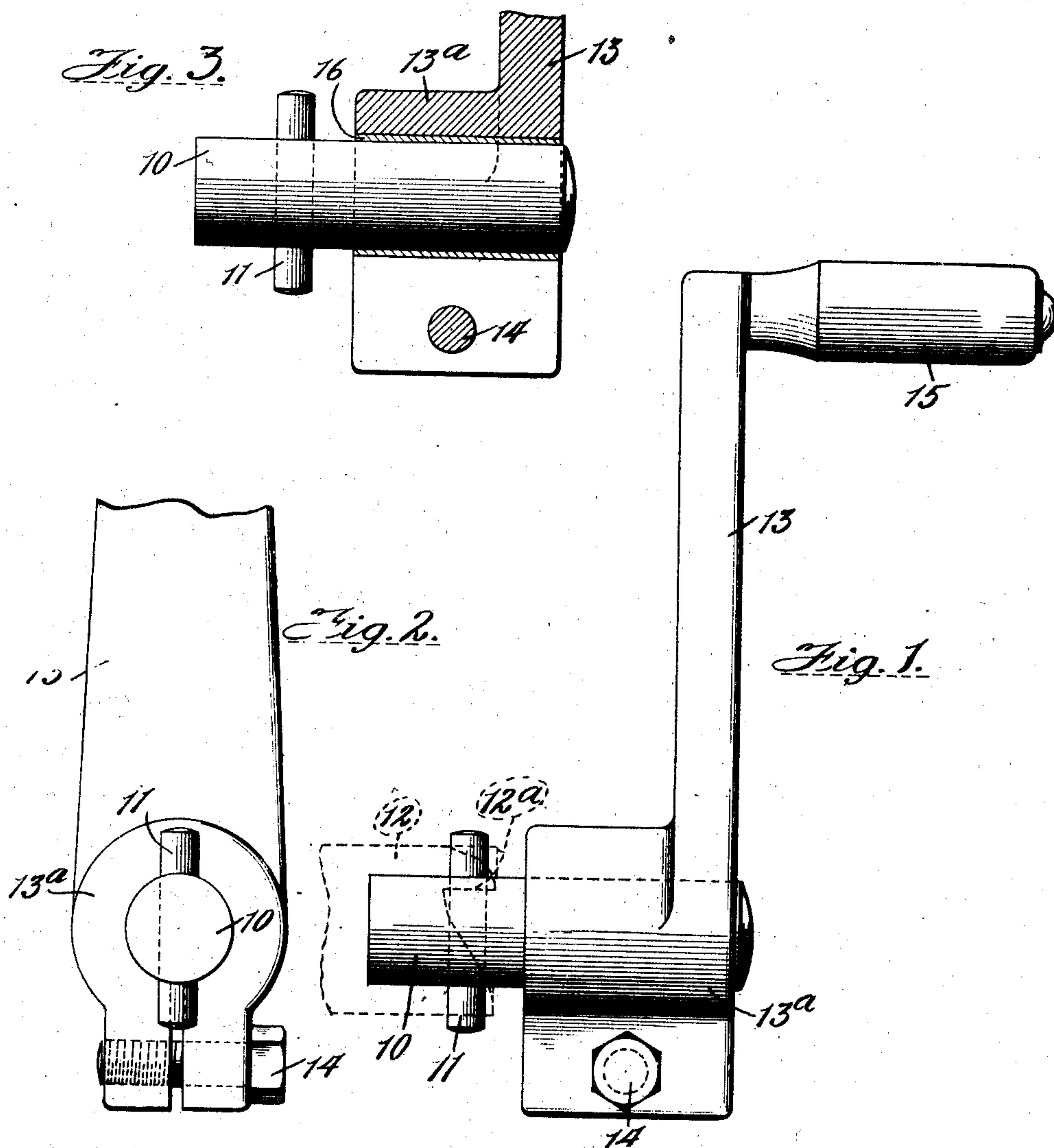


F. W. COEN.
 STARTER CRANK FOR EXPLOSIVE ENGINES.
 APPLICATION FILED AUG. 19, 1907.

908,841.

Patented Jan. 5, 1909.



witnesses:
Wm. D. Perry
H. Sprinkle

Inventor:
F. W. Coen
by Brown & Co. Attys

UNITED STATES PATENT OFFICE.

FREDERICK W. COEN, OF CHICAGO, ILLINOIS.

STARTER-CRANK FOR EXPLOSIVE-ENGINES.

No. 908,841.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed August 19, 1907. Serial No. 389,126.

To all whom it may concern:

Be it known that I, FREDERICK W. COEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Starting-Cranks for Explosive-Engines, of which the following is a full, clear, and exact specification.

The invention relates to a crank adapted especially for use in connection with internal combustion engines in manually starting or "turning over" the same.

Heretofore a common disadvantage and danger has existed in the backward turns of the engines, due to premature explosions during the starting operation, thus causing the crank or starting device to be either violently torn from the hands of the operator, or, as is usually the case, particularly in the use of starter cranks on automobile engines, the operator having a firm grasp on the handle a sudden backward turn of the crank carries his head or other portions of the body violently against some prominent portion of the machine.

The object of the invention is to provide an improved form of crank or starting device that may be used in turning over the crank shaft of the engine in starting, but which when the engine suddenly kicks back due to premature explosions will, to an extent, release its positive connection and so prevent the revolution of the crank or starting device in a reverse direction with sufficient force to injure the operator.

To the attainment of these ends and the accomplishment of other new and useful objects, as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the several parts hereinafter more fully described and claimed, as shown in the accompanying drawings illustrating an exemplification of this invention, and in which:—

Figure 1 is a side elevation of the starter crank embodying the invention showing the same attached to the ratcheted end of a broken crankshaft, which crankshaft appears in dotted lines in the drawing in the illustration. Fig. 2 is a front elevation of a portion of the device shown in Fig. 1. Fig. 3 is a sectional view of the starter crank similar to that shown in Fig. 1 but containing the addition of a bushing surrounding the short shaft of the crank for the purposes hereinafter described.

The short shaft or pin 10 is provided with cross pin 11 and is adapted to enter the end 12 of a protruding end of an engine crank shaft, the cross pin 11 being adapted to engage suitable teeth 12^a constructed in the usual manner so that the cross pin is effective only in turning the crank shaft of the engine in the usual direction and being adapted to slip out of engagement with the teeth when the engine starts properly and the crank shaft attains a speed of revolution greater than the speed of the starter crank.

Short shaft 10 is provided with the crank arm 13 which has at its lower end a slotted collar 13^a, preferably formed integral thereon and adapted to surround the short shaft 10. The bolt or pin 14 is threaded into the slotted collar 13^a, preferably using fine threads for the purpose of securing a delicate adjustment or clamping action of the collar 13^a on the short shaft 10. The outer end of the arm 13 may be provided with any suitable handle 15 by which the crank is adapted to be grasped by the hand of the operator.

It will be apparent from the construction employed in securing the arm 13 to the shaft 10 that any desired degree of friction may be produced between the shaft and the arm and in the use of the improved crank, it is desirable that a sufficient clamping action be exercised on the shaft 10 by the tightening of the threaded pin 14 so that when the operator turns the arm 13 the engine crank shaft may be turned over for the purpose of starting. The degree of clamping action, however, should be gaged so that the amount of friction between the arm and the shaft will be only approximately sufficient to turn the engine over in order that when a premature explosion carries the engine crank shaft in a reverse direction the short shaft 10 will be caused to turn within the collar 13^a before the arm 13 is torn from the hands of the operator or otherwise injures him.

A modification of the device is shown in Fig. 3 in which a thin bushing 16, preferably of brass but of any other desirable material may be inserted between the collar 13^a and the short shaft 10 for the purpose of preventing any possible tendency of the short shaft 10 to stick within the collar 13^a, due to the corrosion or other action of the parts.

In order that the invention might be fully understood, the details of an embodi-

ment thereof have been thus specifically described, and

What I claim as new is—

1. In a starter crank for explosive engines, 5 the combination of a shaft with a pair of clutch members for driving the said shaft forwardly, a starting crank connected with one of the said clutch members, the other of said clutch members being connected with 10 the shaft, a member of ductile and non-corrosive material adapted for insertion between one of the clutch members and the coöperative element to which said member is attached, and means for continually 15 binding the respective clutch member upon the said ductile and non-corrosive member, to regulate the degree of friction that is constantly exerted thereby.

2. In a starter crank for explosive engines, 20 the combination with a crank arm of a short shaft adapted to engage an engine crank

shaft, means for securing the arm to the short shaft comprising a split collar and a threaded pin therefor, and a bushing of ductile material inserted between the said 25 short shaft and the split collar.

3. In a starter crank for explosive engines, the combination with an arm, of a short shaft adapted to engage an engine crank 30 shaft, means for exerting a predetermined degree of holding action between said arm and the said short shaft, and a bushing of ductile and non-corrosive material inserted between the said short shaft and the arm.

In testimony whereof I have signed my 35 name to this specification, in the presence of two subscribing witnesses, on this 16th day of August, A. D. 1907.

FREDERICK W. COEN.

Witnesses:

A. L. SPRINKLE,
HARRIET M. TELLER.