

**No. 706,580.**

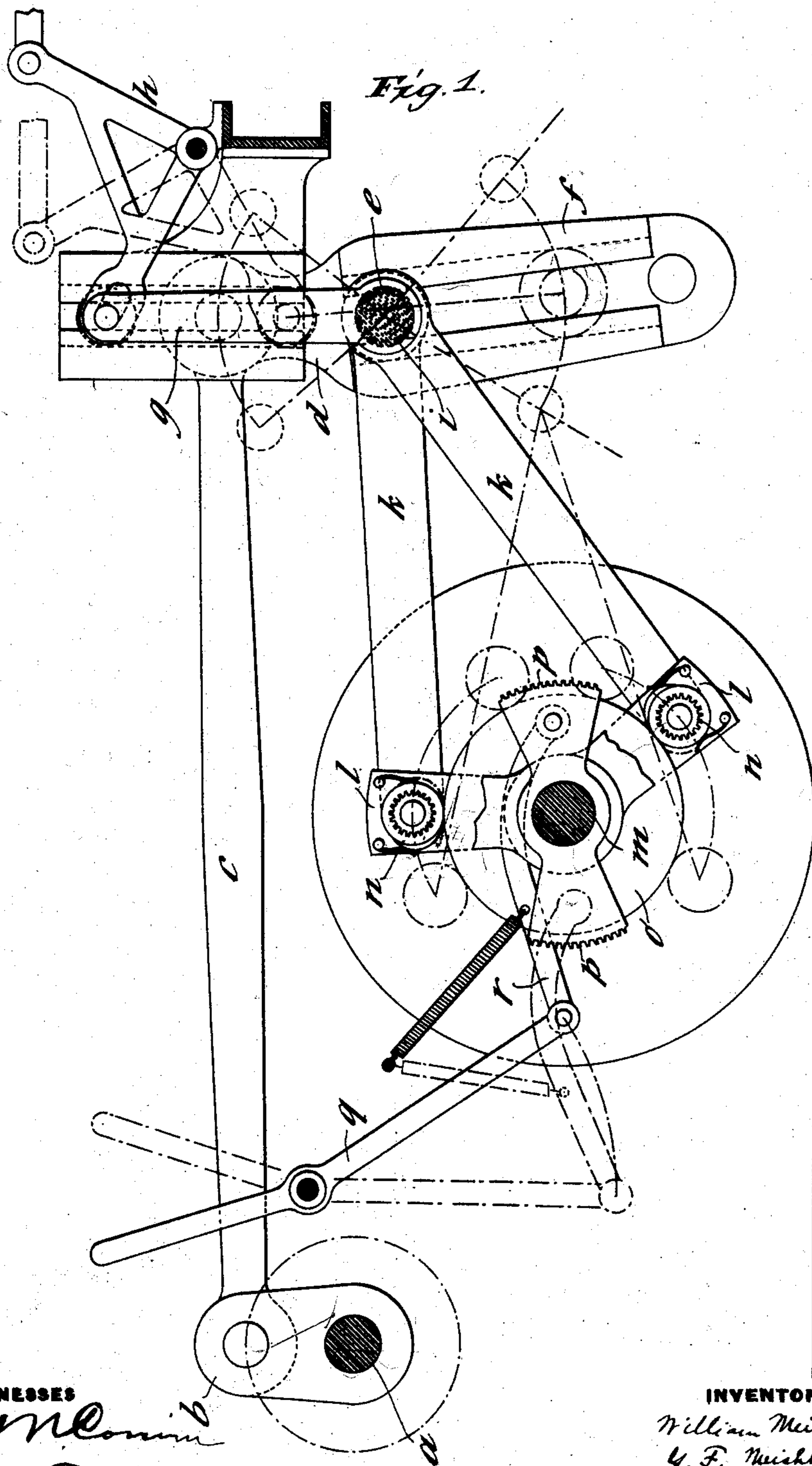
**Patented Aug. 12, 1902.**

**W. & G. F. MEISCHKE-SMITH.**  
**DRIVING GEAR FOR VARYING SPEED AND REVERSING.**

(Application filed July 10, 1902.)

(No Model.)

**2 Sheets—Sheet 1.**



**WITNESSES**

H. M. Corbin  
J. M. Redman

## INVENTORS

William Meiscke-Smith  
 W. F. Meiscke-Smith  
 by R. Russell & Rymer  
 Their attys.

No. 706,580.

Patented Aug. 12, 1902.

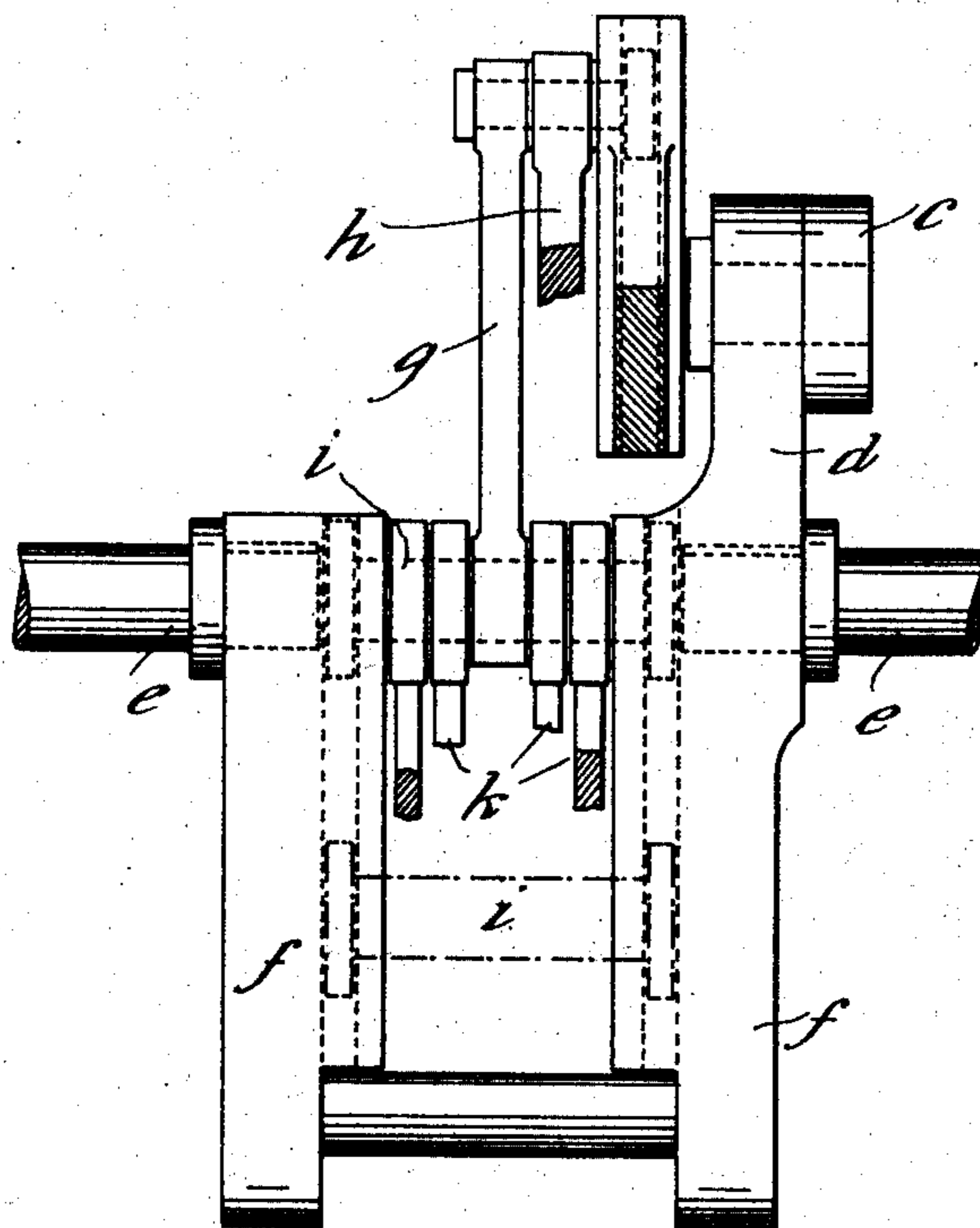
W. & G. F. MEISCHKE-SMITH.  
DRIVING GEAR FOR VARYING SPEED AND REVERSING.

(Application filed July 10, 1902.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 2.



WITNESSES

G. B. Blanning  
L. M. Redman

INVENTORS

William Meischke-Smith  
Gorgius F. Meischke-Smith  
by Baker & Sykes  
their attys.

# UNITED STATES PATENT OFFICE.

WILLIAM MEISCHKE-SMITH AND GEORGIUS FRANCISCUS MEISCHKE-SMITH,  
OF DRESDEN, GERMANY.

## DRIVING-GEAR FOR VARYING SPEED AND REVERSING.

SPECIFICATION forming part of Letters Patent No. 706,580, dated August 12, 1902.

Application filed January 10, 1902. Serial No. 89,159. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM MEISCHKE-SMITH, a subject of the King of Great Britain, and GEORGIUS FRANCISCUS MEISCHKE-SMITH, a subject of the Queen of the Netherlands, both residing at 1 Räcknitzstrasse, Dresden, in the Empire of Germany, have invented certain new and useful Improvements in Driving-Gear for Varying Speed and Reversing, of which the following is a specification.

Our invention relates to driving-gear which may be employed for motor-cars and the like, so arranged that the speed can be readily varied or the driven shaft can be stopped or reversed by the movement of hand-levers.

We shall describe our invention referring to the accompanying drawings, of which—

Figure 1 is a side view, and Fig. 2 is an end view, of gear according to our invention, the framing on which the shafts and other parts are mounted being mostly omitted in order to show the working parts more clearly.

$a$  is the motor-shaft or a counter-shaft driven from it. From a crank  $b$  on this shaft through a connecting-rod  $c$  and arm  $d$  reciprocating motion is given to a rocking shaft  $e$  and arms  $f$  upon it. These arms  $f$  have slots in which by means of a link  $g$  and bell-crank  $h$ , worked by a hand-lever, a pin  $i$  can be caused to slide to greater or less radial distance from the axis of  $e$ . The pin  $i$  is linked by two connecting-rods  $k$  to two arms  $l$ , that are mounted free to turn on a shaft  $m$ , which may be the axle of the driving-wheels of the car. On the arms  $l$  are mounted rollers  $n$ , each having parts of its circumference made prominent in form of a cam, on which cam part the one or the other of a pair of springs bears, so as to press it against the circumference of a disk  $o$ , fixed on the shaft  $m$ . As the arms  $f$  reciprocate the arms  $l$  are caused to reciprocate through less or greater area, according as the pin  $i$  is nearer to or farther from the axis of the shaft  $e$ . When it coincides with that axis, as shown, there is of course no movement of the arms  $l$ ; but when the pin  $i$  is moved along the slots of the arms  $f$ , so that the rods  $k$  and the arms  $l$  move in the one direction, one of the cams  $n$  by its frictional pressure on the disk  $o$  causes it to turn, the

other cam slipping, and when the arms move in the other direction the other cam acts on the disk, causing it to turn in the same direction as before. Thus by continuous reciprocation of the arms  $l$  continuous rotation is given to the disk  $o$  and its shaft  $m$  with speed depending on the stroke of the arms  $l$ , as determined by manipulation of the lever  $h$ .

The gear so far as described suffices in cases where the driven shaft has always to move in one direction; but when reversal is required we mount free to turn on the shaft  $m$  a pair of toothed segments  $p$  and form teeth on the ends of the rollers  $n$ . When we desire to reverse, we move a hand-lever  $q$ , connected by a link  $r$  to one of the segments  $p$ , and we thus swing the segments around to an opposite position. As the segments pass the rollers  $n$  their teeth mutually engage, and the rollers are thus so far turned as to bring their cam prominences around to the opposite side in each case, so that their effect on the disk  $o$  is to turn it in the direction opposite to that in which they previously turned it. The cams  $n$  and disk  $o$  may be made with grooves and ridges in the manner of frictional gear.

Having thus described the nature of this invention and the best means we know of carrying the same into practical effect, we claim—

Gear for varying speed comprising a driving-shaft having a crank, a rocking shaft and arms operated by said crank, an adjustable pin in slots of the rocking arms, arms connected to the adjustable pin and arranged to rock free on a driven shaft, cams on the latter arms arranged to engage with and drive by friction a disk on the driven shaft, toothed segments loosely mounted on the driven shaft, means for swinging said segments, and teeth on the cam-rollers arranged to reverse the movement; substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WILLIAM MEISCHKE-SMITH.

GEORGIUS FRANCISCUS MEISCHKE-SMITH.

Witnesses:

HENRY HASPER,

WOLDEMAR HAUPT.