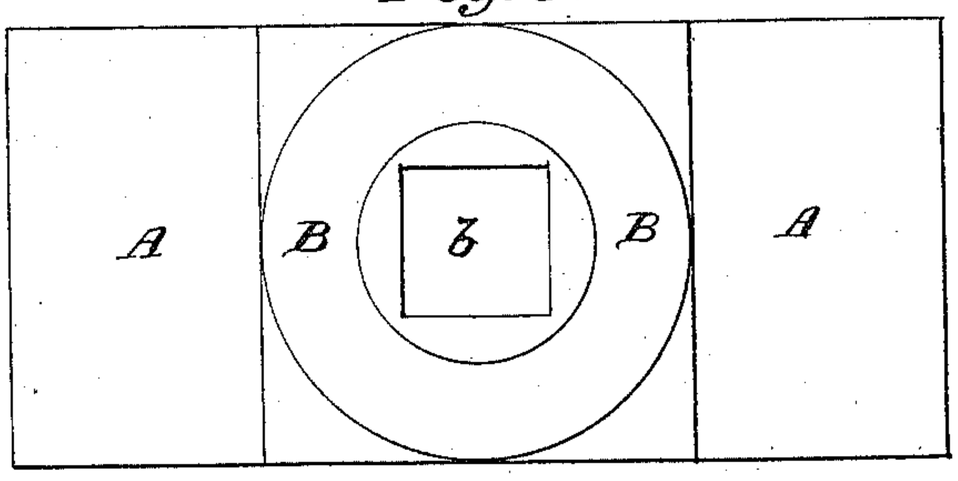
(No Model.)

F. W. SNOW.

SWITCH STAND.

No. 299,176. Patented May 27, 1884.

Fig. 5.



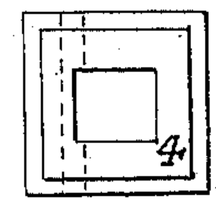
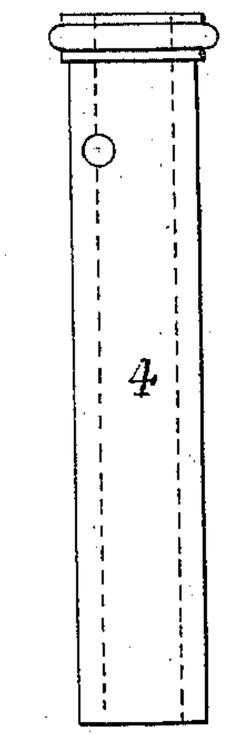


Fig. 4.



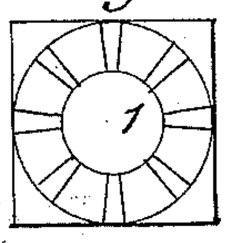
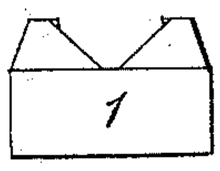


Fig. 1.



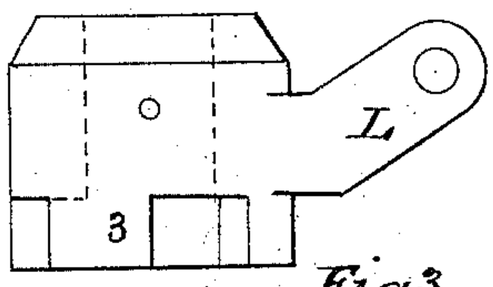
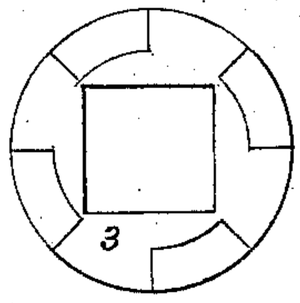


Fig. 3.



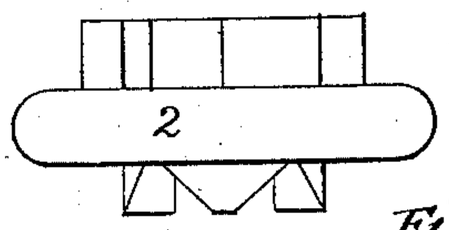


Fig. 2.

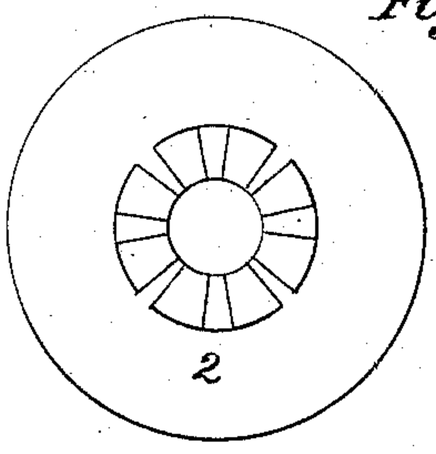


Fig. 6.

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UNITED STATES PATENT OFFICE.

FRED. W. SNOW, OF RAMAPO, NEW YORK.

SWITCH-STAND.

SPECIFICATION forming part of Letters Patent No. 299,176, dated May 27, 1884.

Application filed October 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRED. W. SNOW, of Ramapo, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Switch-Stands, of which the following is a specification, reference being had to the drawings, in which—

Figures 1, 2, 3, and 4 represent detached parts of the stand, each figure presenting a plan view and an elevation of the part it represents. Fig. 5 represents a plan view of the standard; and Fig. 6, an elevation of the stand with all its parts, the interior parts being indicated by dotted lines.

My improvement relates to spindle switch-stands—that is to say, to those stands in which the rail-moving rod is actuated by a crank and crank shaft or spindle, instead of a vibrating lever; and it especially relates to those spindle switch-stands in which the locking devices, while preventing any movement by manual or other light force, yet permit the power of the wheels upon the rails to shift the switch into certain specified or safety positions, locking it there in the same way as before the automatic action.

The improvement relates especially to the locking devices; and it consists in the application to the spindle of the switch of a spring or yielding clutch of peculiar construction with a suitable engaging and releasing device, by which application I obtain in switch-stands of the class specified a great simplicity and cheapness of construction, certainty of operation, and facility of putting the parts together, and of replacing those that are worn out, which constitute the object of the invention, and which object I believe to be better obtained by the use of a yielding clutch than by any other device which has before been applied to the purpose.

The following is a description of the invention as portrayed in the drawings.

Fig. 5 shows the standard or fixed part of the stand, having flanges or base-plate A A, upon which stands a hollow column or standard proper, B B, which parts are also shown in Fig. 6 in elevation. The upper part of the hollow column is closed, but has a square shaft or opening, *b*, Fig. 5. The inner circle of this figure represents the periphery of the top surface of this standard B B at its smallest part or on the line X, Fig. 6. The outer circle of Fig. 5 is the periphery of the largest part of B, where it joins the base-plate A A. The spindle D is seen in Fig. 6. It has upon its lower end the crank *d*, which actuates the moving rod rigidly attached to or made in one piece with it. It has its lower bearing in the bridge or fixed cross-piece C, rigidly attached to the standard, through which it passes upward, and in which bridge it rotates freely, having no vertical motion.

In a socket or cup, *c*, on the bridge rests a coil-spring, E, surrounding the spindle and pressing upward the part 1 of the clutch, which is shown detached in Fig. 1. Part 1, as seen in Fig. 1, has a round bore fitting the spindle, and furnishes its upper bearing or box. It is square on its exterior, fitting accurately into the square opening *b* of the standard, and has therefore no rotary motion, but can slide downward upon the spindle, compressing the spring. It is the non-rotating part of the clutch. Upon its upper face are beveled teeth, (seen in Fig. 1,) which fit accurately in and are counterparts of those on the lower face of part 2, Fig. 2. As the spring E tends continually to push part 1 against part 2, it will be seen that the latter is prevented from rotation by any power insufficient to compress the spring, but that a greater power could rotate it. Moreover, the part 2 must always, when so rotated, tend to assume several positions, regulated by the shape and number of the teeth. It is in itself a flat disk resting upon the upper face of the standard and capable of rotating upon it, as well as upon the spindle which passes through it.

The line marked *x*, Fig. 6, indicates the top of the standard and bottom of part 2, and the line *y* the upper part of the latter.

The inner vertical dotted lines in Fig. 6 indicate the spindle, which down to line *y* has a square or angular cross-section, and from there to the lower edge of piece 1 a slightly larger circular cross-section. Part 2 has no vertical motion, being kept down by the lower end of sleeve 4, which bears upon its upper face. This sleeve 4 is secured to the spindle and can only move with it, as hereinafter shown. Part 2 can also, if desired, be prevented from rising by being swiveled to the standard so as to

rotate freely on it, but not separate from it. The spring therefore tends to push upward parts 1, 2, and 4 and the spindle, but cannot do so by reason of the crank-arm. Part 2 and the spindle can move neither up nor down, and part 2 can only rotate by slipping of the beveled teeth, which can only happen by compression of the spring. If, therefore, part 2 should be locked to the spindle, the latter could only move under the same condition. This locking is effected by means of part 3.

Part 4 is a long sleeve, square upon both its exterior and interior, and fitting accurately upon the spindle, which is also square at this portion of its length. When once in place, it is firmly secured to the spindle by one or more pins or bolts passing through both, so that they move together. For operative purposes, and except for convenience of putting the parts together, it may be considered as part of the spindle and might be made in one piece with it.

Upon the sleeve 4 slides the part 3, having a square interior fitting part, 4, so as to rotate with but move vertically on it. With part 2 it constitutes the rotary part of the clutch. For most purposes these parts 2 and 3 also might be considered as one, in which case, however, some other stop or upper bearing would have to be supplied for the part 1, and certain other slight modifications would be necessary. I prefer, however, to construct them as shown, the part 2 having upon its upper and part 3 upon its lower face square teeth, which can engage and form a positive lock for the two parts, so that they can only rotate together when so engaged. This is effected by the forked lever G, pivoted to the sleeve 4 at *g*, and connected with part 3 by links H. The pivot *g* may be the bolt which secures part 4 to the spindle. The lever G can be locked by a bolt or padlock to the lug L on part 3.

The operation is as follows: When the lever is raised, it raises part 3, disengaging the teeth of parts 2 and 3. Parts 3 4, the spindle, and crank can then be rotated freely and the switch shifted to any desired position. Then, if the lever is depressed and locked, the teeth of parts 2 and 3 become engaged, and there is a rigid connection between parts 2 and the rails through parts 3 and 4, the spindle, crank, and moving rod; but part 2 cannot rotate without compressing the spring, and the bevels of the teeth and power of the spring are so proportioned that this cannot be done by any ordinary force. Should, however, the switch be set in such a position that it would be desirable that it should shift automatically, the power of the wheels upon the rails acting through the crank, spindle, and parts 4, 3, and 2 would be sufficient to rotate the latter one or more spaces. It will be noticed that after the teeth have passed each other the spring tends to continue the rotation until they are again locked, so that the switch tends to rest only in certain fixed positions, and is locked, after thus shifting, as firmly as before. If, as before indicated, the part 4 were made a part of the spindle, the operating-lever would simply be pivoted to the spindle itself, and the spindle might be inserted in the standard from above, the crank being made detachable. So, also, the parts 2 and 3 might be made in one piece, the unlocking being effected by simply lifting this piece and disengaging its beveled teeth from those of part 1. In that case part 1 must be provided with a stop or bearing on the standard to prevent its rising after 2, and part 2 must slide freely on the spindle or part 4. This might be effected by making the opening *b* smaller at its top, part 1 being inserted from below. As constructed, the lever cannot be depressed and locked by the switchman, except when the switch is completely thrown, because the square teeth of parts 2 and 3 will not engage at any other point. If these parts were united, dispensing with these teeth, the same object would be gained by an engagement on the standard, which would prevent the united parts 2 and 3 from being depressed, except at particular points. Any desired semaphore may be placed on the spindle.

Clutches are commonly used to lock together two parts of shafting intended to rotate together when locked, and consist of two engaging parts—one on each piece of the shaft—and in such case both parts would properly be said to rotate; but when, as in this case, it is desired to lock a shaft to a fixed part or standard, the part of the clutch which belongs to the standard may be designated as "non-rotating," and it is in this sense that I have used the word. It might be possible to construct such a clutch in which this non-rotating part should be absolutely immovable and the rotating part made to yield under power; but such an arrangement would involve an entirely different construction of the stand and operating devices; and it will be understood, therefore, that it is characteristic of my invention that the non-rotating part 1 yields under pressure, sliding axially upon the shaft, and that I disclaim any arrangement in which the non-rotating part does not so yield. While also the alternative form, having parts 2 and 3 made in one piece, as hereinbefore suggested, corresponds accurately to the common clutch, the form shown in the drawings has the peculiarity that it consists of three pieces—part 1, which represents one half of the ordinary clutch, and parts 2 and 3, which represent the other half. This intermediate part, 2, has the distinctive feature that it sometimes rotates with the shaft to which it belongs, and is sometimes disconnected with it. From this arises the capacity of its shaft to assume three states—that of rest, that of rotation under power, and that of rotation by hand. As shown, however, in the foregoing specification, the same ends can be gained by a two-part clutch, and I therefore do not wish to be confined to the three parts.

I do not herein claim, broadly, a switch-stand comprising a spindle and switch-operating rod, engaging devices, one of which is car-

ried by the spindle and the other by the stand, and means by which the switch or its lever may be relieved of the resistance offered by the spring-engaging device.

What, then, I claim is—

1. In combination with the spindle of a switch-stand, the clutch-locking mechanism in which the two parts of the clutch are placed upon the spindle and engage by means of beveled teeth by spring or other yielding power, so as not to hold against large powers, and provided with means for releasing the spindle from the yielding non-rotating part of the clutch, substantially as described.

2. A yielding locking device for spindle switch-stands, consisting of the following combination of parts: first, a clutch-box on the spindle, yielding but not rotating with it; second, a rotating clutch-box on the spindle, a spring tending to engage the two clutch-boxes, but permitting them to rotate under power when locked, and a locking-lever or its equivalent by means of which the spindle can be released from and rotate free of the non-rotating part, substantially as described.

3. In a switch-stand, the combination of the spindle, a clutch upon the spindle, the rotating parts of which can move upon the yielding non-rotating parts to specified positions when subject to great strain, although locked, and means for releasing the spindle from the engaged rotary part of the clutch for operation by hand, substantially as described.

4. The combination of the spindle D, the spring E, the non-rotating clutch-box 1, the rotating clutch-box 2 3, the locking-lever and links G H, and the sleeve 4, substantially as described.

5. The combination of the spindle D, the spring E, the non-rotating clutch-box 1, the rotating clutch-box 2 3, and the locking-lever and links G H, without the sleeve 4 interposed between them and the spindle, substantially as described.

6. The combination of the standard A B, spindle D, spring E, clutch-box 1, clutch-box 2, and clutch-box 3, links H, and lever G, with the sleeve 4, substantially as described.

7. In a spindle switch-stand, the combination of a rotating spindle having no vertical movement, a non-rotating spring-locking part, 1, a rotating locking part, 2, the two locking parts being capable of sliding upon each other under great strain, an engaging part, 3, sliding on the spindle to lock part 2 to the spindle, and an operating-lever and links, or their equivalent, substantially as described.

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