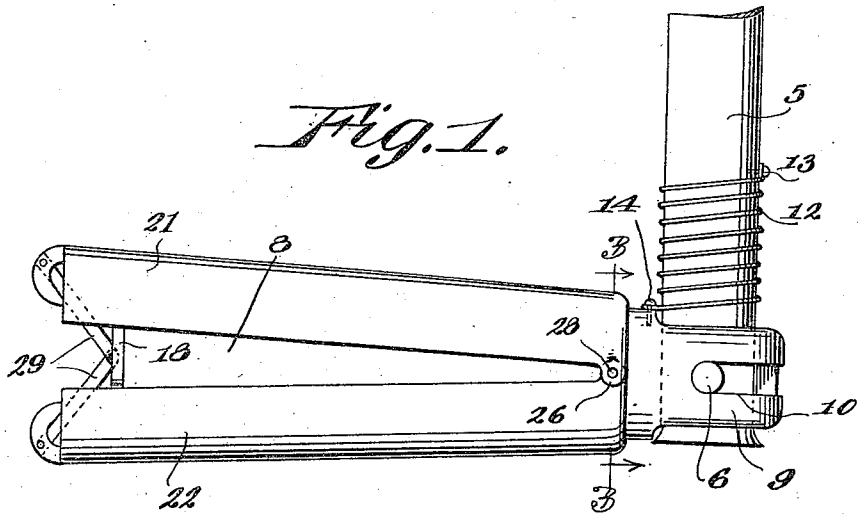
S. C. WAITS.

SAFETY CRANK FOR INTERNAL COMBUSTION MOTORS.

APPLICATION FILED MAY 26, 1921.

1,421,624. Patented July 4, 1922.

Fig. 1.



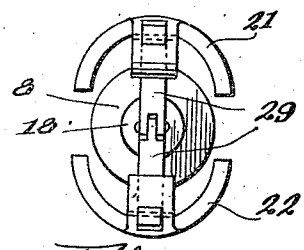


Fig. 2.

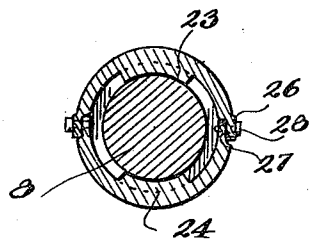


Fig. 3.

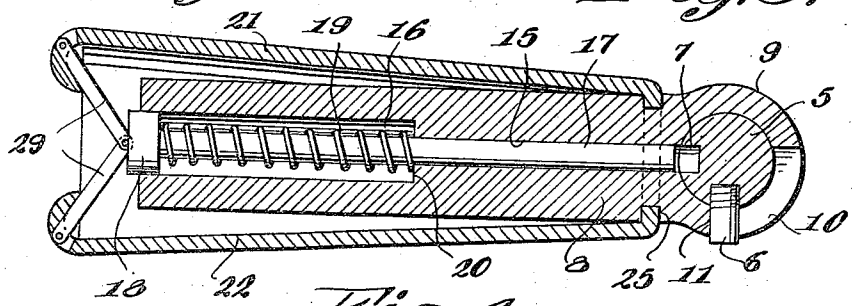


Fig. 4.

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SAFETY CRANK FOR INTERNAL-COMBUSTION MOTORS.

1,421,624. Specification of Letters Patent. Patented July 4, 1922.

Application filed May 26, 1921. Serial No. 472,338.

To all whom it may concern:

Be it known that I, SPENCER C. WAITS, a citizen of the United States of America, and resident of Pine Bluff, in the county of Jefferson and State of Arkansas, have invented certain new and useful Improvements in Safety Cranks for Internal-Combustion Motors, of which the following is a specification.

This invention relates to safety cranks for cranking internal combustion motors, and has for an object the provision of novel means whereby the handle is automatically disconnected from the crank to permit the said handle to move independently of the crank upon back firing of the motor, and an anti-clockwise movement of the crank when the said handle of the crank has been thrown from the hand of the operator.

An object of this invention is to provide against injury to the operator in case of back firing of the motor, and the provision of means whereby the handle may be conveniently re-set for operation by the pressure of the hand of the operator on the said handle or parts associated with it.

A further object of this invention is to yieldingly mount the handle on the crank, in order that the said handle may oscillate with relation to the crank to an extent which will permit it to clear the arm of an operator, means being provided for automatically resetting the handle with relation to the crank and the means by which the handle is coupled to the crank.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a view in elevation of the angularly disposed portion of a crank with the handle applied thereto;

Figure 2 illustrates an end view of the handle;

Figure 3 illustrates a sectional view on the line 3—3 of Fig. 1; and

Figure 4 illustrates a sectional view of the handle and crank.

In these drawings 5 denotes the throw end of a crank having a stud 6 threaded therein, and preferably having a recess 7 at right angles to the position of the stud.

The handle 8 has an eye 9 which is rotatable on the crank section 5, and the portion of the handle forming the eye has a slot 10 therein forming a clearance for the stud 6 which projects through the slot, thereby making it possible for the handle to oscillate on the section of the crank to the limit of the length of the slot. In Fig. 4 the handle is shown in normal position in which it is held by reason of the fact that a shoulder 11, forming one end of the slot, abuts the stud and it is brought to this position by reason of the fact that a spring 12 has one end anchored as at 13 to the crank element, and the opposite end connected as at 14 to the handle, the said spring encircling the crank element between the ends, and the said spring is operative to return the handle to the position in which it is shown in Figs. 1 and 3.

The handle 8 has an opening 15 extending through it and the opening is larger at one end, as shown at 16. A bolt 17 is slidable in the opening 15 and extends through the enlarged portion 16, the said bolt being operative to enter the seat 7 to couple the handle to the crank element. The outer end of the bolt is preferably provided with a head 18 forming an abutment for a spring 19 which encircles the bolt between the said head and the shoulder 20 formed at the junction of the enlarged and restricted portions of the aperture in the handle. The spring is operative to retract the bolt to disengage it from the crank element.

The handle is embraced by two shell-like elements 21 and 22 which have inturned flanges 23 and 24 respectively, at their inner ends, which flanges are free to move in a seat 25 formed near the inner end of the handle, and the elements 21 and 22 have coinciding apertured ears 26 and 27 respectively, which are connected together by pivots such as 28, it being understood that the ears are duplicated on two sides to permit the oscillation of the members with respect to each other and the handle. Links or toggles 29 are pivotally connected to the elements 21 and 22 and in suitable manner to the head 18, and the relation of parts is such that when the elements 21 and 22 are pressed together, the links will be operative to force the bolt inwardly to the seat to couple the

handle to the crank element. The coupling of the links to the head is but conventionally shown, it being understood that any appropriate means may be supplied for effecting this joint.

From an inspection of the drawing, it will be apparent that when an operator presses the members 21 and 22 together, which action will result when an operator grasps these elements during the cranking operation, the pressure exerted will result in forcing the bolt into engagement with the crank element, and hence the crank may be rotated, the elements 21 and 22 constituting what might be termed a sleeve which rotates on the handle. Should the motor back fire, the handle will, of course, be kicked from the grasp of the operator, and the spring 19 will be of sufficient strength as to retract the bolt and disconnect the handle from the crank element. The centrifugal action, due to the travel of the crank, will result in causing the handle to turn to a position parallel with the crank element and it will then clear the arm or hand of the operator. Upon the force of the back fire being expended and the crank coming to rest, the spring 12 will exert a pull effective to return the parts to the normal position shown in Fig. 1, when a repetition of the cranking operation may be resumed.

A device made in accordance with this invention will prove effective, and if the spring 19 is of proper strength, it will hold the parts under such pressure as to prevent undue vibration or rattling, and an effective and satisfactory safety crank will result.

I claim:

1. In a safety crank for internal combustion motors, a crank element, a handle having an eye rotatably mounted on the crank element, means for limiting the oscillatable movement of the handle on the said element, means for returning the handle to a normal position, hand engaging devices operated by pressure due to the grasping of the handle, a bolt for connecting the handle to the crank element, means for communicating the motion of the hand engaged portions of the said bolt, and means for retracting the bolt when the hand engaged elements are released.

2. In a safety crank for internal combustion motors, a crank element, a handle having an eye to receive the crank element, a slot formed longitudinally in the eye, a stud carried by the crank element projecting into the slot, the said crank element having a seat therein, a bolt slidable through the handle and adapted to enter the seat for connecting the handle to the crank element, hand engaging devices oscillatably mounted on the handle, means for communicating the motion of the oscillatable elements to the bolt, and means for retracting the bolt upon release of the oscillatable elements.

3. In a safety crank for internal combustion motors, a crank element, a handle having an eye to receive the crank element, a slot formed longitudinally in the eye, a stud carried by the crank element projecting into the slot, the said crank element having a seat therein, a bolt slidable through the handle and adapted to enter the seat for connecting the handle to the crank element, hand engaging devices oscillatably mounted on the handle, means for communicating the motion of the oscillatable elements to the bolt, means for retracting the bolt upon release of the oscillatable elements, and means for returning the handle to normal position.

4. In a safety crank for internal combustion motors, a crank element, a handle having an eye to receive the crank element, a slot formed longitudinally in the eye, a stud carried by the crank element projecting into the slot, the said crank element having a seat therein, a bolt slidable through the handle and adapted to enter the seat for connecting the handle to the crank element, hand engaging devices oscillatably mounted on the handle, means for communicating the motion of the oscillatable elements to the bolt, means for retracting the bolt upon the release of the oscillatable elements, a spring encircling the crank element, means for anchoring the spring to the crank element, means for anchoring the spring to the handle, the said spring being operative to return the handle to normal position.

5. In a safety crank for internal combustion motors, a crank element, a handle oscillatably mounted thereon, means for limiting the oscillation of the handle, means for returning the handle to normal position, an element for connecting the handle to the crank element, hand pressed members carried by the handle, means for communicating the motion of the hand pressed elements to the means for connecting the handle to the crank element, and means for retracting the said connecting means.

SPENCER C. WAITS.