W. McHAFFIE.

POWER TRANSMITTING MECHANISM.

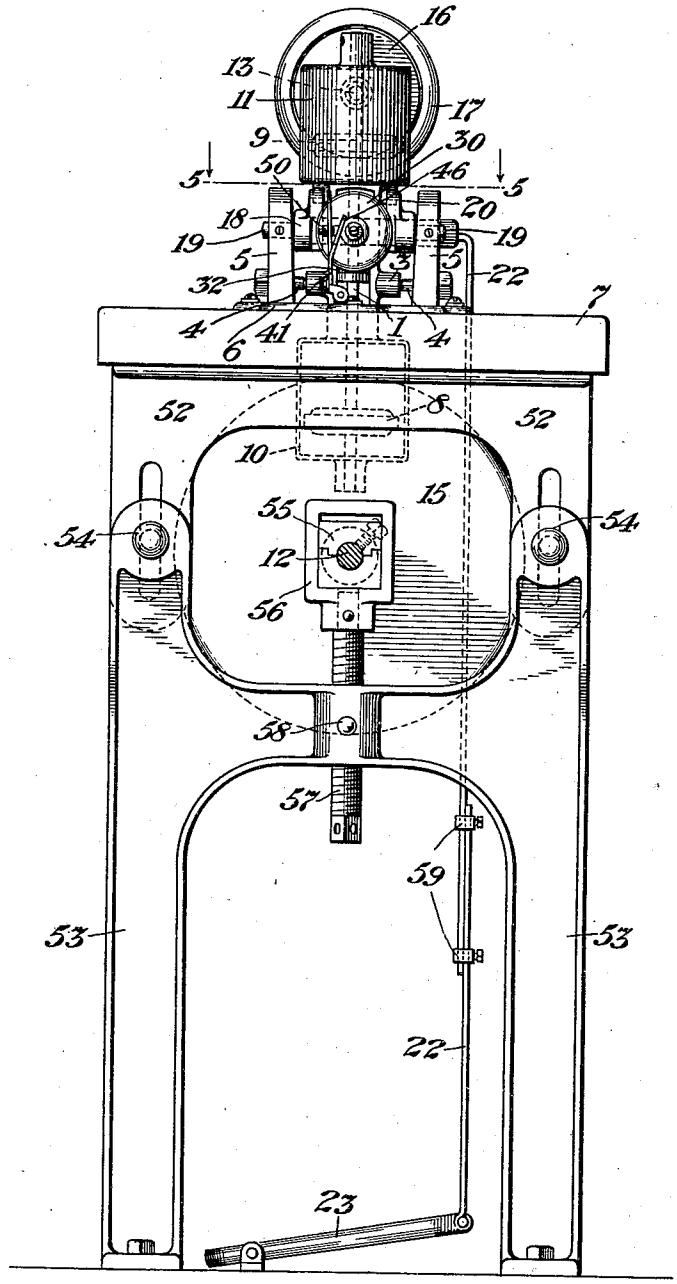
APPLICATION FILED JAN. 8, 1906.

1,007,222.

Patented Oct. 31, 1911.

3 SHEETS—SHEET 1.

Fig. 1



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3 SHEETS—SHEET 2.

Fig. 2

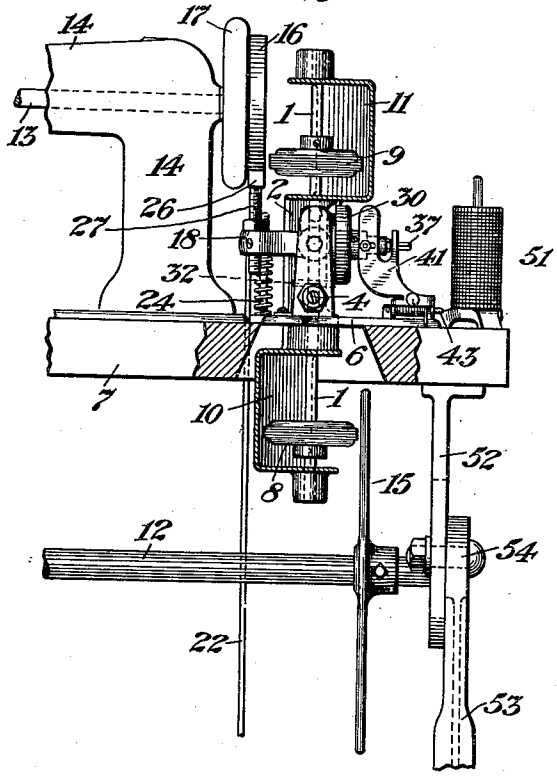


Fig. 3

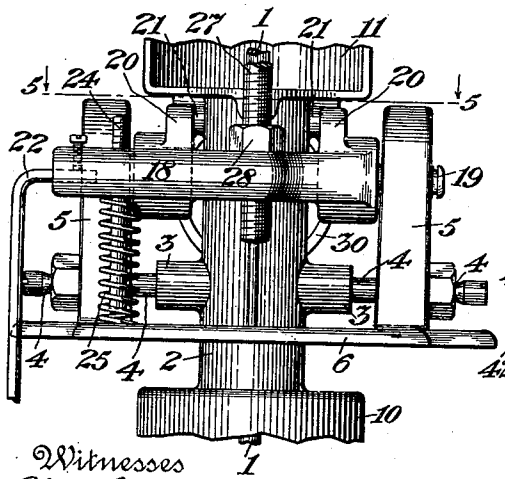
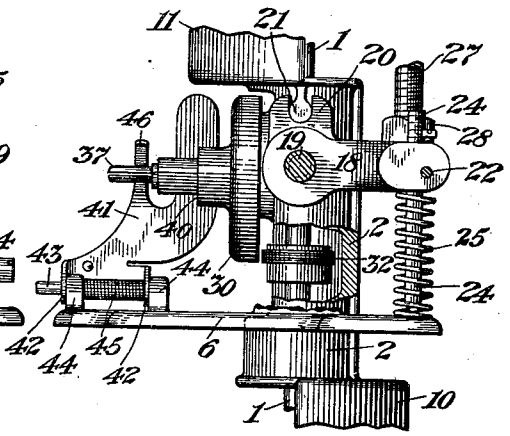


Fig. 4



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3 SHEETS—SHEET 3.

Fig. 5

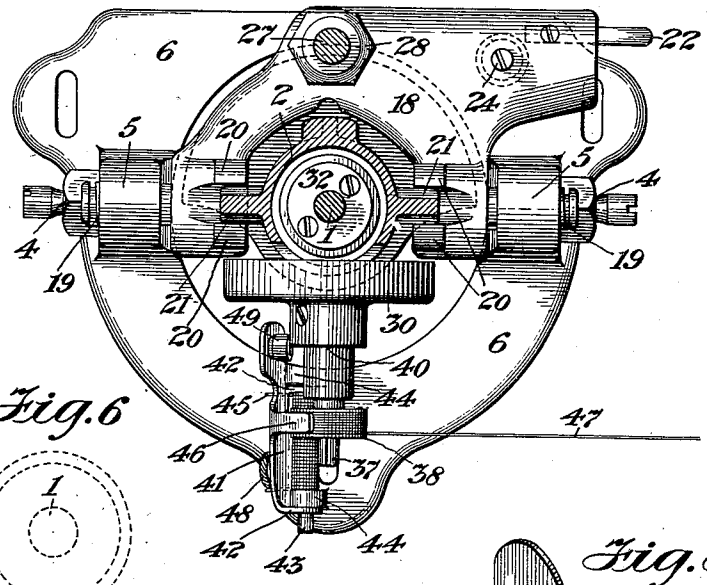


Fig. 6

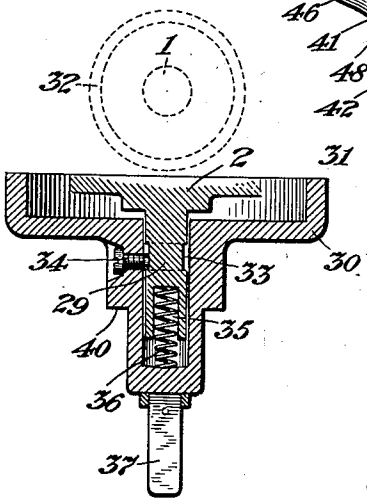


Fig. 8

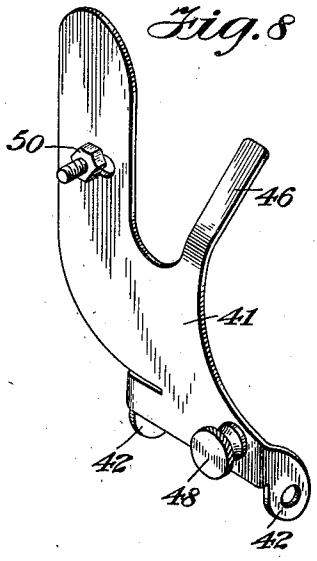
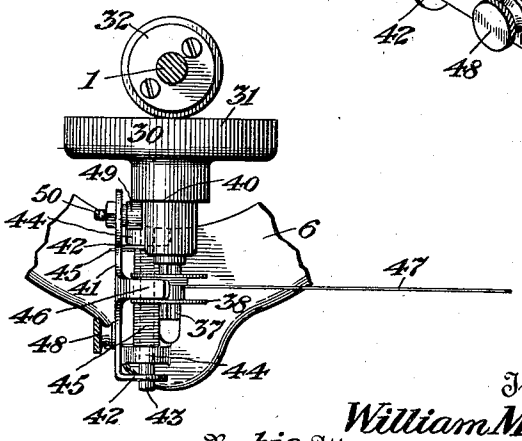


Fig. 7



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UNITED STATES PATENT OFFICE.

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POWER-TRANSMITTING MECHANISM.

1,007,222. Specification of Letters Patent. Patented Oct. 31, 1911.

Application filed January 8, 1906. Serial No. 295,048.

To all whom it may concern:

Be it known that I, WILLIAM McHAFFIE, citizen of the United States, and resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Power-Transmitting Mechanism, of which the following is a specification.

This invention relates more especially to improvements upon a power-transmitter shown in my prior United States Patents No. 656,459, dated August 21, 1900, and No. 719,030, dated January 27, 1903, adapted for transmitting power from a continuously running main driving shaft to sewing or other machines which alternately run and stop.

The present invention has for its more special objects to simplify and cheapen the transmitter and facilitate its operative adjustment relatively to a sewing machine, and also to combine with the transmitter a simple and efficient arrangement of bobbin-winding mechanism operative for winding bobbins when the sewing machine is either at rest or is in use, and in manner assuring automatic stopping of the winding mechanism when the bobbin is filled.

The invention consists in certain novel features of construction and combinations of parts of the power-transmitting and bobbin-winding mechanism, and in their relative arrangement with a sewing or other machine to be operated; all as hereinafter described and particularly pointed out in the appended claims.

Reference is made to the accompanying drawings forming part of this specification, and in which—

Figure 1 is an end elevation of a sewing machine table and a sewing machine fly-wheel and driving and brake wheel, with the improved power-transmitting and bobbin-winding mechanism in operative juxtaposition. Fig. 2 is a partly broken sectional front view of upper parts of the table and portions of a sewing machine thereon and the power-transmitting and bobbin-winding mechanism. Fig. 3 is an enlarged elevation of main central portions of the power-transmitter and bobbin-winder as viewed from the side nearest the sewing machine. Fig. 4 is a partly broken sectional rear view of the parts shown in Fig. 3, and in positions the reverse of those shown in Fig. 2. Fig. 5 is an enlarged plan view with parts in horizontal section on the line 5—5 in Fig. 3, and with the bobbin-winder stopped as the bobbin is filled. Fig. 6 is an enlarged detail horizontal section through the bobbin driving wheel and its relatively fixed support, and with the power-transmitter disk which drives the bobbin-winding wheel indicated by dotted lines. Fig. 7 is a detail plan view illustrating winding of the bobbin; and Fig. 8 is an enlarged perspective view of the bobbin-winder gage device.

In my previously patented power-transmitter the transmitter shaft carrying two bodily adjustable friction disks was journaled in a frame pivoted to a bracket held to the underside of a sewing machine table top, while the yoke for moving said pivoted frame to bring the transmitter disks into operative engagement with coöperating driving and driven parts and which also carried the brake device for stopping the driven part when the transmitter disks were disengaged from their said coöperating parts, was held to a separate bracket fastened to the top of the table. This relative construction and arrangement required many nice adjustments of separate parts while setting up the mechanism for use, and these separate parts also were bulky and heavy and were comparatively expensive to make and apply in use. The present invention overcomes these objections by providing a self-contained construction of all principal parts of the power-transmitter which are sustained upon one bed-plate or support which may be easily and quickly fastened to a sewing machine table, while said support also sustains the improved bobbin-winding devices.

In the drawings, the power-transmitter shaft 1 is shown journaled in a frame 2, which ranges about vertically and is hung by its opposite trunnions 3 and pivot-bearing screws 4, to lugs 5 rising from the main bed-plate 6 which supports all principal parts of the power-transmitting mechanism from a sewing machine table-top 7 to which the support 6 is readily fixed by screws or otherwise. On the shaft 1 are adjustably fitted between inner and outer shaft bearings two friction disks 8, 9, which preferably rotate within protective hoods 10, 11 respectively opening to the right and left hand. On a main driving shaft 12, which in the present case is preferably journaled directly below the driving shaft 13 in the

arm 14 of a sewing machine, is fixed a driving disk or wheel 15 from which the transmitter transmits motion to a disk 16 fixed to the fly-wheel 17 on the shaft 13 for operating the sewing machine, the said transmission of motion being effected by the frictional engagement of the transmitter disks 8, 9, with the disks 15, 16, respectively.

For swinging the transmitter on its bearings 4 to engage or disengage the disks 15, 16, it is preferred to use a horizontally ranging yoke 18 which is fulcrumed by opposite screw-pin bearings 19 or otherwise to upper parts of the support lugs 5. This yoke carries two forked opposite side lugs 20, 20, which engage rounded lugs 21, 21, on the frame 2 above its pivots 4. By swinging the yoke in one direction the transmitter frame 2, its shaft 1, and the friction disks 8, 9, may be adjusted relatively to the disks 15, 16, for operating the sewing machine. Provision is made for thus swinging the yoke and frame and friction disks 8, 9, by connecting to a laterally projecting arm of the yoke the upper end of a rod 22 the lower end of which is pivoted to a treadle 23 beneath the sewing machine table. A vertically arranged pin 24 threaded at its upper end into the yoke 18 and adjustable therein projects downward sufficiently to provide a preferred form of stop for striking the support 6 to limit rocking or swinging movement of the transmitter in order to prevent over-pressure against the coöperating disks 15, 16, such as would result in loss or unnecessary use of power. Preferably around the stop pin 24 is loosely placed a normally expanding spring 25 which restores the yoke 18 and the connecting transmitter to normal positions and also applies a brake to the sewing machine driving disk. This brake is shown as a shoe 26 held to the upper end of a screw 27 threaded into a lateral extension of the yoke 18 and preferably having a lock nut fastening 28. The brake shoe 26 is moved to the periphery of the disk 16 for quickly stopping the sewing machine by an upward rocking movement of the yoke 18 caused by expansion of the spring 25 the instant pressure on the treadle 23 is relaxed.

The coöperating friction disks 8—15 and 9—16 are relatively arranged substantially as in my prior Patent No. 719,030, that is, the disk 8 is in nearer relation to the disk 15 than is the disk 9 to the disk 16 when said parts are in their normal inoperative position, whereby depression of the treadle 23 will operate through the medium of the connecting parts as described to bring the disks 8—15 first in contact for rapidly rotating the transmitting shaft 1 and its disk 9, prior to engagement of said disk 9 with the disk 16. This arrangement and coöperation of parts assures almost instant rapid operation of the sewing machine when the disks 9—16 come together, and without undue wear or strain on the coöperating parts.

By comparison with the prior patented construction this improved power-transmitter is but about one-half as long, and the weight and first cost of making are greatly reduced, and the very simple and compact construction permits most conveniently combination with it of the improved bobbin-winder presently to be described. By sustaining all the main parts of the power-transmitter upon a single bed-plate or support 6, all necessary relative adjustments of said main parts may be made at the factory, so that it requires but a short time to fasten the support 6 to the sewing machine table 7, and then by simply coupling the rod 22 to the yoke 18 and treadle 23, the mechanism is made ready for immediate and satisfactory use.

The power-transmitter frame 2 fixedly carries a laterally projecting stud 29 on which is loosely mounted a friction wheel 30 having a face 31 adapted for contact with a third or intermediate friction disk 32 fixed to the transmitter shaft 1 between the disks 8, 9. A screw 34 threaded into the hub of the wheel 30 and entering at its inner end an annular groove 33 in the stud 29 operates to removably retain the said wheel on the stud. In the preferred construction the end of the stud 29 is counterbored at 35 to receive a spiral spring 36 which expands between the fixed stud 29 and the end wall of the bore of the wheel hub and normally forces the wheel 30 outward to hold its face 31 away from the transmitter disk 32 to prevent rotation of the wheel 30 except when it is desired to wind a bobbin, the said wheel 30 being limited in its outward movement under the action of the spring 36 by the engagement of the inner end of the screw 34 with the side wall of the groove 33, which latter is sufficiently wide to permit necessary movement of the wheel 30 upon the stud 29 for engaging the wheel with and disengaging it from the friction disk 32. The hub of the wheel 30 fixedly carries a split-pin holder 37 to frictionally hold and rotate a bobbin 38, and also has an annular shoulder 40 which coacts with the bobbin-winder gage next described. This gage 41 is preferably stamped from sheet metal and has two lower lugs or ears 42 which are fitted movably upon a pivot pin 43 held to two lugs 44 cast on the power-transmitter support 6 at such distance apart as shall permit the gage to move bodily along the pin 43. On this pin is held a coiled spring 45 one end of which engages behind the gage 41 and normally swings said gage inward to hold its upper inclined lip 46 to the thread 47 being wound upon the bobbin 38. This spring 45 also expands between the outer frame lug 44 and the inner gage lug 42, and thus may move

and hold the entire gage device inward upon the pin 43 to the position shown in Figs. 4 and 5 of the drawings. The gage preferably has a finger knob 48 allowing it to be conveniently swung outward upon and moved along the pin 43 against the double resistance of the spring 45, and until an anti-friction roller 49, held to the gage preferably by a screw-and-slot connection at 50, may be engaged in front or outside of the shoulder 40 on the wheel 30. Any equivalent means may be used instead of the preferred single spring 45, for automatically holding the gage 41 rearward and laterally inward as above described.

While the bobbin-winder is not in use its wheel 30 is held by the spring 36 away from the power-transmitter shaft disk 32, as clearly shown in Fig. 6, and the winder remains inoperative notwithstanding swinging of the transmitter frame 2 by operating the treadle 23 for starting and stopping the sewing machine. To wind a bobbin 38, it will be slipped upon the holder 37 of the wheel 30, and after the thread 47, coming from any conveniently located spool 51, is wound a few times around the bobbin axis, the gage 41 will be drawn outward upon the pin 43 by its finger knob 48, while the spring 45 is compressed endwise. The gage is released when its roller 49 stands outside of the shoulder 40 on the wheel 30. Releasing the gage permits it to be pressed inward upon the pin 43 by the spring 45 which also presses the pivoted gage toward the bobbin so that the gage finger 46 overlies the few coils of thread wound thereon, as shown in in Fig. 7 of the drawings. As the spring 45 is stronger than the wheel spring 36, it overcomes the latter and forces the wheel 30 inward upon its fixed support 29 until the wheel face 31 strikes the disk 32 on the power-transmitter shaft 1, as also shown in Fig. 7 of the drawings. If now the treadle 23 be pressed to bring only the friction disks 8, 15 in contact, the transmitter shaft 1 will be rotated and the disk 32 and wheel 30 also rotate to revolve the bobbin 38 for winding the thread 47 thereon evenly as controlled by the gage finger 46 overlying the wound thread. The bobbin thus may be wound without bringing the upper friction disks 9, 16 into contact and therefore without operating the sewing machine. A slight additional pressure on the treadle 23, however, will also bring said disks 9, 16 together to allow winding of a bobbin while the sewing machine is in operation. Whether the bobbin winding proceed while the sewing machine is at rest or is in use, as the bobbin fills with thread the gage finger 46 is forced backward sufficiently far by the wound thread to swing the whole gage 41 backward on its pivot pin 43 and remove the roller 49 from the shoulder 40 of the wheel 30, thereby leaving the weaker spring 36 free to force the wheel 30 bodily outward again upon the stud 29 and away from the transmitter disk 32, to allow said wheel 30 and the filled bobbin to stop rotating to permit removal of the wound bobbin. The instant the gage roller 49 leaves the wheel shoulder 40, the spring 45 reacts lengthwise to quickly move the whole gage 41 fully inward on its pivot pin 43 to the inoperative position shown in Fig. 5 of the drawings. The roller 49 may be substituted by a pin or stud fixed to the gage 41, but the roller is preferred because it offers little resistance to rotation of the wheel 30 while the bobbin is being wound.

Figs. 1 and 2 of the drawings show how the legs of the sewing machine table may be made in upper and lower parts 52, 53 having a bolt-and-slot connection at 54 allowing the table top 7 to be set at any desired height. To accommodate the main driving shaft 12 and the power-transmitter mechanism to this table adjustment, the shaft journal boxes 55 are sustained in heads or blocks 56 supported by screws 57 threaded into nuts 58 on the lower table leg section 53. For like reason the treadle operating rod 22 is made in two overlapping or telescoping parts fastened at any required length adjustment by suitable clips 59, as shown in Fig. 1 of the drawings.

Various modifications may be made in this invention within the scope of any one or more of the appended claims, as for instance, the term "disk" as applied to the power-transmitting means includes any approved form of wheel or similar device capable of performing the functions herein described.

I claim as my invention:

1. A power transmitter comprising a support, a frame pivoted to said support, a transmitter shaft journaled in said frame, a rocking yoke also pivoted in the same support, and connecting means between said yoke and frame for positively swinging the frame in opposite directions as the yoke is rocked.

2. A power transmitter comprising a support, a frame pivoted to said support, a transmitter shaft journaled in said frame, a rocking yoke also pivoted in the same support, connecting means between said yoke and frame for positively swinging the frame in opposite directions as the yoke is rocked, a treadle, connections between said treadle and the yoke, a stop, and resilient means acting through said yoke to normally hold the transmitter shaft out of operation.

3. A power transmitter comprising a support, a frame pivoted to said support, a transmitter shaft journaled in said frame, a driving and a driven disk, friction disks on said shaft to engage said driving and driven

disks, a rocking yoke pivoted in the same support as said frame, interengaging lugs on the yoke and frame for positively swinging said frame in opposite directions when the yoke is rocked, and a brake device mounted on said yoke and operated thereby to engage the driven disk when the yoke is moved to disengage the transmitter from the aforesaid driving and driven disks.

4. In combination with driving and driven disks, a rocking transmitter shaft, friction disks on said transmitter shaft operative to frictionally engage with said driving and driven disks, an intermediate disk on said transmitter shaft, and a friction wheel normally out of contact with said intermediate disk, but adapted to engage and be rotated thereby when moved into contact therewith.

5. In combination with driving and driven disks, a rocking transmitter shaft, friction disks on said transmitter shaft operative to frictionally engage with said driving and driven disks, an intermediate disk on said transmitter shaft, a friction wheel normally out of contact with said intermediate disk, but adapted to engage and be rotated thereby when moved into contact therewith, and means for locking the friction wheel in contact with the intermediate disk.

6. A driving shaft a friction disk thereon, a driven shaft, a friction disk thereon, a transmitting shaft adapted to rock in a plane common to the axes of said disks, a friction disk on each end of the transmitting shaft to engage the driving and driven disks, means for rocking said shaft, an intermediate disk on the transmitting shaft, and a friction wheel normally out of engagement with the intermediate disk but adapted to contact therewith and be rotated thereby when moved axially toward said disk.

7. The combination with driving and driven disks, a power transmitting mechanism comprising a transmitter shaft, a rocking frame supporting said shaft, a friction disk on each end of said shaft for cooperating with said driving and driven disks, and an intermediate friction disk also on said shaft, a friction wheel rotatably mounted on said rocking frame, and adapted to be rotated by said intermediate disk but normally held out of engagement therewith, and means for holding such wheel in contact with the intermediate disk.

8. The combination with driving and driven disks, a power transmitting mechanism comprising a transmitter shaft, a rocking frame supporting said shaft, a friction disk on each end of said shaft for cooperating with said driving and driven disks, and an intermediate friction disk also on said shaft, a friction wheel rotatably mounted on said rocking frame and adapted to be rotated by said intermediate disk, means for holding said wheel out of engagement with said intermediate disk, and means for moving said wheel axially into engagement with the intermediate disk.

9. The combination with driving and driven disks, of power transmitting mechanism comprising a support, a frame pivoted to rock in said support, a shaft journaled in said frame, disks on said shaft for cooperating with said driving and driven disks, a third intermediate disk fixed on the aforesaid shaft, a stud projecting from said rocking frame perpendicular to said shaft, a friction wheel axially movable on said stud and adapted to contact with the said third disk, means normally holding said wheel away from said intermediate disk, and means for moving the wheel into contact and holding it in contact with said disk for rotation thereof, said means adapted to be automatically disengaged from said wheel.

10. A power transmitting comprising a support, a frame pivoted to said support, a transmitter shaft journaled in said frame, friction disks on said shaft, a rocking yoke pivoted on the support and positively engaging said frame to swing the same, means for rocking said yoke in one direction, a stop operative between the yoke and the frame support for limiting in said direction the swinging movement of the yoke and frame and the power transmitter elements, and resilient means for moving said parts in the opposite direction.

11. A power transmitter comprising a support, a frame pivoted to said support, a shaft extending through said frame, a friction disk on each end of said frame, a yoke pivoted in said support and positively connected to said pivoted frame for imparting thereto and its power transmitting members a rocking movement, a stop for limiting the swinging movement of the yoke and frame and power transmitting members comprising a pin attached to the yoke and adapted to strike the frame, and a spring for restoring said parts to normally inoperative position.

12. A power transmitter comprising a support, a frame pivoted to said support, a shaft journaled in said frame, a friction disk on each end of said shaft, means for swinging the pivoted frame and its power transmitting members including a yoke, pivoted to said support and directly engaging said frame, a driving and a driven disk, a brake device mounted on the pivoted yoke and operated to engage said driven disk, means for operating the yoke, a stop limiting the swinging movement of the yoke, and power transmitting members, and a spring for restoring said parts to normal inoper-

ative position, and simultaneously applying the brake to the driven disk.

13. The combination with a machine mounted on a rigid bed, a driving disk for said machine, a main driving shaft journaled below said bed, and a driving disk on said shaft, of a power transmitter comprising a support secured on said bed, a frame pivoted in said support, a shaft journaled in said frame, a friction disk on each end of said shaft located respectively below and above the bed, and adapted for operative connection with the driving disk below the bed and the machine driving disk, and a yoke pivoted to said shaft and directly connected to said transmitter frame for positively swinging said frame to move the friction disks carried thereon into and out of engagement with the coöperating friction disks.

14. A combination with a machine mounted on a rigid bed, a driving disk for said machine, a main shaft journaled below said bed, a driving disk on said shaft, of a power transmitter comprising a support rigidly fastened on the top of said bed, a frame pivoted in said support above the bed and arranged to swing in a plane common to the axes of said driving disk, a shaft journaled in said frame, friction disks on said shaft located respectively below and above the bed and adapted for operative contact with the driving shaft disk and the machine driving disk, a yoke pivoted on said support and directly connected to the transmitter frame adapted to swing said frame for rendering said machine operative or inoperative, and a brake device supported on the pivoted yoke and operative to engage the machine driving disk when the yoke is moved to disengage the transmitter members from the driving disks.

15. The combination with a machine mounted on a rigid bed, a driving disk for said machine, a main driving shaft journaled below said bed, and a driving disk on said shaft, of a power transmitter comprising a support, rigidly secured on the top of the bed, a frame pivoted to said support, a shaft journaled in said frame, friction disks on said shaft located respectively above and below the bed and adapted for coöperative contact with the driving shaft disk and the machine driving disk, a yoke pivoted on the support and directly connected to the transmitter frame for rendering said machine operative or inoperative, means for rocking said yoke including a treadle and connection between the treadle and the yoke, said transmitter shaft and its frame being so disposed that the friction disk on its lower end will engage the disk on the driving shaft before the disk on its upper end is brought into contact with the friction disk on the machine to be driven.

Signed at New York, in the county of New York, and State of New York this 2nd day of January, A. D. 1906.

WILLIAM McHAFFIE.

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