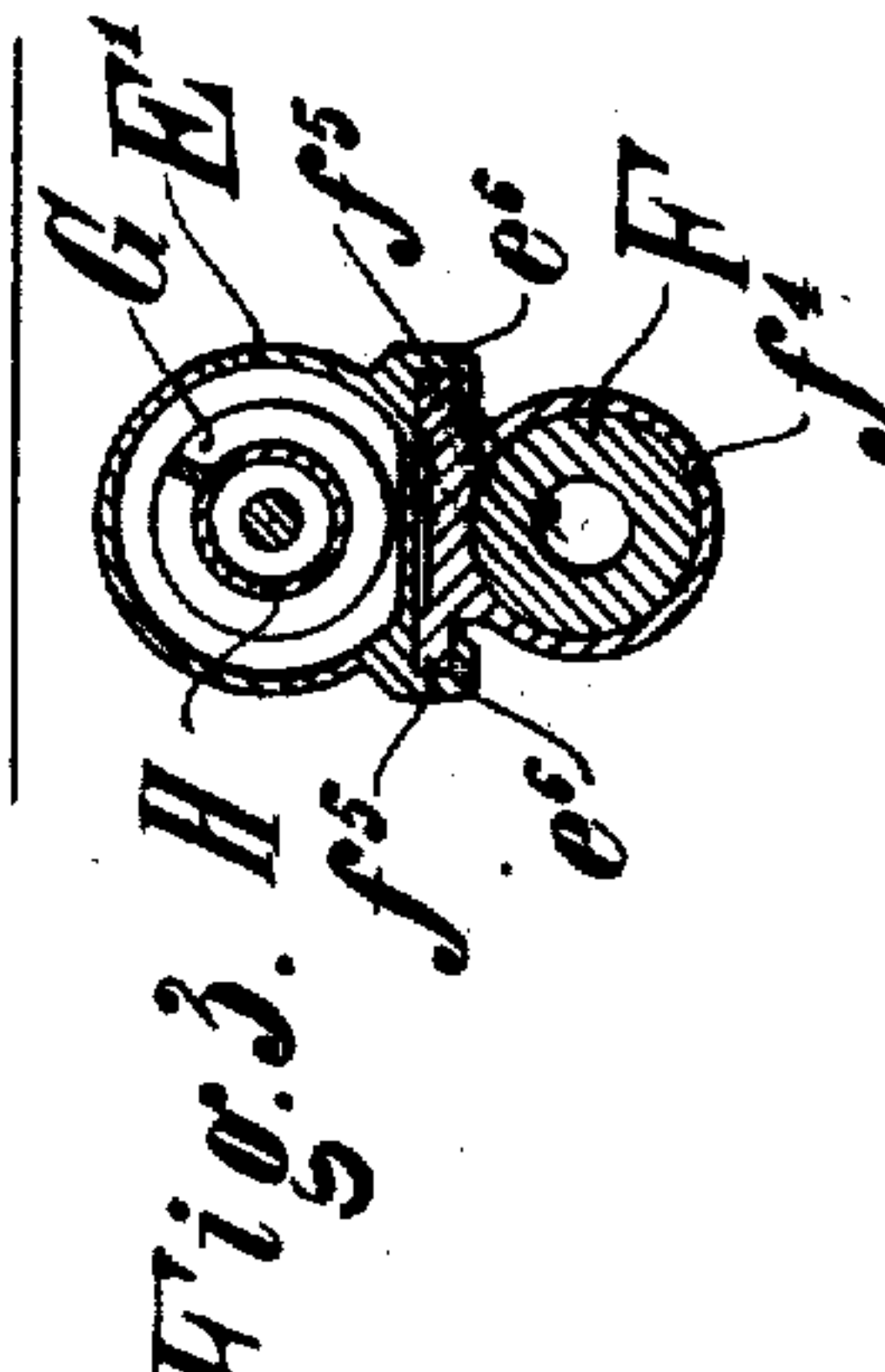
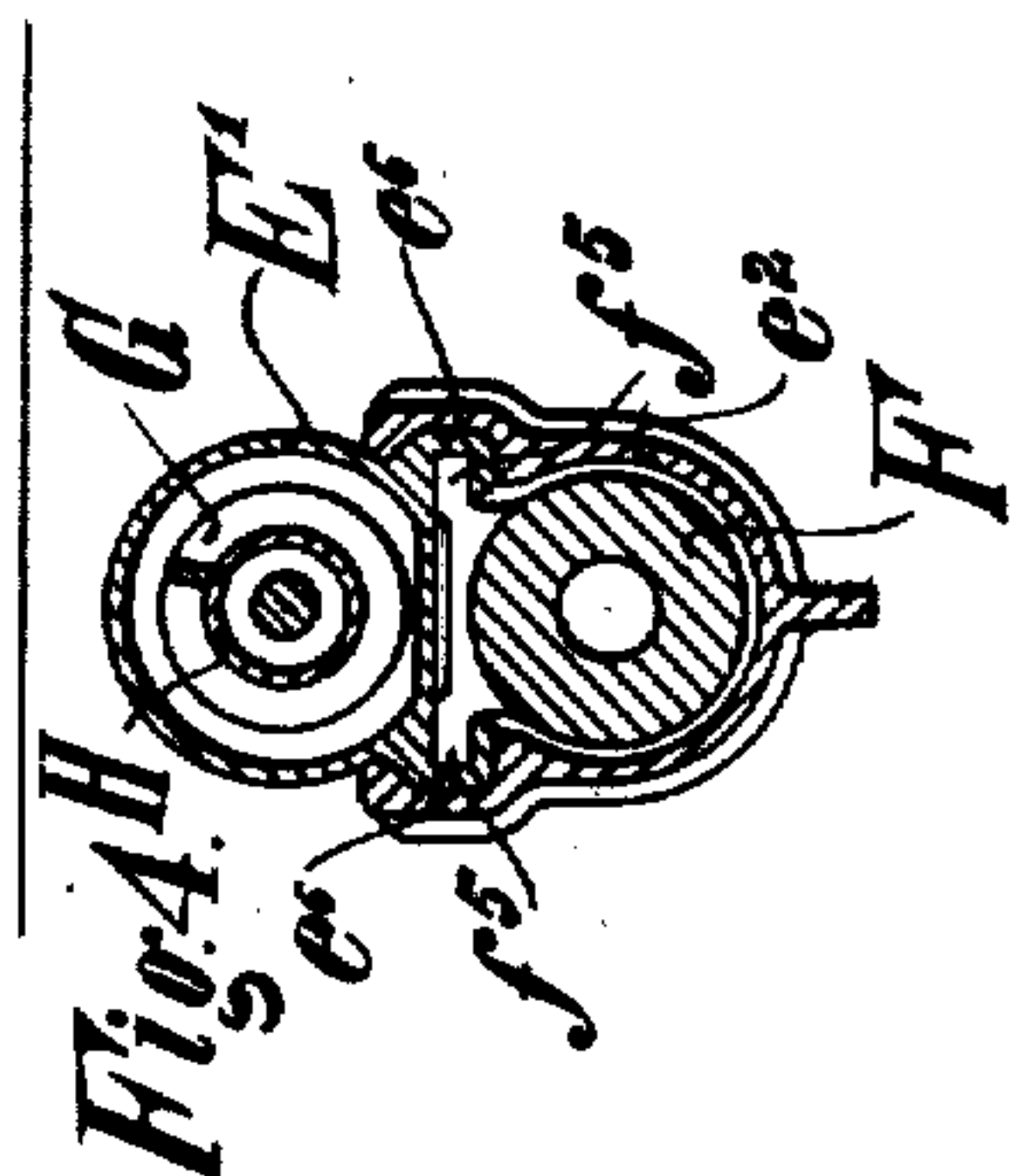
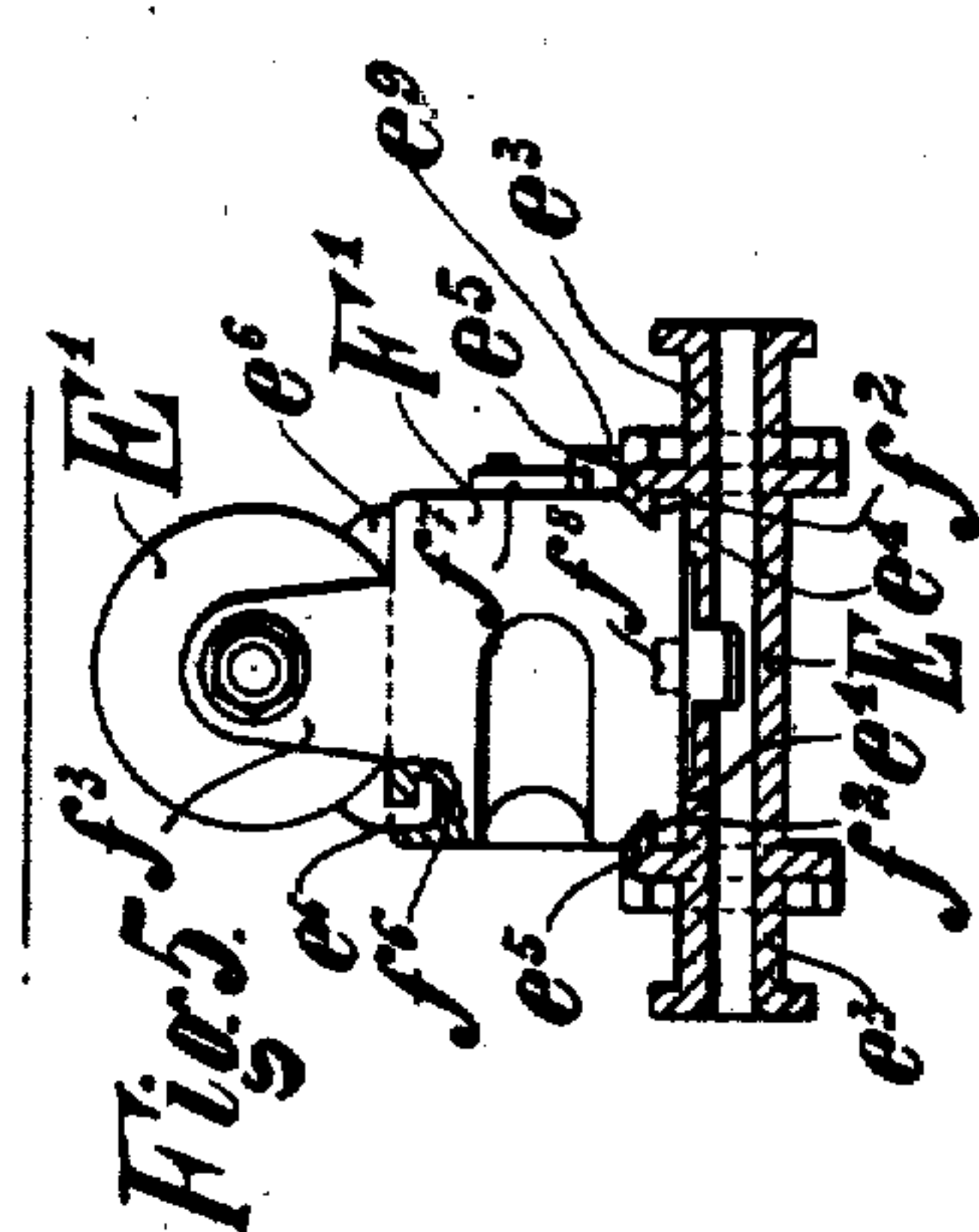
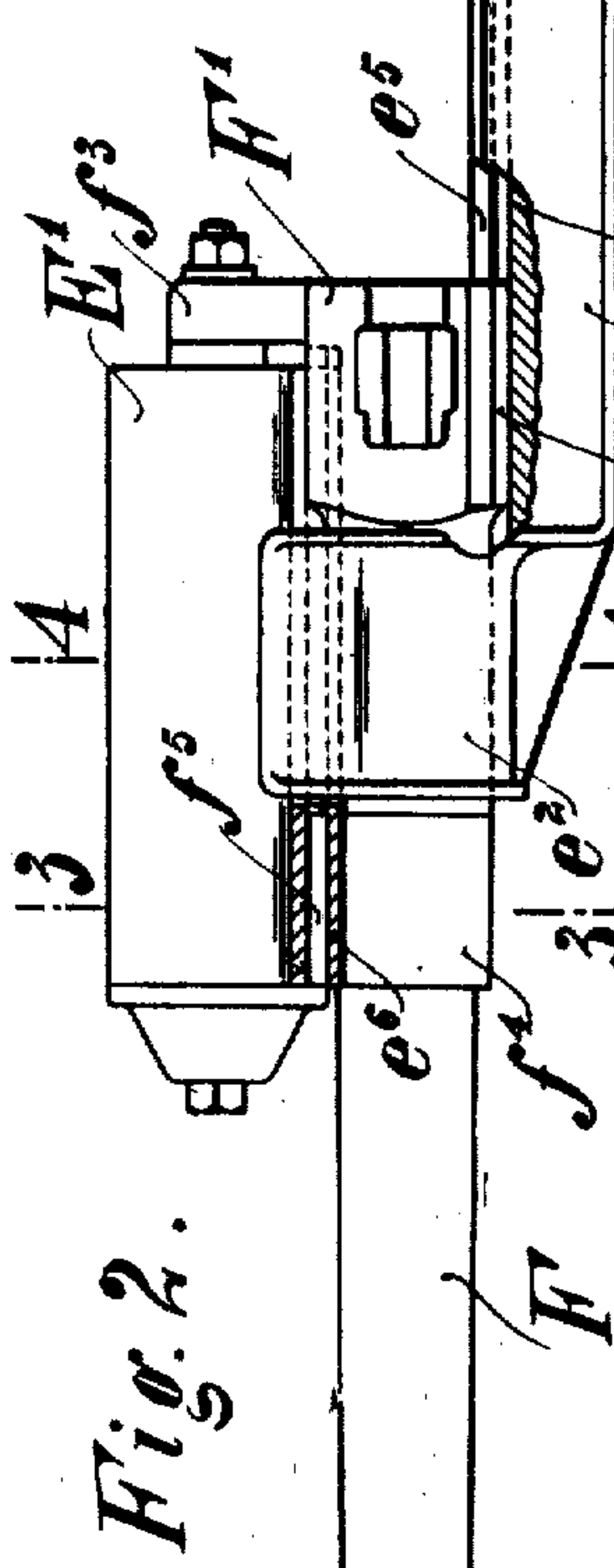
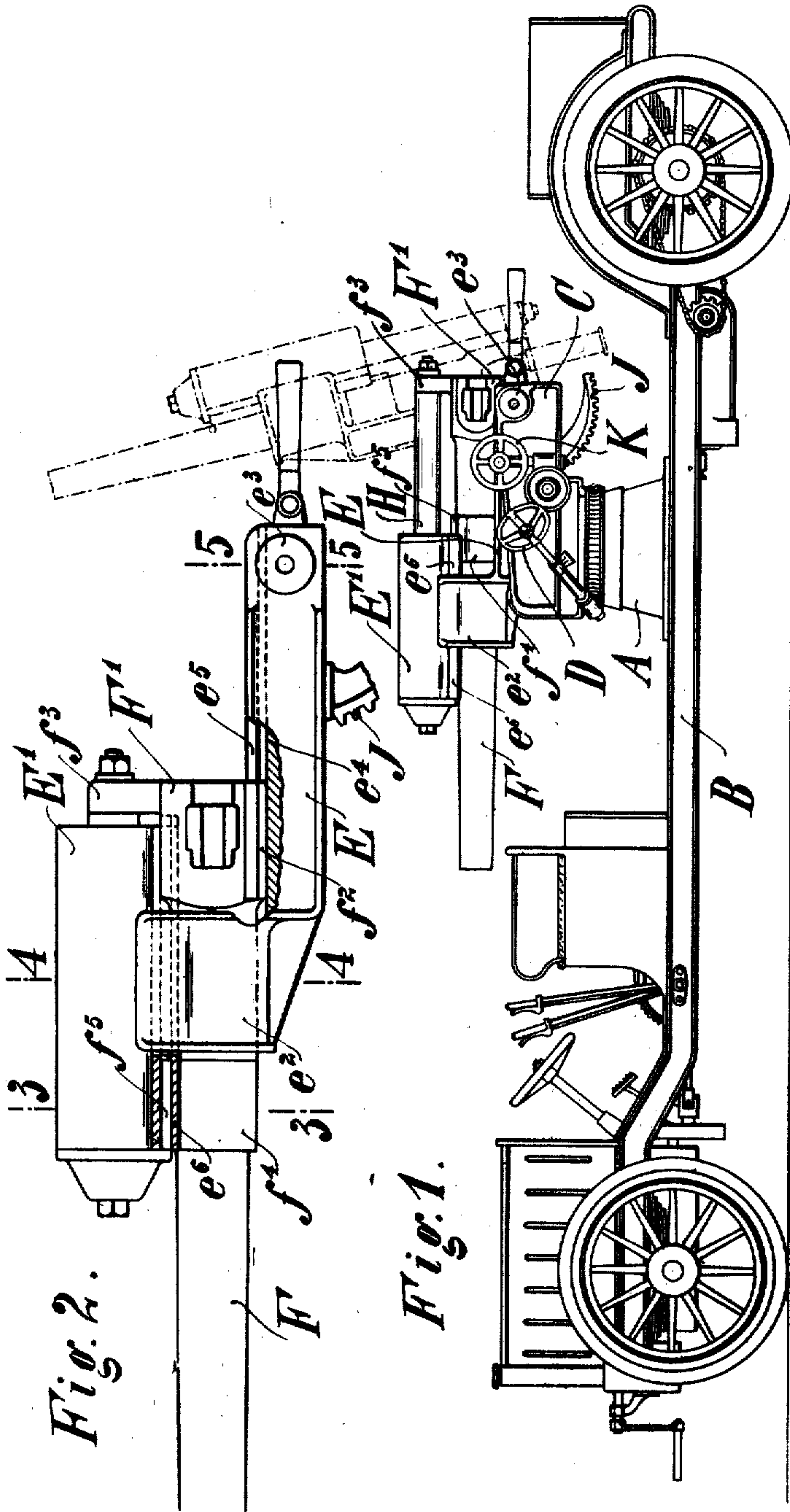


N. KOCH & G. HAYN.
BARREL RECOIL GUN.
APPLICATION FILED APR. 4, 1908.

913,403.

Patented Feb. 23, 1909.
2 SHEETS—SHEET 1.



Witnesses:
J. M. Thompson
E. R. Smith

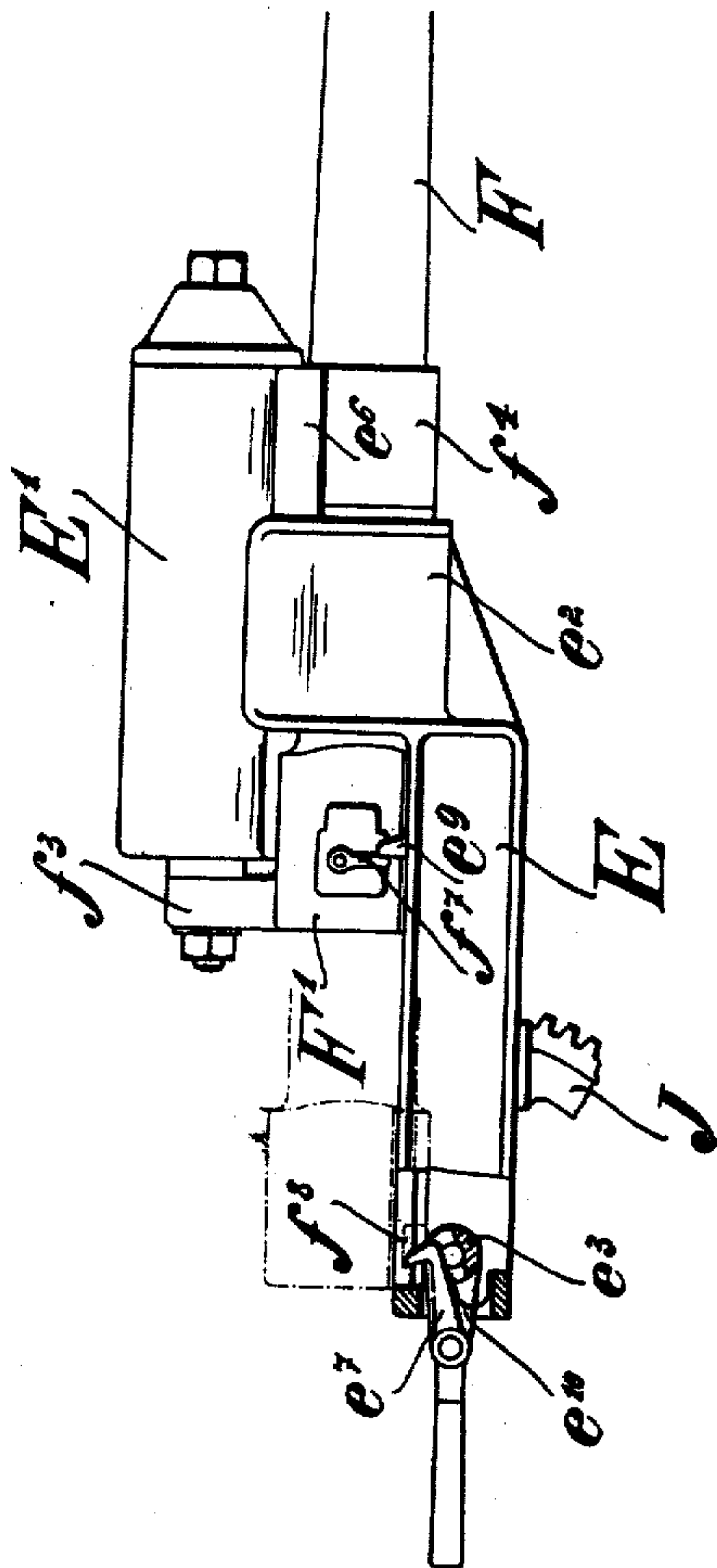
Inventors:
Norbert Koch & Geng Hayn
by Knight Bros
attys.

N. KOCH & G. HAYN.
 BARREL RECOIL GUN.
 APPLICATION FILED APR. 4, 1908.

913,403.

Patented Feb. 23, 1909.
 2 SHEETS—SHEET 2.

Fig. 2 a.



Witnesses
 J. M. Hymkoop
 L. B. Peritt

Inventors,
 Norbert Koch & Georg Hayn.
 by Knight & Co.
 attys.

UNITED STATES PATENT OFFICE.

NORBERT KOCH AND GEORG HAYN, OF ESSEN-ON-THE-RUHR, GERMANY.

BARREL-RECOIL GUN.

No. 913,403.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed April 4, 1908. Serial No. 425,162.

To all whom it may concern:

Be it known that we, NORBERT KOCH, residing at Essen-on-the-Ruhr, Germany, and GEORG HAYN, residing at Essen-on-the-Ruhr, Germany, both subjects of the Emperor of Germany, have invented a certain new and useful Improvement in Barrel-Recoil Guns, of which the following is a specification.

The present invention relates to barrel-recoil guns and the object of the invention is to provide a barrel-recoil gun which, while having a small firing height and having the mount and its support subjected to the smallest strain possible, permits of the highest elevations occurring in practice being imparted to the gun-barrel.

The invention consists in a barrel-recoil gun which is constructed to permit loading to take place in the position of recoil and firing to take place during the return movement of the gun-barrel and in which the axis, about which the gun-barrel swings during the elevation, is located in the proximity of the breech of the gun-barrel when the latter is in the position of recoil.

In the accompanying drawings the invention is shown applied to a gun with pivot-mount, by way of example.

Figure 1 is a side view of the gun mounted on an automobile; Fig. 2 is a side view, on an enlarged scale and partly in section, of the slide-track carrier and the gun-barrel, the latter being shown in its foremost position; Fig. 2^a is the other side view of the parts shown in Fig. 2 and of the means for firing the gun and for retaining it in the position of recoil; Fig. 3 is a section on line 3—3, Fig. 2, looking from the right; Fig. 4 is a section on line 4—4, Fig. 2, looking from the right, and Fig. 5 is a rear view, partly in section on line 5—5, Fig. 2.

The pivot-support A of the gun is mounted on a platform which is carried by the frame B of an automobile. In the support A the bifurcated upper carriage C is rotatably mounted through the medium of a vertical trunnion (not shown in the drawings). A horizontal training mechanism of known construction and having a hand-wheel D is inserted between the upper carriage C and the support A. The slide-track carrier E E', which guides the gun-barrel F during the recoil and return movement, is swingingly mounted in the upper carriage C

through the medium of horizontal trunnions e². The slide-track carrier is composed of two parts one of which (E) is located below the gun-barrel while the other (E') is located above the gun-barrel. A U-shaped projection e³ (see in particular Fig. 4) provided on the part E embraces the gun-barrel and is rigidly secured to the part E' and serves for connecting the two parts E and E' of the slide-track carrier. The relative arrangement of the parts E E' and projection e³ is selected in such a manner that the slide-track carrier is substantially stepped-shape. The part E carries on its free end the horizontal trunnions e² and is adapted to guide the breech F' of the gun-barrel. For that purpose the part E is provided with a slide-track e⁴ (Figs. 2 and 5) for two rails f² mounted on the breech F' and with two claws e⁵ which overlap the rails f². The slide-track e⁴ and the claws e⁵ extend over the entire length of the part E. The part E' contains a recoil-brake of known construction and a recuperator-spring G (Figs. 3 and 4) which surrounds the cylinder H of the recoil-brake. The cylinder H is secured to a horn f³ on the breech F'. The part E' is provided with two guide-claws e⁶ which extend throughout its length and with which engage rails f⁵ arranged on a ring f⁴ secured on the gun-barrel. In the breech F' are provided guide-grooves for the claws e⁶, one of which grooves (f⁶) is shown in Fig. 5.

The part E carries a long toothed sector J (Figs. 1, 2 and 2^a) which forms one part of an elevating mechanism inserted between the upper carriage C and the slide-track carrier. The hand-wheel of the elevating mechanism is designated K (Fig. 1) in the drawings. The gun is furthermore provided with devices which make it possible to draw the gun-barrel back from the position shown in Fig. 2 to the position of recoil shown in Fig. 1 and to secure the gun-barrel in the position of recoil and which cause the gun to be automatically fired during the return movement of the gun-barrel. These devices may be of any suitable known construction; they may for instance consist of a rack and pinion for drawing the gun-barrel back, a hand operated latch e' (Fig. 2^a) which cooperates with a notch f² on the breech end of the gun barrel (see the position of the latter represented in dotted lines in Fig. 2^a) and secures the latter by means of a spring e'', and a nose e² ac-

cured on the slide-track carrier and adapted to cooperate with the trigger f^7 of the firing device of the gun-closure.

The horizontal trunnions e^3 are arranged in such a manner that they are located in the proximity of the breech F^1 when the latter is in the position of recoil. This arrangement makes it possible, while having the firing height of the gun comparatively low, to impart to the gun-barrel any desired elevation that can occur in practice and to load the gun at such elevation of the barrel (compare the position of the parts shown in dotted lines in Fig. 1).

Attention is further drawn to the fact that the guides e^4 e^5 e^6 of the slide-track carrier and the guides f^1 f^2 of the gun-barrel, which are adapted to engage with the guides on the carrier, are arranged in such a manner that they engage with each other at any position of the gun-barrel relatively to the track-carrier. In this way the gun-barrel is guided as securely as possible.

When the gun-barrel, during the transport of the gun, assumes the position shown in Fig. 2 relatively to the slide-track carrier, the gun-barrel is, before the first shot is fired, drawn back into the position of recoil shown in Fig. 1, through the medium of the aforesaid device (rack and pinion) and is secured in that position by means of the latch e^7 entering the notch f^3 of the breech end. The gun is thereupon loaded and pointed and the gun-barrel is subsequently released by withdrawing the latch e^7 and moves forwardly under the action of the recuperator-spring. During the forward movement of the gun-barrel the gun is automatically fired by means of the trigger f^7 striking the nose e^8 . After the gun is fired the recoil takes place, the energy of which is partially absorbed by the energy of the forwardly moving gun-barrel. The remainder of the recoil-energy is partially taken up by the recoil-brake and by the friction in the guides, etc., and partially stored in the recuperator-spring. However the recoil carries the gun-barrel back into the position shown in Fig. 1 in which position the gun-barrel is automatically secured by means of the latch e^7 . After the gun has been loaded afresh and the gun-barrel is released the operation is repeated in the aforesaid manner.

As above stated a part of the recoil-energy is absorbed by the energy of the forwardly moving gun-barrel and the resistance in the brake and in the recuperator need therefore only be small and the gun-barrel can nevertheless have a relatively short recoil. A small resistance in the brake etc., permits of the gun-carriage being of light construction without endangering the stability of the carriage, while a short recoil permits of great elevations being imparted to the gun while having the firing height small. Further-

more by having the horizontal trunnions arranged in the proximity of the breech when the latter is in the position of recoil it is possible, in spite of a small firing height, to impart to the gun-barrel any desired elevation and load the gun at any elevation. By reason of the combination of these properties the improved gun presents a fighting medium suited for mounting on light vehicles on land and water and which is especially serviceable against airships.

The invention is of course equally adaptable to guns with wheeled mount.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent, is:

1. In a barrel-recoil gun, means adapting it to be loaded in the position of recoil of the gun barrel; and means adapting said gun barrel to be fired during the return movement of the gun-barrel said gun barrel being mounted to swing about an axis in proximity to the breech when the gun-barrel is in the position of recoil.

2. In a barrel-recoil gun, a recoiling barrel, means for securing the barrel in the position of recoil to permit loading to take place in the position of recoil, and means whereby the gun is fired during the return movement of the gun-barrel, the barrel being mounted to swing about a horizontal axis located in the proximity of the breech when the gun-barrel is in the position of recoil.

3. In a barrel-recoil gun, a recoiling barrel, a substantially step-shaped slide-track carrier for the barrel and provided with horizontal trunnions located in the proximity of the breech when the gun-barrel is in the position of recoil, means for securing the barrel in the position of recoil to permit loading to take place in the position of recoil, and means causing the gun to be fired during the return movement of the barrel.

4. In a barrel-recoil gun, a recoiling barrel, a substantially step-shaped slide-track carrier provided with horizontal trunnions located in the proximity of the breech when the gun-barrel is in the position of recoil and having guides for the breech extending substantially to the horizontal trunnions; means for securing the barrel in the position of recoil to permit loading to take place in the position of recoil, and means causing the gun to be fired during the return movement of the barrel.

5. A slide-track carrier for recoiling gun-barrels comprising an upper front part, a lower rear part, and an intermediate part connecting said upper and lower parts.

6. A slide-track carrier for recoiling gun-barrels, said carrier being of substantially step-shape.

7. In a barrel-recoil gun, the combination with the recoiling barrel, of a slide-track carrier for the barrel comprising a forwardly pro-

jecting part *located above* the barrel and provided with guides for the barrel, a rearwardly projecting part located below the barrel and provided with guides for the barrel, and an intermediate part rigidly connecting said parts.

8. In a barrel-recoil gun, the combination with the recoiling barrel, of a slide-track carrier for the barrel comprising a forwardly projecting part located above the barrel and provided with guides for the barrel, a rearwardly projecting part located below the barrel, carrying the horizontal trunnions of

the gun and having guides for the barrel extending substantially to the horizontal trunnions, and an intermediate part rigidly connecting said forwardly and rearwardly projecting parts.

The foregoing specification signed at Düsseldorf, Germany, this seventeenth day of 20 February, 1908.

NORBERT KOCH.
GEORG HAYN.

In presence of—
PETER RIEDER,
WILHELM FLASCHKE.