

G. E. MOLYNEUX.
POWER TRANSMITTING DEVICE.
APPLICATION FILED NOV. 27, 1908.

987,640.

Patented Mar. 21, 1911.

Fig. 1.

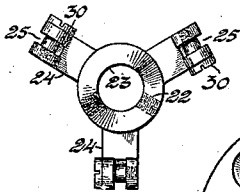
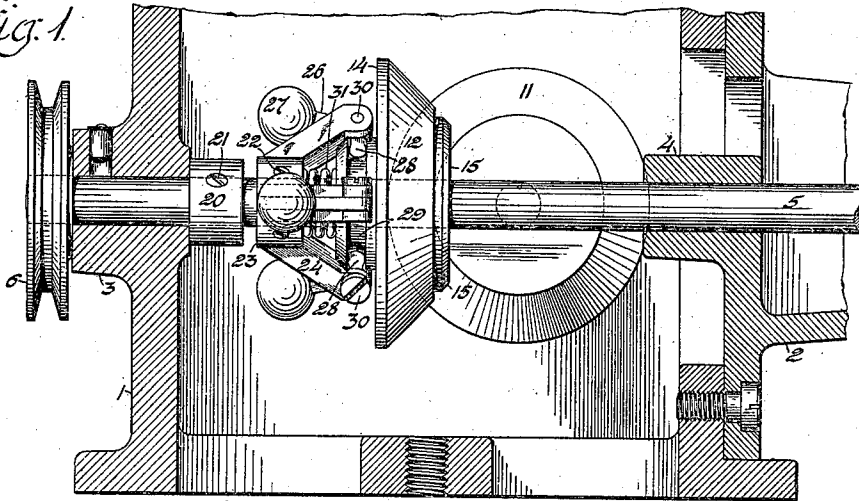


Fig. 3.

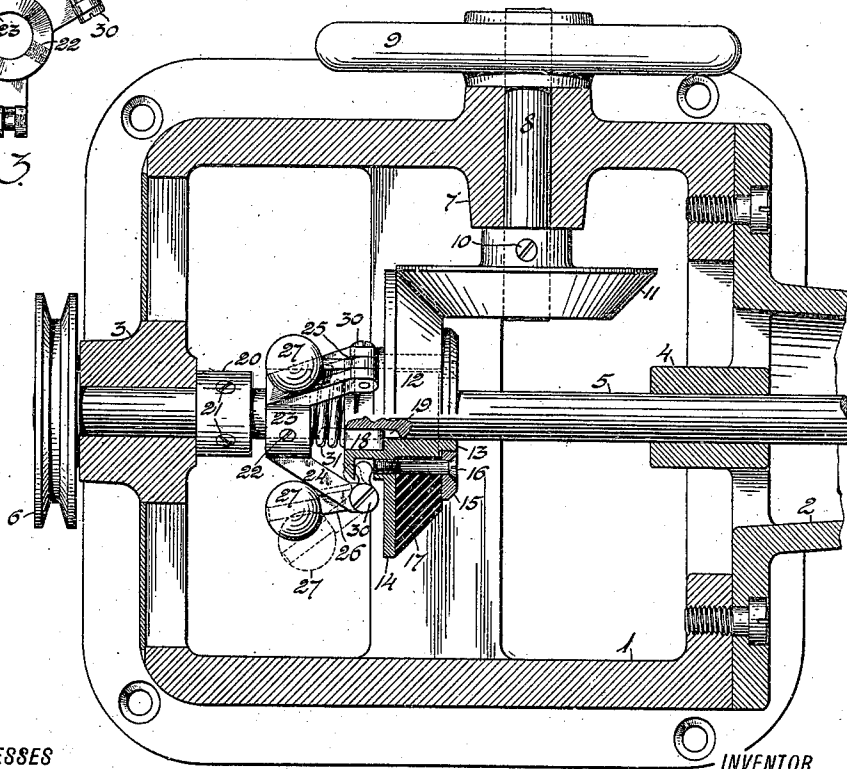


Fig. 2.

WITNESSES

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POWER-TRANSMITTING DEVICE.

987,640.

Specification of Letters Patent. Patented Mar. 21, 1911.

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To all whom it may concern:

Be it known that I, GEORGE E. MOLYNEUX, a citizen of the United States, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Power-Transmitting Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention has for its object to provide means for automatically uncoupling a countershaft or balance-wheel shaft from the main-shaft of a machine adapted to operate at high speed, such as a sewing machine; and in its preferred form it includes a coupling device of which the interengaging members are normally maintained in operative relation by means of a spring and are retracted from such operative relation by means of a centrifugal governor rotating with the main-shaft.

15 In the accompanying drawings, the present improvement is represented as applied to the base of a cylinder-bed sewing machine in which the main-shaft is journaled longitudinally of the cylinder arm or work-support and the balance-wheel shaft is arranged at right angles therewith; Figure 1 being a vertical sectional elevation of the portion of the sewing machine containing the improvement, Fig. 2 a sectional plan view of the same, and Fig. 3 an end view of a portion of the centrifugal governor.

20 The machine frame comprises the usual bracket-arm of which the hollow base 1 is provided with the laterally extending cylinder arm or work-support 2. Mounted in the aligned bearings 3 and 4 of the base 1 and arm 2 is the rotary main-shaft 5 extending through the arm 2 and having upon its rearward end the grooved belt-wheel 6 to which is imparted through the usual belt the power for rotating the main-shaft.

25 Mounted in the bearing boss 7 at one side of the base 1 is the balance-wheel shaft 8 whose axis intersects that of the main-shaft. Upon the outer end of this shaft is fixed the hub of the balance-wheel 9, and upon the inner end of said shaft is secured by means of the set-screw 10 the bevel friction-wheel 11 normally maintained yielding in operative relation with a similar friction-wheel 12 upon the main-shaft. The wheel 12 is formed with a hub 13 slidably mounted upon the shaft 5 and provided with a flange

14 between which and a face-plate 15 centrally apertured to fit the shouldered forward end of the hub 13 by means of clamp-screws 16 is interposed the conical block 17 of fibrous material affording the wearing face of the wheel adapted to roll in contact with the corresponding metallic face of the driven wheel 11. The hub 13 of the driving friction-wheel is provided with an inwardly extending spline 18 whose inner portion enters a longitudinal groove 19 in the main-shaft by means of which the wheel 12 is caused to rotate with the main-shaft while free to move endwise thereon.

30 The shaft 5 is provided with a thrust-collar 20 adjacent the inner end of the bearing 3 fixed thereon by means of set-screws 21, and upon said shaft adjacent said thrust-collar is also fixed by means of set-screws 22 the hub 23 of a spider whose forwardly projecting divergent arms 24 are provided at their outer ends with slots 25 each to receive an angle lever of which a rearwardly extending arm 26 is provided with a ball or weight 27 and a rounded inwardly extending arm 28 enters an annular groove 29 formed in the periphery of the hub 13 of the driving friction-wheel. The several elbow or angle levers 26 28 are fulcrumed within the slots of their respective spider arms 24 by means of the screw-pins 30, and are free to swing inwardly, as represented in the lower portion of Fig. 2, under the centrifugal action produced by the rapid rotation of the main-shaft.

35 Interposed between the adjacent ends of the collars 13 and 23 is a spring 31 encircling the shaft 5 and acting to press the driving friction-wheel 12 into operative or rolling contact relation with the driven friction-wheel 11.

40 As will be observed, when the machine is at rest the pressure of the spring 31 upon the hub 13 maintains the driving member 12 in operative relation with the driven member 11, the angle levers 26 28 of the governor being maintained in their initial inner positions by their operative connection with the hub 13, as represented in full lines in the drawings. Under these conditions, the main-shaft may be permitted by application of the operator's hand to the balance-wheel 9 to move the operative parts of the machine slowly for such purpose as may be required; but as soon as power is applied to

the belt-wheel 6 to rotate the shaft 5 at its normal speed, the balls 27 of the governor will be all thrown outwardly into the dotted line position represented in Fig. 2, thereby retracting the driving friction-wheel 12 from operative relation with the driven wheel 11 and permitting the balance-wheel shaft 8 to come to rest while the operation of other parts of the machine continues. As soon as the machine has sufficiently slowed down by removal of the full driving power from the belt-wheel 6, the spring 31 overcomes the centrifugal action of the governor balls 27 and forces the driving wheel 12 again into engagement with the wheel 11, thereby recoupling the balance-wheel to the main-shaft and permitting the manipulation of the machine by hand in the introduction and removal or adjustment of the work and such other operations as may be desirable under the manual control of the machine.

As herein represented, the machine is provided with a frictional driving device between the main-shaft and balance-wheel shaft, but it is evident that other driving means, such as bevel gearing, may be employed in lieu thereof, if desired.

It will be observed that, according to the present improvement, a certain degree of end-thrust is applied to the main and balance wheel shafts by the action of the spring 31 when they are in driving relation, but this is entirely removed when the machine is running at its normal speed of operation, under which the wear in the bearing portions would be the greatest.

The driving and driven shafts are held against endwise movement under the end-thrust, to which they are subjected by the action of the spring-pressed friction-wheels, respectively by means of the hub of the belt-wheel 6 and thrust-collar 20 embracing the bearing 3 of the main-shaft and the hubs of the balance-wheel 9 and friction-wheel 11 embracing the bearing 7 of the driven shaft.

Having thus set forth the nature of the invention, what I claim herein is:—

1. The combination with the frame, a rotary driving shaft journaled therein and provided with means for holding it against endwise movement in relation thereto, and a driven shaft also journaled in said frame and in angular relation with said driving shaft, of gearing adapted for operatively connecting said shafts and comprising a plurality of coacting members, one of which is

fixed upon the driven shaft and another of which is slidingly mounted upon the driving shaft, and a centrifugal governor rotating with said driving shaft and connected with the sliding member mounted thereon, whereby the latter is automatically shifted out of and into operative relation with the first named member respectively as the speed of rotation of the main-shaft exceeds or falls below a predetermined speed.

2. The combination with the frame, a rotary driving shaft journaled therein and provided with means for holding it against endwise movement in relation thereto, and a driven shaft also journaled in said frame and in angular relation with said driving shaft, of bevel friction-wheels mounted upon the driving and driven shafts, the one being movable upon its respective shaft toward and from the other, and a centrifugal governor rotating with said driving shaft and connected with said movably mounted friction-wheel, whereby the latter is automatically shifted out of and into contact with the other friction-wheel respectively as the speed of rotation of the main-shaft exceeds or falls below a predetermined speed.

3. The combination with a freely running driven shaft and a hand-wheel thereon, of a driving shaft, a driving friction-wheel slidingly mounted thereon but connected to rotate therewith, a driven friction-wheel fixed on the driven shaft and normally in contact with the driving friction-wheel, a collar fixed upon the driving shaft adjacent its friction-wheel, a spring interposed between said collar and friction-wheel for maintaining the latter normally in driving relation with the driven friction-wheel, a plurality of levers pivotally mounted upon said collar and each having an arm operatively connected with the driving friction-wheel and a laterally extending arm, and weights applied to the lateral arms of said levers and adapted to move outwardly under centrifugal action for disengagement of the driving friction-wheel from the driven friction-wheel and maintaining such disengagement at all speeds beyond a given minimum.

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

GEORGE E. MOLYNEUX.

Witnesses:

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