March 11, 1952 R. B. PEALER 2,588,565

SWITCH LOCK FOR POWER-DRIVEN TOOLS

Filed Nov. 13, 1948 2 SHEETS--SHEET 1

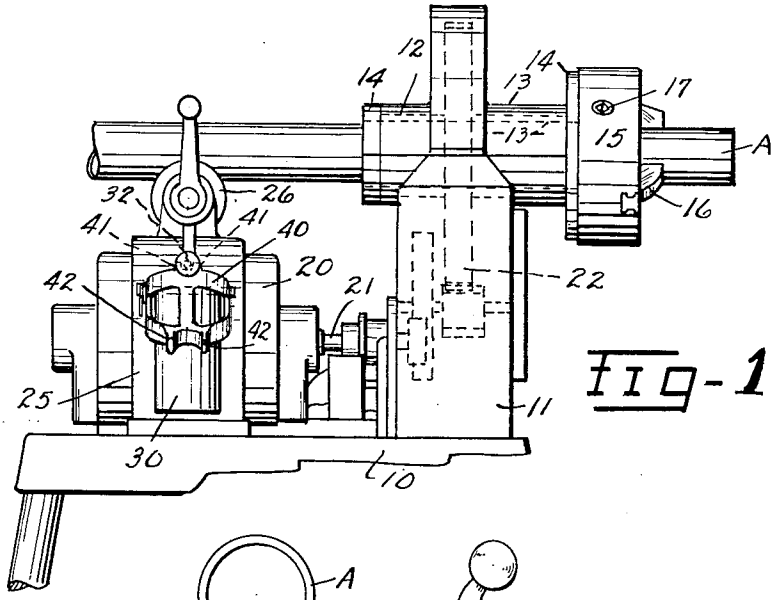


FIG-1

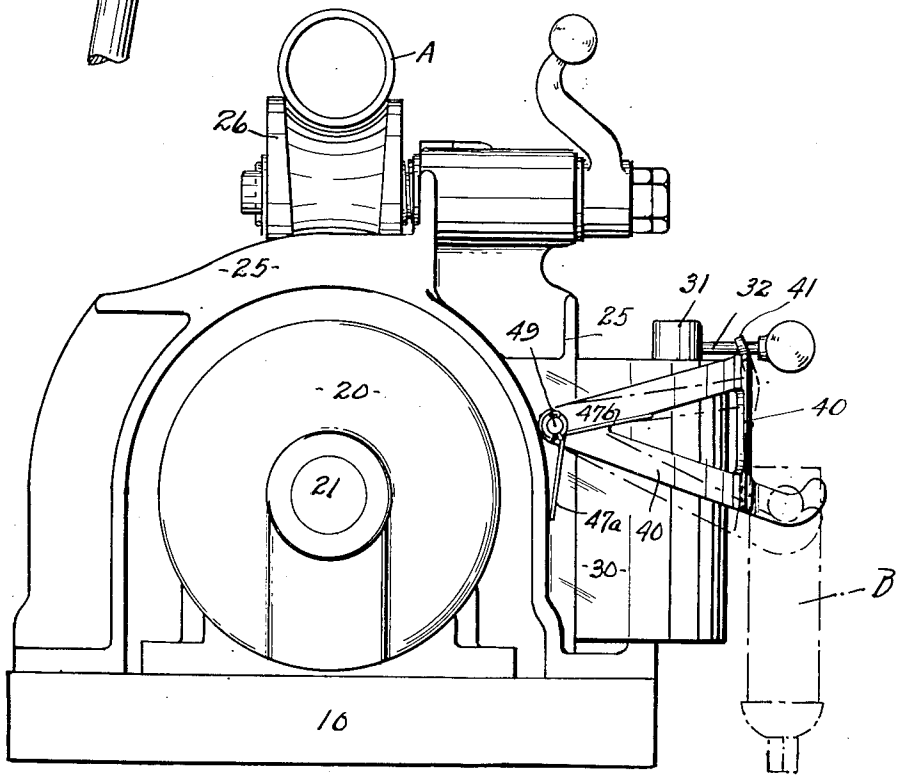


FIG-2

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SWITCH LOCK FOR POWER-DRIVEN TOOLS

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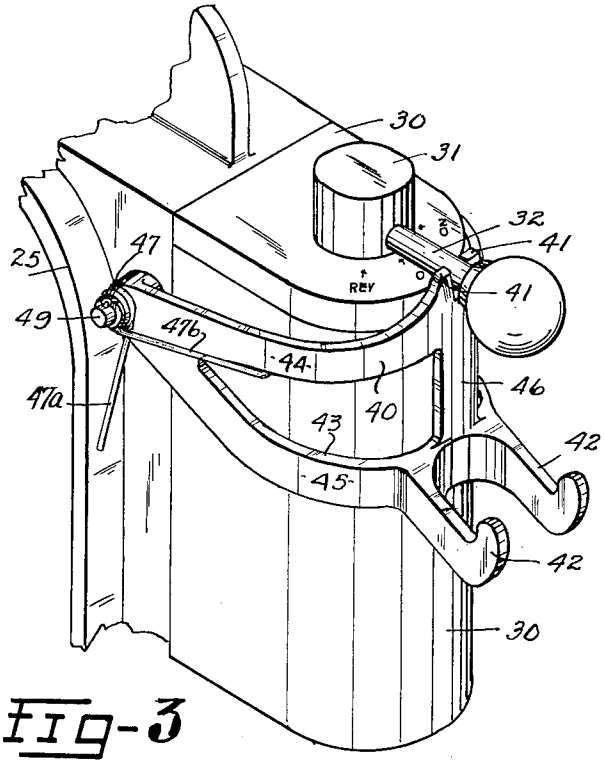


FIG-3

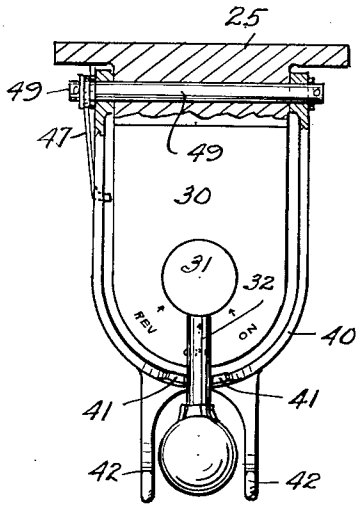


FIG-5

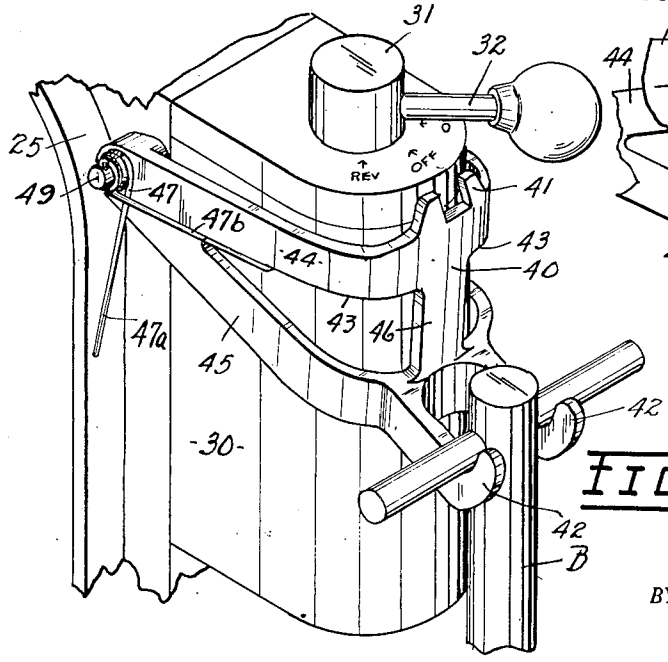


FIG-4

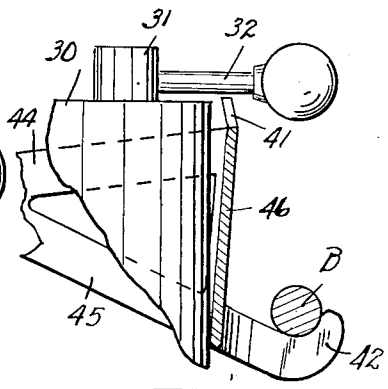


FIG-6

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2,588,565

UNITED STATES PATENT OFFICE

2,588,565

SWITCH LOCK FOR POWER-DRIVEN TOOLS

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11 Claims. (Cl. 200—169)

1

This invention relates to a safety lock for the controlling switch of an electrically driven power tool. Many power driven machine tools, as for example pipe working machines, have rotary chucks the jaws of which must be set in clamping position by a removable manual wrench. Such wrench when in use usually projects radially from the chuck head. It sometimes happens that the operator forgets to remove the chuck wrench after effecting the clamping and starts the machine with the wrench still in the chuck head. The result is that the projecting wrench is carried around by the rotary chuck head and may cause injury to the operator or may come into engagement with the bed of the machine or some other fixed part and cause breakage of some part of the machine.

The object of this invention is to provide means to prevent the starting of the machine in case the operator inadvertently leaves the chuck wrench standing in the chuck. To this end, I have provided a holding device which normally locks the switch in neutral position and has provision for supporting the chuck wrench. When the chuck wrench is put on such support it acts to release the lock from the switch lever, allowing the operator to move the switch in the usual manner.

The present invention, as illustrated in the accompanying drawings and hereinafter fully described, is concerned especially with power machines having an electric switch the control lever of which moves in a horizontal plane, as for instance the well-known type of barrel switch having the operating lever projecting horizontally from the top of the vertical housing containing the barrel and contact fingers. Such lever is usually swung from a central "off" position in either direction for forward or reverse rotation of the motor control thereby. Simplicity, cheapness of construction of the switch locking device, as well as its adaptability for mounting on the existing tools having such switches, are features of the present invention.

In the drawings, Fig. 1 is a side elevation of a machine tool in the form of a power drive for holding and rotating the pipe to be cut or threaded, this machine tool having a barrel switch, the operating lever of which is shown as locked by my locking device; Fig. 2 is an end view on a larger scale of the machine shown in Fig. 1, looking from the left hand end; Fig. 3 is a perspective of a barrel switch on a portion of a machine tool, showing my device in locking position, due to the absence of the chuck wrench.

2

Fig. 4 is a similar view showing the locking device in unlocking position with the chuck wrench present; Fig. 5 is a plan of the barrel switch with the locking device retained in locking position by its spring, the chuck wrench being absent; Fig. 6 is a fragmentary vertical section of the forward portion of the locking device held in released position by the chuck wrench.

In Figs. 1 and 2, 10 indicates any suitable bed from which rises a hollow housing 11 having laterally extending hollow bearing portions 12 and 13. Mounted in bearings in these extensions is a rotary barrel 14 carrying a chuck head 15. The jaws 16 of this chuck are controlled by a radial socket 17 suitable for the application of a chuck wrench, the jaws being shown as gripping a pipe A.

At the left of the standard 11 is an electric motor 20, the shaft 21 of which is coupled with mechanism extending into the housing 11 and there connected by reduction gearing with a gear tight on the chuck barrel. The reduction gearing may be of any suitable type and is not fully shown but is indicated by the dotted lines 22 at Fig. 1. One form of such gearing is illustrated in my Patent 2,079,179, issued May 4, 1937.

In Figs. 1 and 2, I have shown at 25 an arched frame extending over the motor and carrying an adjustable pipe support 26 for the projecting portion of the pipe in the chuck. The arched frame at its front carries the housing 30 of the barrel switch. The controlling barrel in this switch has an upwardly extending vertical shaft 31 from which an operating lever 32 extends horizontally toward the front of the machine. This operating lever in the usual construction projects directly forward when in the "off" position but may be swung either to the right or left to connect the motor for forward movement or for reverse rotation.

So much of the construction as is above described is already in use and is set out merely as showing a power drive or machine tool having a chuck controlled by a chuck wrench and driven by an electric motor which is controlled by a switch having a horizontal operating lever.

Coming now to my switch lock, suitable for the machine described, this lock comprises a U-shaped member 40 extending around the switch barrel housing and pivotally connected at the ends of its arms to the frame of the machine behind the housing 30. This U-shaped member carries at its upper edge a pair of spaced jaws 41 adapted to stand on opposite sides of the switch lever 32 or to clear the same when the

member 40 is lowered. This member carries also a pair of spaced jaws 42 extending forwardly from its lower portion and adapted to support a T-shaped chuck wrench, with its handle member resting on the jaws. Such wrench is shown at B in Figs. 4 and 6, and is indicated by broken lines in Fig. 2.

The locking member is preferably lightened by openings 43 of a general triangular shape in its two sides, giving it the upper portion 44, the diverging lower portion 45 and the connecting front portion 46 shown in the drawings.

The U-shaped frame 40 is given a tendency to swing upwardly by a suitable spring, shown as a coiled spring 47, coiled about the pivotal axis of the member 40 and having one end, as 47*a*, extending downwardly and engaging the frame and the other end as 47*b*, extending forwardly and then bent laterally beneath the upper portion 44 of the locking member.

The pivoting of the locking member to the frame is preferably effected by a through rod 49 extending through both arms of the member and through an intermediate portion of the frame member 25, this rod carrying suitable stops at its ends, as for instance cotter pins. A projecting end portion of this rod forms a convenient support for the spring coiled about it.

It will be seen from the description given that the U-shaped locking member of this invention may be readily mounted on existing machines having barrel switches, which are in common use. It is only necessary to drill a hole through the frame for the passage of the pivot bolt 49 and then mount the locking member with its spring in place. The locking member occupies little room and is normally held in idle position by the weight of a chuck wrench resting on the forwardly projecting jaws.

Whenever the chuck wrench is to be used on the chuck to loosen or clamp a pipe, the switch is necessarily standing in the off position, as the motor is of course not running during the clamping or unclamping, and the removal of the chuck wrench from its support causes an automatic locking of the switch by reason of the rising of the locking member to embrace the switch lever, so that the switch is positively retained locked until the operator has completed the wrench operation and returns the chuck wrench to the forwardly projecting jaws of the locking member. These jaws form a very convenient support for the chuck wrench, and, even in the idle position of the device, provide a guard preventing the operator accidentally moving his body against the switch lever and unintentionally turning the motor on.

It will be noticed that the outer edges of the switch locking jaws 41 are curved or inclined outwardly and downwardly with the result that if the operator after starting the machine with the chuck wrench on the locking device should thereafter remove the chuck wrench while the machine is running, then when he swings the switch lever toward neutral position to stop the machine such action will cause the switch lever to engage one of the camming surfaces of the locking member and automatically depress that member as the switch lever comes into neutral position. Then the elevation of the locking member by its spring will immediately lock the switch lever in neutral position and retain it locked until the chuck wrench is restored in supporting position on the device.

I claim:

1. The combination of an electric switch having an enclosing housing and a switch lever projecting from the housing and swingable in a horizontal plane, a pivotally mounted U-shaped member extending about the switch housing and having means to coact with the switch lever, a spring tending to swing the U-shaped member upwardly on its pivot into such coacting position, said U-shaped member having also means for supporting a weight sufficient to lower it into non-active position.

2. The combination of a barrel type of switch for controlling an electric circuit, said switch having an enclosing housing and a switch lever projecting above the top of the housing and swingable in a horizontal plane, a U-shaped member extending about the switch housing and having the rear ends of its arms pivotally mounted, said U-shaped member having a pair of shoulders adjacent its top adapted to coact with the switch lever and having also a pair of forwardly projecting jaws suitable for supporting a weight, and a spring adapted to swing the U-shaped member upwardly on its pivot when the weight is absent.

3. The combination of a switch mounted in a vertically extending housing and having a horizontally movable lever above the housing, a U-shaped locking member extending about the housing and having upwardly extending means adapted to engage the lever and hold it in neutral position, means for pivotally mounting the rear ends of the locking member, a spring between the machine frame and locking member tending to elevate it, and a pair of spaced jaws extending forwardly from the intermediate portion of the U-shaped member.

4. The combination of a switch, a housing for the switch, the switch having a horizontally movable operating lever, of a U-shaped locking member extending about the switch housing and having its two arms pivoted to the frame at the rear of the housing, a spring coiled about the pivotal axis of the locking member and bearing at one end against said frame and at the other end against the locking member tending to elevate the locking member, the locking member having a pair of upwardly extending jaws adapted to stand on opposite sides of the switch lever when the latter is in idle position and the locking member elevated, and a pair of forwardly extending jaws adapted to carry a tool the weight of which will swing down the locking member against the action of its spring to release the switch lever.

5. The combination of a barrel switch having upright housing and an operating lever at the top thereof and movable in a horizontal plane, a U-shaped locking member extending about the housing having its rear ends pivotally mounted, a spring tending to swing the locking member upwardly, a pair of upwardly extending jaws carried by the locking member and adapted to embrace the switch lever when the latter is in "off" position and the locking member elevated, and a pair of spaced jaws extending forwardly from the intermediate portion of the U-shaped locking member adapted to carry a tool the weight of which may lower the locking member against the action of its spring.

6. The combination of a housing for a switch, the switch having a horizontally movable operating lever, of a U-shaped locking member extending about the switch housing and having its two

arms pivotally mounted at their ends, a spring coiled about the pivotal axis of the locking member and tending to elevate the locking member, the locking member having means to engage the switch lever when the latter is in idle position and the locking member elevated, and a pair of forwardly extending jaws on said locking member adapted to carry a tool the weight of which will swing down the locking member against the action of its spring to release the switch lever.

7. The combination of a switch having an upright housing and an operating lever movable in a horizontal plane adjacent the upper end of the housing, a U-shaped locking member extending about the housing having its intermediate portion beneath the operating lever, the rear ends of the member being pivotally mounted, said member flaring in an up and down direction toward its intermediate portion, a spring tending to swing the locking member on its pivot to move the intermediate portion upwardly, said intermediate portion being formed at its upper part with a pair of jaws adapted to embrace a switch lever when the latter is in its off position and the member elevated and with a pair of jaws extending forwardly from the lower part of its intermediate portion and adapted to support a tool the weight of which may lower the locking member against the action of the spring.

8. The combination of a switch having an enclosing housing and a switch lever projecting from the housing and swingable in a horizontal plane, a pivotally mounted U-shaped member extending about the switch housing and swingable in a vertical plane and having means to coact with the switch lever, a spring tending to swing the U-shaped member upwardly on its pivot into such coacting position, said U-shaped member having also forwardly projecting means to lower it into non-coacting position.

9. The combination of a barrel type of switch, said switch having an enclosing housing and a switch lever projecting above the top of the housing and swingable in a horizontal plane, a U-shaped member extending about the switch housing and having the rear ends of its arms pivotally mounted on a horizontal axis, said U-shaped member having a pair of shoulders adjacent its top adapted to embrace the switch lever and hold it in neutral position, a spring tending to swing the U-shaped member upwardly on its pivot, and a forward projection on the U-shaped member below the switch lever by which said member may be lowered.

10. The combination of a switch mounted in a vertical extending housing and having a horizontally movable operating lever, a U-shaped locking member extending about the housing, means for pivotally mounting the rear ends of the locking member, a spring tending to elevate it, and a pair of spaced jaws extending upwardly from the intermediate portion of the U-shaped member and adapted to straddle the switch lever and hold it in neutral position, the outer edges of said jaws being outwardly and downwardly inclined to form camming surfaces adapted to be engaged by the switch lever in moving toward "off" position.

11. In the combination of a switch having a vertically extending housing and having a horizontally movable operating lever, a U-shaped locking member extending about the housing, means for pivoting the rear ends of the locking member on a horizontal axis, said looking member having means to engage the switch lever when the member is elevated, a spring tending to elevate it, and means extending forwardly from the intermediate portion of the U-shaped member and adapted to support a sufficient weight to lower the member to idle position.

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