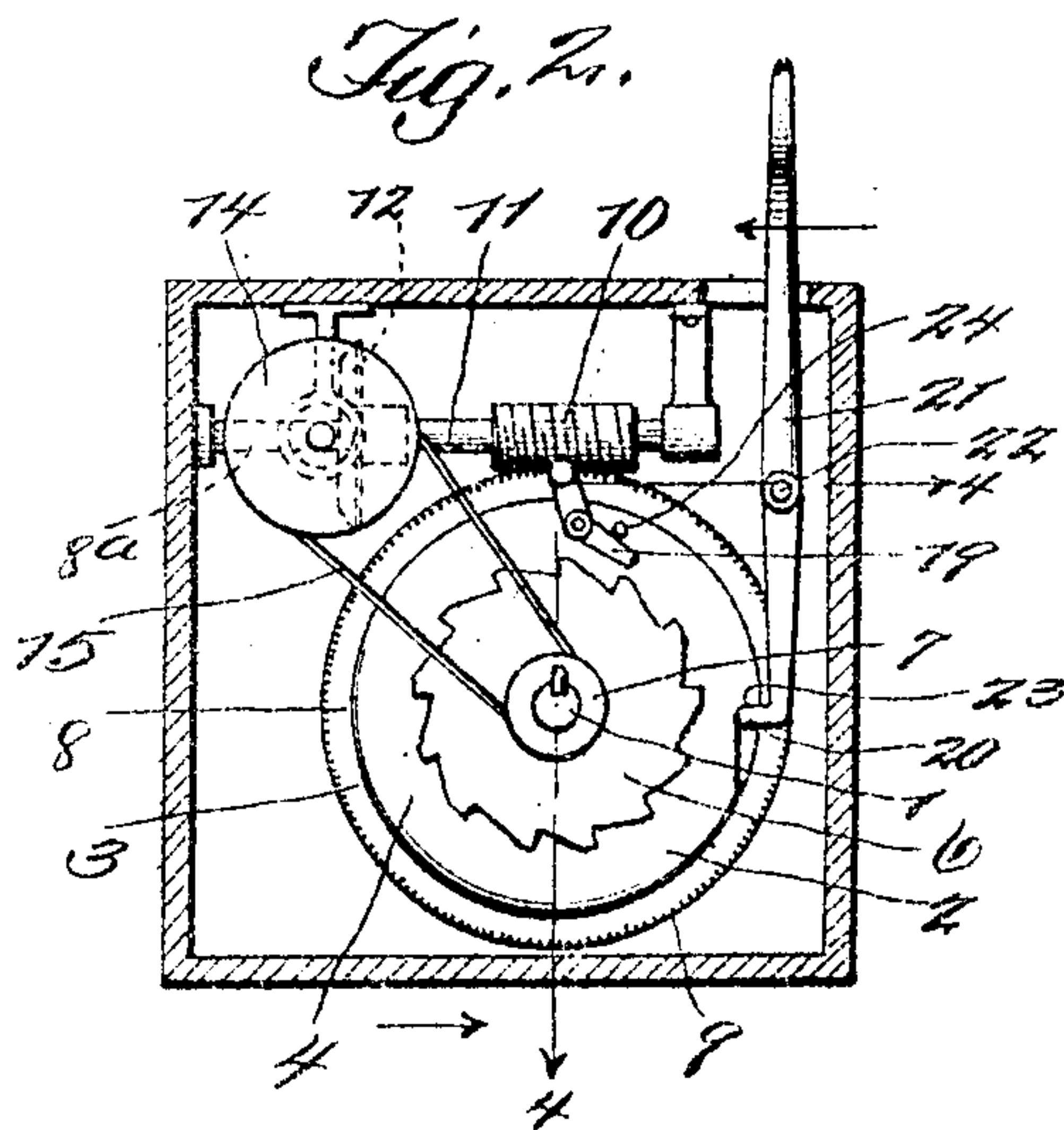
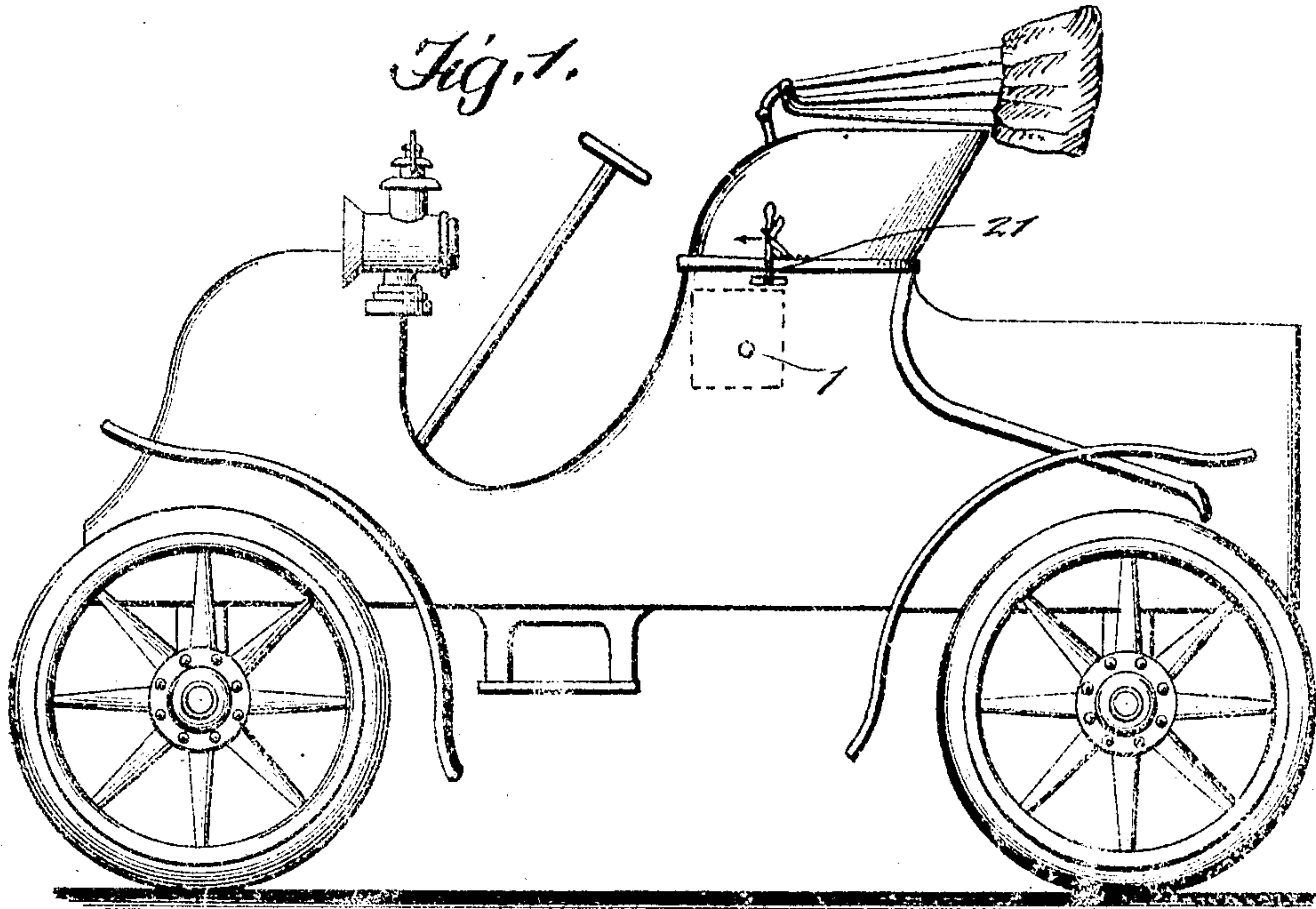


904,799.

A. E. NELSON.
STARTING DEVICE.
APPLICATION FILED SEPT. 20, 1907.

Patented Nov. 24, 1908.
2 SHEETS—SHEET 1.



Witnesses

Arthur C. Nelson
Inventor

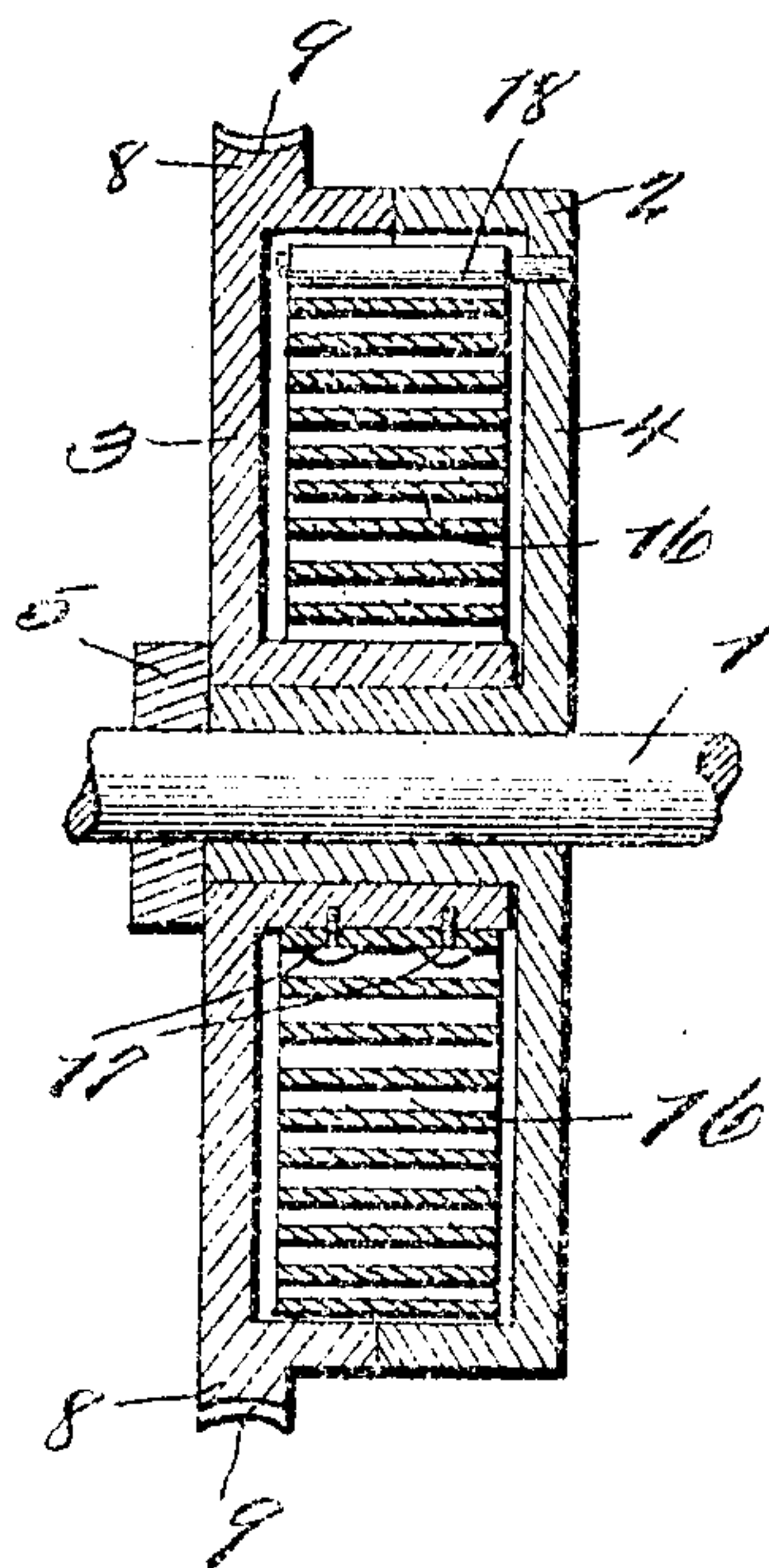
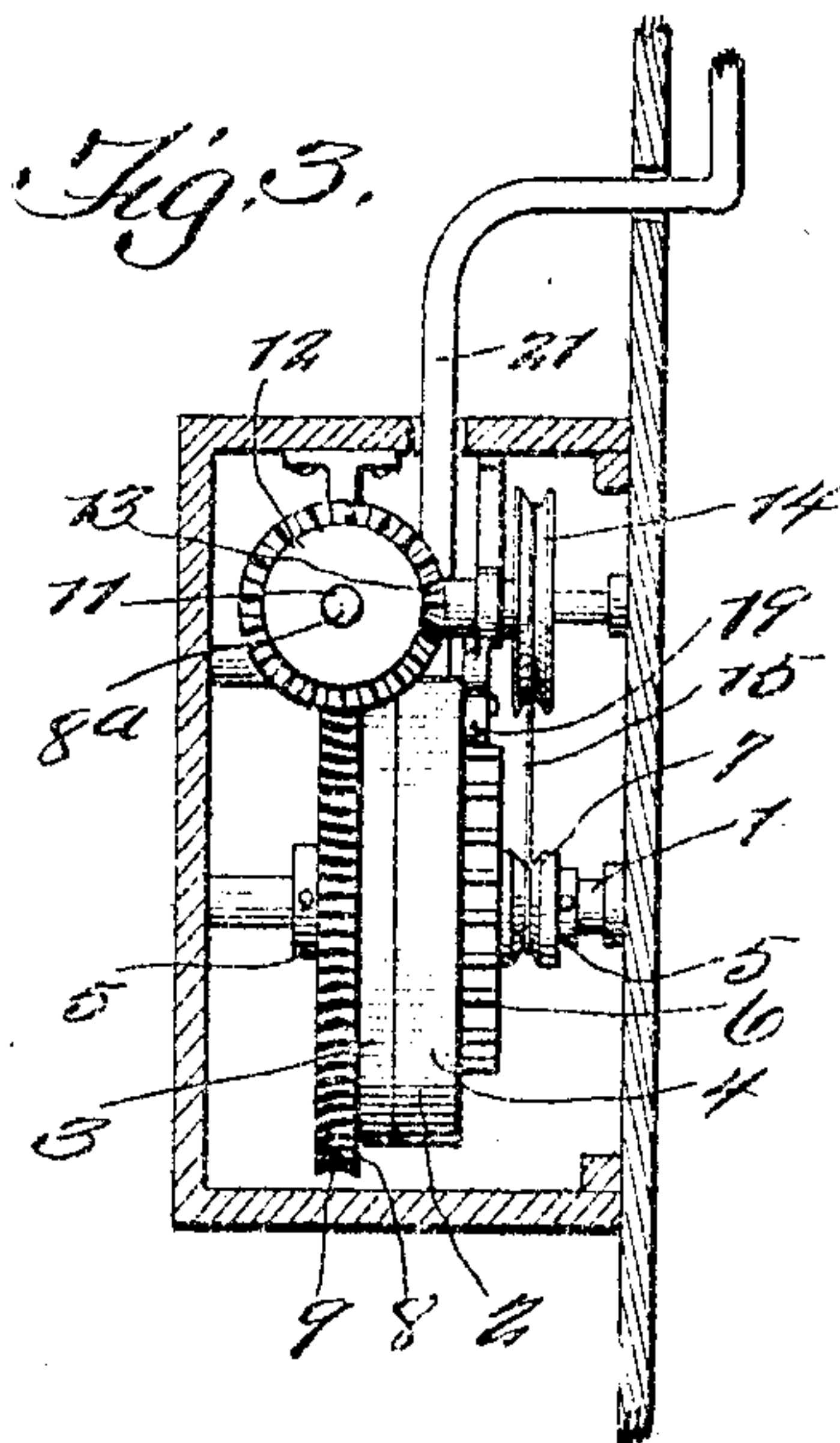
D. Swift & Co.
Attorneys

R. G. Whitcomb

904,799.

A. E. NELSON.
STARTING DEVICE.
APPLICATION FILED SEPT. 20, 1907.

Patented Nov. 24, 1908.
2 SHEETS—SHEET 2.



Witnesses

J. J. Roswell
K. G. Whitcomb

Inventor
Arthur E. Nelson.
By *D. Swift & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

ARTHUR ELIAS NELSON, OF COHOES, NEW YORK.

STARTING DEVICE.

No. 904,798.

Specification of Letters Patent.

Patented Nov. 24, 1908.

Application filed September 20, 1907. Serial No. 393,858.

To all whom it may concern:

Be it known that I, ARTHUR E. NELSON, a citizen of the United States, residing at Cohoes, in the county of Albany and State of New York, have invented a new and useful Starting Device; and I do hereby 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.

This invention pertains to a new and useful starting device for gas engines, specially gas engines that are generally designed for automobiles and the like; and the invention in its broadest latitude, consists of a simple, efficient and compact mechanism, the essential elements of which consists of a two-part casing, one of which fitting upon the other and the other being constructed so as to be keyed to a ratchet wheel, which is keyed to the crank shaft of the engine, said parts being provided with a winding spring to cooperate therewith. One of said parts is provided with a ratchet and pawl device, while the other is provided with worm teeth, causing the said part to perform the function of a worm wheel, which is cooperated with by mechanism for transmitting power thereto, from the crank shaft of the gas engine.

This invention comprises further objects and combinations of elements which will be hereinafter more fully, described, shown in the accompanying drawings, and the novel features thereof will be pointed out by the appended claims.

To obtain a full and correct understanding of the details of construction, combinations of features, elements and advantages, reference is to be had to the hereinafter set forth description, and the accompanying drawings in connection therewith, wherein

Figure 1 is a side elevation of an automobile, showing the application of the improved starting device. Fig. 2 is an enlarged side elevation of the starting device detached from the automobile. Fig. 3 is an enlarged edge elevation of the starting device. Fig. 4 is a sectional view on the line 4—4 of Fig. 2. Like numerals of reference indicate like parts throughout the several views.

Referring to the accompanying drawings 1 designates the crank shaft of an automobile, upon which shaft is journaled a casing 2, which comprises two parts 3 and 4, which are prevented from having movement par-

allel with the shaft 1, by means of an annular shoulder 5, and the ratchet and pulley 6 and 7, which are keyed to the shaft 1, as shown clearly in the drawings. One of said parts is provided with an annular flange 8, upon which is formed a plurality of teeth 9, of such character so as to cause the part 3 to perform the function of a worm wheel with which the worm 10 engages, the purpose of which is hereinafter set forth. This worm is provided with a shaft 11, upon the end of which is a bevel gear 12, journaled thereon, and with which a beveled pinion 13 meshes, as clearly shown; this beveled pinion is movable with the pulley 14, about which a suitable endless belt or other means 15 travels, as clearly shown. This belt also travels about the pulley 7 as will be clearly observed in the drawings.

Mounted between the parts 3 and 4 and adapted to cooperate therewith is a spring 16, the inner end of which is fixed to the part 3, as at 17, while the outer end is fixed to the part 4, as at 18, as clearly shown.

The part 4 is provided with a pivoted weighted pawl 19, which when it reaches a certain location radial with the center of the shaft 1, through the medium of the rotation of the part 4, it overbalances which causes its engagement with the ratchet 6.

When the part 4 and the ratchet 6 are rotating together power is transmitted to the pulley and pinion 14 and 13, by the pulley 7 and the belt 15; power is then transmitted by the bevel gear 12 to the worm 10, which in turn operates the worm wheel or part 3, which rewinds the spring and when rewound the belt 15 slips, thus preventing exerting further winding or rewinding action upon the spring. This transmission of power which is utilized for starting the gas engine and rewinding the spring is caused by releasing the bent end 20 of the lever 21, which is pivoted as at 22, from engagement with the notch 23, formed in the part 4, which, when released, is free to rotate, as the spring unwinds. The part 4 is provided with a lug 24, to limit the movement of the pawl 19, as clearly shown. The lever 21 is pushed in the direction of the arrow, when it is desired to disengage its end from the said notch.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

Having thus described the invention, what

is claimed as new and useful, by the protection of Letters Patent;—

1. In a starting device for the crank shaft of an automobile, a casing formed in two parts loosely mounted on the shaft, a ratchet and pulley keyed to the shaft, a lever, one of said parts having worm-teeth, while the other part has means to be coöperated with by said lever and provided with weighted means to coöperate with the ratchet, a stop for said weighted means, and means for transmitting power from said pulley to the part having the worm teeth so as to rewind the spring.
2. In a starting device, a two part casing, a spring inclosed thereby and adapted to coöperate therewith, one of which parts performs the function of a worm wheel, a shaft, said casing being loosely mounted upon said shaft, a ratchet and pulley keyed to the shaft, the other part of said casing having a notch and provided with a weighted pawl to coöperate with said ratchet, a lever to engage said notch, and means for transmitting power from the said shaft to the worm wheel when the lever is disengaged from the notch so as to rewind the spring.
3. In a starting device, for the crank shaft of an automobile, a casing formed in two parts mounted loosely upon said crank shaft; a spring inclosed thereby and adapted to coöperate between the two parts of the casing, a ratchet and pulley keyed to said crank shaft, one of said parts of the casing having a notch and provided with a weighted

means designed to be overbalanced at times so as to cause the said ratchet and pulley to move therewith, a lever to engage said notch, and means for transmitting power from the said crank shaft to one of the parts of the casing when the lever is disengaged from the notch so as to rewind the spring.

4. In a starting device for the crank shaft of an automobile, a casing formed in two parts mounted loosely upon said crank shaft, a spring inclosed thereby and adapted to coöperate between the two parts of the casing, a ratchet and pulley keyed to said crank shaft, one of said parts of the casing having a notch and provided with a weighted pawl designed to be overbalanced at times so as to cause said ratchet and pulley to move with said part, a lever to engage said notch, a shaft disposed at right angles to the crank shaft, a worm carried thereby, one of said parts having worm teeth to engage said worm, a bevel gear movable with the shaft of the worm, a second pulley having a beveled pinion designed to engage said bevel gear, said pulleys having belt connection so as to cause the worm to rotate one of the parts of the casing so as to rewind the spring when the lever is disengaged from the notch.

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

ARTHUR ELIAS NELSON.

Witnesses:

PETER NELSON,
ELMER S. NELSON.