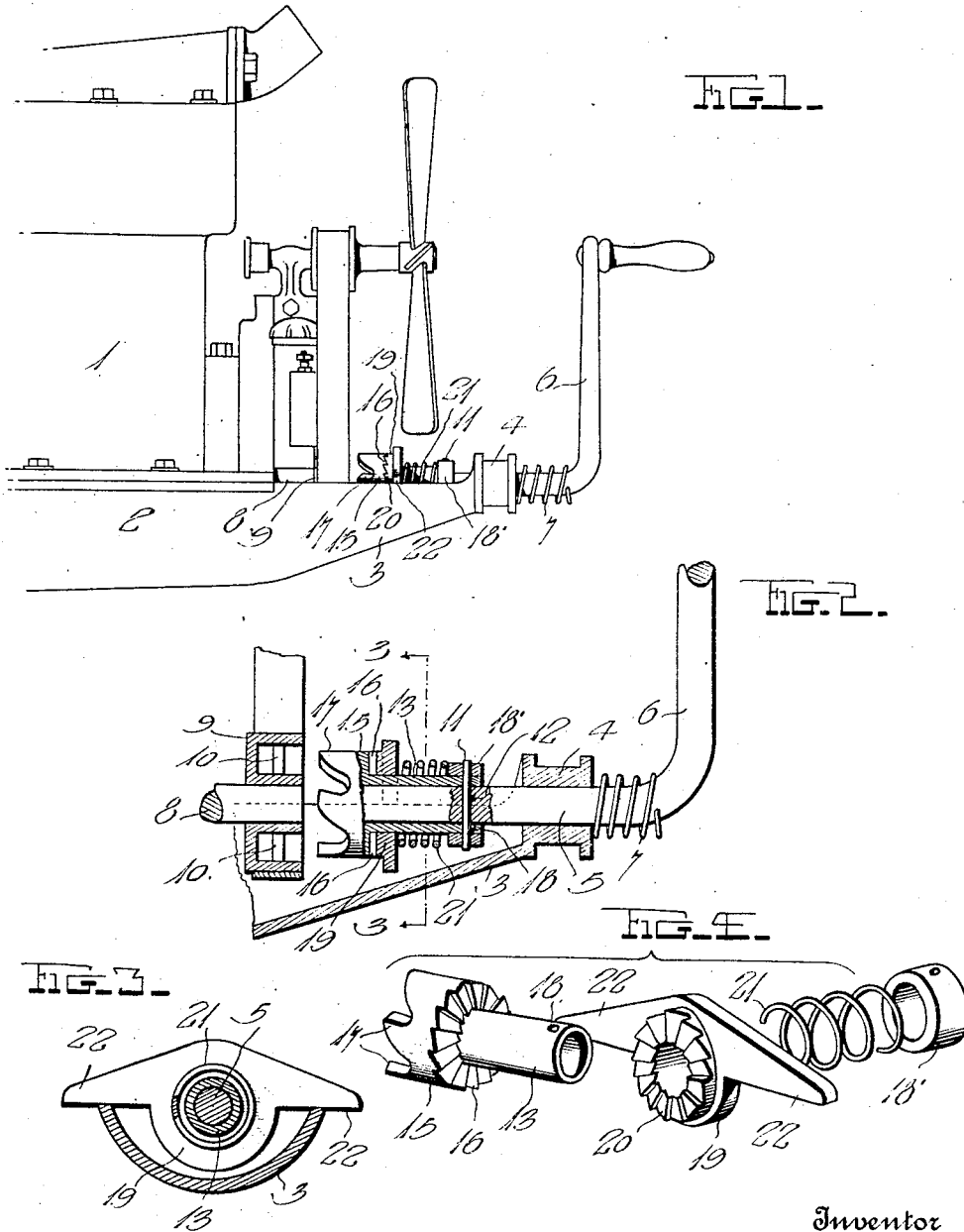


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STARTING CRANK LOCK FOR AUTOMOBILES.  
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# UNITED STATES PATENT OFFICE.

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## STARTING-CRANK LOCK FOR AUTOMOBILES.

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Specification of Letters Patent.

Patented Dec. 10, 1918.

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*To all whom it may concern:*

Be it known that I, CHRISTIAN CHRISTIANSEN, a citizen of the United States, residing at Sioux Falls, in the county of Minnehaha and State of South Dakota, have invented certain new and useful Improvements in Starting-Crank Locks for Automobiles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an extremely simple and inexpensive, yet a highly efficient and durable device for locking the starting cranks of automobiles against retrograde rotation in case the motor should attempt to back fire, thus preventing injury to the person cranking the machine.

A further object of the invention is to provide a lock of the character set forth which is carried entirely by the shaft of the starting crank and is quickly and easily applicable to this shaft without the necessity of altering the same in any manner whatsoever.

A still further object is to provide a locking device of the class set forth which will be particularly adaptable to automobiles having a forwardly extending channeled arm carrying the bearing of the starting crank shaft.

With the foregoing general object in view, the invention resides in the novel features of construction and unique combinations of parts to be hereinafter fully described and claimed, the descriptive matter being supplemented by the accompanying drawing which forms a part of this specification and in which:

Figure 1 is a side elevation of a well known form of automobile motor showing the application of the invention thereto;

Fig. 2 is an enlarged longitudinal section with parts in elevation;

Fig. 3 is a transverse section on the plane of the line 3—3 of Fig. 2; and

Fig. 4 is a disassembled perspective view of the lock.

In the drawing above briefly described, the numeral 1 designates a well known form of automobile motor, it being the type commonly used in the Ford car. The crank case 2 of the motor 1 is provided with a

forwardly extending channeled arm 3 carrying the bearing 4 in which the longitudinal shaft 5 of the starting crank 6 is rotatably mounted, a coiled spring 7 being provided for normally moving said shaft forwardly. The engine shaft 8 is provided on its front end with a fan belt pulley 9 having internal radial pins 10 with which a clutch member on the rear end of the shaft 5 usually coöperates to lock the two shafts together for cranking the motor, and in securing said clutch member to the shaft 5, a pin 11 is passed through the hub of the former and through an opening 12 formed in said shaft. In applying the present invention, the old clutch member is removed and discarded, but the pin 11 is retained to secure the lock to the shaft 5. A sleeve-like hub 13 is provided on one end with a head 15 forming a locking member, the front end of said head having ratchet teeth 16 while the rear end of the head is provided with clutch teeth 17 for coöperation with the pins 10 of the pulley 9. The hub 13 is adapted to surround the rear end of the shaft 5 and is secured in place by passage of the pin 11 through openings 18 in the front end of the hub, said pin extending through the opening 12 of the shaft 5 and also through similar openings in a collar 18' which surrounds the front end of the hub.

A second locking member 19 in the form of a collar, surrounds the hub 13 and the latter is free to rotate therein. The rear side of the locking member 19 is formed with ratchet teeth 20 which coast with the teeth 16 in preventing retrograde rotation of the shaft 5, the two sets of teeth being constantly held in engagement by a coiled spring 21 which surrounds the hub 13 between the locking member and the collar 18'. To hold the locking member 19 against rotation, yet to permit bodily movement thereof with the shaft 5 as the latter is moved forwardly and rearwardly in cranking the motor, I provide said collar with rotation preventing means which is slidable along the arm 3, said means preferably consisting of a pair of oppositely extending arms formed integrally with the member 19 and resting slidably on the horizontal upper edges of said arm 3, said edges forming tracks upon which the arms may slide as the shaft 5 moves forwardly or rearwardly.

In applying the invention, the clutch member on the rear end of shaft 5 is detached by removal of the pin 11 and the several parts of the present invention, previously assembled, are substituted, the hub 13 and collar 18' being now secured in place by re-insertion of the pin 11 or possibly by a new pin if this is desirable. As the crank 6 is forced inwardly to engage the teeth 17 with the pins 10, the arms 22 slide along the channeled arm 3, the spring 21 in the meantime retaining the two sets of teeth 16 and 20 in operative relation. As the crank is now rotated in the proper direction spring 21 permits the locking member 19 to yield so that the teeth 16 may pass over the teeth 20, but in case the motor should have any tendency to backfire, the two sets of teeth immediately come into play to lock the engine shaft 8 against retrograde movement. Since the engine shaft is not permitted to gather any momentum whatever before it is held against reverse turning, there is no great strain placed on any parts of the motor, the effect being no more serious than common "choking" of the motor. Since the shaft 8 is held against reverse turning, it follows that injury to the operator by backfiring is prevented.

From the foregoing, taken in connection with the accompanying drawing, it will be obvious that my invention is of extremely simple and inexpensive nature, may be quickly and easily applied, and will be highly efficient and desirable. Since probably the best results are obtained from the several details shown and described, they are preferably followed, but within the scope of the invention as claimed, numerous minor changes may well be made.

I claim:

1. A starting crank lock comprising a locking member adapted to be mounted on the shaft of the crank for rotation bodily therewith, a second locking member adapted to be mounted on said shaft for coaction with the first named member in preventing retrograde rotation of said shaft, both of said locking members being movable bodily with said shaft when the latter is moved rearwardly for engagement with the engine shaft, and means for holding said second locking member against rotation while permitting free forward and rearward movement thereof.

2. A starting crank lock comprising a locking member adapted to be mounted on the shaft of the crank for rotation bodily therewith, a second locking member adapted to be mounted on said shaft for coaction with the first named member in preventing retrograde rotation of said shaft, both of said locking members being movable bodily with said shaft when the latter is moved rearwardly for engagement with the engine

shaft, and rotation preventing means extending laterally from said second locking member and adapted to slide along a fixed horizontal track when said shaft moves forwardly or rearwardly.

3. A structure as specified in claim 2, said rotation preventing means comprising a pair of oppositely extending arms joined rigidly to said second locking member.

4. A starting crank lock comprising a hub and means for securing it on the shaft of the crank, a locking member carried by said hub, a second locking member through which said hub passes rotatably, said second member cooperating with the first to hold the shaft against retrograde turning, an abutment on said hub, a spring between said abutment and said second locking member for engaging the latter with the first named locking member, and means for preventing rotation of said second locking member while permitting free forward and rearward movement thereof.

5. A structure as specified in claim 4, the rotation preventing means of said second locking member consisting of oppositely extending arms rigidly joined thereto.

6. A structure as specified in claim 4, said first named locking member having clutch means for engagement with the clutch member on the front end of the engine shaft.

7. The combination with the starting crank of an internal combustion engine, of a locking device for preventing retrograde rotation of the shaft of said crank, said locking device being formed of relatively fixed and rotatable members mounted on and movable bodily with said shaft when the latter is moved rearwardly for engagement with the engine shaft.

8. The combination with the starting crank of an internal combustion engine, of a locking member rotatable bodily with the shaft of said crank, a second locking member mounted on said shaft and coacting with the first named locking member to hold said shaft against retrograde movement, both of said members being movable bodily with said shaft when moving the latter rearwardly for engagement with the engine shaft, and means for preventing rotation of said second locking member.

9. A structure as specified in claim 8, the rotation preventing means of said second locking member consisting of oppositely extending arms and a fixed horizontal track along which they slide.

10. The combination with an internal combustion engine and its starting crank, said engine having a forwardly extending channeled arm carrying a bearing for the shaft of said crank; of a locking member rotatable bodily with said shaft, a second locking member coacting with the first to hold said shaft against retrograde rotation,

both locking members being movable bodily with said shaft when the latter is moved rearwardly for engagement with the engine shaft, and rotation preventing means extending from said second locking member and sliding along said channeled arm.

11. A structure as specified in claim 10, said rotation preventing means consisting of oppositely extending arms sliding along the upper edge of said channeled arm.

12. An article of manufacture comprising a locking member through which the cranking shaft of an automobile engine is adapted to pass rotatably, said member being

adapted for coaction with a second locking member on said shaft, and oppositely extending rigid arms on said locking member for holding the same against retrograde rotation, said arms being adapted to slide along an arm extending forwardly from the engine.

In testimony whereof I have hereunto set my hand.

CHRISTIAN CHRISTIANSEN.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."