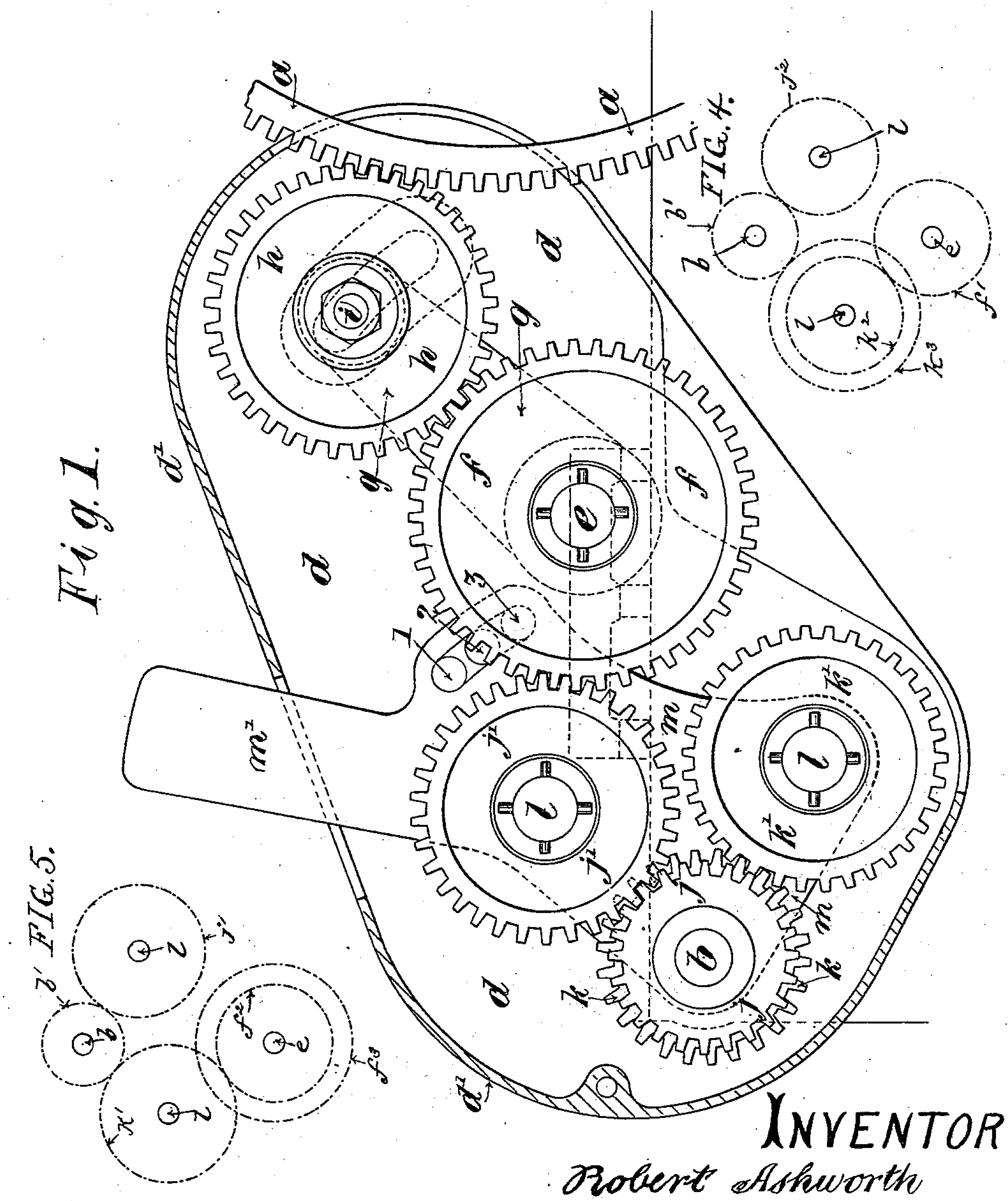
(No Model.) 2 Sheets—Sheet 1.

R. ASHWORTH.

DRIVING MECHANISM FOR CARDING ENGINE CALENDER OR DELIVERY ROLLERS.

No. 455,088. Patented June 30, 1891.



INVENTOR

Robert Ashworth

By his Attys.

Howson and Howson

Witnesses.

George Baumann

John Revell

(No Model.) 2 Sheets—Sheet 2.

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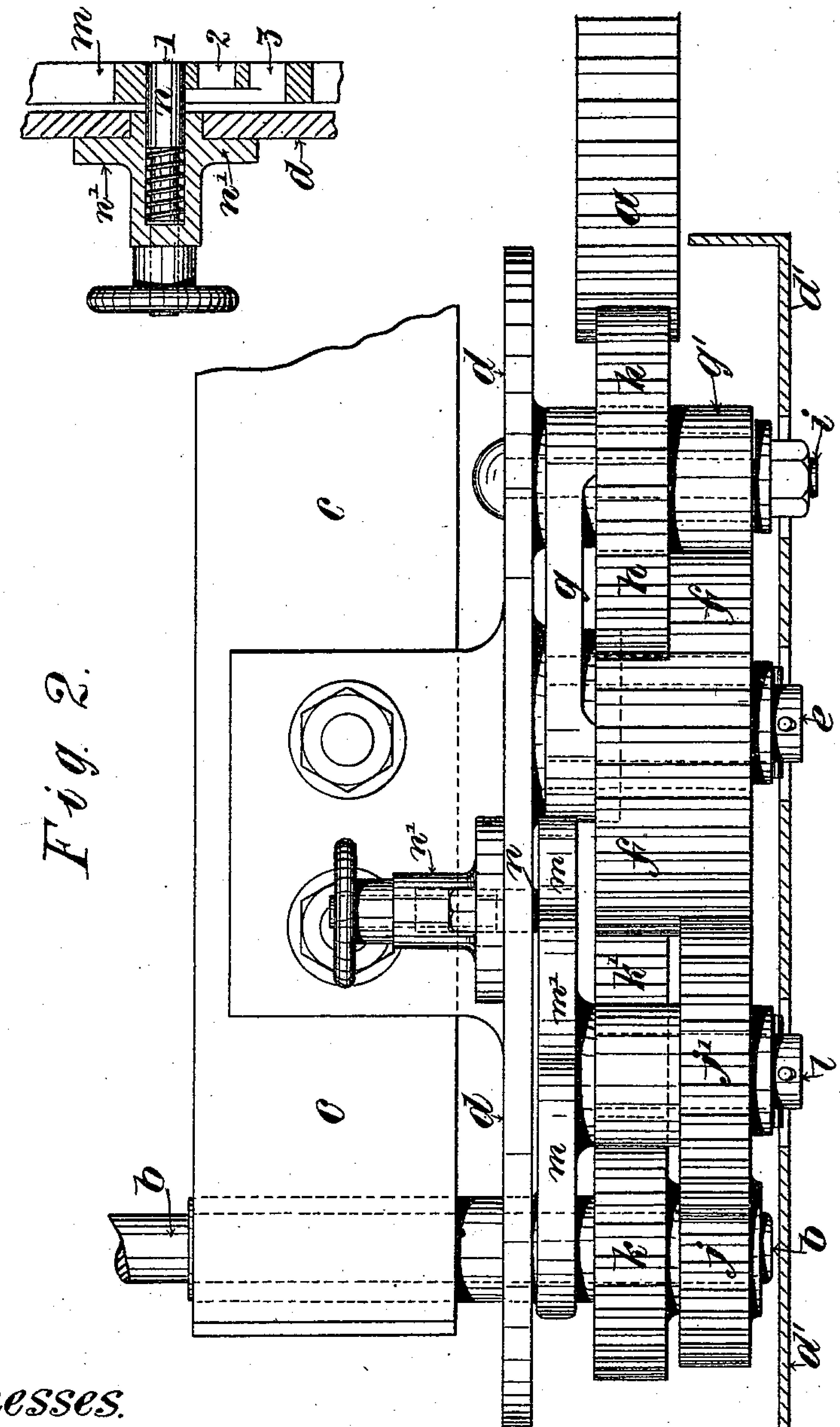
Fig. 3.

Fig. 2.



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George Baumann
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UNITED STATES PATENT OFFICE.

ROBERT ASHWORTH, OF PROVIDENCE, RHODE ISLAND.

DRIVING MECHANISM FOR CARDING-ENGINE CALENDER OR DELIVERY ROLLERS.

SPECIFICATION forming part of Letters Patent No. 455,088, dated June 30, 1891.

Application filed February 28, 1891. Serial No. 383,313. (No model.)

To all whom it may concern:

Be it known that I, ROBERT ASHWORTH, a citizen of the United States of America, residing at Providence, Rhode Island, have invented an Improved Driving Mechanism for Carding-Engine Calender or Delivery Rollers, of which the following is a specification.

My invention relates to mechanism for driving the calender or delivery rollers which draw away the doffed fleeces in carding-engines. It has been found that the delivery of the fleece from the doffer to the calender-rollers is subject to climatic and other influences, so that while at one time the fleece is drawn forward at a suitable rate at other times the fleece is not taken off with sufficient rapidity, whereby it is liable to sag or to fall down between the doffer and the rollers. So far as I am aware, no means have hitherto been provided for effecting the slight variation in the speed of the rollers, which would be required to prevent the at times excessive sagging of the fleece. I propose to obviate this defect by imparting motion to the rollers through gearing which can be readily altered to produce the required acceleration or retardation in the speed of the rollers. I employ differential gearing, which can be changed by shifting a swivel-plate carrying two intermediate gear-wheels or sets of gear-wheels, one for the ordinary speed and the other for a quicker speed.

In the accompanying drawings, Figure 1 is a front elevation of the improved motion. Fig. 2 is a plan of the same. Fig. 3 is a sectional view of a detail illustrated in outside view in Fig. 2. Figs. 4 and 5 are diagrams illustrating modifications.

In the said figures, *a* represents a part of the periphery of the ordinary gear-wheel upon the doffer-cylinder shaft, and *b* is the outer end of the calender-roller shaft.

To the under framing *c* of the engine I secure a bracket *d*, which carries intermediate parts of the motion and is provided with a wheel casing or shield *d'*. To the said bracket is secured a stud *e*, on which is mounted a broad intermediate gear-wheel *f*. Upon the same stud an arm *g* is mounted, and upon or to the outer end of this arm a tubular stud *g'* is formed or fixed. Upon this last-named stud a gear-wheel *h* is mounted, this wheel meshing with the two wheels *a f* and serving as an intermediate, whereby the wheel *f* is caused to revolve in the same direction as the wheel *a*. A bolt *i* passes through the said tubular stud and through a curved slot in the bracket and serves when tightened to secure the arm *g* in its adjusted position. By adjusting the said arm around the stud *e* to the required extent the wheel *h* can be readily and quickly brought to mesh properly with the wheel *a* after adjustment of the doffer. Upon the roller-shaft *b* are fixed two gear-wheels *j k*, which differ in the number of their teeth to the extent of one, two, or more teeth, as may be considered or found to be most suitable. In the example illustrated the wheel *j* has twenty-four teeth and the wheel *k* has twenty-six teeth. Each of these wheels meshes with an intermediate *j'* or *k'*, as the case may be, these intermediates being mounted to revolve upon studs *l*, which are fixed to a swivel-plate *m*. The said swivel-plate is mounted to turn upon the axis of the roller-shaft *b*, so that by turning the swivel-plate in one direction or the other either one of the intermediates *j' k'* can be made to mesh with the gear-wheel *f*. In the example the swivel-plate is formed with a long boss, which is turned to fit and to turn in a hole bored in the framing. In this boss is bored a bearing for the shaft *b*. I have adopted this method of mounting the swivel-plate, as it provides that the plate shall be firm and steady; but I do not confine myself to such method. The swivel-plate is provided with a handle *m'* of any suitable form, whereby the plate can be moved to change the gearing. I prefer to limit the movements of the swivel-plate, so as to prevent the gears being caused to mesh too deeply. Fig. 3 illustrates the method I have adopted for this purpose. In the swivel-plate I drill three holes, marked 1 2 3 in Figs. 1 and 3. These holes are formed on a curved line which is struck from the center of the shaft *b*, so that all the holes are the same distance from such center. The holes are connected at the back of the plate by a curved slot, the ends of the holes 1 and 3 forming the ends of the slot. A sliding bolt *n*, mounted in a fixing *n'*, by entering one of the holes serves to lock the swivel-plate in any one of three positions, a spiral spring shooting the bolt into locking position.

When the swivel-plate is to be shifted, the bolt is drawn back; but this movement is limited, so that the bolt cannot be withdrawn clear of the curved slot, which therefore limits the movements of the swivel-plate. It will be seen that when the bolt *n* is in hole 1 the gearing will be meshing, as in the drawings, the wheel *j'* meshing with the wheel *f*, whereby the calender-rollers will be revolved at the quick speed. When, however, the plate is turned into its other extreme position and the bolt shot into hole 3, the wheel *k'* will mesh with the wheel *f* and the rollers will be revolved at a slower speed. When the bolt is in hole 2, the roller-shaft is disconnected from the driving-gear, and therefore does not revolve. As the important feature is the swivel-plate carrying two intermediate gears giving different speeds when in use, the proportions and dispositions of the gearing can be varied. Thus I can apply one broad gear upon the end of the shaft *b* and substitute two gears varying in diameter for the broad gear *f*, or differential gears might take the place of one of the wheels *j' k'*, a gear of single width acting as the wheel *f*.

The diagrams, Figs. 4 and 5, illustrate these two modifications. In Fig. 4, *b'* is the wheel fixed on the end of the shaft *b*, and *f'* corresponds to the wheel *f* in Fig. 1, j^2 and k^2 k^3 being intermediates mounted upon the swivel-plate in place of the wheels *j' k'*. The intermediates k^2 k^3 consist of two wheels, one k^2 meshing with the wheel *f'* and the other, or larger wheel k^3, meshing with the wheel *b'*. It will be seen that when the swivel-plate is shifted to bring j^2 into position to mesh with *f'* in place of k^2 the calender-rollers will be driven at a slower speed. In Fig. 5 the intermediates *j' k'* are used, but two wheels f^2 f^3 of different diameters take the place of the wheel *f*. The intermediate *j'* meshes with the larger wheel f^3 and the intermediate *k'* with the smaller wheel f^2, the latter giving the slow speed and the former the quick speed. As the two intermediates *j' k'* could not be in the same plane, it will be understood that the wheel *b'*, which is fixed on the shaft *b*, must be broad enough to mesh with both intermediates. In Fig. 4 the wheel *f'* would mesh with the wheel *h* in Fig. 1, and in Fig. 5 either of the wheels f^2 or f^3 might mesh with the wheel *h*.

If preferred, the gearing may be simplified by dispensing with wheels *f* and *h*, the proportions of the other gearing being altered so that the intermediates on the swivel-plate could gear directly with the wheel *a*; but it will be seen that in such a case the movements of the swivel-plate would vary in consequence of the necessity for the adjustment of the doffer.

What I claim is—

1. The combination of the calender-roll shaft of a carding-engine and a driving-wheel with a gear-wheel on said shaft, a swivel-plate, and gear-wheels carried by the latter to mesh with the wheel on the calender-roll shaft and with the said driving-wheel, one of said four gear-wheels being a double gear having wheels of different diameters to transmit motion at different speeds but in the same direction to the calender-roll shaft, substantially as described.

2. The combination of a calender-roll shaft of a carding-engine, having gear-wheels *j k* thereon of different diameters, with a swivel-plate having studs carrying intermediate gear-wheels *j' k'*, meshing with the said wheels *j* and *k*, respectively, and a gear-wheel to mesh with either of the intermediates to transmit motion of varying speeds but in the same direction from the doffer to the calender-roll shaft.

3. The combination of the doffer-wheel of a carding-engine and a calender-roll shaft *b*, having wheels *j k* of different diameters, with a swivel-plate *m*, carrying intermediate gears *j' k'*, meshing with the said wheels *j* and *k*, respectively, a broad wheel adapted to mesh with either of the intermediates, and a gear-wheel *h* to transmit motion of different speeds but in the same direction from the doffer-wheel to the broad wheel.

4. The combination of a doffer-wheel of a carding-engine, a calender-roll shaft having wheels *j k* of different diameters, with a swivel-plate carrying intermediates *j'* and *k'*, meshing with the said wheels *j* and *k*, respectively, a broad intermediate *f*, adapted to gear with either of the intermediates *j' k'*, a wheel *h* to transmit motion of different speeds but in the same direction from the doffer-wheel to the broad intermediate, the framing *c*, the plate *d* thereon, and an adjustable arm *g* to carry the wheel *h*.

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

ROBERT ASHWORTH.

Witnesses:
H. W. PARMENTER,
EDWARD D. BASSETT.