G. W. SAGE.

SAFETY CRANKING ATTACHMENT FOR INTERNAL COMBUSTION ENGINES.

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1,007,608. Patented Oct. 31, 1911.

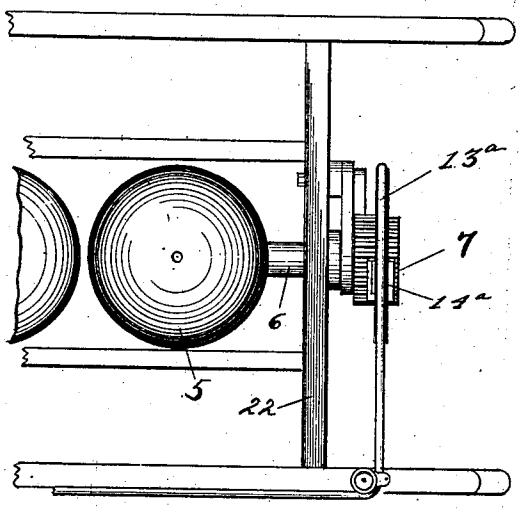

Fig. 1

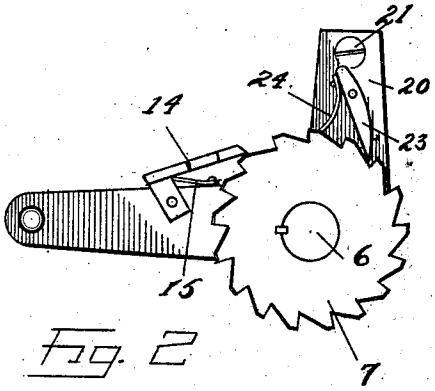

Fig. 2

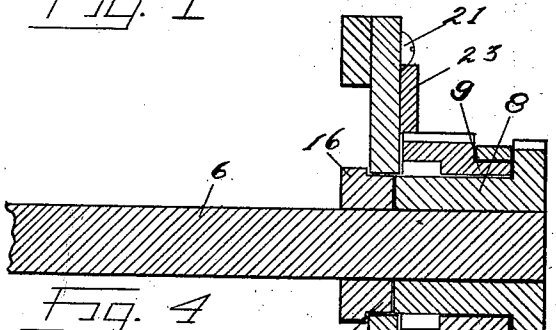

Fig. 4

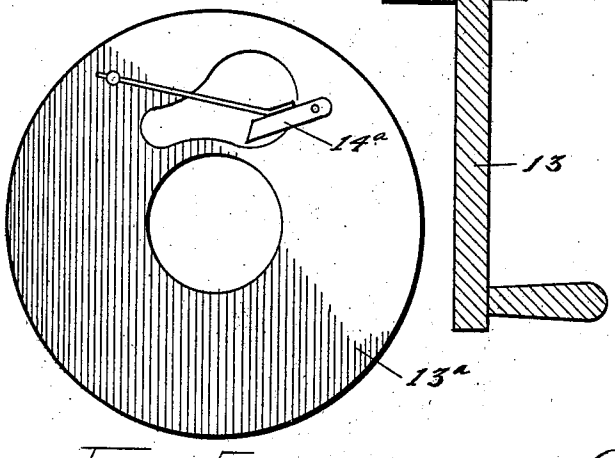

Fig. 5

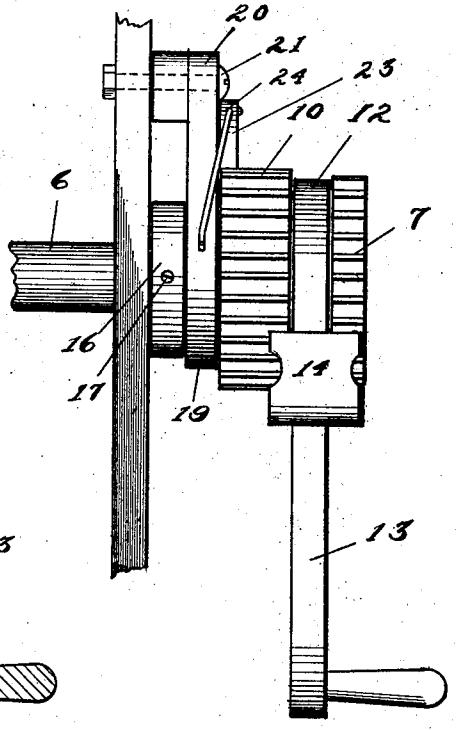

Fig. 3

Inventor

George W. Sage

By Shepherd & Campbell

Attorneys

Witnesses

Nevelle Lyles

Ann M. Murray

UNITED STATES PATENT OFFICE.

GEORGE W. SAGE, OF SAN DIEGO, CALIFORNIA.

SAFETY CRANKING ATTACHMENT FOR INTERNAL-COMBUSTION ENGINES.

1,007,608. Specification of Letters Patent. Patented Oct. 31, 1911.

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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 particularly for automobile engines, the object of the invention being to provide a manually operable member which when turned in one direction, will positively engage the engine shaft, together with means for disconnecting said manually operable member from the engine shaft upon any initial reverse movement of said shaft.

It is a well known fact that many persons have been seriously injured by the premature explosion of the charge in the cylinders of internal combustion engines, this being usually occasioned by having the spark too far advanced so that the spark occurs before the engine passes over the center. It is to prevent accidents under such conditions that the present invention is particularly designed.

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 plan view of the vertical portion of the chassis of an automobile showing the invention applied thereto, Fig. 2 is a front elevation of the cranking attachment, Fig. 3 is a plan view thereof, Fig. 4 is a sectional view thereof, and Fig. 5 is a detail face view of a pulley which may be employed if desired.

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

Referring to the drawing, the numeral 5 designates one of the cylinders of an internal combustion engine and 6, the shaft thereof. Fixed rigidly upon the front end of the shaft 6 is a ratchet wheel 7 that is provided with a hub or sleeve 8. The hub or sleeve 9 of a second ratchet wheel 10 embraces the hub or sleeve 8 and serves to space the ratchet wheel 10 from the ratchet wheel 7. The sleeve 9 likewise forms a bearing for a ring-like portion 12 of a crank handle 13. The handle 13 carries a pawl 14 that is of such width as to engage both the ratchet wheel 10 and the ratchet wheel 7. A spring 15 carried by the handle 13 bears against the underside of pawl 14 to normally hold said pawl into engagement with the teeth of the ratchet wheels.

A collar 16 is fixed upon the shaft 6 by a set screw 17 and is provided with a reduced portion 18. This reduced portion forms a bearing for the ring-like portion 19 of an arm 20. The arm 20 is fixed by a screw or other fastening device 21 to a cross bar 22 of the chassis. The arm 20 carries a pawl 23, this pawl being normally held by a spring 24 into engagement with the teeth of ratchet wheel 10.

The operation of the device is as follows: When the handle is turned in a forward direction or in the direction of the arrow in Fig. 2, the pawl 14 engages the teeth of the ratchet wheels 7 and 10, carrying them to the right in Fig. 2 and turning the engine shaft 6 in the proper direction to crank the engine, it being understood that the ratchet wheel 7 is fast upon the shaft and that the ratchet wheel 10 is loosely mounted. The pawl 23, however, prevents reverse movement of the ratchet wheel 10. The teeth of the ratchet wheel 10 are very slightly longer than those of the ratchet wheel 7. If the engine "back fires" and the ratchet wheel 7 starts to move rearwardly, initial rearward movement of said ratchet wheel 7 starts to move the handle 13 rearwardly through the medium of pawl 14, but the ratchet wheel 10 cannot move rearwardly because of the pawl 23, and consequently pawl 14 rides up one of the teeth of ratchet wheel 10 and in so doing, is lifted out of engagement with the teeth of ratchet wheel 7, after which the ratchet wheel 7 and the engine shaft may rotate rearwardly without moving the handle 13. The movement necessary to thus free the pawl 14 of the teeth of the ratchet wheel 7 is a very slight one, not enough to cause the operator any discomfort.

If desired, a pulley 13^a may be employed in the place of the handle 13, this pulley carrying a pawl 14^a corresponding to the pawl 14. This structure is illustrated in Fig. 1, and the pulley is illustrated in Fig. 5. In other respects, the structure is the same as that shown in Fig. 2 and the same reference numerals have been applied.

From the foregoing description, it will be seen that simple and efficient means are herein provided for accomplishing the ob-

jects of the invention, but while the elements shown and described are well adapted to serve the purposes for which they are intended, it is to be understood that the invention is not limited to the precise construction set forth, but includes within its purview, such changes as may be made within the scope of the appended claim.

Having described my invention, what I claim is:

The combination with the shaft of an internal combustion engine, of a ratchet wheel fixed thereon, a ratchet wheel loosely mounted thereon, the last named ratchet wheel being slightly larger than the first named ratchet wheel, a pawl engaging the loosely mounted ratchet wheel for preventing reverse movement thereof, an operating member loosely mounted to turn between said ratchet wheels, and a pawl pivotally carried by said operating member, of such width as to engage both of said ratchet wheels, initial reverse movement of the fixed ratchet wheel carrying the operating member and its pawl rearwardly until said pawl is lifted out of engagement with the teeth of the first named ratchet wheel by riding up one of the teeth of the loosely mounted ratchet wheel.

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

GEORGE W. SAGE.

Witnesses:
MARY RUSS,
H. M. VOLLMER.