O. C. FRICK.

DRIVING AND REVERSING GEARING.

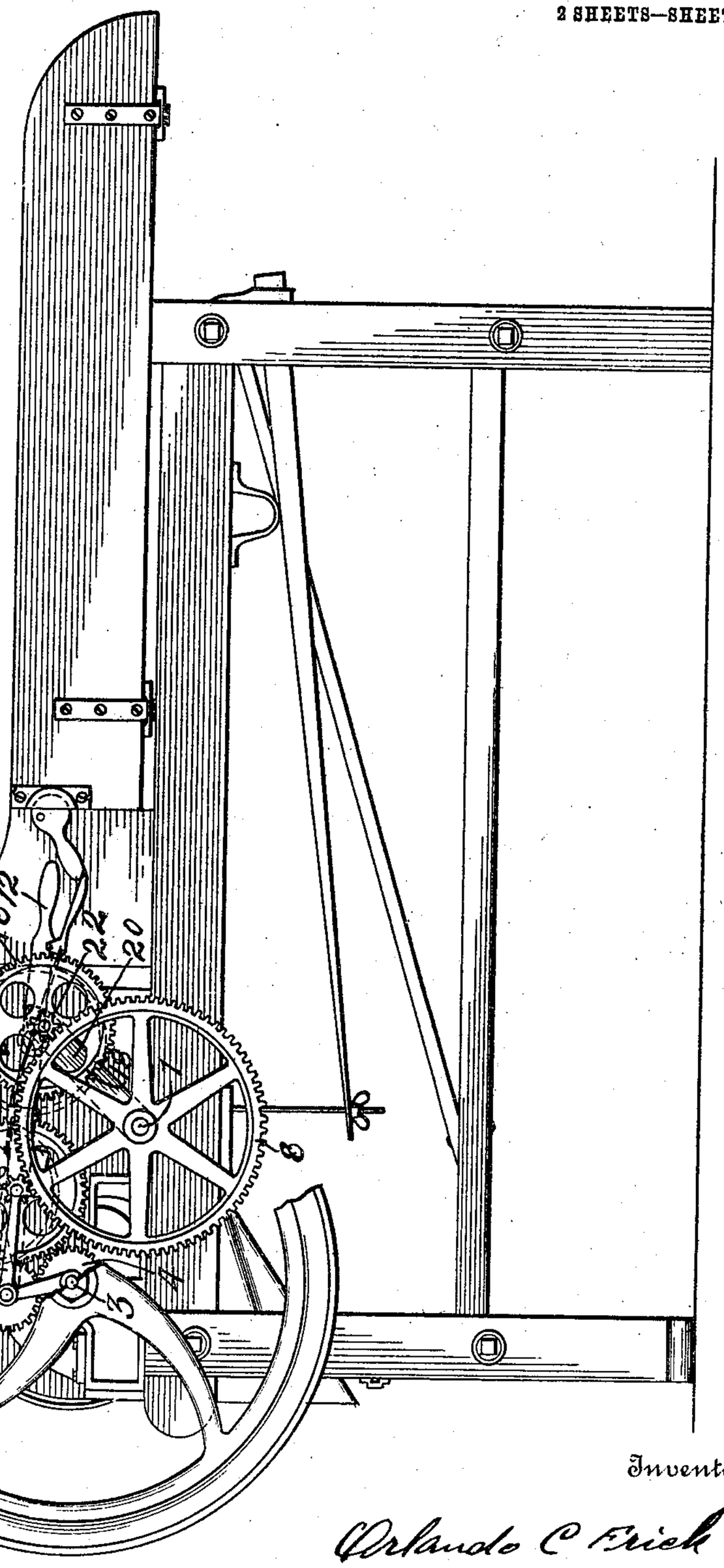
APPLICATION FILED FEB. 10, 1910.

966,679.

Patented Aug. 9, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

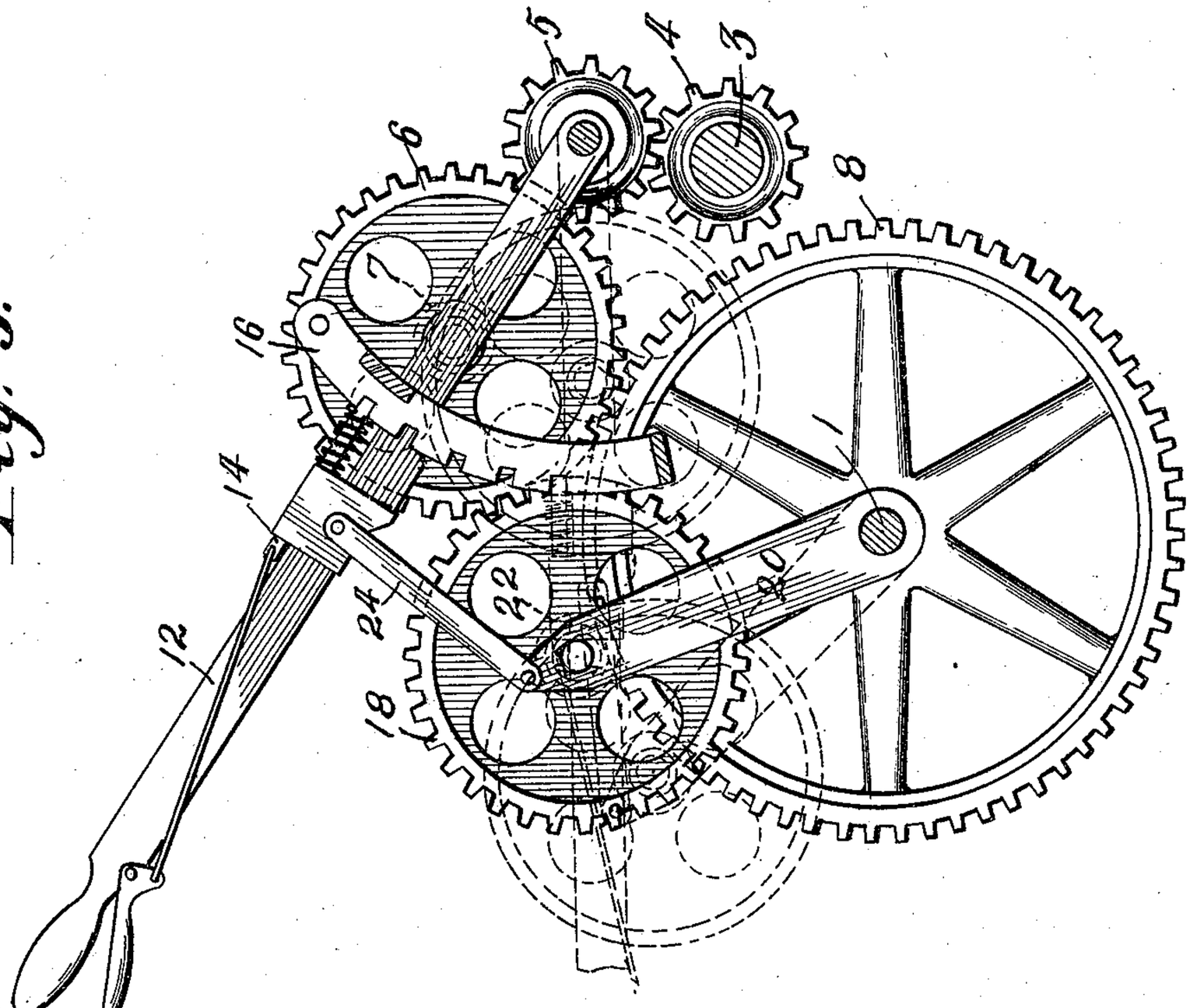
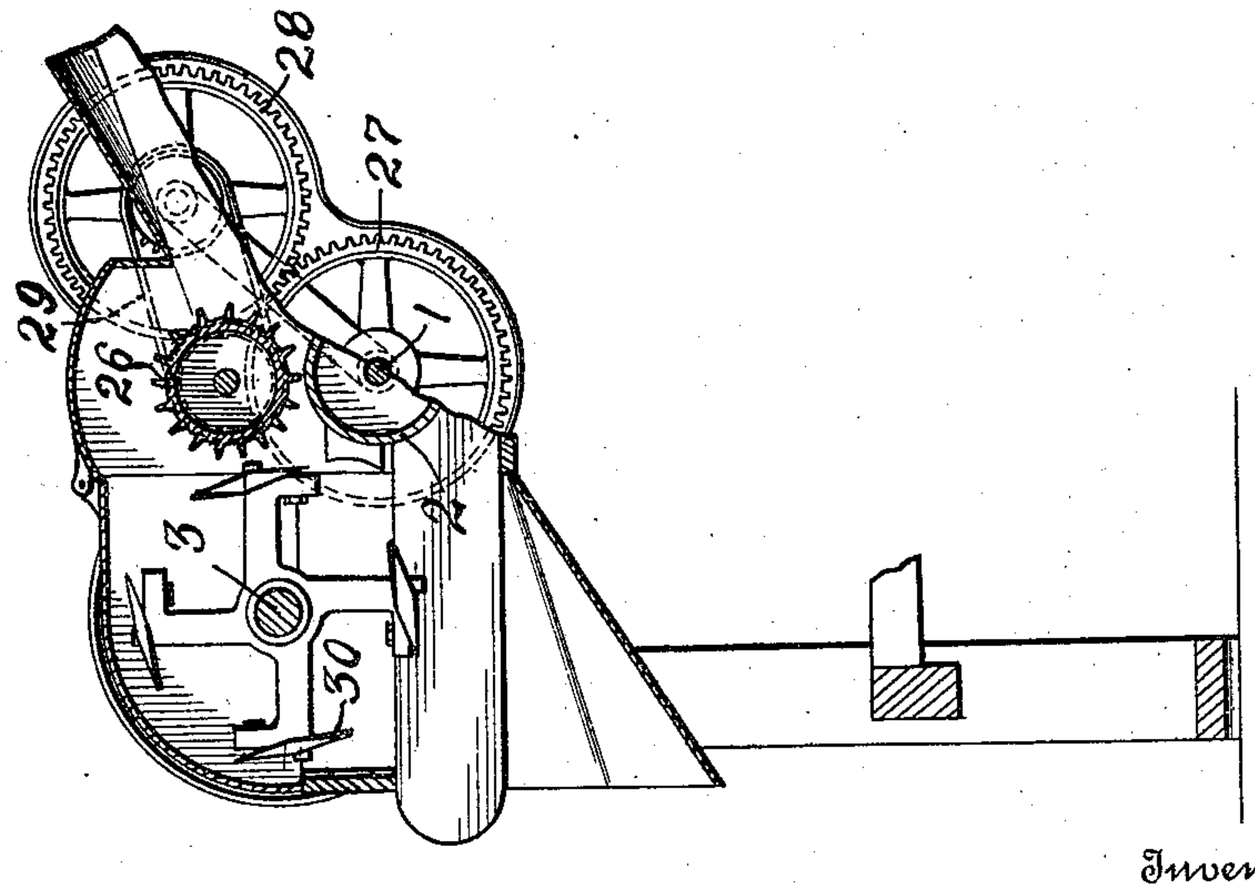


Fig. 2.



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UNITED STATES PATENT OFFICE.

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DRIVING AND REVERSING GEARING.

966,679. Specification of Letters Patent. Patented Aug. 9, 1910.

Application filed February 10, 1910. Serial No. 543,056.

To all whom it may concern:

Be it known that I, ORLANDO C. FRICK, a citizen of the United States, residing at Manitowoc, county of Manitowoc, and State of Wisconsin, have invented new and useful Improvements in Driving and Reversing Gearing, of which the following is a specification.

My invention relates to improvements in driving and reversing gearing with particular reference to that class of gearing employed in connection with feed cutters, shredders, and other machines in which it is frequently desirable to stop the operation of the feed mechanism or cause a reversal thereof.

The object of my invention is to provide means whereby the motion of the machine or of certain parts thereof, may be controlled by changing the relative position of the gears, thus avoiding the necessity of using complicated clutch mechanisms and securing thoroughly reliable adjustments, which can be instantaneously made.

In the following description, reference is had to the accompanying drawings, in which—

Figure 1 is a side view of a feed cutter embodying my invention. Fig. 2 is a detail sectional view, drawn transversely of the feed mechanism and cutters and showing the relation of the feed mechanism to the cutters and the motion transmitting connections for the feed rollers. Fig. 3 is a detail view of the driving and reversing gearing as seen from the inner side, the same being shown in reversing position with dotted lines indicating the normal driving position.

Like parts are identified by the same reference characters throughout the several views.

Normally, motion is transmitted to the shaft 1 of the feed roller 2 from a main driving shaft 3 through the gear wheels 4, 5 and 6, pinion 7 and gear wheel 8, the latter being fast on the shaft 1, and the pinion 4 being fast on the driving shaft 3. The gear wheel 6 and pinion 7 are supported from the shaft of the gear wheel 5 by means of a swinging arm 10 and the adjusting lever 12. By lifting lever 12 therefore, the gear wheel 6 and pinion 7 may be raised to the position indicated by dotted lines in Fig. 1, whereupon the pinion 7 will be disengaged from the gear wheel 8. The shaft 3 may then continue to revolve without transmitting any motion to the gear wheel 8, shaft 1 and feed roller 2. The lever 12 may be held in any desired position of adjustment by a latch 14 of ordinary construction, which is adapted to engage a sector 16 connected with the machine frame.

Another gear wheel 18 is supported from the shaft 1 by a pivotally swinging arm 20. This gear wheel 18 is provided with a pinion 22, which meshes with the gear wheel 8. The arm 20 is connected with the lever 12 by a link 24, so that when the lever 12 is raised, the arm 20 will swing upwardly, thus causing the pinion 22 and gear wheel 18 to travel around gear wheel 8 in the direction of gear wheel 6. The gear wheel 18 is located in the same plane as that occupied by the gear wheel 6 and when the lever 12 is raised to a sufficient height, the pinion 7 will not only be disengaged from the gear wheel 8, as above explained, but the gear wheel 18 will be brought into mesh with the gear wheel 6. Motion will then be transmitted in a reverse direction to the shaft 1 and roller 2 from the gear wheel 6 through the gear wheel 18, pinion 22, and gear wheel 8.

It is desirable in most cases that both feed rollers be actuated. In the construction illustrated, the feed roller 26 is actuated from the shaft 1 through gear wheels 27 and 28 and a sprocket chain 29. The gear wheels 27 and 28 are preferably located on the opposite side of the machine from the reversing gears. It will be observed that the feed cutters 30 mounted on shaft 3 will, in the construction illustrated, be continuously actuated in the same direction regardless of the direction in which the shaft 1 and feed rollers revolve.

With the above described construction, if the parts be assumed to be in the position shown in Fig. 1, a forward feed motion will be transmitted to the feed rollers 2 and 26, this motion being communicated to the shaft 1 of the lower feed roller through the gear wheel 6, pinion 7, and gear wheel 8, as above described. In case it is desired to check the feeding operation, the lever 12 is lifted to an intermediate position, thus disengaging pinion 7 from gear wheel 8, whereupon the feed rollers will come to rest,—the cutters continuing to revolve.

If it is desired to retract the material from

the feed rollers in order to remove a clog or for any other purpose, the lever 12 will be lifted to its extreme raised position, as shown in Fig. 3, whereupon gear wheel 18 will be brought into mesh with gear wheel 6, as above explained, and a reverse motion transmitted through pinion 22 and gear wheel 8 to the shaft 1 and the feed rollers.

From the foregoing description, it will be observed that so far as my invention is concerned, the gear wheel 5 may be regarded as a driving wheel and the gear wheel 8 as a driven wheel, normally in operative relation to the driving wheel through the gear wheel 6 and pinion 7, the gear wheel 6 being adjustable in a planetary movement about the driving gear wheel 5. Also that the gear wheel 18 may be termed a normally idle gear wheel, which, with its pinion 22, is supported from the axis of the gear wheel 8 and is adapted to move with a planetary adjustment about said gear wheel 8, the pinion 22 remaining constantly in mesh with the gear wheel 8, while the pinion 7 moves into and out of mesh therewith, and the gear wheel 18 moves out of and into mesh with the gear wheel 6, the latter remaining constantly in mesh with the driving gear wheel 5.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is—

1. The combination with a driving gear wheel, of an intermediate gear wheel pivotally supported from the axis of the driving gear wheel, a driven gear wheel, a reversing gear pivotally supported from the axis of the driven gear wheel, an actuating lever connected with the axes of the driving and intermediate gear wheels, and a link connecting said lever with the support of the reversing gear wheel, and pinions connected with the intermediate and reversing gear wheels respectively and adapted to mesh with the driven gear wheel.

2. The combination of a driving gear wheel, a driven gear wheel, an intermediate gear wheel and a pinion connected therewith, a support for the intermediate gear wheel and pinion pivotally mounted upon the axis of the driving gear wheel and permitting a planetary adjustment of the intermediate gear wheel and pinion, a reversing gear wheel and pinion connected therewith, a support for the reversing gear wheel and pinion pivotally connected with the axis of the driven gear wheel, and an actuating lever operatively connected with the intermediate and reversing gear wheels and adapted to transmit a planetary motion to said wheels, said lever being arranged to move the intermediate gear wheel pinion into and out of mesh with the driven gear wheel and to correspondingly move the reversing gear wheel to and from the intermediate gear wheel and into mesh therewith when said intermediate gear wheel is adjusted to its extreme outward position with reference to the driven gear wheel.

3. The combination with a driving gear wheel, a driven gear wheel, an intermediate gear wheel supported for a planetary adjustment with reference to the driving gear wheel, a pinion connected with the intermediate gear wheel and movable during said planetary adjustment into and out of mesh with the driven gear wheel, a reversing gear wheel a pinion connected therewith and meshing with the driven gear wheel, said reversing gear wheel being supported for planetary movement about the axis of the driven gear wheel and into and out of mesh with the intermediate gear wheel, a lever for adjusting the intermediate gear wheel, and a link connected with the lever and with the reversing gear wheel and adapted to throw said reversing gear wheel into mesh with the intermediate gear wheel when the latter with its pinion, is moved away from the driven gear wheel.

In testimony whereof I affix my signature in the presence of two witnesses.

ORLANDO C. FRICK.

Witnesses:
C. F. SMALLEY,
A. L. HOUGEN,