

A. C. SMITH.
 SPEED VARYING MECHANISM.
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942,416.

Patented Dec. 7, 1909.

FIG. 1.

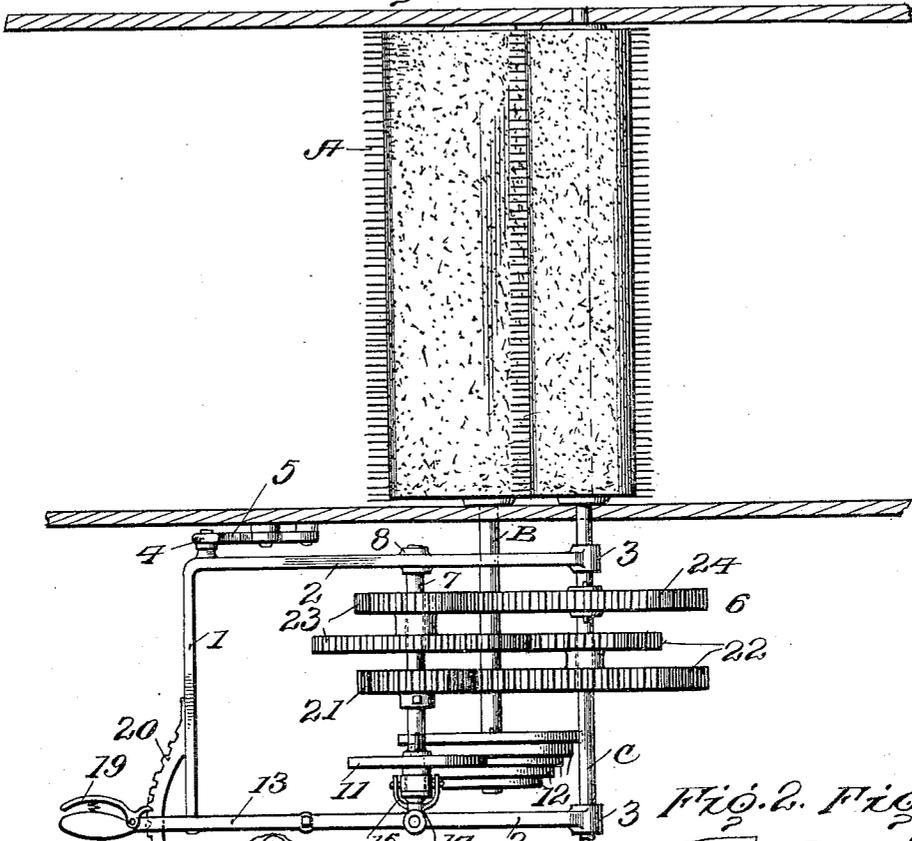
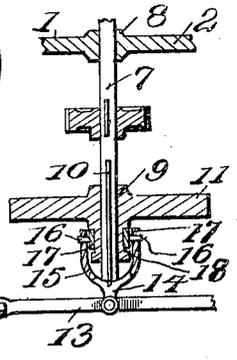
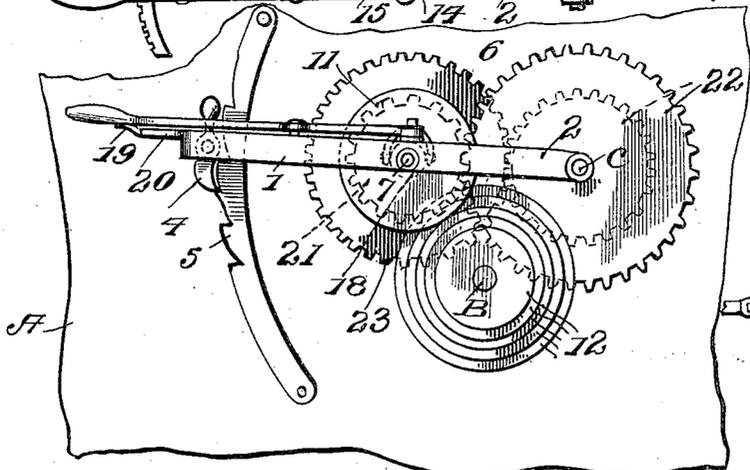


FIG. 2.

FIG. 3.



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SPEED-VARYING MECHANISM.

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To all whom it may concern:

Be it known that I, ALEXANDER C. SMITH, citizen of the United States, residing at Hobart, in the county of Kiowa and State of Oklahoma, have invented certain new and useful Improvements in Speed-Varying Mechanisms, of which the following is a specification.

This invention comprehends certain new and useful improvements in speed-varying mechanism, and the invention has for its object a simple, durable and efficient construction of apparatus of this character which is designed particularly for use in connection with a cotton gin so as to admit of the speed of the same being changed to adapt the gin to the condition of the cotton or the quantity of the same fed therein.

With this and other objects in view that will more fully appear as the description proceeds, the invention consists in certain constructions and arrangements of the parts that I shall hereinafter fully describe, and then point out the novel features thereof in the appended claims.

For a full understanding of the invention and the merits thereof, and to acquire a knowledge of the details of construction, reference is to be had to the following description and accompanying drawing, in which:

Figure 1 is a top plan view showing my improved speed-varying mechanism applied to a cotton gin; Fig. 2 is a side elevation thereof; and Fig. 3 is a longitudinal section of the countershaft.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawing by the same reference characters.

Referring to the drawing, A designates a cotton gin to which my invention is applied, and the main shaft B of which is driven in any approved manner and is designed to transmit such motion to the driven shaft C operating the feeder rolls, the two shafts projecting laterally beyond the gin at one side thereof, as shown. A preferably U-shaped supporting frame 1 is provided at the extremities of its side bars 2 with hollow cylindrical bearings 3 that are rotatably mounted upon the projecting end of the driven shaft C so as to connect the frame thereto to swing about the same as an axis. This frame is

movable toward and away from the projecting end of the main shaft B and is adapted to be held in different adjusted positions relative thereto through the instrumentality of a pawl 4 disposed at the swinging end of the frame and engaging with the teeth of a segment 5. The projecting portion of the driven shaft C is operatively connected by means of suitable intermeshing gears 6 with a substantially parallel countershaft 7 that is disposed transversely of the supporting frame 1 and is journaled in suitable bearings 8 provided on the side bars 2. A sleeve 9 is mounted upon this countershaft 7 by a feather key 10 or other similar means, so as to be turned with the countershaft and at the same time be susceptible of having a limited sliding movement thereon. This sleeve carries a gear wheel 11 which is preferably in the form of a friction wheel, although not necessarily so, and which is arranged to operatively engage the different sections of a stepped cone wheel 12 that is keyed or otherwise rigidly mounted upon the projecting portion of the main shaft B, said gear wheel 11 engaging any selected section of the cone wheel, to regulate the speed imparted from the main shaft B to the driven shaft C.

In order to shift the sleeve 9 on the shaft, to cause the gear wheel 11 to be brought into vertical alinement with the selected section of the cone wheel 12 and to maintain the gear wheel in such adjusted position, I employ a controlling device which consists essentially of a lever 13 that is fulcrumed at an intermediate point upon one of the side bars 2 of the supporting frame 1. The end of the lever adjacent to the countershaft 7 is pivoted to a link 14 that is disposed laterally toward the gear wheel 11 and that is bifurcated at such end, as indicated at 15. These bifurcations are pivotally connected to substantially diametrically oppositely disposed trunnions 16 formed on a collar or strap 17 that is loosely mounted in an annular groove 18 formed in the periphery of the sleeve 9. The lever 14 is normally held against any rocking movement through the instrumentality of a spring latch 19 disposed at the opposite end thereof and adapted to engage the teeth of a quadrant 20, the latter being secured to the swinging end of the supporting frame 1.

In the practical use of my improved speed-varying mechanism, when occasion de-

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mands that the speed of the driven shaft C be changed, say decreased, it is only necessary to press the spring latch 19 out of engagement with the quadrant 20 and rock
 5 the controlling lever 13 in such direction as to shift the sleeve 9 and the gear wheel 11 transversely on the shaft to cause the gear wheel to assume a position in substantially the same plane with the requisite smaller
 10 section of the cone wheel 12, the spring latch being reengaged with the quadrant to retain the parts in such adjusted position. Inasmuch as the friction wheel 11 is moved into vertical alinement with a smaller section
 15 thereof, and in order to effect the completion of the adjustment, it is only necessary to release the pawl 4 from the toothed segment 5 and swing the supporting frame 1 about the driven shaft C as an axis and toward the main shaft B until the gear wheel 11 engages with the selected section of the cone wheel with the necessary frictional contact. The frame is sustained in
 25 such latter position by reengaging the pawl 4 with the toothed segment 5. It will be readily apparent that when the countershaft 7 has an operative connection with a smaller section of the cone wheel 12, it will be rotated at a less speed, and hence the speed transmitted from the countershaft 7 will be correspondingly decreased as desired. In event of the necessity of increasing the speed of the driven shaft C, it will be manifest
 35 that the same may be conveniently effected by reversing the operation just described.

From the foregoing description, in connection with the accompanying drawing, it will be apparent that I have provided
 40 an improved speed-varying mechanism, through the instrumentality of which the countershaft may be operatively connected to any selected one of the sections of the cone wheel; which may be advantageously employed in connection with cotton gins, although it is susceptible of various other applications, as will at once present themselves to those for whom the device is intended; which embodies to a marked degree the
 50 characteristics of simplicity, durability and efficiency in construction and operation, and which consists of comparatively few parts that may be easily and cheaply manufactured and readily assembled.

55 In the present instance, the gearing connection between the countershaft 7 and the driven shaft C is effected by means of a gear wheel 21 which is rigidly mounted upon the countershaft and meshes with one
 60 of a pair of gear wheels 22 that are loosely mounted upon the driven shaft. The other one of the gear wheels 22 meshes with one of another pair of gear wheels 23 that are loosely mounted upon the countershaft 7,
 65 the remaining one of said last named pair,

in turn meshing with a gear wheel 24 that is rigidly mounted upon the driven shaft C. The gear wheels of the two pairs 22 and 23 are rigidly connected together, although both wheels of each pair are loosely mounted upon the respective shafts.

Having thus described the invention, what I claim is:

1. The combination of substantially parallel drive and driven shafts, a cone gear
 75 rigidly mounted on said drive shaft, a supporting frame journaled on the driven shaft and adjustable toward and away from the cone gear, a countershaft substantially parallel to the said shafts and journaled on the
 80 frame, a gearing connection between the countershaft and the driven shaft, and a gear wheel mounted to turn with the countershaft and slidable longitudinally thereon to effect engagement with different sections
 85 of the cone gear.

2. The combination of substantially parallel drive and driven shafts, a cone gear rigidly mounted on one of said shafts, a supporting frame journaled on the other
 90 shaft and adjustable toward and away from the cone gear, a counter shaft substantially parallel to the said shafts and journaled on the frame, a gearing connection between the countershaft and the shaft on which the
 95 frame is journaled, a gear wheel mounted to turn with the countershaft and slidable longitudinally thereon to effect engagement with different sections of the cone gear, a toothed segment disposed in proximity to
 100 the swinging end of the supporting frame, and a pawl carried by the supporting frame and engaging with the segment to retain the frame in adjusted position.

3. The combination of substantially parallel drive and driven shafts, a cone gear
 105 rigidly mounted on one of said shafts, a supporting frame journaled on the other shaft and adjustable toward and away from the cone gear, a countershaft substantially parallel to the said shafts and journaled on the frame, a gearing connection between the countershaft and the shaft on which the supporting frame is journaled, a gear wheel mounted to turn with the countershaft and
 110 slidable longitudinally thereon to effect engagement with different sections of the cone gear, a lever fulcrumed on the supporting frame and connected to the last named gear to shift the same on the countershaft, and
 115 means for holding the lever in different adjusted positions.

4. The combination of substantially parallel drive and driven shafts, a cone gear rigidly mounted on one of said shafts, a
 125 supporting frame adjustable toward and away from the cone gear and embodying spaced side bars provided with bearings journaled on the other shaft at longitudinally spaced points, a countershaft jour-
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naled transversely of the side bars, a gear-
ing connection between the countershaft
and the shaft on which the side bars are
journaled, and a gear wheel mounted to turn
5 with the countershaft and slidable longitu-
dinally thereon to effect engagement with
different sections of the cone gear.

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

ALEXANDER C. SMITH.

Witnesses:

ROY HART,
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