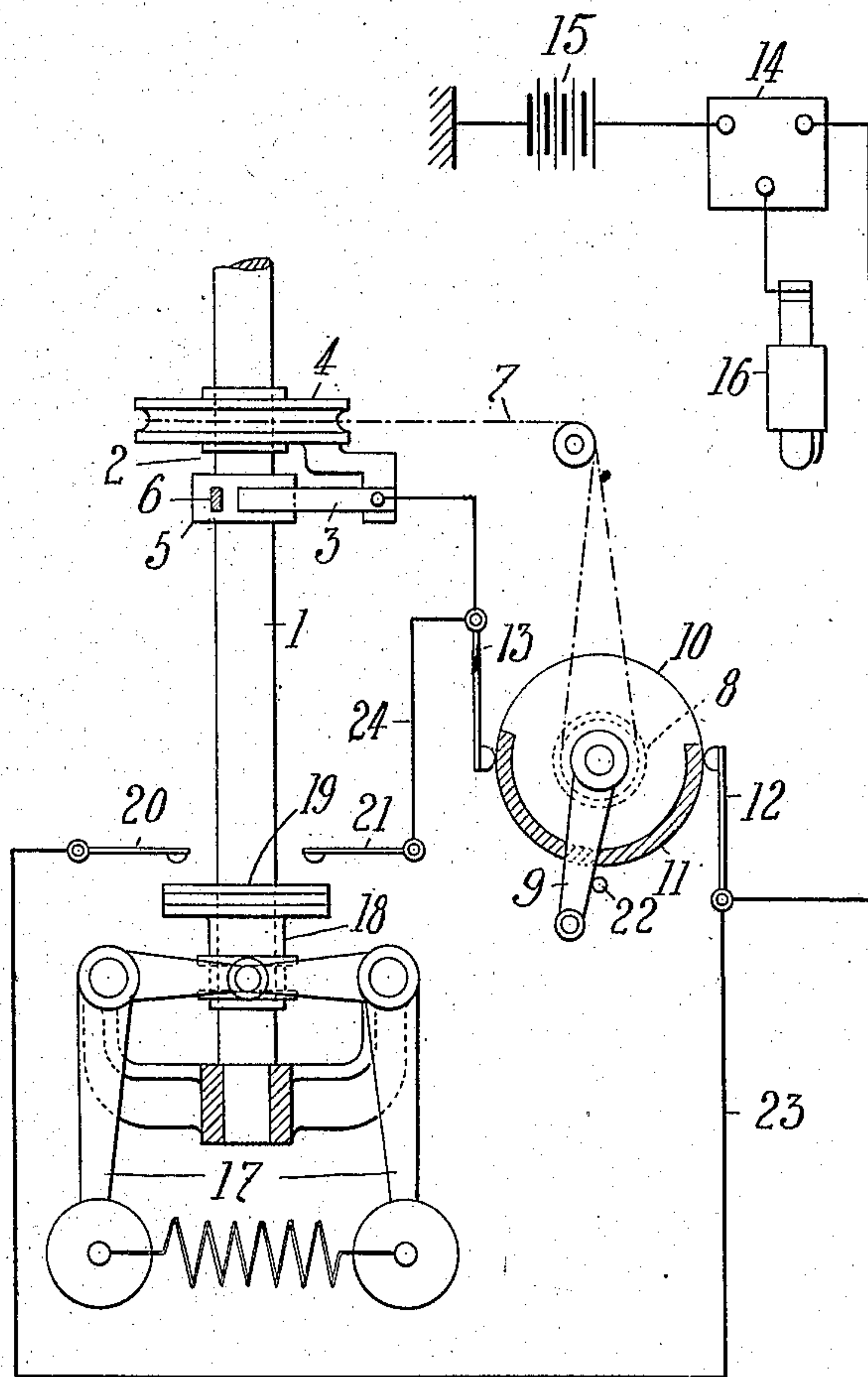


C. W. ASKLING.
ELECTRIC IGNITING DEVICE FOR REVERSIBLE INTERNAL COMBUSTION ENGINES.
APPLICATION FILED OCT. 10, 1907.

923,929.

Patented June 8, 1909.



Witnesses:
W. C. Deady
J. J. Sheehy.

Inventor:
Carl W. Askling.
by James J. Sheehy
Attorney.

UNITED STATES PATENT OFFICE.

CARL WILHELM ASKLING, OF SÖDERHAMN, SWEDEN.

ELECTRIC IGNITING DEVICE FOR REVERSIBLE INTERNAL-COMBUSTION ENGINES.

No. 923,929.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed October 10, 1907. Serial No. 396,801.

To all whom it may concern:

Be it known that I, CARL WILHELM ASKLING, a citizen of the Kingdom of Sweden, residing at Söderhamn, Sweden, have invented new and useful Improvements in Electric Igniting Devices for Reversible Internal-Combustion Engines, of which the following is a specification.

This invention relates to improvements in electric igniting devices for reversible internal combustion engines and more particularly such engines in which the reversal is accomplished by pre-ignitions. Before the reversal of such engines the speed of the same should be decreased so much that the counter-pressure caused by a pre-ignition is sufficient to change the direction of rotation of the engine. The said reduction of the speed generally is accomplished by manually putting the igniting device out of operation. Inasmuch as the speed of the engine after the disconnection of the igniting device is diminished to *nil* in a few seconds it is important that the igniting device is again put in operation within a short period of time in order to prevent the engine from stopping. In reversible engines heretofore known it is usual that the operator manually returns the igniting device into active position, judging from the speed of the engine or by means of a speed-indicator when the speed of the engine is suitable for reversal. In each case such maneuver requires great practice and promptness of the operator, and it often happens that the engine stops or reversal does not take place.

The object of the present invention is to provide a device by which the said inconveniences will be removed and which will automatically effect a pre-ignition in the moment most suitable for reversal.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawing I have shown diagrammatically an embodiment of my invention.

Referring to the drawing, 1 indicates the controlling shaft or any other shaft driven by the engine. On said shaft is mounted a sliding-contact 2 consisting of the sliding-spring 3 and a pulley 4. To the shaft 1 is further secured a collar 5 of insulating material and having a contact piece 6 electrically connected to the shaft 1. The pulley 4 and the sliding-spring 3 can be rotated on

the shaft by means of a belt 7 and a pulley 8 which is connected to an operating crank 9. To the latter is rigidly connected a disk 10 having a contact piece 11 which in a certain position closes a circuit between two contact springs 12 and 13 bearing against the said disk. The spring 13 is in connection with the sliding-spring 3 and the spring 12 with an induction apparatus 14 which is connected to the one pole of a suitable source of electric current 15 and to the usual igniter 16. The other pole of the source of current is connected to earth.

The above described devices are of well known construction and constitute an electric spark igniter in which the moment of ignition may be changed or which may be put out of operation at will. The constructive details of the said device are unessential for the present invention and for the same other well known similar igniting devices may be substituted. I would also have it understood that any conventional driving connection may, when deemed expedient, be substituted for the pulleys 4 and 8 and the belt 7. For instance sprocket wheels may be used in lieu of the pulleys 4 and 8, and a sprocket belt in lieu of the belt 7, but I have deemed it unnecessary to illustrate said sprocket gears and sprocket belt. In combination with the said device I arrange according to my present invention a second ignition circuit the action of which depends exclusively on the speed of the engine. In the form shown the shaft 1 is provided with a switch which is connected in shunt to the switch 9—13, and the position of which is controlled by a centrifugal governor 17 provided on the shaft 1. The said switch is combined with the longitudinally movable sleeve 18 of the said governor and consists of a ring 19 of an electrically conducting material, such as metal, insulated from the sleeve, and of two contacts 20 and 21 which are connected to the brushes 12 and 13 respectively. While the engine runs normally, the governor 17 keeps the sleeve 18 in such a position, that the contacts 20 and 21 do not engage the ring 19. The arm 9 is in such a position that the current can flow from the battery 15 through the sliding spring 12, contact piece 11, sliding spring 13 and the contact apparatus 2—6. The contact piece 6 is in such a position on the shaft 1 that the circuit is closed at a suitable position of the crank of the engine, and a spark in well known man-

ner and at the desired moment is obtained at the igniter 16. When the engine is to be reversed, the operating crank 9 is moved from its position against the stop 22 to a position 5 in which the contact piece 11 is separated from the spring 12. In said position the ignition circuit is broken at the switch 9—13, so that no ignitions occur and the speed of the engine decreases. When a certain reduced 10 speed has been reached, the sleeve 18 of the governor is so displaced that the ring 19 comes into contact with the brushes 20 and 21. The switch 9—13 is then shunted through wire 23, sliding spring 20, ring 19, 15 sliding spring 21 and wire 24, so that the ignition device again becomes active. By means of the gear 4, 7, 8 the sliding spring 3 has, however, been turned into such a position that a pre-ignition is obtained by which 20 the engine is reversed. As soon as the reversal has been accomplished, the operating crank 9 should be moved so that the normal ignition circuit is again closed and ignition is obtained at the position of the crank-shaft. 25 that is most suitable for the new direction of rotation. The said adjustment of the operating crank may be accomplished either manually or automatically by means of any suitable adjusting device actuated by the 30 engine itself.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an electric igniting device for reversible combustion engines, the combination of an ignition circuit having adjustable 35 circuit-closing means, a switch in said circuit connected with the said circuit-closing means to adjust the latter on movement of the switch, a second circuit, and a switch in the 40 last mentioned circuit controlled by the speed of the engine.

2. In an electric igniting device for reversible internal combustion engines, the combination of an ignition circuit having adjustable 45 circuit-closing means, a switch in said circuit connected with the said circuit-closing means to adjust the latter on movement of the switch, a second circuit, and a switch in the last mentioned circuit controlled by the speed of the engine and shunted 50 to the first mentioned switch.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL WILHELM ASKLING.

Witnesses:

NILS SONCSION,
CLAES TANDSTRÖM.