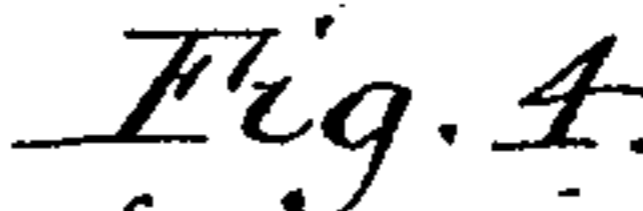
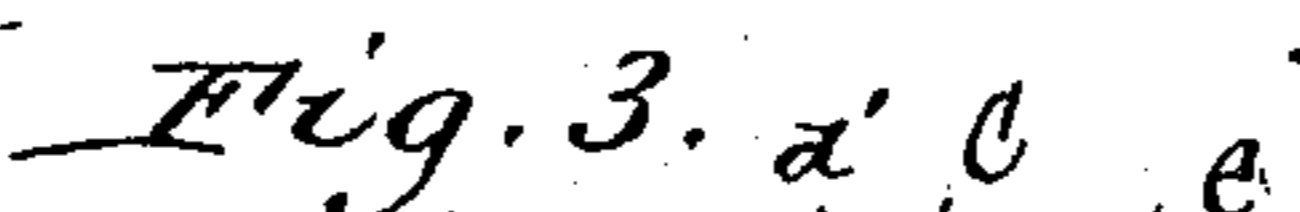


2 Sheets—Sheet 1.

CAR STARTER.

Patented May 16, 1893.



Hans Boysen
Ole Nissen Sorensen } Inventors.
By Wilhelm Horner
Attorneys.

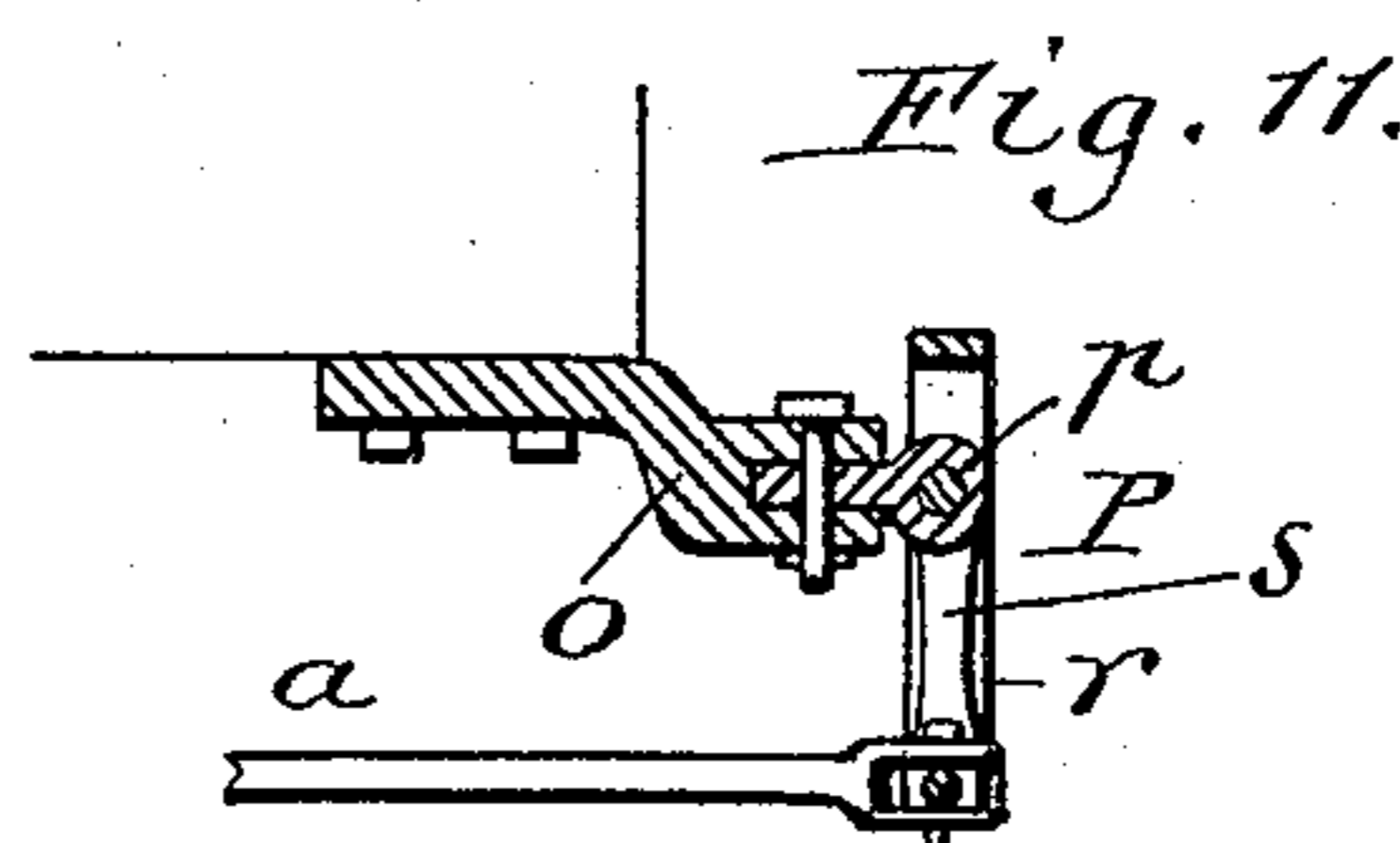
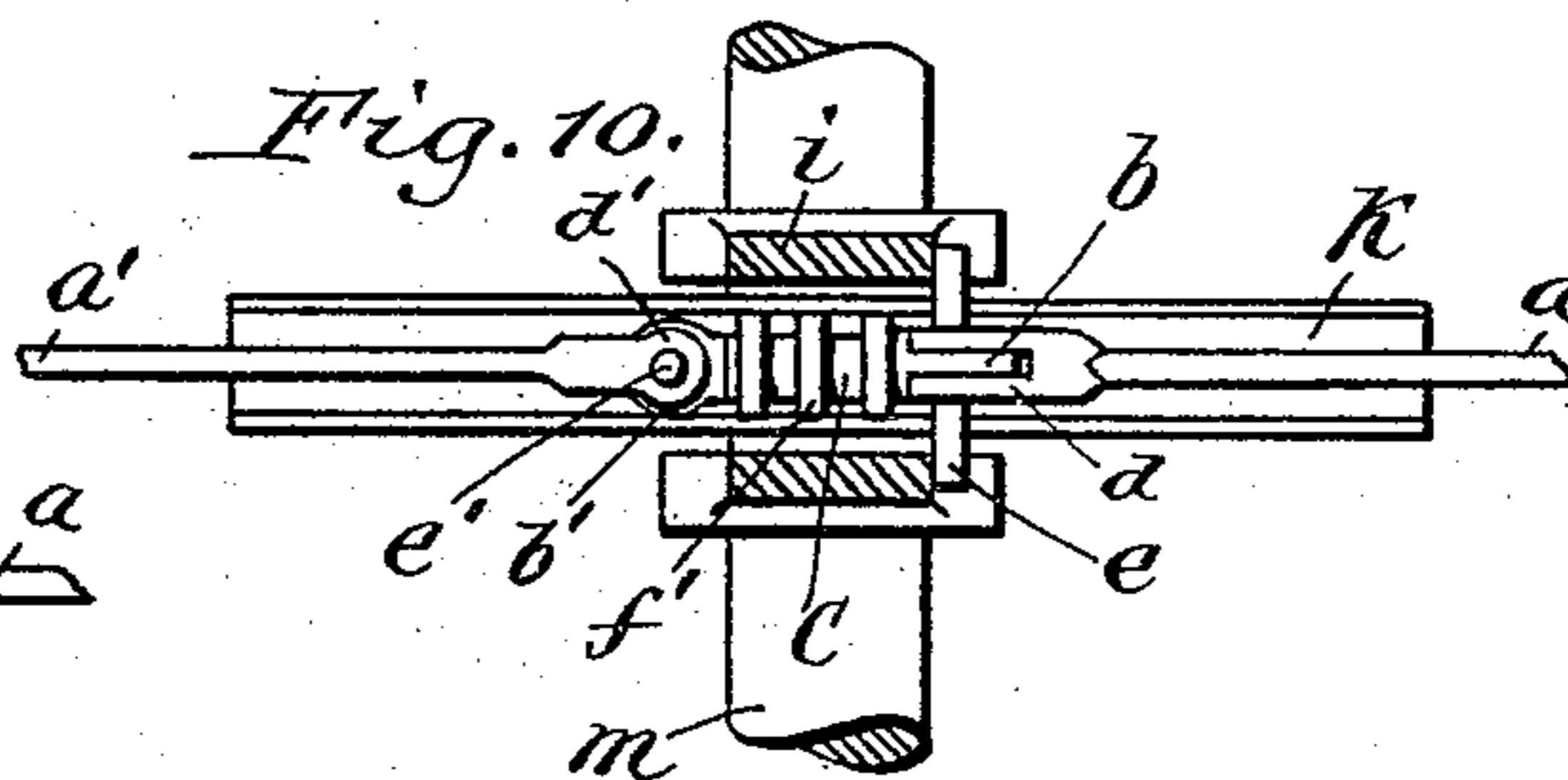
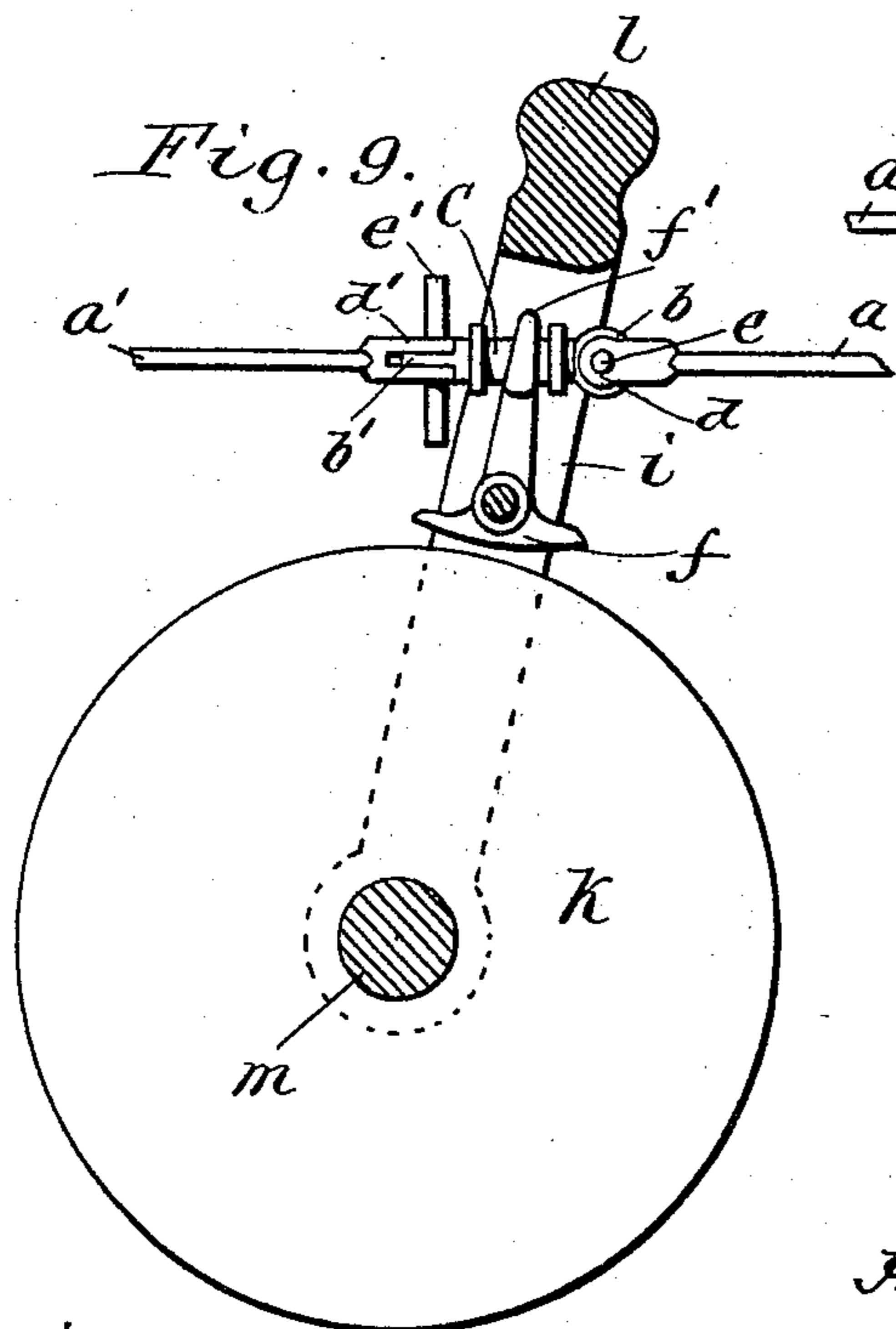
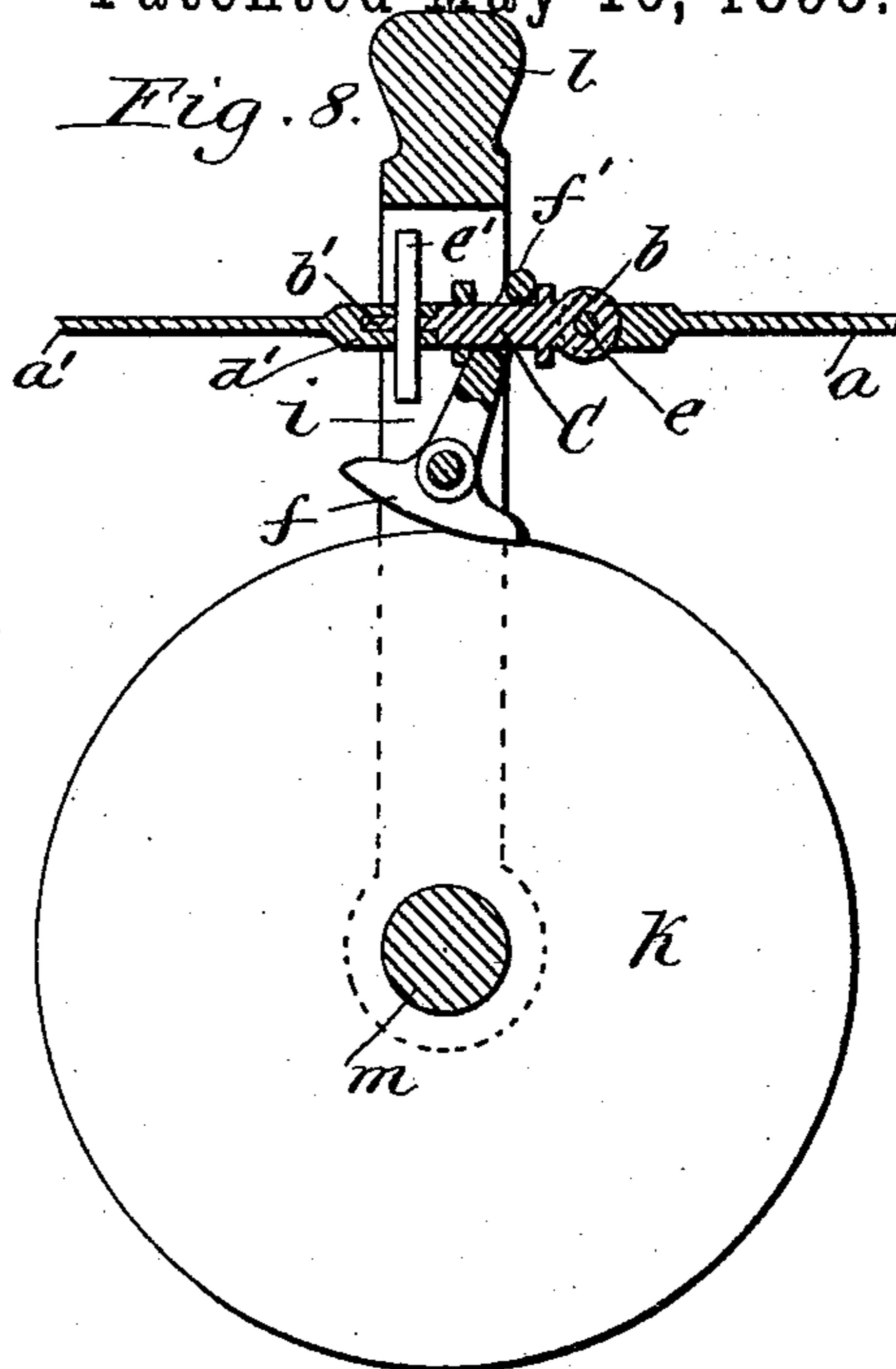
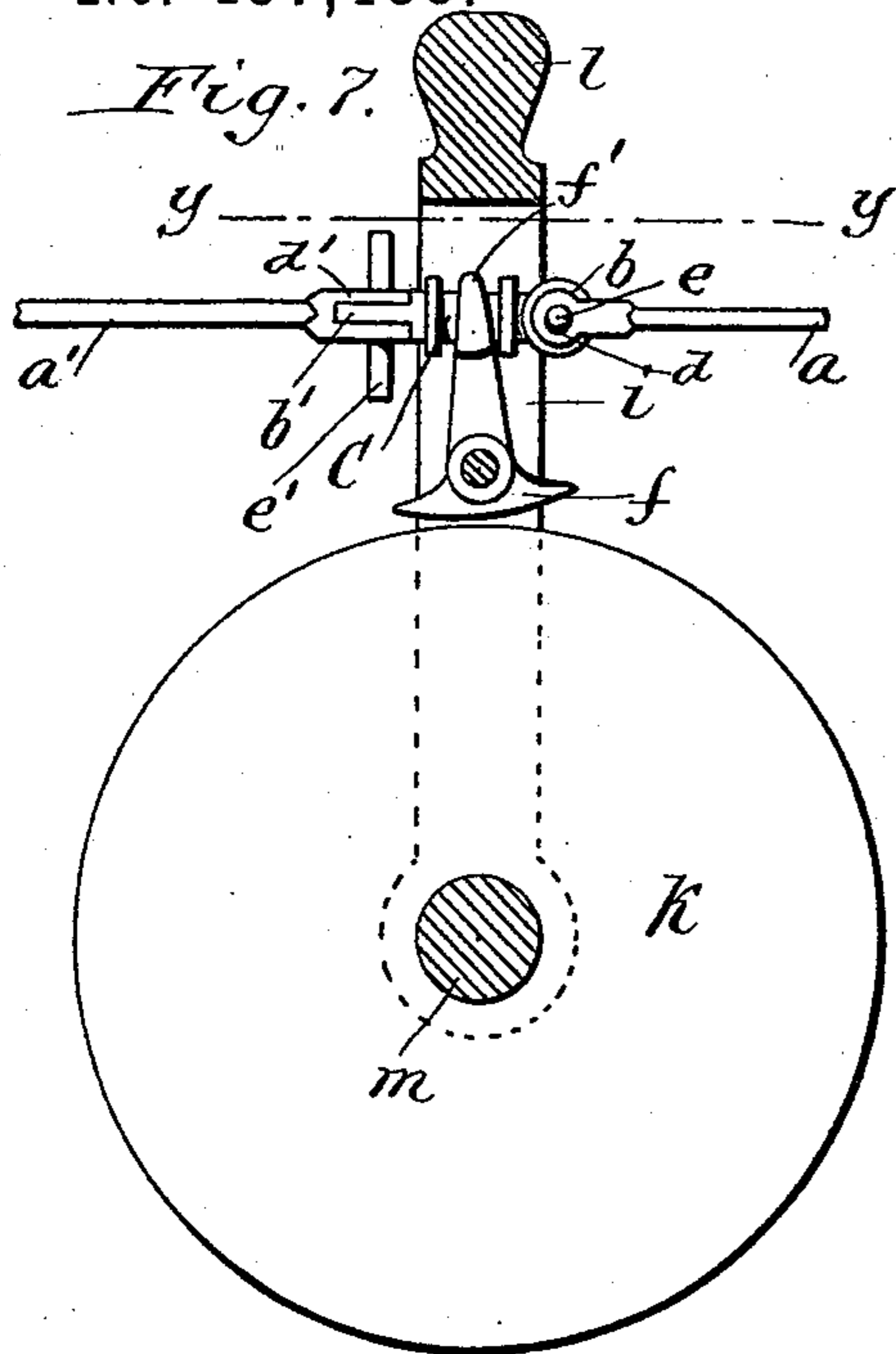
(No Model.)

2 Sheets—Sheet 2.

H. BOYSEN & O. N. SÖRENSEN.
CAR STARTER.

No. 497,488.

Patented May 16, 1893.



Witnesses:
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UNITED STATES PATENT OFFICE.

HANS BOYSEN, OF ELISALUND, AND OLE NISSEN SÖRENSEN, OF KOLDING,
DENMARK.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 497,488, dated May 16, 1893.

Application filed November 14, 1891. Serial No. 411,964. (No model.)

To all whom it may concern:

Be it known that we, HANS BOYSEN, of Elisalund, and OLE NISSEN SÖRENSEN, of Kolding, Denmark, have invented a new and useful Improvement in Car-Starters, of which the following is a specification.

This invention relates to an improvement in car starters which is more especially designed for horse cars.

10 The object of our invention is to produce a simple device of this character which is automatic in action and which enables the car to be easily started by the draft animals.

In the accompanying drawings consisting of 15 two sheets:—Figure 1 is a top plan view of a horse car provided with our improvements, the body being broken away to expose the mechanism underneath it. Fig. 2 is a fragmentary side elevation of the car with a portion thereof broken away to expose the starting mechanism. Fig. 3 is a detached view of 20 the draft rods and connecting parts, on an enlarged scale. Fig. 4 is a detached side elevation of the clutch, on an enlarged scale. Fig. 5 is a front elevation thereof. Fig. 6 is a top plan view of the whiffletree. Fig. 7 is a sectional elevation, on an enlarged scale, of the clutch, showing the cam in its normal position. Fig. 8 is a similar view, showing the 30 cam gripping the friction disk. Fig. 9 is a similar view, showing the cam moved forward and out of engagement with the friction disk. Fig. 10 is a horizontal section in line $y-y$, Fig. 7. Fig. 11 is a vertical section in line $x-x$, Fig. 6.

35 Like letters of reference refer to like parts in the several figures.

40 g represents the lower frame of the car body, $m m$ the rotary axles journaled in bearings on the frame and j the supporting wheels rigidly secured to the axles.

45 k represents a friction disk rigidly secured to one of the axles and preferably composed of a wooden body secured between two metal plates.

i represents an oscillating yoke or bifurcated frame which straddles the friction disk and is pivoted with its ends upon the axle carrying the disk.

50 f represents a clutch cam or pawl carried by the yoke i , whereby the latter is clamped

to the friction disk. This cam is pivoted between the arms of the yoke by a transverse pin or bolt and is provided with an upwardly extending arm. The cam f extends outwardly on opposite sides of its pivot in the form of a convex shoe, so that upon tilting the cam in either direction it clutches the friction disk.

60 $a a'$ represent draft rods whereby the clutch is operated in starting the car. These rods are supported lengthwise underneath the car by guide loops $v v$ and are connected with the arm of the cam f by a horizontal coupling bar C . This coupling bar is connected with the 65 arm of the cam in such a manner as to permit the bar to turn upon said arm and at the same time compel the arm to move with the bar when the same is shifted in either direction by one of the draft rods. This connection is preferably effected by providing the 70 cam arm at its upper end with a ring or fork f' which loosely embraces the coupling bar and forming the bar on opposite sides of said ring or fork with shoulders or collars between 75 which the ring is confined, the collars being at a sufficient distance apart to afford the requisite play of the ring upon the bar to prevent binding.

80 The coupling bar is provided at its ends with bifurcated eyes $b b'$ which are arranged at right angles to each other. The inner ends of the draft rods are provided with eyes $d d'$ which are pivotally attached to the eyes of the coupling bar by transverse pins $e e'$. The 85 latter extend laterally beyond the eyes $b b'$ and are of such a length that they extend across the yoke when they are in a horizontal position. The eyes at the outer ends of the draft rods are arranged at right angles to 90 each other, so that when the eye of one of the rods is in a horizontal position, the eye of the other rod is in a vertical position, the former being the normal position of the eye.

95 P is the whiffletree which consists of a bow r provided at opposite ends with eyes r' or other means for attaching the traces of the harness thereto, a supporting rod q connecting the end portions of the bar, and two forwardly extending arms $s s$ secured at their 100 inner ends to the supporting bar q . The outer ends of these arms embrace the outer eye of

the adjacent draft rod and are connected with the latter by a horizontal coupling pin, as shown in Fig. 11. *p* is a horizontal sleeve or bearing removably attached to the draw-head *O* of the car and in which the rod *q* is journaled in such a manner as to allow the whiffletree to swing into a vertical position, as represented in Figs. 2 and 11, or forwardly and upwardly, as shown by dotted lines in Fig. 2. The sleeve *p* is connected with the draw-head *O* by a coupling pin passing through the draw-head and a perforated lug formed on the sleeve.

w w are stop chains connecting the yoke with the car frame and which limit the swinging movement of the yoke. The yoke is preferably provided with a weight *l* which causes it to move forward in starting the car.

In the normal position of the parts represented in Figs. 2, 4, 9 and 11, the whiffletree hangs vertically by gravity and the yoke stands in a vertical position, so that its clutch cam clears the friction disk *k*. The stop pin in front of the yoke is horizontal, while the other stop pin is vertical and free to pass through the yoke. When the draft animal pulls upon the traces, the whiffletree is swung forwardly and upwardly on its supporting rod *q* as a pivot and caused to pull forward the draft rod connected with the whiffletree. The initial portion of this movement of the draft rod causes the pivoted clutch cam to tilt forwardly in the yoke and clutch the rim of the friction disk, as represented in Fig. 8, and turn the latter, thus turning the axle carrying the friction disk and starting the car. The yoke *i* moves forward with the friction disk until the cam reaches the limit of its movement, when the yoke falls forward a short distance beyond the cam, causing the latter to turn on its pivot in the proper direction to throw it out of gear with the disk, thereby allowing the latter to rotate without restraint. The chains *w*, by limiting the forward movement of the yoke, prevent the cam from assuming a position in which its rear portion engages against the friction disk and retards the same. The parts remain in the position just described, until the animal ceases to pull when the whiffletree falls to a vertical position by gravity and moves the draft rod coupled thereto rearwardly, causing the horizontal pin *e* to strike the yoke and return the same to its normal vertical position, and bringing the clutch arm to its former position preparatory to again clutching the friction disk when the whiffletree is again raised in starting the car. As the other return pin stands vertically it is inoperative and simply passes through the yoke in the forward and backward movements of the draft rod. When it is desired to run the car in the opposite direction, the whiffletree is detached from the draw-head *O* and attached to the draw-head at the opposite end of the car and before connecting the arms *s* of the whiffletree to the outer end of the adjacent draft rod, the latter is given a

quarter turn, which also causes the coupling bar *C* and the other draft rod to turn correspondingly, thus bringing the return pin which was formerly horizontal, into a vertical position and the pin which was vertical into a horizontal position, so that the last mentioned pin returns the yoke to its vertical position after the same has been moved forward in starting the car, while the first mentioned pin is inoperative and moves freely through the yoke. The clutch cam or pawl is thus automatically returned to its normal position ready to clutch the friction disk whenever the car is stopped and the whiffletrees are allowed to swing into their vertical position by the slackness of the traces.

Any other suitable clutch mechanism may be employed in lieu of the cam and friction disk, but the friction clutch herein described and shown is preferably used as it starts the car without jar.

The weight *l* may be omitted if the yoke *i* is made sufficiently heavy to move forward as described. The chains *w* may be replaced by any other suitable stop device for limiting the forward swinging of the yoke.

We claim as our invention—

1. In a car starter, the combination with a rotary axle of the car, of a clutch wheel or disk mounted on said axle, an oscillating yoke pivoted to said axle, a cam or pawl carried by said yoke and adapted to engage with said clutch wheel, a whiffletree pivoted to the end of the car and capable of assuming either a horizontal or a depending position, and a rigid draft rod connecting said cam or pawl with said whiffletree, whereby the yoke is swung forward and the cam is caused to grip the clutch wheel when the whiffletree is raised to its horizontal position and a stop arranged on the inflexible draft rod, whereby the yoke is automatically returned to its normal position by the descent of the whiffletree, when the latter is relieved from the draft, substantially as set forth.

2. In a car starter, the combination with a rotary axle of the car, of a clutch wheel mounted on said axle, an oscillating yoke pivoted to said axle, a duplex cam pivoted to said yoke and provided above its pivot with an actuating arm and below its pivot with a convex gripping shoe extending forwardly and backwardly of its pivot, rigid draft rods extending from the actuating arm of said cam to opposite ends of the car, and a removable whiffletree, adapted to be connected with either of said draft rods and capable of assuming either a horizontal or a depending position, and stops for returning the yoke to its normal position, arranged on said draft rods on opposite sides of said yoke, substantially as set forth.

3. The combination with the axle of the car provided with a clutch disk, of a yoke or frame pivoted to the axle, a cam or pawl attached to said yoke and adapted to engage with said disk, a coupling bar connected with said cam and capable of turning on the same

but held against lengthwise movement there-
on, draft rods extending in opposite directions
from said coupling bar, and return pins or
projections arranged respectively on said
5 draft rods and at an angle to each other, sub-
stantially as set forth.

4. In a car starter, the combination with the
car axle, a clutch device and a draft rod for
operating the clutch extending from the lat-
10 ter to opposite ends of the car, of a sleeve
or bearing detachably secured to the end of
the car, and a vertically swinging whiffletree

adapted to be connected with the draft rod
and journaled in said detachable sleeve or
bearing, substantially as set forth.

In witness whereof we have hereunto signed
our names in the presence of two subscribing
witnesses.

HANS BOYSEN.

OLE NISSEN SÖRENSEN.

Witnesses:

F. PORTYER BALMSEN,

FR. BAHR.