M. G. DELANEY & H. D. SELBY.

DRIVING MECHANISM.

APPLICATION FILED JAN. 27, 1911.

1,010,599.

Patented Dec. 5, 1911

2 SHEETS—SHEET 1.

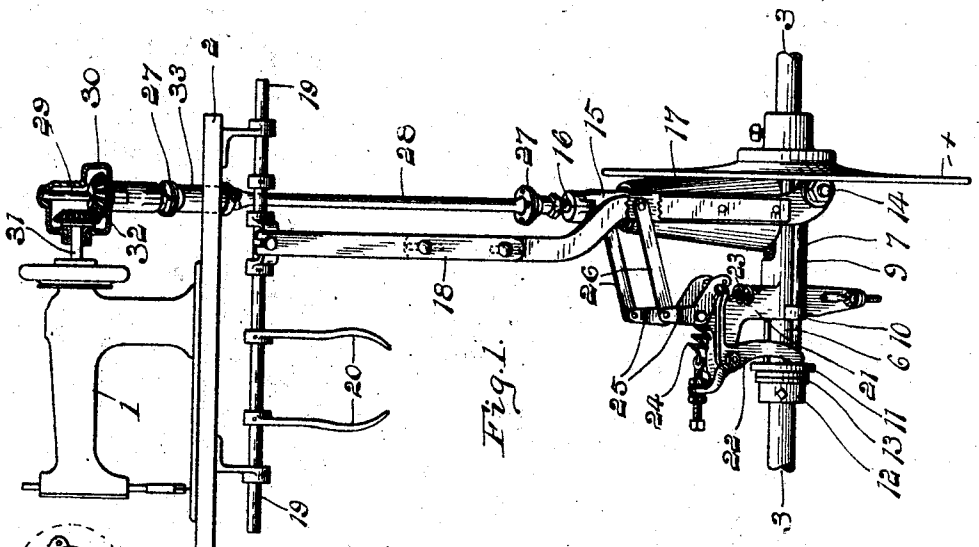


Fig. 1.

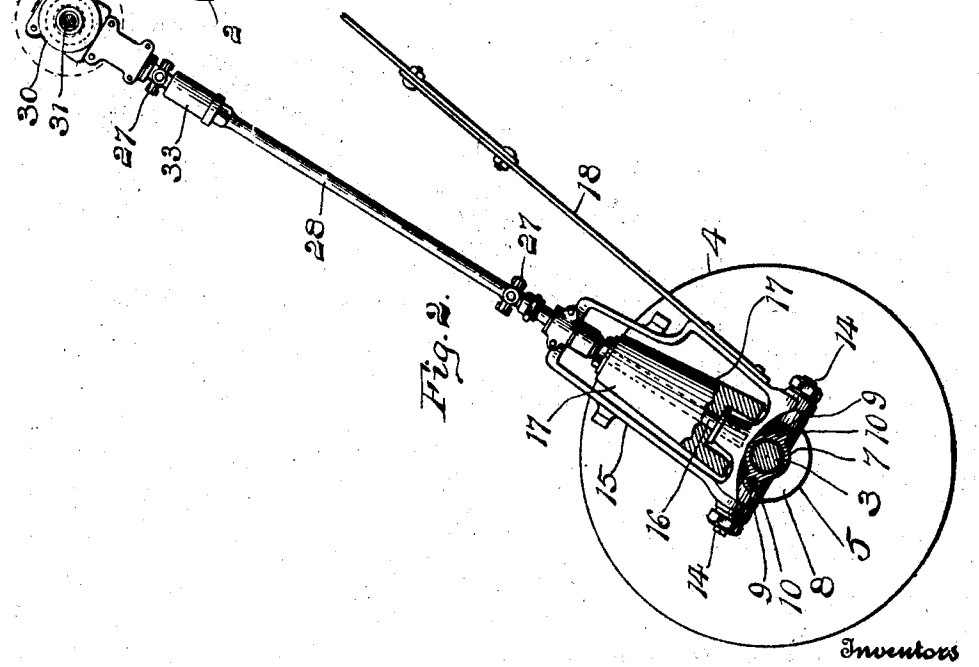


Fig. 2.

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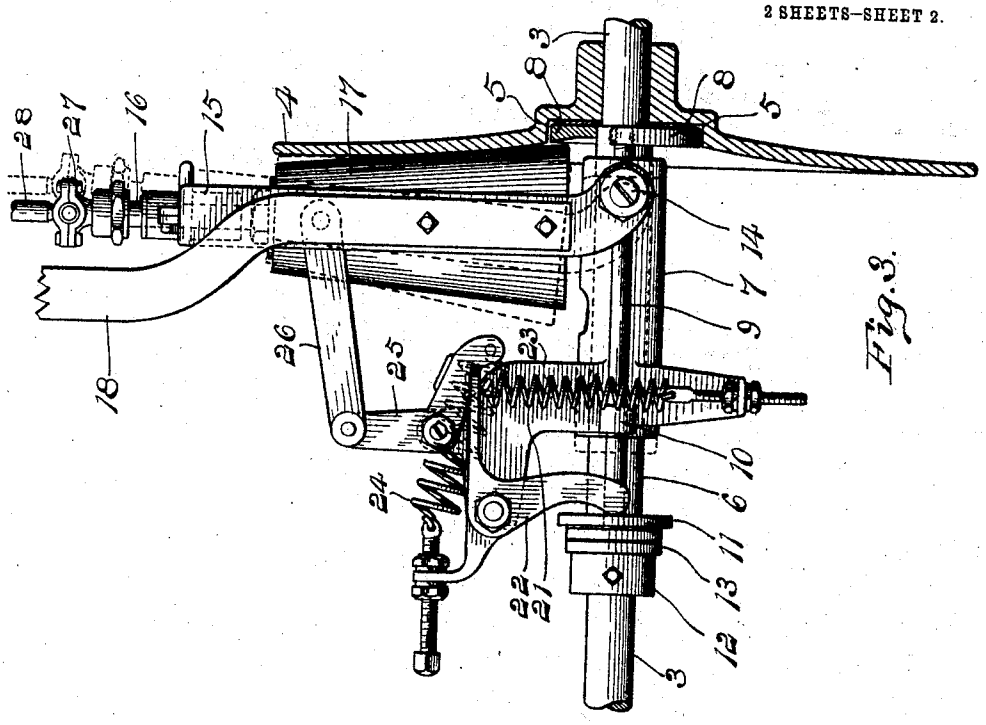


Fig. 3.

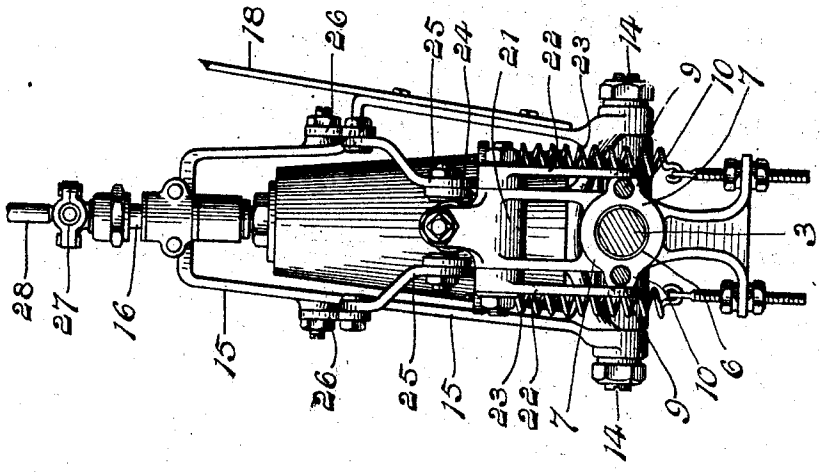


Fig. 4.

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UNITED STATES PATENT OFFICE.

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DRIVING MECHANISM.

1,010,599. Specification of Letters Patent. Patented Dec. 5, 1911.

Application filed January 27, 1911. Serial No. 604,978.

To all whom it may concern:

Be it known that we, MICHAEL G. DELANEY and HOWARD D. SELBY, citizens of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Driving Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in variable speed power transmitting mechanisms, and more particularly to such mechanism especially adapted for driving sewing machines and other light machinery.

The object of the invention is to provide simple and efficient mechanism for transmitting from a shaft driven at a constant speed, motion at a speed which may be varied through wide ranges and which mechanism may be easily operated to vary the speed or stop the transmission of motion.

A further object is to provide certain other new and useful features in the construction and arrangement of parts, all as hereinafter more fully described reference being had to the accompanying drawings in which,

Figure 1 is a front elevation of a mechanism embodying the invention showing the same operatively connected to a sewing machine. Fig. 2 is an end elevation of the same with parts broken away and in section to show the construction; Fig. 3 is an enlarged sectional front elevation of the variable speed mechanism; and Fig. 4 is an end elevation of the same.

In factories where numbers of sewing machines are used, several sewing machine heads, such as that indicated at 1 in the drawings, are mounted upon a table 2 and at the rear of the table near the floor is a horizontal line shaft 3 driven in any suitable manner to furnish power to drive the machines. Secured upon the line shaft is a friction disk 4 having a contact face at one side which is dished or curved radially outward from an axial recess or chamber 5 in said side, and mounted upon the shaft at that side of the disk is a bearing tube 6 upon which is a sleeve 7 adapted to slide longitudinally on the tube toward and from said disk. Within the recess 5 of the disk upon the end of the bearing tube is a fixed brake disk 8 held from turning by rods 9 engaging screw-threaded openings in the disk and passing through bearing ears 10 on the sleeve 7, their opposite ends being secured to a collar 11 on the other end of the bearing tube which is prevented from longitudinal movement on the shaft by a collar 12 fixed on the shaft by a set screw, with a thrust bearing 13 interposed between said collars.

Pivotally attached to the sleeve 7 at its lower end by pivot bolts 14, is an open frame 15 having bearings in its upper and lower ends for a short shaft 16 upon which is secured a conical roll 17 adapted to be engaged with the contact face of the disk 4 by swinging the frame upon its pivots by means of a lever or bar 18 bolted to one side of the frame and extending upward therefrom. Mounted in bearing brackets extending downward from the lower side of the table is a shaft 19 which is slidable longitudinally in its bearings, and the upper end of the lever 18 is pivotally attached to said shaft in any convenient manner to swing the frame 15 on its pivots 14 when the shaft 19 is shifted. Arms 20 on the shaft 19 extend downward therefrom to embrace the operator's knee so that he may easily and conveniently move the shaft and tilt the roll longitudinally upon the face of the friction disk. Extending upward from the outer end of the sleeve 7 is a bracket 21 and pivotally attached to said bracket are two bell-crank levers 22 with downwardly extending arms engaging the collar 11 and laterally extending arms, to the free ends of which coiled springs 23 are attached at their upper ends, the lower ends of said springs being adjustably attached to a downwardly extending bracket on the sleeve 7. The springs thus exert a force to move the sleeve longitudinally on the tube 6 toward the disk 4 and thus the lower end of the roll is moved toward the disk also. The swinging of the upper end of the roll toward the disk is resisted by the springs 23 owing to the contact of the straight side of the roll with the curved surface of the disk, it being necessary in order to bring the upper end of the roll into contact with the margin of the disk, to move the sleeve upon which the roll is pivotally supported, away from the disk, and to assist the operator in so swinging the roll against the action of said springs, a counter spring 24 is adjustably attached at one end to an arm on the bracket 21 and at

its opposite end to the downwardly extending arms of bell crank levers 25 pivotally attached to lugs on said bracket with their upwardly extending arms connected by links 26 to the frame 15 near the upper end thereof. The upper end of the short shaft 16 upon which the roll is mounted, is connected by a universal joint 27 to a transmission shaft 28 and the upper end of said shaft 28 is connected by a like joint with a short shaft 29 mounted in a gear casing 30. Said casing is provided with a bearing at one side for the projecting end of the driving shaft 31 of the sewing machine head which extends into the casing at right angles to the shaft 29 and is provided with a bevel gear 32 in mesh with a like gear on said shaft 29. A slip joint or connection 33 is provided in the shaft 28 so that with the two universal joints, the shaft is made flexible to permit the roll to be swung or tilted.

When the lever 18 is moved to swing the upper end of the roll toward the disk, said roll rocks upon its point of contact with the disk, which point changes as the roll is tilted and thus the speed with which the roll will be driven is increased as said point of contact nears the margin of the disk. When the roll is tilted in the opposite direction, its speed is decreased as the point of contact moves inward on the disk and if tilted sufficiently, said roll will be moved out of contact with the disk and its lower end will be brought into engagement with the brake disk 8 which is held from turning by the rods 9, engaged with the sleeve 7 which in turn is held from rotation by the lever 18. Frictional resistance is thus put upon the roll to quickly stop its rotation and the actuation of the sewing machine, when said roll is swung out of contact with the driving friction disk which is secured to and rotates with the main shaft 3.

Obviously, changes in the construction and arrangement of parts may be made without departing from the spirit of our invention and we do not wish to limit ourselves to the particular arrangement of parts shown.

Having thus fully described our invention what we claim is:

1. A driving mechanism comprising a friction disk, a roll arranged with its axis of rotation extending radially of said disk, the roll and disk each having a contact surface and one of said surfaces being curved radially of the disk, means for pivotally supporting the roll at one end adjacent to the axis of the disk to tilt in a direction longitudinally of its axis of rotation and means for holding the roll against revolving about the axis of the disk.

2. A driving mechanism comprising a dished friction disk having a curved contact surface, a roll extending radially of said disk across said surface from near the axis of the disk to its periphery, a non-rotatable member supported adjacent to the inner end of said roll, and means for rocking said roll upon its point of contact with said disk and into engagement with said member.

3. A driving mechanism comprising a friction disk having a curved contact surface, a roll extending radially of said disk, means for guiding and pivotally supporting the inner end of said roll at the axis of said disk to turn thereon and move longitudinally of the axis of said disk when the roll is rocked upon its point of contact with the curved surface of the disk, means for rocking said roll, and holding the same against revolving about the axis of the disk to cause the roll to be rotated by its contact with the disk.

4. A driving mechanism comprising a friction disk having a curved contact surface, a roll extending radially of said disk, means for pivotally supporting the inner end of said roll adjacent to the axis of said disk to turn upon its axis and swing upon said pivot toward and from said disk, and means for holding said roll against revolving about the axis of the disk.

5. A driving mechanism comprising a friction disk having a curved contact surface, a power shaft upon which said disk is secured to turn therewith, a sleeve on said shaft, a frame pivotally attached at one end to said sleeve, a roll mounted upon said frame to turn thereon and to be moved by the swinging of said frame into engagement with said disk, and means for yieldingly moving the sleeve toward the disk to hold the roll in yielding contact therewith.

6. A driving mechanism comprising a friction disk having a curved contact surface and an axial recess, a roll extending radially of said disk, means for pivotally supporting and holding the inner end of said roll adjacent to said disk adapted to be swung upon said pivotal support to bring the roll into contact with said surface, and a stationary member in said recess of said disk adapted to be engaged by said roll when the same is swung out of contact with said disk.

7. A driving mechanism comprising a friction disk having a dished side formed with a curved contact surface, a driving shaft upon which the disk is mounted and secured, a sleeve on the shaft, a frame pivotally attached at its lower end to said sleeve adjacent to said disk, a roll mounted on said frame to turn thereon, a power transmitting shaft turned by the roll, means for turning the frame to bring the roll into contact with the disk, and a spring to move the sleeve longitudinally on the shaft toward the disk.

8. In a driving mechanism, the combina-

tion of a power shaft, a friction disk fixed on said shaft formed with a curved and dished contact surface and with a recess at its axis, a sleeve on the shaft movable longitudinally thereof, a non-rotatable disk within the recess of the friction disk, a frame pivoted at one end to said sleeve and provided with bearings, a short shaft mounted in said bearings, a roll on said short shaft extending radially of the friction disk across its curved surface, means for swinging the frame to engage the roll with the curved surface of the disk and rock the same upon its point of contact therewith, a spring to yieldingly move the sleeve toward the disk, a transmission shaft, and a universal joint connecting said transmission shaft with said short shaft.

9. In a driving mechanism, the combination of a power shaft, a friction disk on said shaft having a dished side provided with a curved contact surface and a recess at its axis around said shaft, a sleeve on said shaft slidable longitudinally thereon, a brake disk in said recess adjacent to the end of the sleeve, a collar on the shaft loose thereon at a distance from the other end of the sleeve, rods engaging guide bearings on the sleeve and secured at their ends to said brake disk and collar, a collar fixed on the shaft to hold the loose collar against longitudinal movement on the shaft, a spring to hold the sleeve pressed toward the disk, a frame pivoted at its lower end to the sleeve a short shaft mounted in bearings on said frame, a roll on said short shaft, a transmission shaft, a universal joint connecting said transmission shaft and said short shaft, and a lever secured to said frame for swinging the same upon its pivot.

In testimony whereof we affix our signatures in presence of two witnesses.

MICHAEL G. DELANEY.
HOWARD D. SELBY.

Witnesses:
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LEWIS E. FLANDERS.