

W. A. MAYBACH.
LOCK FOR GEAR SHIFTING DEVICES.

(Application filed Mar. 28, 1901.)

(No Model.)

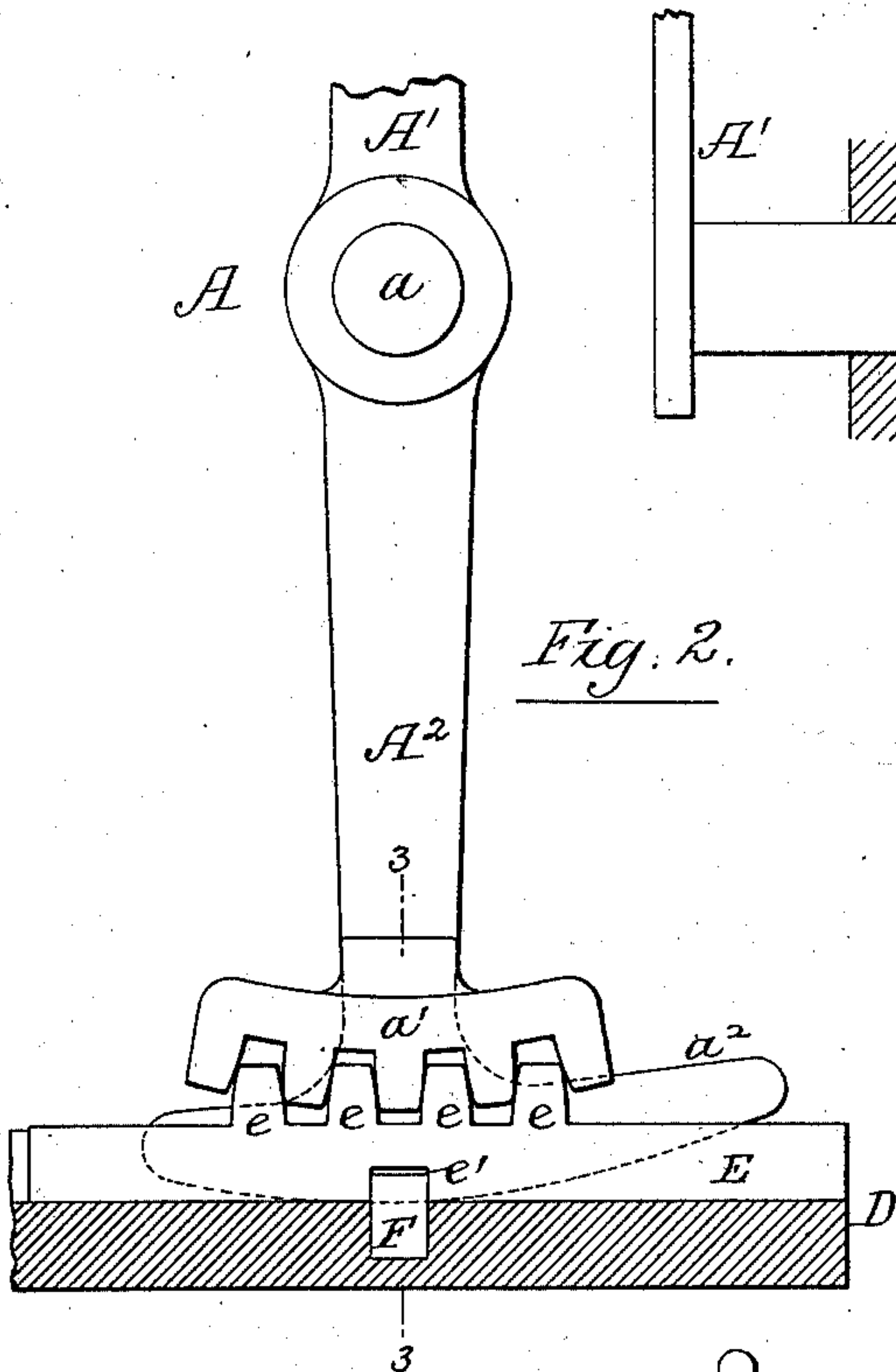


Fig. 2.

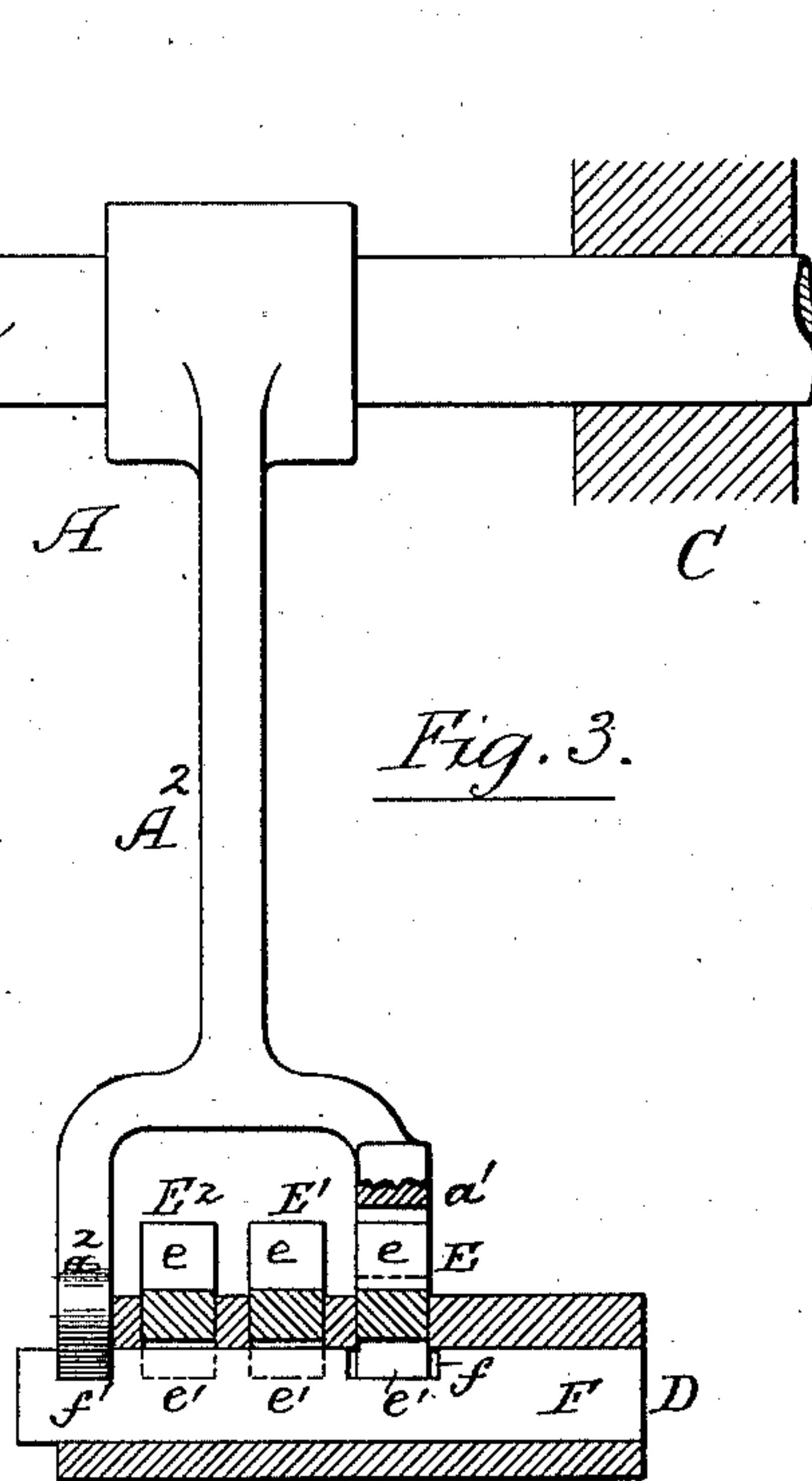


Fig. 3.

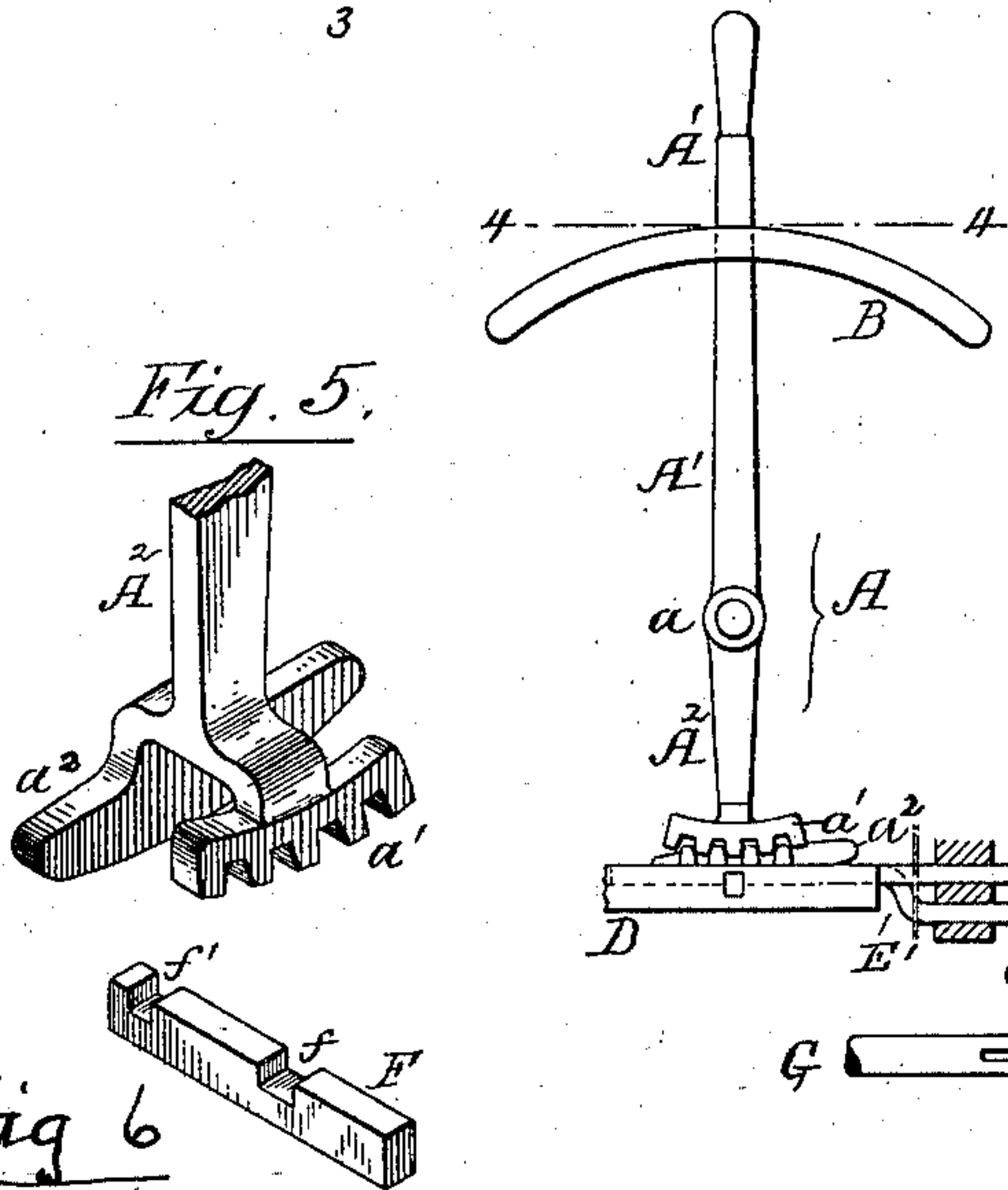


Fig. 5.

Fig. 6

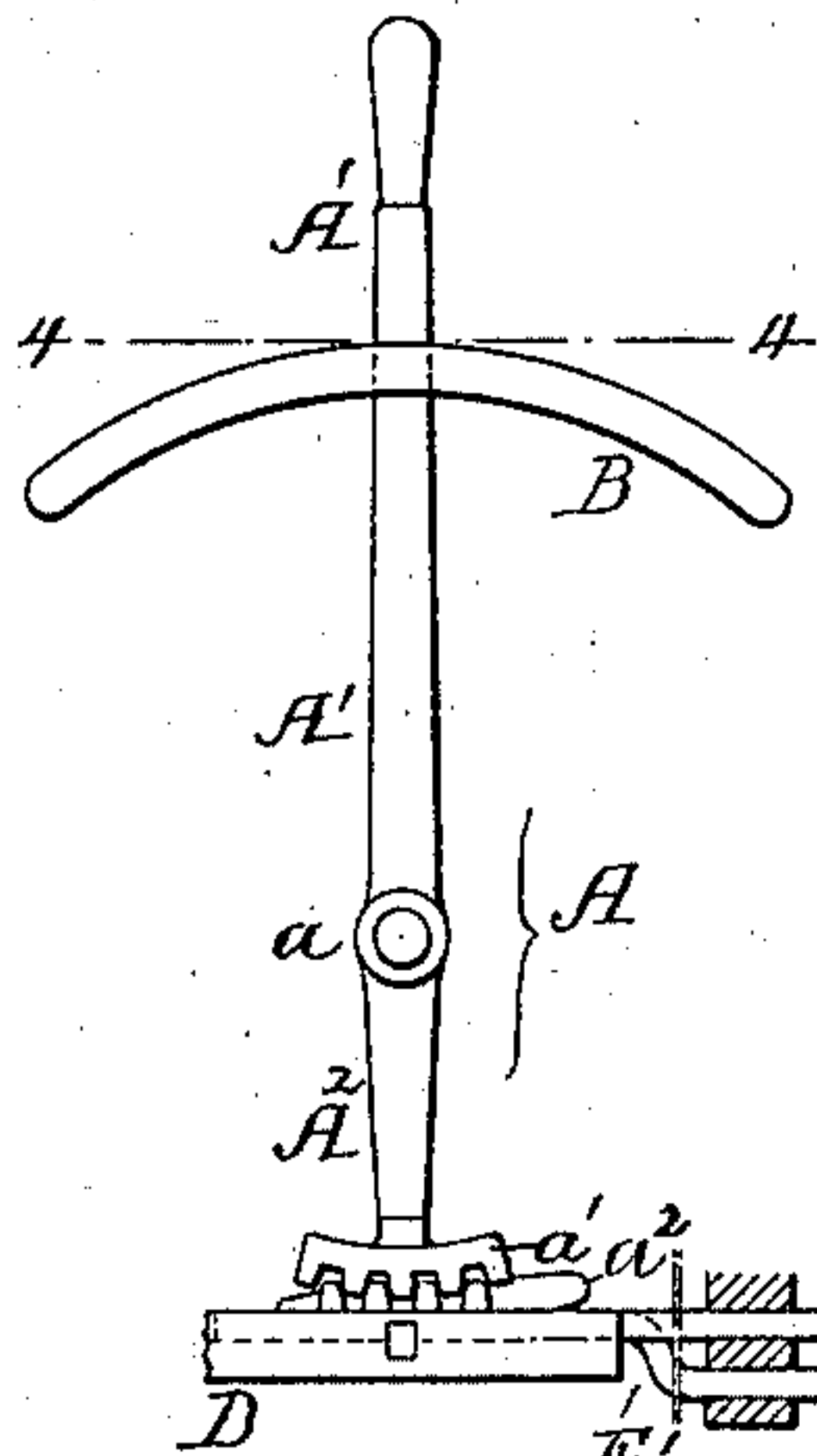
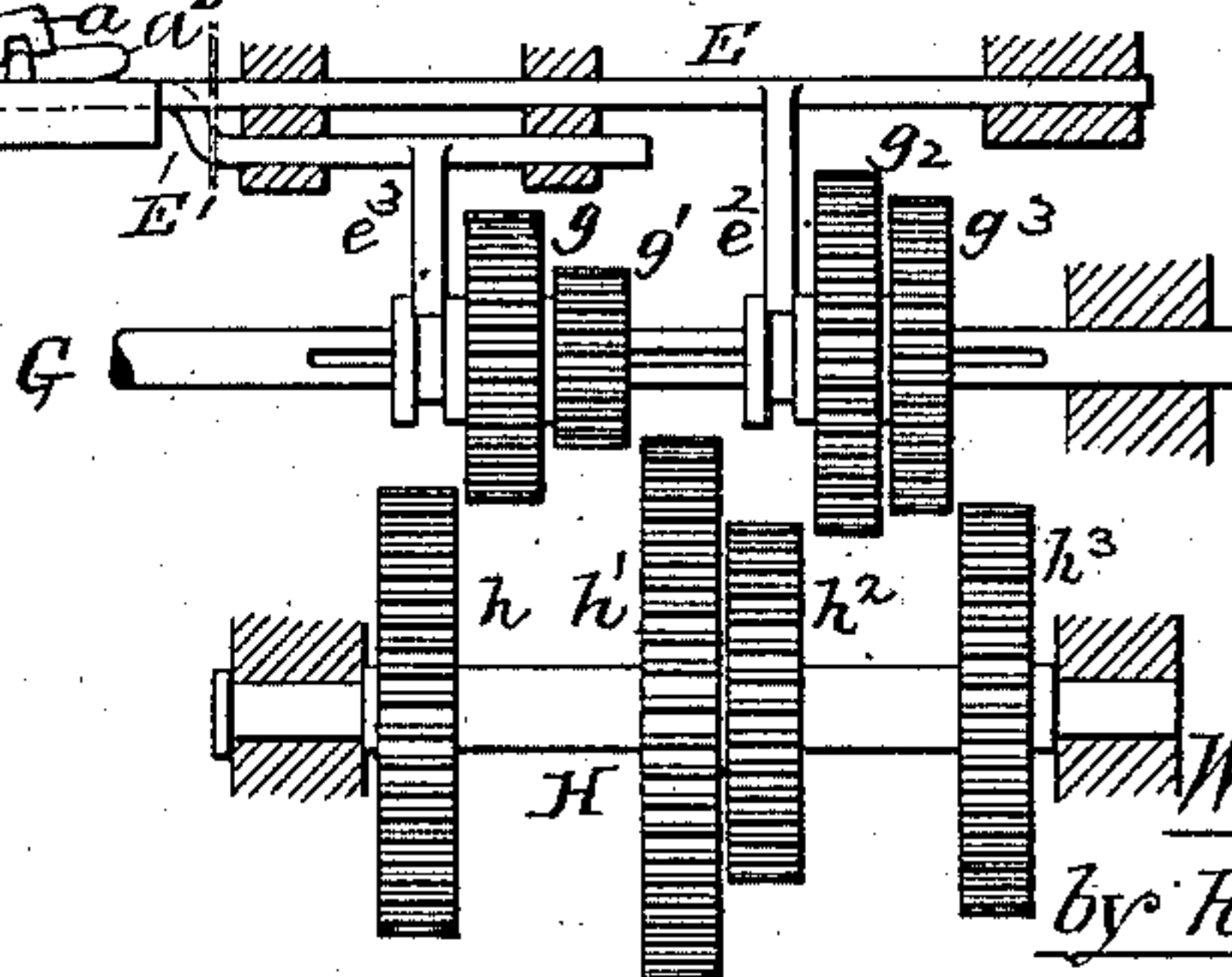


Fig. 1.



Fig. 4.



Witnesses:-
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Wilhelm A. Maybach
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UNITED STATES PATENT OFFICE.

WILHELM A. MAYBACH, OF CANNSTADT, GERMANY, ASSIGNOR TO DAIMLER MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

LOCK FOR GEAR-SHIFTING DEVICES.

SPECIFICATION forming part of Letters Patent No. 686,100, dated November 5, 1901.

Application filed March 28, 1901. Serial No. 53,343. (No model.)

To all whom it may concern:

Be it known that I, WILHELM AUGUST MAYBACH, a subject of the Emperor of Germany, and a resident of Cannstadt, in the Kingdom of Würtemberg, Germany, have invented certain Improvements in Locks for Gear-Shifting Devices, of which the following is a specification.

The object of my invention is to provide means for throwing into and out of gear one or more sets of gear-wheels and to lock the said gear-wheels after being shifted. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a view of a group of gear-wheels and the shifting-lever illustrating my invention. Fig. 2 is an enlarged view of a portion of Fig. 1. Fig. 3 is a section on the line 3 3, Fig. 2. Fig. 4 is a plan view on the line 4 4, Fig. 1. Fig. 5 is a perspective view of the lower portion of the shifting-lever, and Fig. 6 is a perspective view of the bolt used in connection with my improved device.

A is the shifting hand-lever pivoted at a and having at one end a handle working in an arched guide B, having a series of slots $b' b^2 b^3$ connected by a transverse slot b , as clearly shown in Fig. 4. The other end of the lever A is made in the form clearly shown in Fig. 5, having a toothed segment a' and a curved locking-arm a^2 .

D is a guide for the shifting-rods E E' E², each having rack-teeth e engaging with the teeth of the segment a' , as clearly shown in Fig. 2, and, as shown in Fig. 3, the teeth e of the rod E are in engagement with the segment a' of the lever.

F is a transverse bolt, notched at f and f' , as clearly shown in Fig. 6. The curved locking-arm a^2 extends into the notch f' of the bolt F, and the notch f , as shown in Fig. 3, is in the present instance in line with the shifting-rod E, so that it can be moved by the lever A.

The shifting-rods E E' E² are each notched at e' , so that when the rods are in a central position the bolt F can be shifted.

The pivot a of the lever A, as shown in Fig. 3, is arranged to slide longitudinally in bear-

ings C C, the pivot in the present instance being in the form of a rock-shaft, having two arms A' A²; but the construction of the lever may vary according to the arrangement of parts of the vehicle or other mechanism to which it is applied.

I have shown in Fig. 1 one form of gearing with which this mechanism is connected. G is the driving-shaft in the present instance, and H is a counter-shaft. On the shaft G are wheels $g g' g^2 g^3$. These wheels are splined to the shaft and arranged to slide thereon, being controlled by rods E E' in the present instance. The rod E has an arm e^2 , which engages the hub on which the wheels $g^2 g^3$ are mounted, and the rod E' has an arm e^3 engaging the hub on which the wheels $g g'$ are mounted. On the shaft H are gear-wheels $h h' h^2 h^3$, so spaced that when the wheels $g g' g^2 g^3$ are in the position shown in Fig. 1 they are out of engagement with the wheels on the shaft H; but if the rod E' is moved to the left then the wheel g is in engagement with the wheel h . If the rod E' is moved to the right, the wheel g' engages the wheel h' . The same is the case with the rod G and its wheels.

It will be seen by the above description that by shifting the lever laterally its toothed segment a' can be thrown into gear with the teeth on either of the rods E E' E², and when the lever is shifted laterally the bolt F is shifted with it, so that the notch f can be moved into line with any one of the rods, the bolt locking the remaining rods in the fixed position, so that they cannot be accidentally operated or shifted in jolting, as my invention is mainly intended for the shifting mechanism used on power-driven vehicles.

The operating-lever A cannot be shifted except when brought to the central position to pass through the transverse slot b , which connects one longitudinal slot with another.

If, as shown in the figures of the drawings, the lever is in such position that it will operate the shifting-rod E and shift its gears $g^2 g^3$ either to the right or left, as desired, then the rods E E' E² will be locked by the bolt. If it is desired to shift the rod E' in order to throw either the gear-wheel g or g' into gear

with either of the gear-wheels on the shaft H, then the lever is brought to a central position and shifted from the slot B' to the slot B², shifting the locking-bolt F, so as to bring its notch *f* in line with the rod E' and locking the rod E in its adjusted position. The third rod E² can be used to shift another train of gears or used to reverse by throwing in an intermediate gear. This is not shown, as any form of reverse-gear mechanism may be connected to this rod.

I claim as my invention—

1. The combination in shifting mechanism, of a lever, two or more operating devices, said lever having a segment arranged to engage with either one of said operating devices, a bolt controlled by said lever and acting to lock the operating device not engaged with the segment of the lever, substantially as described.

2. The combination of two or more shifting-rods having teeth and notched on one side, a transverse bolt arranged to enter the said notches and also having a notch, a shifting-lever having a segment and a locking-arm, said locking-arm engaging the bolt so that on shifting the lever laterally on its pivot its toothed segment can be thrown into gear with either of the shifting-rods and the bolt will be moved to lock all the shifting-rods except the one in gear with the lever, substantially as described.

3. The combination of two or more shifting-rods having teeth on one side and notched on the other side, a transverse bolt arranged to enter the notches in the said levers, said bolt having two notches, a pivoted operating-lever arranged to move laterally on its pivot,

said lever having a toothed segment arranged to engage with the teeth of any one of the shifting-rods and having a locking-arm entering a notch in the said bolt, and means for guiding the said lever after it is shifted, so that the lever cannot be shifted after it is moved to either side of the center, substantially as described.

4. The combination of two or more shifting-rods, a lever engaging with said rods, a locking-bolt for locking the rods that are not in engagement with the lever, and a guide-frame having a series of longitudinal slots and a transverse slot, substantially as described.

5. The combination of a lever A having an operating-arm A' and an arm A², the toothed segment *a'* on the arm A², and a curved locking-arm *a*² opposite the segment *a'*, a series of operating-rods having gear-teeth with which the segment *a'* can engage, a transverse locking-bolt, bearings therefor in said rods, said rods having notches into which the locking-bolt extends, said locking-bolt having two notches therein, the segmental locking-arm entering one notch and the other notch being arranged so that when the locking-bolt is shifted the notch will be in line with the rod with which the segment is in engagement, and a longitudinally-slotted guide B for the lever, substantially as described.

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

WILHELM A. MAYBACH.

Witnesses:

WM. HAHN,
H. E. REICHARDT.