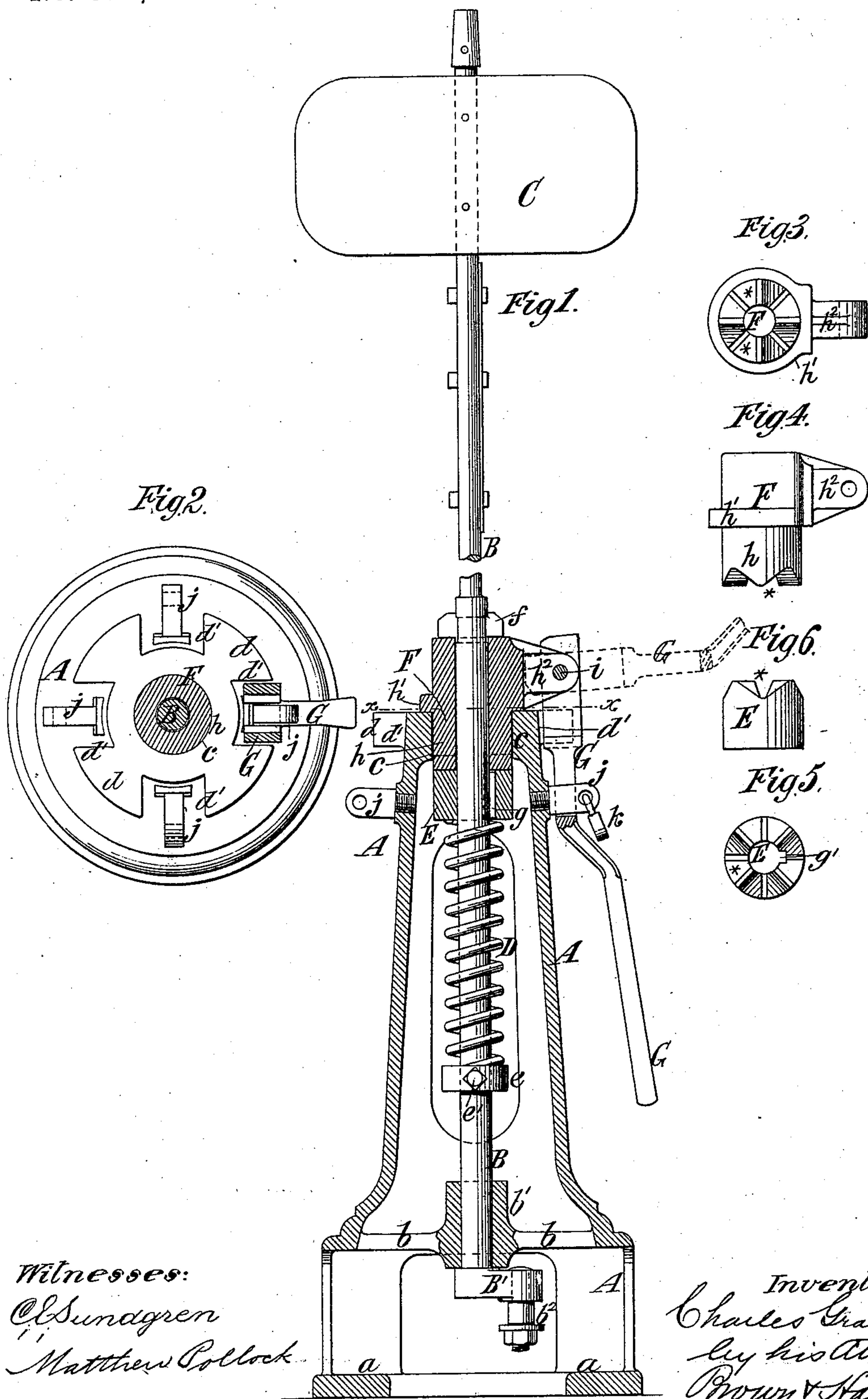


(No Model.)

C. GRAHAM.
SAFETY SWITCH STAND.

No. 316,258.

Patented Apr. 21, 1885.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES GRAHAM, OF KINGSTON, ASSIGNOR OF ONE-HALF TO WILLIAM F. HALLSTEAD, OF SCRANTON, PENNSYLVANIA.

SAFETY SWITCH-STAND.

SPECIFICATION forming part of Letters Patent No. 316,258, dated April 21, 1885.

Application filed January 29, 1885. (No model.)

To all whom it may concern:

Be it known that I, CHARLES GRAHAM, of Kingston, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Improvement in Safety Switch-Stands, of which the following is a specification.

My invention is applicable to what are commonly known as "safety" or "automatic" switch-stands, the stand being so constructed that the target-shaft will, when the switch is wrongly set, be turned automatically by the wheels of the train acting on the movable switch-rails, which transmit their motion through the switch-operating rod to the crank or arm on the target-shaft with which it is connected. In order to enable the target-shaft to be thus automatically turned there are commonly employed two engaging devices, one of which is held fixed relatively to the stand when the switch is locked, and the other of which is made yielding, usually by being acted upon by a spring. The spring holds the yielding engaging device in engagement with its fellow, and the force required to overcome the spring is such that the switch cannot be surreptitiously changed; but when the wheels of a train act to turn the target-shaft the power will be sufficient to cause the compression of the spring and enable the yielding engaging device to move upon and pass its fellow, and the target-shaft will thereby be turned to a second position, where it will be again held by the engaging devices.

My invention relates to those safety switch-stands of the kind above described, in which the two engaging devices consist of two clutch-pieces, through which the target-shaft passes, and which are held in engagement by a spiral spring surrounding the shaft and acting on one of the clutch-pieces.

My invention consists in novel combinations of parts and features of construction hereinafter described, and pointed out in the claims, and whereby simplicity and cheapness of construction, and convenience for the ready assembling and operation of the parts, are secured without in any way detracting from the efficiency of the apparatus.

In the accompanying drawings, Figure 1 is

a sectional elevation of a switch-stand embodying my invention, the target-shaft being shown as locked in position. Fig. 2 is a horizontal section and plan on the plane indicated by the dotted line *xx*, Fig. 1. Fig. 3 is a plan, and Fig. 4 is an elevation, of one of the clutch-pieces or engaging devices detached from other parts; and Figs. 5 and 6 are similar views of the other clutch-piece.

Similar letters of reference designate corresponding parts in all the figures.

A designates the stand proper, or the frame of the stand. It may be of cast metal and bolted securely to a suitable base, it being provided at the bottom with an inwardly-projecting flange, *a*, through which holding-down bolts may pass. This stand or frame A has at the base a cross-bar, *b*, wherein is formed a bearing, *b'*, and at the top it has a circular bearing, *c*, and an outwardly-projecting flange, *d*, in which are notches *d'*.

B designates the target-shaft, on which is fixed a target, C. This shaft is fitted to turn in the bearing *b'*, and has at the lower end a crank or crank-arm, B', to the pin *b²* of which the switch-operating rod (not here shown) is to be attached.

On the shaft B are placed in the order named the following parts—namely: a collar or abutment, *e*, which may be adjustably secured in place by a set-screw, *e'*, a spiral spring, D, a clutch-piece, E, and a second clutch-piece, F; and above the clutch-piece F is a key, *f*, which is inserted through a slot in the shaft and so secures them all in place.

The clutch-piece E is fitted to the shaft B, so that it may slide up and down thereon, but so that neither the shaft or clutch-piece can turn independently of the other. In this example of the invention this connection is obtained by a spline or feather, *g*, fixed in the shaft and fitting a seat or groove, *g'*, in the clutch-piece, as shown in Fig. 5. The clutch-piece F is bored out to fit the shaft B, but is not secured thereon. It has a circular lower portion or journal, *h*, which enters and fits snugly in the bearing *c* in the stand, and which can turn therein when permitted. It has also a collar or shoulder, *h'*, which rests upon the

top of the stand, and a radially-projecting lug or ear, h^2 , to which an operating-handle, G, is pivoted at i . The key f has its middle portion reduced in depth for a length equal to the diameter of the shaft, thereby forming at the ends shoulders, which prevent the displacement of the key or cotter after it is once in place. In assembling the parts above described, the collar e is secured on the shaft B, and the parts are all then slipped upon the shaft and secured by the key or cotter f , the spring D being compressed sufficiently to enable the key or cotter to be inserted into its slot.

As best shown in Figs. 4 and 6, the adjacent faces, *, of the two clutch-pieces E F are notched or have cam-like inclines, and the spring D must be compressed to enable them to be turned one on another. If, however, sufficient power be applied to the crank B', the shaft and clutch-piece E may be turned while the clutch-piece F is held stationary or against turning, the spring D yielding enough to permit of this and then acting to press the clutch E into engagement with the clutch F after their high points have passed by one another.

When the shaft and its accompanying parts are placed in the stand and the handle G raised into a horizontal position, as shown by dotted lines in Fig. 1, the shaft and both clutch-pieces turn together to set the switch; but after the switch is so set in one or other position the handle G is dropped down into one of the notches d' and so locks the clutch-piece F against turning in the stand. If the switch-rails are now acted upon by the wheels of a train, the power will be transmitted through the switch-operating rod and crank B', and the shaft B will be turned, the clutch-piece E being pressed downward against the spring D sufficiently to enable it to turn relatively to the clutch-piece F, and the switch will then be locked in its new position.

When desired to reset the switch, all that is necessary is to raise the handle G and turn the shaft and both clutch-pieces. In order to lock the handle G down it may be forked or slotted to receive a hasp, j , on the stand, and is there secured by a lock, k .

An important advantage results from having a number of notches d' in the stand, the distance between the notches representing the same part of a circle as that through which the crank moves. Were there only two notches at right angles to each other, the handle and clutch-piece F would have to be turned a quar-

ter-turn relatively to the clutch-piece E and shaft after the switch had been shifted automatically and before it could be again locked in the position which it before occupied. When four notches are provided, however, the handle and clutch-piece F do not ever need to be turned relatively to the clutch-piece E, except the change in relative position produced by the automatic shifting of the switch; and hence, as the switch is repeatedly brought back to its original position and locked after the automatic shifting, the handle will stand at different points around the stand, or will, as it were, be changed step by step in position around the stand.

To lock the handle in any position which it may occupy, I provide a number of hasps j equal to the number of notches d' .

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

1. The combination, with the target-shaft and frame of a safety switch-stand, of the clutch-pieces E F, fitting the shaft, the clutch-piece E being free to slide on the shaft, but held against turning thereon, the spring D, for supporting the clutch-piece E, and the handle G, pivoted to the clutch-piece F, and capable of being swung downward to engage with the stand and hold the clutch-piece F against turning, substantially as herein described.

2. The combination, with a stand, A, having a bearing, c , at the top, and a target-shaft, B, of the clutch-piece F, fitting and free to turn in said bearing, and within which the shaft may turn, the pivoted handle G, for turning said clutch-piece and locking it against turning by engagement with the stand, the sliding clutch-piece E, locked to the shaft and the spring D, all substantially as herein described.

3. The combination, with the stand A, having notches d' at equidistant points around its circumference, of the target-shaft B, the clutch-piece E F, and spring D, arranged for operation, as described, and the handle G, pivoted to the clutch-piece F and adapted to engage with the notches d' in the stand when swung downward, substantially as herein set forth.

4. The combination, with the target-shaft B, of the clutch-pieces and spring E F D, placed thereon, and the collar e , and key or cotter f , between which said parts are secured on the shaft with the spring under tension, substantially as herein described.

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Witnesses:

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