E. O. SESSIONS.

LOCKING SWITCH.

APPLICATION FILED NOV. 2, 1917.

1,322,065.

Patented Nov. 18, 1919.

Fig. 1.

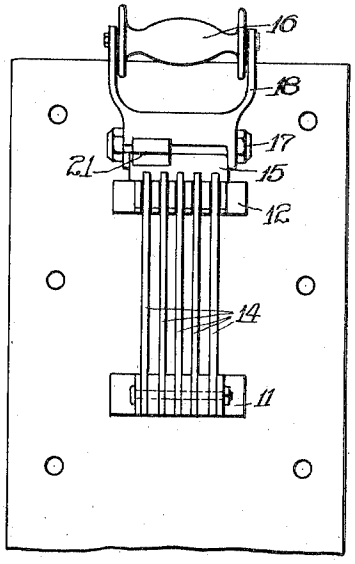


Fig. 4

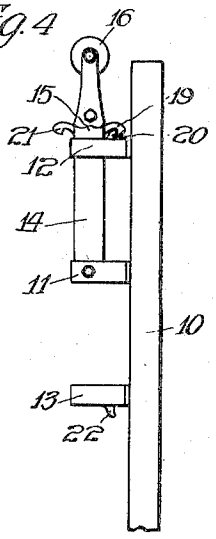


Fig. 2

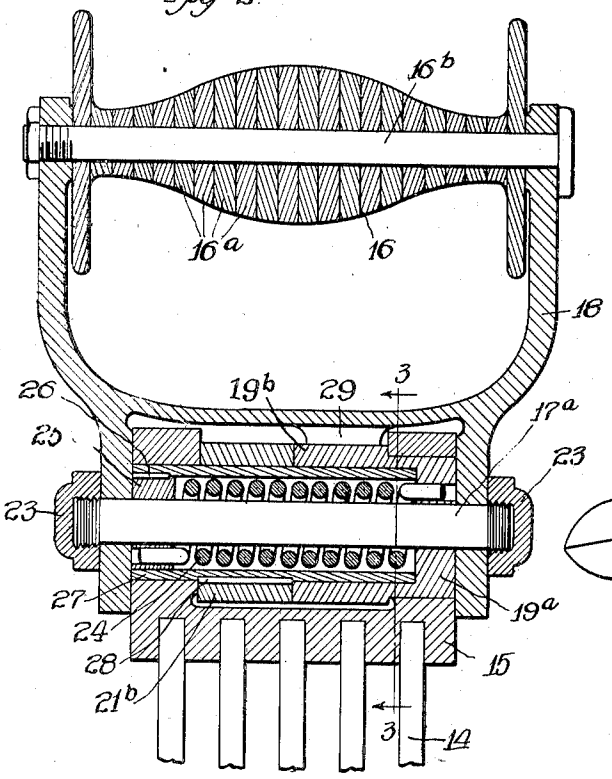
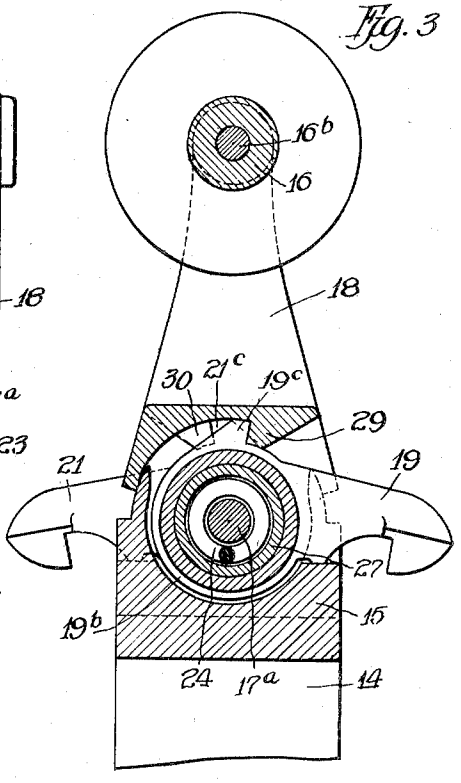


Fig. 3



Witness:

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LOCKING-SWITCH.

1,322,065. Specification of Letters Patent. Patented Nov. 18, 1919.

Application filed November 2, 1917. Serial No. 199,970.

To all whom it may concern:

Be it known that I, EDSON O. SESSIONS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Locking-Switches, of which the following is a specification.

My invention relates to an improved form of locking switch particularly adapted for use in connection with lines carrying large quantities of current, as for example 5000 amperes or more. When switches of this kind are employed in connection with alternating current circuits they must be securely locked in closed position and the quantity of current flowing through them makes it necessary to provide locking devices of unusual character, so that the switches will not be opened by the large flow of current through them particularly if a partial or total short circuit should result in temporarily running the current flow to a considerable amount above its normal value. My improved construction is intended to completely meet the requirements of such a locking switch, the locking mechanism being constructed in a novel manner, so that it may positively lock the switch in its closed position under the action of a powerful spring, although at the same time the locking mechanism is readily released by the natural movement of the operating handle in opening the switch, whether the switch is of the single throw or double throw type.

My invention will best be understood by reference to the accompanying drawings showing a preferred embodiment thereof, in which,

Figure 1 shows a portion of the switch in front elevation,

Fig. 2 is a central, longitudinal sectional view taken through the locking mechanism of the switch on a plane parallel with the switch base, this view being considerably enlarged,

Fig. 3 is a sectional view of the parts shown in Fig. 2 taken along the line 3—3, and,

Fig. 4 is a view of the complete switch on a reduced scale in side elevation.

Similar numerals refer to similar parts throughout the several views.

As shown in Fig. 4 the switch consists of a base 10 supporting a pivot clip 11 and contact clips 12 and 13. A plurality of switch blades 14 are pivotally secured to the pivot clip 11 and arranged to engage either the contact clip 12 or the contact clip 13 depending on the closed position in which the double throw switch illustrated is employed. The movable ends of the switch blades 14 are connected as more clearly shown in Fig. 1 to a block 15 to which the operating handle 16 is pivotally secured at 17 by means of a yoke 18. The block 15 carries a first locking latch 19 for engaging a catch 20 associated with the contact clip 12 and a second locking latch 21 for engaging a catch 22 associated with the contact clip 13 by means of which the switch may be securely locked in either of its closed positions.

The locking mechanism is more clearly shown in Figs. 2 and 3 and as seen in these figures the block or housing 15 has extending therethrough a rod 17^a and upon this rod the yoke 18 is pivotally mounted to support the handle 16. The ends of the rod are threaded to receive the nuts 23, which securely hold the parts in the position indicated. Within the block 15 a stiff helical spring 24 is disposed around the rod 17^a which spring has bent ends, the left hand one of which engages a collar 25 mounted on the rod 17^a, which collar is secured by a key 26 to a sleeve or tube 27 surrounding the spring. The other bent end of the spring is secured to the end wall 19^a of the hook 19, this end wall being drilled to fit loosely the rod 17^a. The hook 19 is provided with a boss 19^b encircling the tube 27 and forming a sliding fit therewith, the end of said tube resting against the inner surface of the end wall 19^a. The outer portion of the end wall 19^a is a sliding fit in a hole bored therefor through the end of the block 15 so that the hook may turn freely in said block. The hook 21 is provided with a boss 21^b which surrounds the tube 27 forming a tight fit therewith and this boss is secured to the tube 27 by means of a key 28. The tube 27 at its left hand end as seen in Fig. 2 is supported with a sliding fit in a hole formed therefor through the left hand portion of the block 15. As a result of the construction described the spring 24 which is given a considerable initial tension in assembling the parts tends at all times to hold the locking latches 19 and 21 positively in the position indicated in Fig. 3.

To release the latches from their locking engagement the latch 19 is provided with a lug 19^c projecting from its hub 19^b in the

path of a lug 29 carried by the yoke 18, so that when the handle 16 is moved toward the observer for the position shown in Fig. 2 or to the left for the position shown in Fig. 3 the lugs 19c and 29 engage each other and the latch 19 is lifted or moved to its disengaging position after which the switch may be opened. Similarly the hub 21b of the latch 21 is provided with a projecting lug 21c in the path of a lug 30 carried by the yoke 18 the relation of these lugs being opposite to that of the lugs 19c and 29 as a result of which when the handle 16 is moved in the reverse direction to that last referred to the lugs 30 and 21c by their engagement move the latch 21 to its releasing position, after which continued motion of the handle opens the switch from its opposite closed position. The relation of the various lugs is such that the yoke 18 and the handle 16 are normally held in mid position on the block 15 by the action of the spring 24.

The handle 16 is preferably constructed of a number of disks 16a of insulating material mounted on a bolt 16b extending through the ends of the arms of the yoke 18, said bolt serving to clamp the parts of the handle securely together.

The switch construction described with its locking mechanism may be employed either with single throw or double throw switches, as desired, all that is necessary to change the construction described to a switch of the single throw type being to omit one of the latches 19 and 21, or, if desired, for the single throw type of construction the tube 27 may be rigidly secured to the block 15 at its left hand end, and the latch 21 and its hub may be entirely omitted.

From the above description it will appear that my improved switch construction provides opportunity for using as stiff a locking spring as may be required to meet any condition found in practice and is therefore applicable to switches of the largest capacity.

It is immaterial how many switch blades may be employed in the switch construction described above, the only requirement being that they shall together have the requisite current carrying capacity to meet the requirements of any particular case.

It will be noted that my improved switch handle construction not only affords an effective and strong construction to withstand the forces frequently required in the operation of large switches, but in addition provides an effective means of constructing the insulated portion of the handle, since the disks of which it is made may be more readily and economically formed than could be the case were the insulating portion turned from solid stock, particularly in view of the desirability of having the end disks of relatively large diameter to shield the hand of the operator from contact with the metal of the supporting yoke.

While I have shown my invention in the particular embodiment above described I do not however limit myself to this exact construction, as I may employ equivalents thereof known to the art at the time of the filing of this application without departing from the scope of the appended claims.

What I claim is:

1. In a locking switch, the combination of a pivot clip, a contact clip, a switch blade pivotally connected to the pivot clip and engaging the contact clip when the switch is closed, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported upon said rod, a handle carried by said yoke, a locking latch pivotally supported in said housing and projecting therefrom, a catch adjacent said contact clip for engaging said latch, a spring encircling said rod for holding said latch in its engaging position, and lugs carried by said yoke and latch for disengaging said latch when said handle is operated to move said switch to its open position.

2. In a locking switch, the combination of a pivot clip, a contact clip, a switch blade pivotally connected to the pivot clip and engaging the contact clip when the switch is closed, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported upon said rod, a handle carried by said yoke, a locking latch pivotally supported in said housing and projecting therefrom, a catch adjacent said contact clip for engaging said latch, a spring encircling said rod for holding said latch in its engaging position, a tube surrounding said spring for supporting said latch, and lugs carried by said yoke and latch for disengaging said latch when said handle is operated to move said switch to its open position.

3. In a locking switch, the combination of a pivot clip, a contact clip, a switch blade pivotally connected to the pivot clip and engaging the contact clip when the switch is closed, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported upon said rod, a handle carried by said yoke, a locking latch pivotally supported in said housing and projecting therefrom, a catch adjacent said contact clip for engaging said latch, a spring encircling said rod for holding said latch in its engaging position, a tube surrounding said spring for supporting said latch, said spring being secured to said tube and said latch being also secured to said tube, and lugs carried by said yoke and latch for disengaging said latch when said handle is operated to move said switch to its open position.

4. In a locking switch, the combination of a pivot clip, a contact clip, a switch blade pivotally connected to the pivot clip and engaging the contact clip when the switch is closed, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported upon said rod, a handle carried by said yoke, a locking latch pivotally supported in said housing and projecting therefrom, a catch adjacent said contact clip for engaging said latch, a spring encircling said rod for holding said latch in its engaging position, and lugs carried by said yoke and latch for disengaging said latch when said handle is operated to move said switch to its open position, said housing and said yoke completely inclosing said spring, lugs and latch with the exception of the portion of the latch projecting from said housing to engage said catch.

5. In a locking switch, the combination of a pivot clip, a contact clip, a switch blade pivotally connected to the pivot clip and engaging the contact clip when the switch is closed, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported upon said rod, a handle carried by said yoke, a locking latch pivotally supported in said housing and projecting therefrom, a catch adjacent said contact clip for engaging said latch, a spring encircling said rod for holding said latch in its engaging position, a tube surrounding said spring for supporting said latch, and lugs carried by said yoke and latch for disengaging said latch when said handle is operated to move said switch to its open position, said housing and said yoke completely inclosing said spring, lugs, latch and tube with the exception of the portion of the latch projecting from said housing to engage said catch.

6. In a locking switch, the combination of a pivot clip, a contact clip, a switch blade pivotally connected to the pivot clip and engaging the contact clip when the switch is closed, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported upon said rod, a handle carried by said yoke, a locking latch pivotally supported in said housing and projecting therefrom, a catch adjacent said contact clip for engaging said latch, a spring encircling said rod for holding said latch in its engaging position, a tube surrounding said spring for supporting said latch, said spring being secured to said tube and said latch being also secured to said tube, and lugs carried by said yoke and catch for disengaging said latch when said handle is operated to move said switch to its open position, said housing and said yoke completely inclosing said spring, lugs, latch and tube with the exception of the portion of the latch projecting from said housing to engage said catch.

7. In a locking switch, the combination of a pivot clip, two contact clips, one upon either side of said pivot clip, a switch blade pivotally connected with said pivot clip for engaging either of said contact clips as desired, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported on said rod, a handle carried by said yoke, two locking latches pivotally supported in said housing and projecting from opposite sides of said housing, a catch adjacent each contact clip for engaging the corresponding latch, a spring connected with said latches to hold them in engaging position, and lugs carried by said yoke and latches for moving the engaged latch to its releasing position when said handle is operated to move said switch blade from engagement with either contact clip.

8. In a locking switch, the combination of a pivot clip, two contact clips, one upon either side of said pivot clip, a switch blade pivotally connected with said pivot clip for engaging either of said contact clips as desired, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported on said rod, a handle carried by said yoke, two locking latches pivotally supported in said housing and projecting from opposite sides of said housing, a catch adjacent each contact clip for engaging the corresponding latch, a spring connected with said latches to hold them in engaging position, a tube surrounding said spring and supporting said latches, and lugs carried by said yoke and latches for moving the engaged latch to its releasing position when said handle is operated to move said switch blade from engagement with either contact clip.

9. In a locking switch, the combination of a pivot clip, two contact clips, one upon either side of said pivot clip, a switch blade pivotally connected with said pivot clip for engaging either of said contact clips as desired, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported on said rod, a handle carried by said yoke, two locking latches pivotally supported in said housing and projecting from opposite sides of said housing, a catch adjacent each contact clip for engaging the corresponding latch, a spring connected with said latches to hold them in engaging position, a tube surrounding said spring and supporting said latches, said tube being closed at one end and rigidly secured to one latch and the other latch having a wall in-

closing the other end of said tube and being rotatably mounted on said tube, and said spring being secured to said tube and its rotatable end closure, and lugs carried by said yoke and latches for moving the engaged latch to its releasing position when said handle is operated to move said switch blade from engagement with either contact clip.

10. In a locking switch, the combination of a pivot clip, two contact clips, one upon either side of said pivot clip, a switch blade pivotally connected with said pivot clip for engaging either of said contact clips as desired, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported on said rod, a handle carried by said yoke, two locking latches pivotally supported in said housing and projecting from opposite sides of said housing, a spring connected with said latches to hold them in engaging position, and lugs carried by said yoke and latches for moving the engaged latch to its releasing position when said handle is operated to move said switch blade from engagement with either contact clip, said housing and said yoke completely inclosing said spring, lugs and latches with the exception of the portions of the latches projecting from said housing to engage said catches.

11. In a locking switch, the combination of a pivot clip, two contact clips, one upon either side of said pivot clip, a switch blade pivotally connected with said pivot clip for engaging either of said contact clips as desired, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported on said rod, a handle carried by said yoke, two locking latches pivotally supported in said housing and projecting from opposite sides of said housing, a spring connected with said latches to hold them in engaging position, a tube surrounding said spring and supporting said latches, and lugs carried by said yoke and latches for moving the engaged latch to its releasing position when said handle is operated to move said switch blade from engagement with either contact clip, said housing and said yoke completely inclosing said spring, lugs, latches and tube with the exception of the portions of the latches projecting from said housing to engage said catches.

12. In a locking switch, the combination of a pivot clip, two contact clips, one upon either side of said pivot clip, a switch blade pivotally connected with said pivot clip for engaging either of said contact clips as desired, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported on said rod, a handle carried by said yoke, two locking latches pivotally supported in said housing and projecting from opposite sides of said latch, a spring connected with said latches to hold them in engaging position, a tube surrounding said spring and supporting said latches, said tube being closed at one end and rigidly secured to one latch and the other latch having a wall inclosing the other end of said tube and being rotatably mounted on said tube, and said spring being secured to said tube and its rotatable end closure, and lugs carried by said yoke and latches for moving the engaged latch to its releasing position when said handle is operated to move said switch blade from engagement with either contact clip, said housing and said yoke completely inclosing said spring lugs, latches and tube with the exception of the portions of the latches projecting from said housing to engage said catches.

13. In a locking switch, the combination of a pivot clip, a contact clip, a switch blade pivotally connected to the pivot clip and engaging the contact clip when the switch is closed, a housing carried by the switch blade, a pivot rod extending through said housing transversely of said blade, a yoke pivotally supported upon said rod, a handle carried by said yoke, a locking latch pivotally supported on said rod and projecting from said housing, a catch adjacent said contact clip for engaging said latch, a spring for holding said latch in its engaging position, and lugs carried by said yoke and latch for disengaging said latch when said handle is operated to move said switch to its open position.

In witness whereof, I hereunto subscribe my name this 25th day of October, A. D. 1917.

EDSON O. SESSIONS.