

G. W. SAGE.

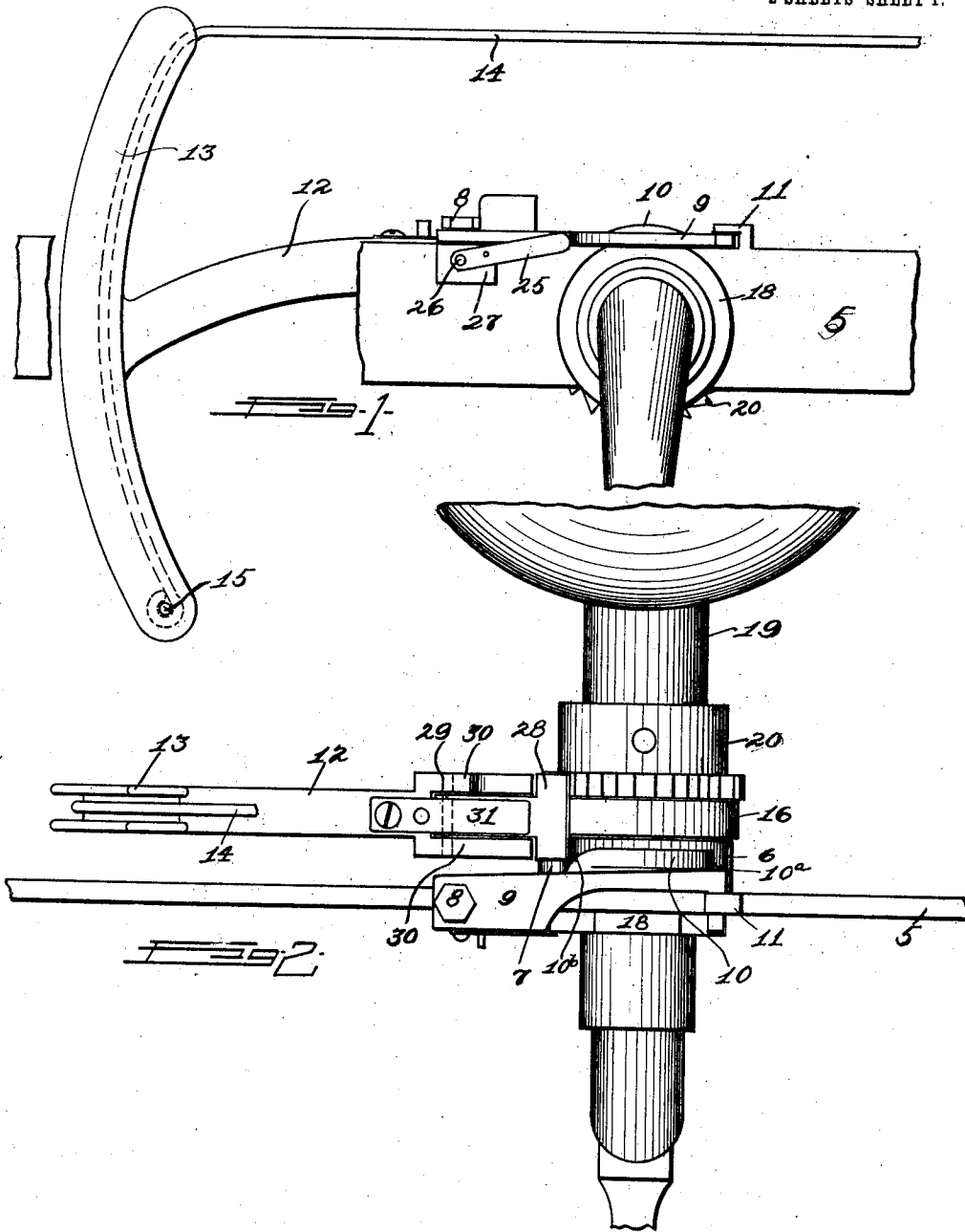
SAFETY CRANKING ATTACHMENT FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JULY 29, 1912.

1,058,389.

Patented Apr. 8, 1913.

2 SHEETS-SHEET 1.



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Witnesses
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C. L. Schmidt

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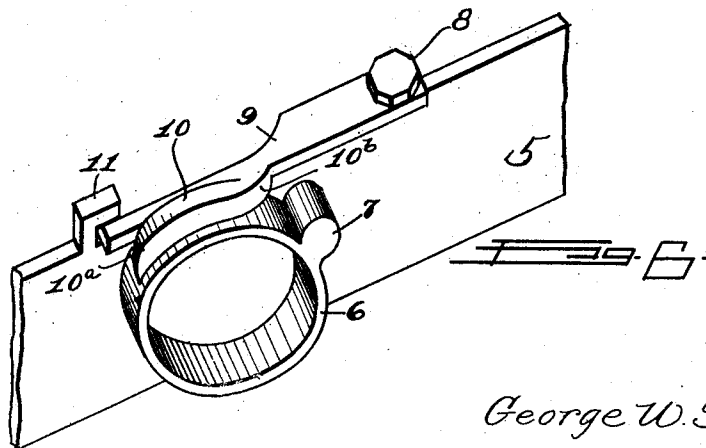
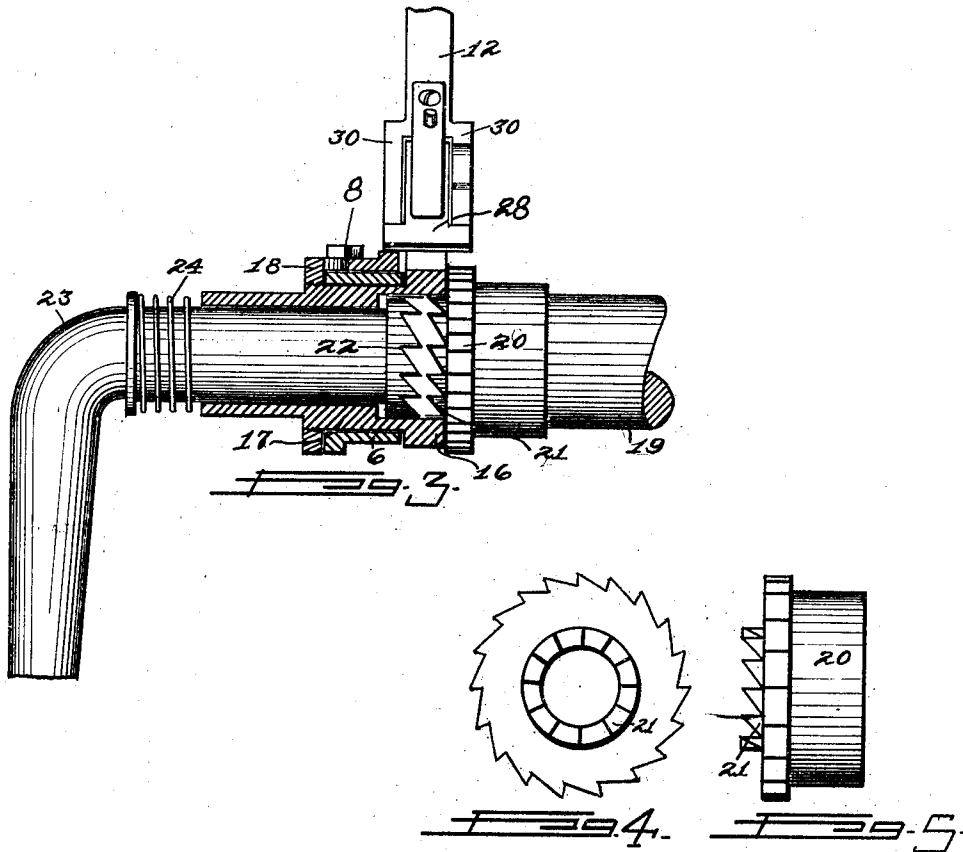
Attorney

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UNITED STATES PATENT OFFICE.

GEORGE W. SAGE, OF SAN DIEGO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO W. R. BYARS, OF SAN DIEGO, CALIFORNIA.

SAFETY CRANKING ATTACHMENT FOR INTERNAL-COMBUSTION ENGINES.

1,058,389.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed July 29, 1912. Serial No. 711,962.

To all whom it may concern:

Be it known that I, GEORGE W. SAGE, a citizen of the United States of America, residing at San Diego, in the county of San Diego and State of California, have invented certain new and useful Improvements in Safety Cranking Attachments for Internal-Combustion Engines, of which the following is a specification.

This invention relates to a safety cranking attachment for internal combustion engines, and has for its object, the provision of an improved device of this character constructed in such manner that it may be operated either locally or from a distant point, as from the seat of an automobile upon which the device is mounted, for instance.

This device comprises a ratchet carried by the engine shaft, and a pawl carried by a movable member, together with a very simple structure adapted to maintain the pawl out of engagement with the ratchet under normal conditions, that is, when the engine is running or when the engine is at rest, to permit the pawl to move into engagement with the ratchet upon initial movement of an operating member and to remain in engagement therewith until the engine fires. Means are provided for immediately causing the ratchet to move out of engagement with the pawl if the engine should back fire, and thereby cause a reverse movement of the engine shaft. It is a well known fact that many persons have had their arms broken by the back firing of the engine when attempting to "crank" the engine with cranks of the ordinary construction.

Further objects and advantages of the invention will be set forth in the detailed description which now follows.

In the accompanying drawing Figure 1 is a front elevation of a safety cranking attachment constructed in accordance with the present invention. Fig. 2 is a plan view thereof. Fig. 3 is a longitudinal sectional view therethrough. Figs. 4 and 5 are face and edge views of the ratchet, and Fig. 6 is a detailed perspective view of the bearing member and the laterally movable cam block, hereinafter described.

Like numerals designate corresponding parts in all of the figures of the drawing.

Referring to the drawing, the numeral 5 designates a transverse bar comprising a part of the automobile frame. This bar carries

a bearing ring 6 (see Fig. 6) and said ring has formed upon it, an outstanding lug 7. Pivoted to the bar 5, by means of a bolt 8, is a laterally movable cam block 9 carrying a cam 10. The forward end of the cam block 9 slides laterally through a guide 11. The cam block 10 is provided with the cam face 10^a and the cam face 10^b.

A cranking arm 12 is provided with a grooved head 13 to which a cord, wire or other cable 14 is secured at 15. This cable provides means for actuating the structure from a distant point. The arm 12 is carried by a hub 16, said hub having a reduced portion thereof indicated at 17, mounted in the bearing ring 6. A nut like retaining device 18 is threaded upon the hub 16 to retain the same in place.

19 designates the shaft of the engine that is to be cranked, and 20 designates a ratchet wheel pinned thereto. This ratchet wheel carries a subsidiary ratchet 21 adapted to be engaged by a ratchet 22 formed upon the end of a crank arm 23. A spring 24 normally holds ratchet 22 out of engagement with ratchet 21. It is apparent that this provides means for cranking the engine in the usual manner.

A flat spring 25 is fastened at 26 to a block 27 carried by bar 5. This spring bears against cam block 9 and normally moves said cam block toward the right in Fig. 3, or in other words, normally moves said cam block toward the ratchet 20. A pawl 28 is pivoted at 29 between ears 30 of arm 12, and a spring 31 normally tends to force this pawl into engagement with the ratchet 20.

In operation, the arm 12 normally lies in the position shown in Fig. 1, at which time pawl 28 rides up upon lug 7 (see Fig. 2) and said pawl is consequently held out of engagement with ratchet 20 during the time that the engine is running and during the time that the engine is at rest, so that if the circuit to the spark plug in any of the cylinders of the engine should be completed, and cause a back fire due to the careless advance of the spark control of the engine, such back firing would not be transmitted to the arm 12 and consequently no damage to the parts would result. When it is desired to crank the engine, cord 14 is drawn upon which swings the arm 12 over toward the right in Fig. 1. As soon as pawl 28 moves off of lug

7, it moves into engagement with ratchet 20 and by acting against cam face 10^b, it forces cam block 9 away from ratchet wheel 20 and permits the pawl 28 to remain in engagement with said ratchet wheel to thereby crank the engine, as will be readily understood. When the cranking movement has been continued a sufficient distance for pawl 28 to clear cam 10, this cam, under the influence of spring 25, moves over and lies in the rear of pawl 28. It is at about this time that the spark is supposed to occur, and if the position of the piston of the engine is such that the occurrence of the spark causes a back firing, or "kick back" of the engine, it is apparent that the pawl 28 will at once ride up cam face 10^a and be lifted out of engagement with ratchet 20, so that reverse movement of the engine shaft will not be imparted to arm 12.

From the foregoing description it will be seen that a very simple and economical structure is herein provided for automatically achieving the results set forth, but it is to be understood that the invention is not limited to the precise construction set forth, but includes within its scope, such changes as may be covered by the appended claims.

Having described my invention, what I claim is:—

1. In a safety cranking attachment for internal combustion engines the combination with a movable pawl carrying member, a ratchet carried by the engine shaft, a fixed frame member, and a pivotally mounted cam carrying block carried by said fixed frame member, said cam carrying block being moved by said pawl during forward movement of said pawl and moving into position to the rear of said pawl after said pawl passes it.

2. In a safety cranking attachment for internal combustion engines, the combination with a movable pawl carrying member, a ratchet carried by the engine shaft, a fixed frame member, a pivotally mounted cam carrying block carried by said fixed frame member, said cam carrying block being

moved by said pawl during forward movement of said pawl and moving into position to the rear of said pawl after said pawl passes it, said cam block carrying a cam having a pawl engaged face upon one of its edges by which said cam block is shifted laterally, and having a pawl engaged face upon its top, by which said pawl is moved out of engagement with the ratchet of the engine shaft.

3. In a device of the character described the combination with a fixed frame member of a cam block pivotally mounted thereon for horizontal swinging movement, a cam carried by said cam block, said cam having a vertical cam face upon one of its edges and having a cam face upon its upper surface, a swinging operating member, a pawl carried thereby, a ratchet wheel and engine shaft upon which the ratchet is mounted, said pawl engaging both the ratchet and the cam, and a spring normally tending to force said cam block toward said ratchet.

4. In a device of the character described, the combination with a fixed supporting member, of a hollow hub having its bearing therein, an operating arm carried by said hub, a pawl carried by said operating arm, a swingingly mounted and laterally movable cam block, a cam carried thereby adapted for engagement by said pawl, a spring normally tending to force the cam block toward said pawl, an engine shaft, a ratchet mounted upon said engine shaft, and adapted for engagement by said pawl, a second ratchet projecting into said hub, a crank, a cooperating ratchet carried by said crank for engagement with the first named ratchet and a spring normally tending to hold the ratchet of the crank out of engagement with the first named ratchet.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. SAGE.

Witnesses:

J. C. HIZAR,
G. U. FRY.