M. LAMORT.

CONTROLLING MECHANISM FOR CHANGE SPEED GEARINGS.

APPLICATION FILED MAY 4, 1908.

970,836.

Patented Sept. 20, 1910.

2 SHEETS—SHEET 1.

Fig. 1

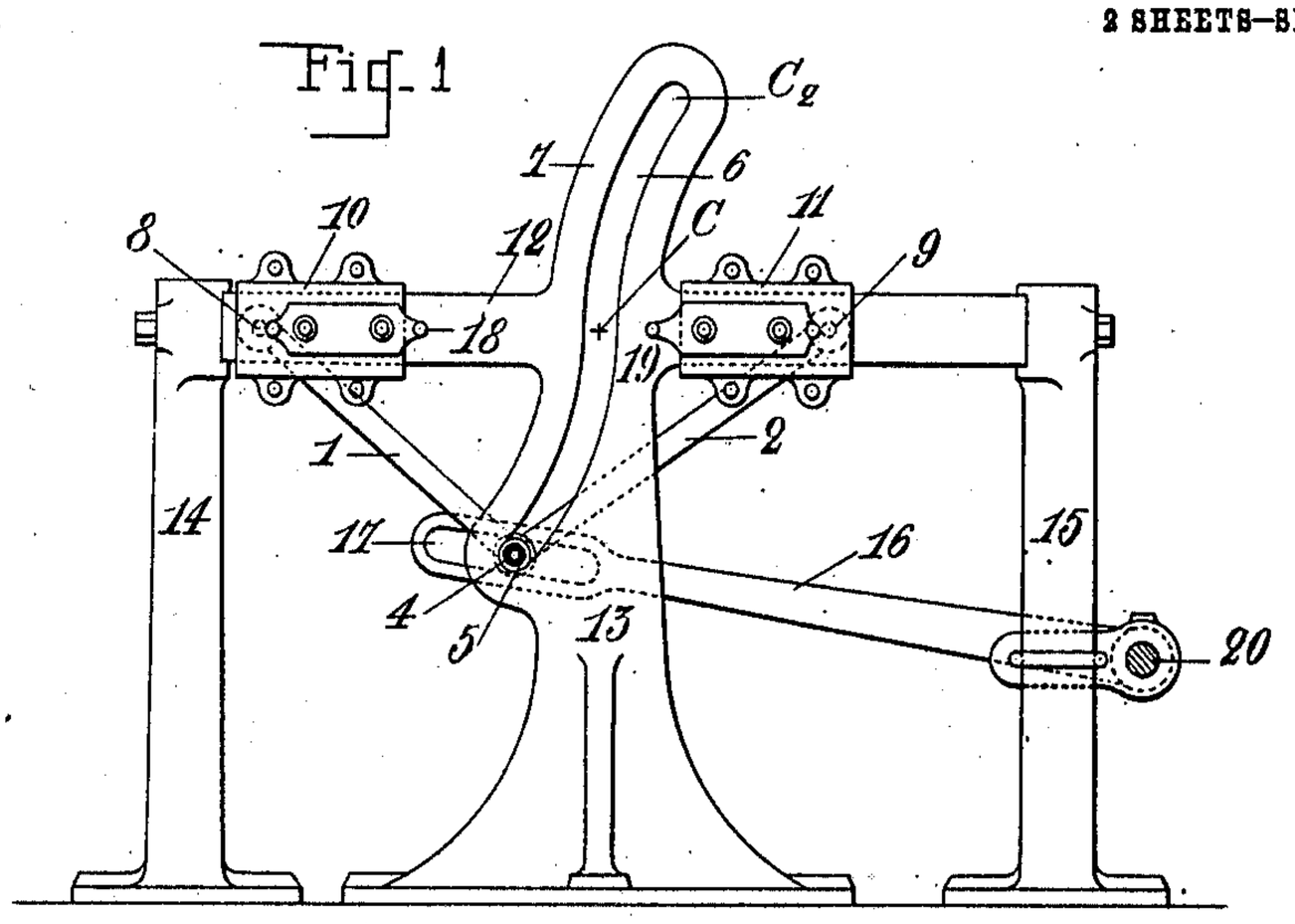

Fig. 2

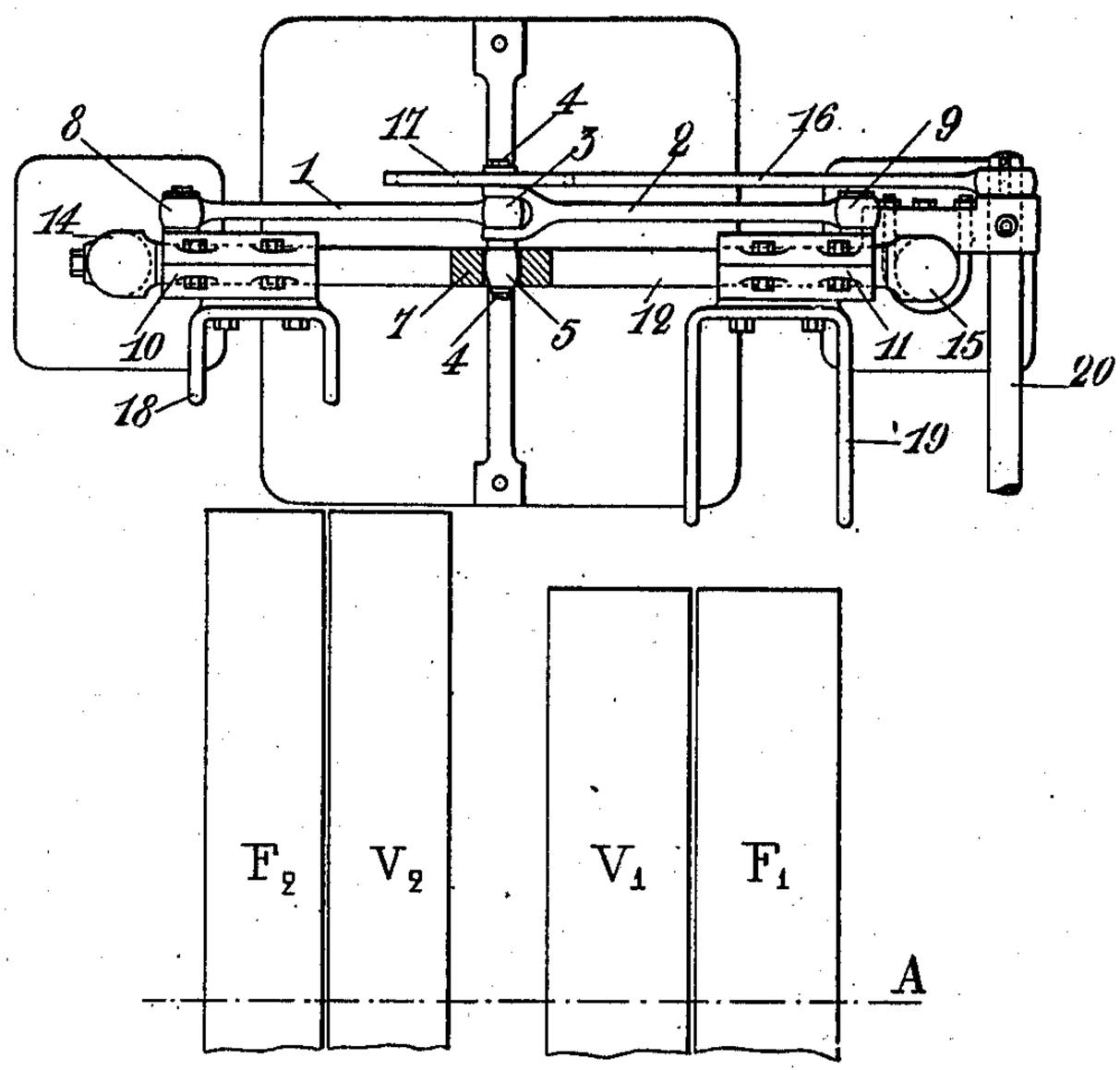

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Fig. 3

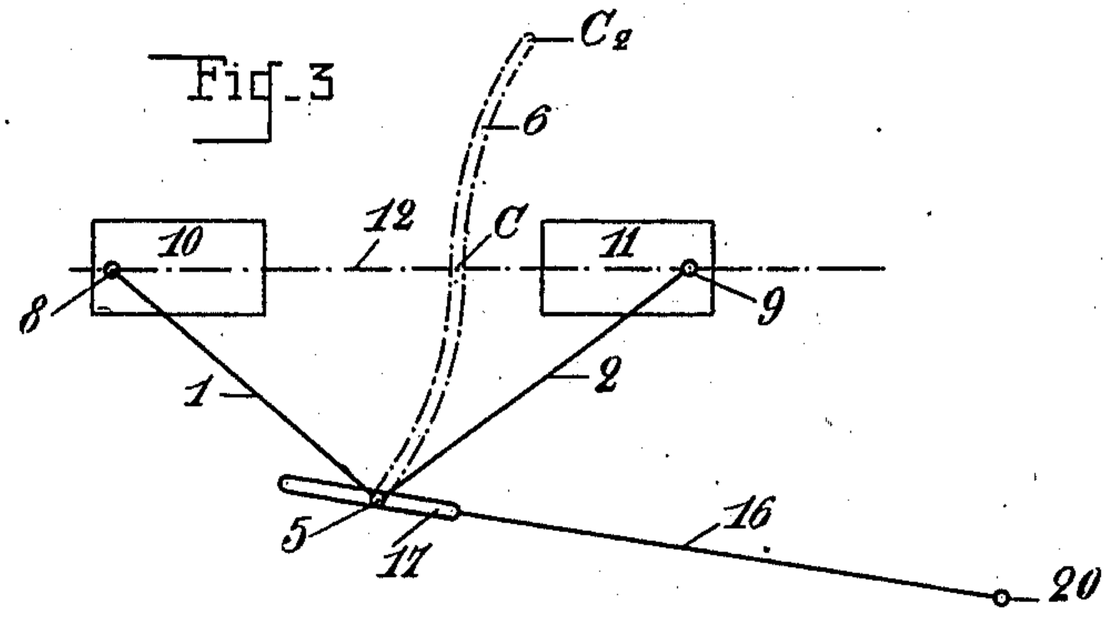


Fig. 4

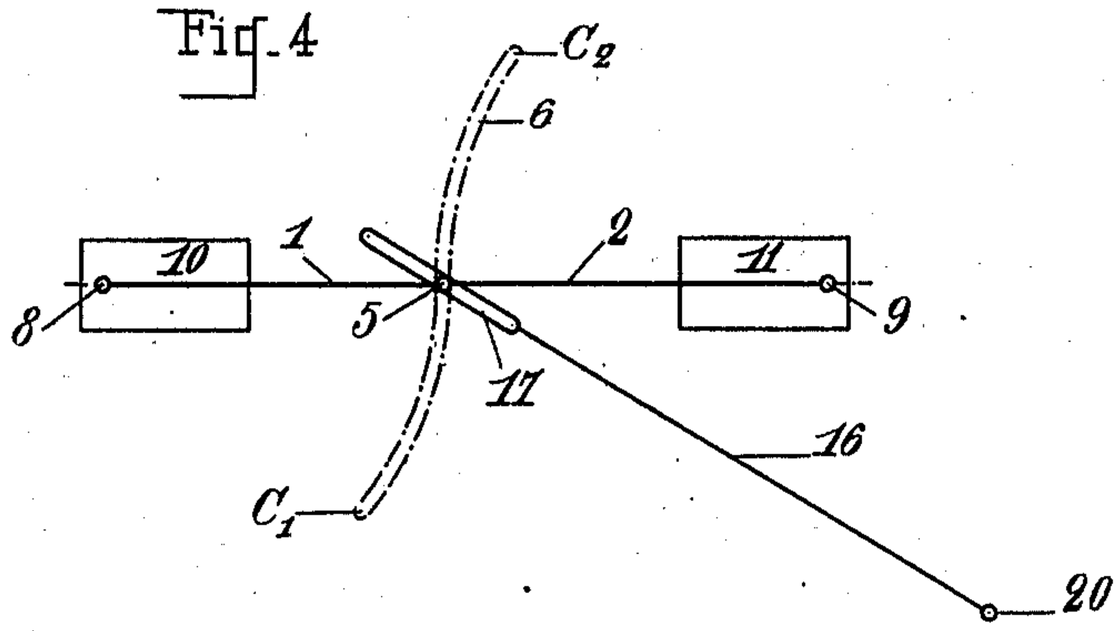
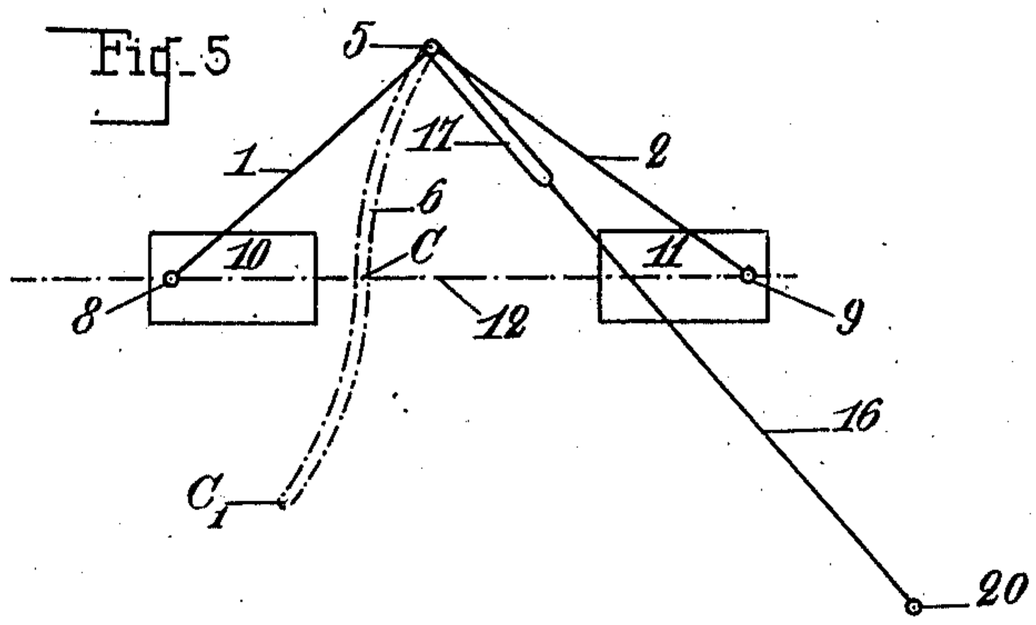


Fig. 5



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UNITED STATES PATENT OFFICE.

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CONTROLLING MECHANISM FOR CHANGE-SPEED GEARINGS.

970,836. Specification of Letters Patent. **Patented Sept. 20, 1910.**

Application filed May 4, 1908. Serial No. 430,799.

To all whom it may concern:

Be it known that I, MARCEL LAMORT, a citizen of France, residing at Vitry-le-François, in the Department of the Marne, have invented new and useful Improvements in Controlling Mechanism for Change-Speed Gearings, (for which I have obtained a patent in France, No. 377,694, bearing date May 10, 1907,) of which the following is a specification.

The present invention has for its object a device for controlling the throwing into and out of gear and changing of gears of variable speed driving mechanisms of all kinds, this device being designed to insure automatically that the movements of the gearing mechanism shall be effected with perfect regularity, and that the passage through the dead point between two gears or between two speeds of drive shall be automatically insured.

In order to facilitate the description of the invention it has been illustrated by way of example in one form of construction in the accompanying drawings.

Figure 1 is an elevation showing one form of the device; Fig. 2 is a plan view of the same device, partially in section and showing the parts in a different position from Fig. 1; Figs. 3, 4 and 5 are diagrammatic views illustrating the three principal positions which the parts of the mechanism may take up when in use.

The same letters of reference refer to the same parts in all the figures.

The device comprises essentially two levers 1 and 2 jointed together at 3, on the axis 4 of a roller 5. This roller is arranged to move on a track or in a groove 6 of a particular shape formed in a suitable piece 7. The other ends of the levers are hinged respectively at 8 and 9 to corresponding slides 10 and 11 adapted to move on a guide bar 12. The whole device is so arranged that when the slide 10 is at the end of its movement farthest removed from the center C of the groove 6, as shown in Figs. 1 and 3, the point 8 is exactly at the center of curvature of the part C_1—C which forms the first half of the said groove, and that on the other hand when the slide 11 is at the end of its movement farthest removed from the same center C as shown in Fig. 5, the point 9 is exactly at the center of curvature of the part C—C_2, which forms the second half of the groove 6. Each of these positions corresponds to one of the extreme positions of the roller 5 at C_1 and C_2, and the middle position in which the said roller lies at the point of inflection C of the center line of the groove 6, corresponds to the position in which the two slides 10 and 11 are farthest apart from one another, that is to say, in which the points 8 and 9 are simultaneously and respectively at the centers of the circular parts C_1—C and C—C_2 above specified.

The mechanism is conveniently supported on a suitable frame 13, 14, 15.

The displacement of the roller 5 in the groove 6 may be effected in any convenient manner, for example, by means of a lever 16 as shown in the drawings, arranged to oscillate about the axis of a shaft 20 on which said lever is fixed, while the shaft is controlled by hand in any convenient manner by the workman in charge of the apparatus. The free end of the lever 16 ends in a fork or slot 17 in which one end of the shaft 4 of the roller 5 is arranged to engage. The amount of free play allowed in the slot 17 and the length of the lever 16 are such that the roller 5 may be moved from the point C_1 to the point C_2, or conversely, by the action of said lever. Under these conditions it will be at once seen that by the movement of the lever 16 through the shaft 20 the slides 10 and 11 may be caused to take up any one of the three positions shown in Figs. 3, 4 and 5.

Referring now to Figs. 1 and 2 which illustrate the application of the mechanism for the control of a speed changing device using belts and fixed pulleys V_1, V_2 and loose pulleys F_1, F_2 mounted on a shaft A, it is seen that the slides 10 and 11 are provided with belt forks 18, 19 for effecting the lateral displacement of the belts, and that the pulleys are arranged as shown in Fig. 2, that is to say, two loose pulleys F_1 F_2 are at the outside, while the two fixed pulleys V_1, V_2 are at the inside; the following results can then be obtained: If the roller 5 is at C_1 the slides 10 and 11 occupy respectively the positions shown in Fig. 3, that is to say the pulley V_1 drives the shaft A or is driven from it, while the pulley V_2 is out of engagement, its belt running on the loose pulley F_2.

When the lever 16 is moved to adjust the roller 5 from C_1 to C, the slide 10 remains stationary, since the point 8 is at the center

of the circular part C_1 C, the slide 11 on the other hand, moves away from the center C and arrives ultimately at the position shown in Fig. 4 when the roller 5 is at the point C. The belt of pulley V_1 has then passed on to the loose pulley F_1 and in this position both pulleys are out of engagement. If the movement of the lever 16 is continued in the same direction the roller 5 comes to the point C_2 and during this movement the slide 11 remains stationary since the point 9 is at the center of the curve C, C_2, but the slide 10 moves toward the center C, causing the belt to come on to its pulley V_2. In the movement of the roller 5 from C_2 to C_1 the reverse action takes place, that is to say, the pulley V_2 is disengaged after which the pulley V_1 comes into action.

It will be readily seen that with the mechanism as above described it is impossible to change the speed of drive without first disengaging the shaft A.

Evidently what has been said as to the control of the speed changing mechanism using belts and pulleys applies equally to any other kind of speed varying mechanism either using toothed gearing or friction cones or any other known device. It is evidently sufficient in applying the device for the control of such mechanisms to mount on the slides 10 and 11 suitable arrangements playing the part of the forks 18 and 19 as above described, and capable of giving the required movement to the speed changing devices which are to be thrown into and out of gear. The device forming the object of the present invention is also evidently applicable to the case in which two machines are to be put in action successively, but never simultaneously, and the device makes it certain that these machines will be controlled and kept separate in working, in the desired manner.

What I claim is:

1. An actuating device for speed changing mechanism, said device comprising two slides adapted to operate the speed changing elements; a guide-bar (12) on which said slides move; two connecting rods (1), (2), hinged respectively, at one of their ends, to one of the said slides, operating the same and movable respectively, in the same plane; a roller (5), connecting the other end of the said connecting rods; a track (6) parallel to the said connecting rods, and guiding the said roller; a lever (16) controlling the displacement of the said roller in the said track.

2. An actuating device for speed changing mechanism, said device comprising two slides adapted to operate the speed changing elements; a guide-bar (12), on which said slides move; two connecting rods (1), (2), hinged, respectively, at one of their ends, to one of the said slides, operating the same and movable respectively, in the same plane; a roller (5), connecting the other ends of the said connecting rods; a track (6) parallel to the said connecting rods, and guiding the said roller; a lever (16) controlling the displacement of the said roller in the said track, the latter consisting of a double circular curve having a radius equal to the length of the connecting-rods, in such a manner that, if the roller (5) is displaced in the first half of this track, the slide (10) remains stationary and the slide (11) is displaced, while if the roller (5) is displaced in the second half of this track, the slide (11) remains immovable, and the slide (10) is displaced in the opposite directions, and vice versa.

3. An actuating device for speed changing mechanism, said device comprising two slides adapted to operate the speed changing elements; a guide-bar (12), on which said slides move; two connecting rods (1), (2), hinged, respectively, at one of their ends to one of the said slides, operating the same and movable respectively, in the same plane; a roller (5), connecting the other end of the said connecting-rods; a track (6) parallel to the said connecting rods, and guiding the said roller; a lever (16) controlling the displacement of the said lever in the said track, the latter consisting of a double circular curve having a radius equal to the length of the connecting rods, in such a manner that the roller (5) operates the connecting rods and the slides in producing, first, the putting out of action of the speed changing element which was in action, and, second, putting into action the speed changing element which was out of action.

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

MARCEL LAMORT.

Witnesses:
ANDRÉ BORDILLON,
EUGÈNE PICHON.