

F. C. ANDERSON.  
 REVERSIBLE AND ADJUSTABLE SWITCH STAND CRANK.  
 APPLICATION FILED JUNE 18, 1918.

1,320,522.

Patented Nov. 4, 1919.

Fig. 1.

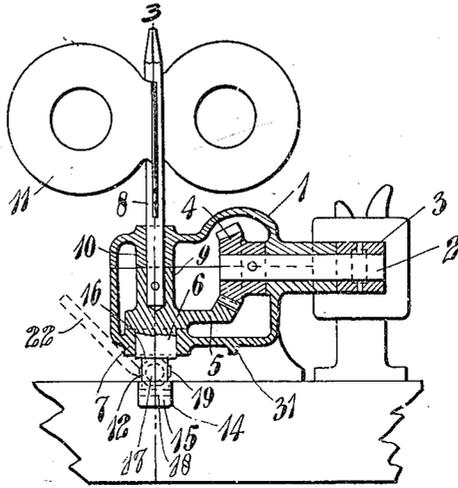


Fig. 3.

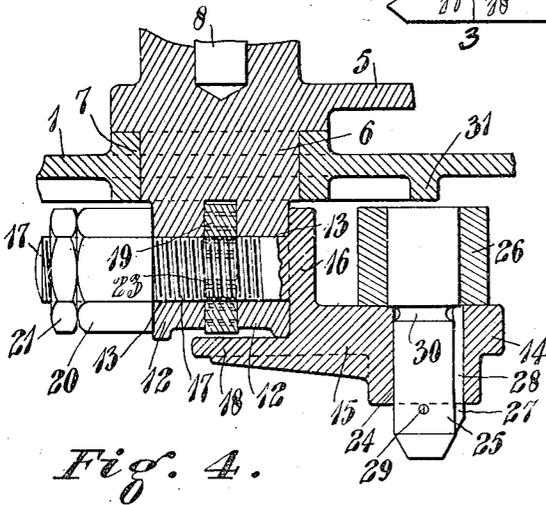


Fig. 2.

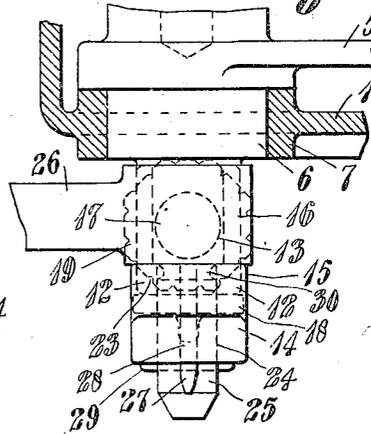


Fig. 4.

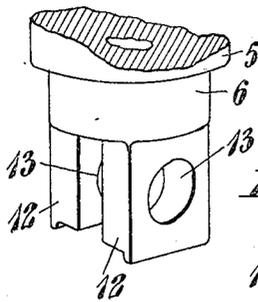


Fig. 6.

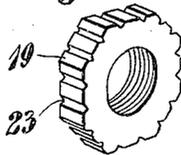


Fig. 5.

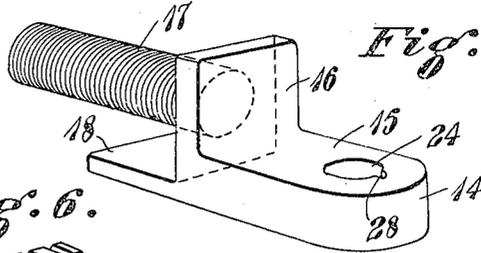
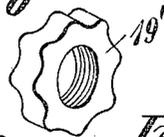


Fig. 7.



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# UNITED STATES PATENT OFFICE.

FRANK C. ANDERSON, OF CINCINNATI, OHIO, ASSIGNOR TO THE AMERICAN VALVE & METER COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

REVERSIBLE AND ADJUSTABLE SWITCH-STAND CRANK.

1,320,522.

Specification of Letters Patent.

Patented Nov. 4, 1919.

Application filed June 18, 1918. Serial No. 240,589.

*To all whom it may concern:*

Be it known that I, FRANK C. ANDERSON, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Reversible and Adjustable Switch-Stand Cranks, of which the following is a specification.

My invention relates to switch stands, and its object is to provide a crank connection which will be reversible for switches that turn out to the right or left, or for placing the switch stand on one side or the other of the switch, and which will be readily adjustable to vary the throw of the crank to compensate for wear in the various connections and operating parts, both of the switch stand and of the parts that operatively connect the switch stand to the rails of the track.

In the drawing:

Figure 1 is a vertical cross section of a switch stand equipped with my improved crank, the latter being shown in full end elevation;

Fig. 2 is a partial similar view enlarged;

Fig. 3 is a vertical longitudinal section on a plane corresponding to the line 3—3 of Fig. 1;

Fig. 4 is a detail perspective view of the lower-end part of the shaft;

Fig. 5 is a similar view of the crank arm;

Fig. 6 is a similar view of the adjusting nut; and

Fig. 7 is a similar view of a modified adjusting nut.

I have chosen to exemplify my invention in use on a low switch stand; but it will be understood that it is adapted for use on high stands, and in fact on any stand where a crank is used for imparting the motion to the rails of the switch through the medium of a connecting rod connected to the crank and to the rails in any well-known manner.

In the example, there is the switch-stand casing 1 in which is horizontally journaled the operating shaft 2 having fixed to its outer end the operating lever 3 and to its inner end the bevel gear 4. The bevel segment 5 meshes with the bevel gear 4 and has integral with it the shaft 6 extending down through a suitable bearing 7 in the bottom of the switch-stand casing 1. The target shaft 8 is suitably fixed in the upwardly extending hub 9 of the segment 5 and extends

up through a bearing 10 in the top of the casing 1, and carries the target 11.

These parts are old and well known on a certain type of switch stand, and are described herein merely to facilitate the description of the details of the present invention.

The lower end of the shaft 6 where it projects below the bearing 7 in the casing 1, is reduced to a general rectangular cross-section and bifurcated so that it has two downwardly extending separated lugs 12. Extending through the lugs 12 in alignment are openings 13.

The crank arm 14 comprises the main crank part 15, the upwardly extended bracket 16, the threaded shank 17 which is preferably integral with this bracket 16 and extends therefrom in the direction opposite to that of the main part 15, and the guide 18 some distance below and parallel with the shank 17.

The shank 17 passes through the openings 13 in the lugs 12 of the shaft 6, and has screwed onto it between the lugs 12 the adjusting nut 19, the guide 18 passing under the lower end of one of the lugs 12, and the upper surface of this guide 18 and said lower end of the lug 12 being transversely substantially straight so that the engagement of the guide 18 with said end of the lug 12 prevents turning of this crank arm in the mounting thus provided for it. At the same time, by rotating the nut 19, the crank arm is made to extend a greater or a less distance from the shaft 6 accordingly as the nut 19 is turned one way or the other, and during such adjustment, the guide 18 will ride along under the lower end of the lug 12 and guide the crank arm as just mentioned.

To hold the crank arm in any one of the adjusted positions, a nut 20 is screwed onto the projecting end part up against the adjacent lug 12, so that this lug is clamped tightly between the adjusting nut 19 and this nut 20. To lock the nut 20, another thin lock-nut 21 is screwed onto the end part of the shank 17. These nuts 20 and 21 are shown in Fig. 3. They are preferably the ordinary hexagonal nuts, but the adjusting nut 19 should have at least eight sides, because it is not permissible to make it of very great diameter in the space allowed for it below the bearing 7 and above the guide 8, and by having a relatively great number of

sides, the nut may be engaged where it slightly extends past the lugs 12 at either side, either with the fingers when the device is new, or with a chisel or spike or other suitable means which is then struck with a hammer if the nut 19 has become tight from rust or accumulation of foreign substances after the device has been in use for some time. The adjusting nut will be readily accessible on practically all switch stands, as for example, as shown in Fig. 1, where a suitable instrument 22 is represented by dotted lines. It will be seen that the instrument 22 inclined downwardly at an angle of about forty-five degrees readily engages with the projecting periphery of the nut. To facilitate this use of such an instrument, I prefer to provide the nut with notches 23 in its periphery in which the end of the instrument 22 may readily engage.

The nut may have a serrated periphery, as the nut 19' shown in Fig. 7. Such a nut may be more suitable for turning with the fingers, and it will be seen that the end of the instrument 22 may be very readily engaged in its depression as in the notches 23 in the octagonal nut of the other example.

The main crank part 15 has the opening 24 down through it into which is inserted the pin 25 pivotally connecting it to the connecting rod 26 (Fig. 3,) which it will be understood is connected to the point rails of the switch in a well-known manner which need not be described or shown herein. Preferably, this pin 25 is of the breakable kind shown, described and claimed in my Patent No. 1,034,948, dated August 6, 1912; and it is preferably provided with an integral lug 27 near its lower end which passes down through a key-way 28 in the crank part 15, and then upon partial turning of the pin 25, prevents the pin from rising out of the crank. In addition to this, a cotter pin 29 passes through the pin below the crank. This construction is claimed in my Patent No. 1,088,119, dated February 24, 1914. The connecting rod fits down over the upwardly projecting part of the pin 25 which is of slightly greater diameter than the lower part down in the crank, and which lower part it joins through the reduced neck 30 that renders the pin breakable. This pin 25 and the connecting rod 26 swing around with the crank under a flange 31 on the bottom of the switch-stand casing 1. This prevents the rod 26 from rising off the pin 25 and is also an additional means of holding the pin down in the crank.

By having the segment 5 and its shaft 6 integral, the switch stand is rendered much more reliable than where the segment is riveted or similarly connected to the shaft. But it will be seen that this integral construction necessitates that the lower end part of the shaft 6 should pass down through

the bearing 7 in the assembling of the switch stand. Cranks have heretofore been connected to this downwardly extending part and they have been made reversible for the purposes hereinbefore set forth, but they have not been provided with a means for convenient adjustment to any one of an indefinite number of positions whereby any amount of wear may be accurately compensated for without taking the mechanism apart.

In the present construction, in order to lengthen the throw of the crank, it is necessary only to loosen the nuts 20 and 21 and screw them out away from the lug 12, at least as far as the adjustment is intended to be made, and then by turning the nut 19 in the proper direction, the entire crank arm is moved radially in the bifurcated lower end part of the shaft 6. When the desired adjustment has been reached, the nuts 20 and 21 are then tightened and the mechanism is ready for operation.

As before stated, when the mechanism is new, the nut 19 may be readily turned by the fingers. The switch stands usually can be furnished with the crank assembled for a certain position. When the switch stand is to be installed, if it requires a reversed position of the crank, the nut 19 is readily turned with the fingers after the nuts 20 and 21 have been completely removed, and the crank arm is thus readily taken off the shaft and has its shank inserted through the lugs 12 of the shaft in the opposite direction; the nut 19 being first placed between the lugs 12 and receiving the threaded shank 17 as it passes through.

By having the lugs 12 with the adjusting nut 19 between them, the bearing extent of the crank arm in the shaft 6 is permitted to be almost the entire diameter of the shaft. It is necessary that this connection of the crank arm to the shaft should have such an extended bearing in order to have the rigidity required in this part of the switch stand where the strain is very much concentrated. This strain is due, not only to the ordinary throwing of the switch, but to the pressure on the switch rails of the heavy rolling stock passing over the switch. It is necessary, therefore, that the shaft 6, made integral with the segment 5 for reasons similar to those just mentioned, should readily pass down through its bearing 7 and should have a very substantial connection to the crank arm. At the same time, it is highly desirable that the effective throw of this arm be readily changed to compensate for wear, and that the arm be readily reversed to accord with the various positions in which the switch stand may be used relative to the rails. It will be seen that all of these requirements are met by the construction herein shown and described, and which at the

same time is simple, readily constructed, readily understood by comparatively unskilled workmen, and not subject to derangement, either by neglect of the workmen or by any ordinary strains imposed on the switch mechanism. It will be understood that the breakable pin 25 protects the entire mechanism in that it breaks under any strain sufficient to disrupt the less readily replaced parts.

While certain constructional details are deemed preferable in connection with my invention, and I have shown and described these rather specifically in elucidating the construction and use of my invention, as is required, I do not wish to be understood as being limited to such precise showing and description, but having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a switch-stand crank, in combination with a downwardly projecting shaft having a reduced terminal part with a transverse opening, a crank arm comprising a main crank part, and a shank extending through the opening in the shaft, and means for mounting said shank in various positions in said opening.

2. In a switch-stand crank, in combination with a downwardly projecting shaft having a reduced terminal part with a transverse opening, a crank arm comprising a main crank part, and a shank extending through the opening in the shaft, said shank being adapted to be inserted through said opening in either direction, whereby said crank arm may project from said shaft in either direction, and means for clamping said shank in said shaft when projected in either direction.

3. In a switch-stand crank, in combination with a downwardly projecting shaft having a reduced terminal part with a transverse opening, a crank arm comprising a main crank part, and a shank extending through the opening in the shaft, said shank being adapted to be inserted through said opening in either direction, whereby said crank arm may project from said shaft in either direction, and means for clamping said shank in said shaft when projected in either direction, or for adjusting said shank longitudinally in said opening to change the throw of said crank.

4. In a switch-stand crank, a shaft comprising two downwardly projecting separated lugs with alined openings through them, a crank arm comprising a main crank part, and a threaded shank projecting through said alined openings and through a nut threaded on said shank and lying between said lugs.

5. In a switch-stand crank, a shaft comprising two downwardly projecting separated lugs with alined openings through

them, a crank arm comprising a main crank part, and a threaded shank projecting through said alined openings and through a nut threaded on said shank and lying between said lugs, and a guide projecting from said main crank part below and substantially parallel with said shank, and slidably contacting with the lower end part of one of said lugs on said shaft to prevent turning of said crank arm and shank in said openings.

6. In a switch-stand crank, a shaft comprising two downwardly projecting separated lugs with alined openings through them, a crank arm comprising a main crank part, and a threaded shank projecting through said alined openings and through a nut threaded on said shank and lying between said lugs, said threaded shank projecting past said lugs, and locking means screwed onto said shank where it thus projects, and clamping the adjacent one of said lugs between said nut and said locking means.

7. In a switch-stand crank, in combination with a switch-stand casing, a shaft bearing in said casing and having a reduced part projecting downward therefrom with an opening transversely through said reduced part, a crank arm comprising a main crank part spaced downwardly from the bottom of said casing and having an upward extension integral with said main crank part, and a shank integral with said upward extension and extending therefrom in direction opposite to the extension of the main shank part, said shank extending through said opening in said shaft, means to hold said shank in said opening in various positions, a pin projecting up from said main crank part, and a connecting rod fitting down over said pin, said casing lying close enough to the upper sides of said pin and said connecting rod to prevent their material movement up from said crank.

8. In a switch-stand crank, an integral segment and shaft, said shaft having downwardly projected separated lugs below its bearing, said lugs being adapted to be passed through said bearing, a crank arm, a threaded shank on said crank arm, said lugs having alined openings transversely through them, and a nut between said lugs, said shank passing through said openings and through said nut between said lugs, with said nut threaded on said shank.

9. In a switch-stand crank, a shaft having downwardly projected separated lugs below its bearing, said lugs being adapted to be passed through said bearing, a crank arm, a shank on said crank arm, said lugs having alined openings transversely through them, and said shank passing through said openings and through a nut between said lugs, said nut being threaded on said shank.

10. In a switch-stand crank, a shaft having downwardly projected separated lugs below its bearing, said lugs being adapted to be passed through said bearing, a crank arm, a threaded shank on said crank arm, said lugs having alined openings transversely through them, and a nut between said lugs, said shank passing through said openings and through said nut between said lugs, with said nut threaded on said shank, and said nut having recessed peripheral parts projecting laterally past said lugs successively as the nut is rotated on said shank, said recessed parts being adapted for ready engagement of an instrument for forcibly turning said nut.
11. In a switch-stand crank, a shaft comprising a lug with an opening transversely through it, a crank arm comprising a threaded shank projected through said opening, an adjusting nut screwed on said shank against one side of said lug, and locking means screwed onto said shank against the other side of said lug.
12. In a switch-stand crank, a shaft comprising a lug with an opening transversely through it, a crank arm comprising a threaded shank projected through said opening, an adjusting nut screwed on said shank against one side of said lug, locking means screwed onto said shank against the other side of said lug, and means to limit movement of said adjusting nut away from said lug.
13. In a switch-stand crank, a shaft comprising a lug with an opening transversely through it, a crank arm comprising a threaded shank projected through said opening, an adjusting nut screwed on said shank against one side of said lug, locking means screwed onto said shank against the other side of said lug, and means to limit turning of said shank in said opening.
14. In a switch-stand crank, a shaft comprising a lug with an opening transversely through it, a crank arm comprising a threaded shank projected through said opening, an adjusting nut screwed on said shank against one side of the lug, locking means screwed onto said shank against the other side of said lug, means to limit movement of said adjusting nut away from said lug, and means to limit turning of said shank in said opening.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."