No. 776,752. PATENTED DEC. 6, 1904.

W. McHAFFIE & G. D. BEINERT.

POWER TRANSMITTING MECHANISM.

APPLICATION FILED SEPT. 29, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 2

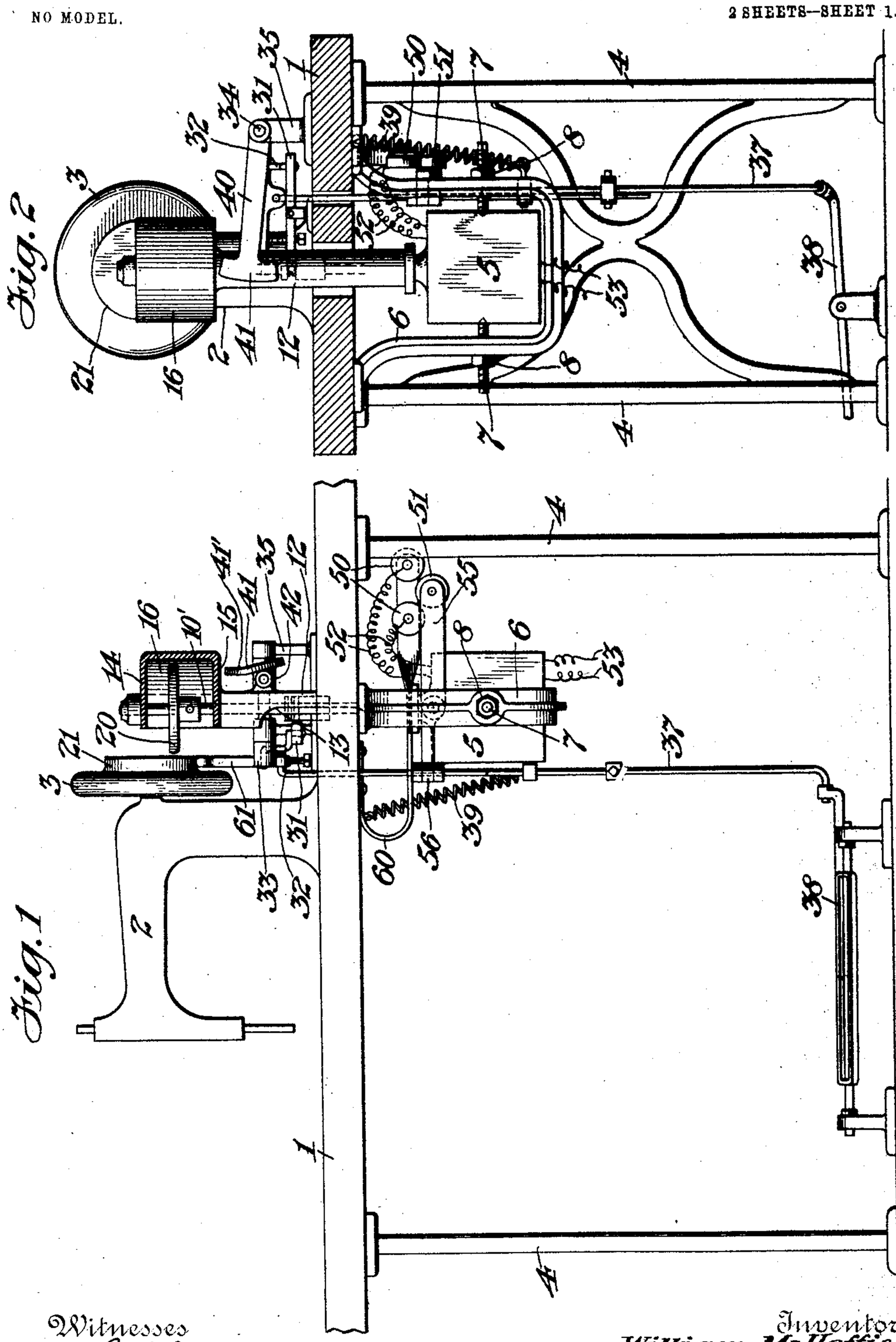

Fig. 1

Witnesses
C. W. Smith
E. M. Faith

Inventors
William McHaffie
George D. Beinert
By their Attorney
Chas. A. Pope

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3

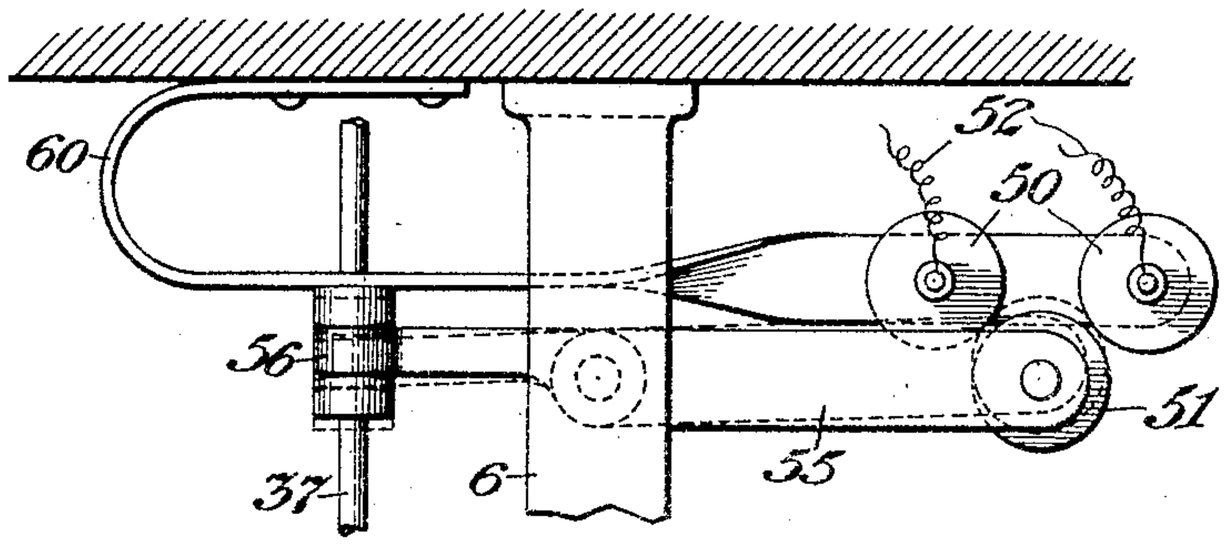
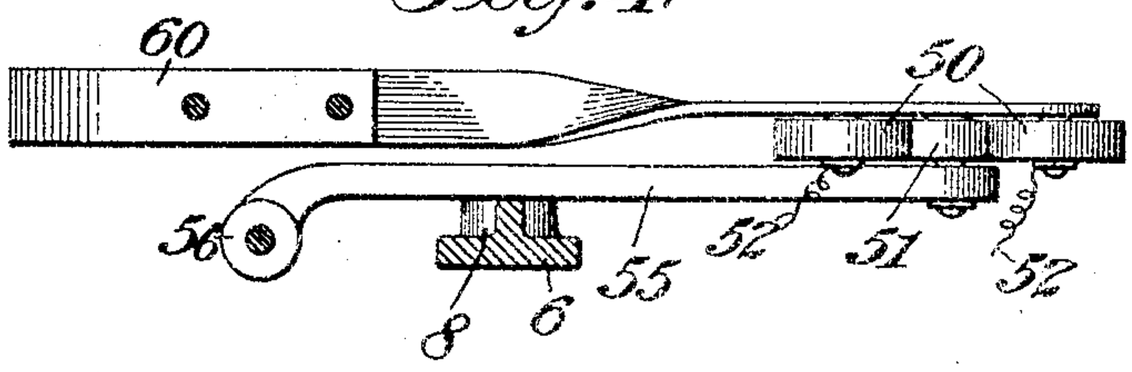


Fig. 4



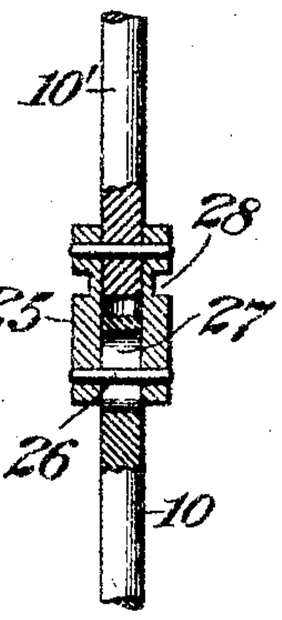


Fig. 6

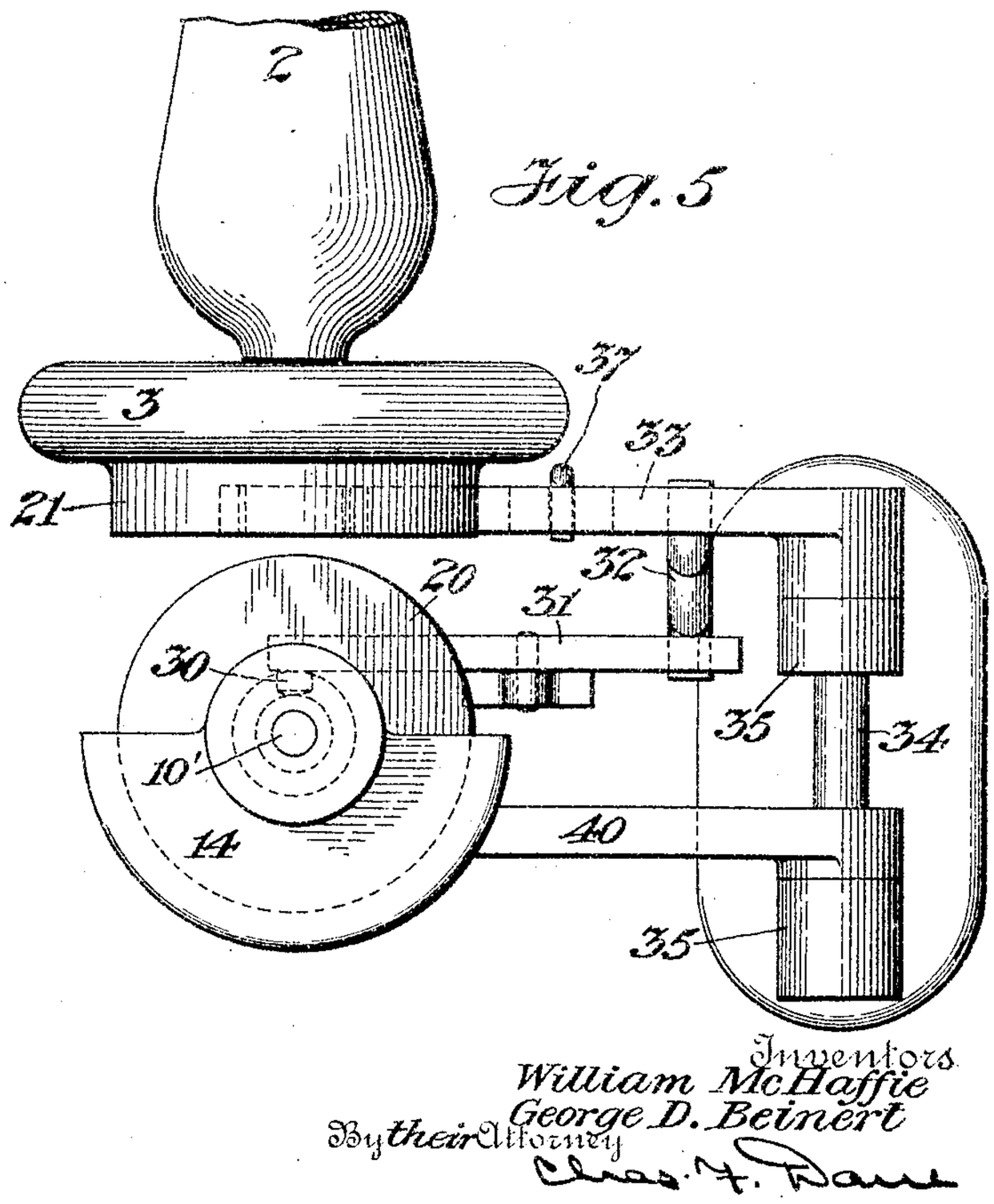


Fig. 5

Witnesses
C. W. Smith
E. M. Faith

Inventors
William McHaffie
George D. Beinert
By their Attorney
Chas. F. Pond

No. 776,752. Patented December 6, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM McHAFFIE, OF TENAFLY, AND GEORGE D. BEINERT, OF JERSEY CITY, NEW JERSEY.

POWER-TRANSMITTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 776,752, dated December 6, 1904.

Application filed September 29, 1903. Serial No. 175,040. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM McHAFFIE, a resident of Tenafly, Bergen county, and GEORGE D. BEINERT, a resident of Jersey City, Hudson county, State of New Jersey, citizens of the United States, have invented certain new and useful Improvements in Power-Transmitting Mechanism, of which the following is a specification.

This invention relates to improvements in power-transmitting mechanism for transmitting power from a main driver to a suitable driven machine which is adapted to run and stop alternately with frequent changes from one to the other of these conditions.

Our invention is especially designed and intended to utilize the principal of controlling driven machines by individual motors, especially small electric motors, the economy of which, as compared with a single source of great power adapted to drive a large number of machines from one or more line-shafts, is now generally recognized.

In power-transmitting mechanisms as heretofore employed for driving sewing-machines and other machines intermittently it has been customary to make use of a transmitter or transmitting devices capable of intermittently connecting the driven machine with the source of power and also varying the speed of the driven machine by varying the ratio of movement between the transmitting devices and the rotary element of the driven machine.

One of the principal objects of our present invention is to provide an improved means for varying the speed of operation of the driven machine, and we accomplish the desired result preferably by providing an electric motor, which controls the rotation of the driving element of the mechanism and permits said driving element to be shifted lengthwise of its axis to vary the ratio of movement between the driving and driven parts. It is customary to operate power-transmitting mechanisms of this type from a treadle, and in our present invention both the circuit of the motor and the means for varying the ratio of movement between the driving and driven parts are controlled by the treadle. The parts are so organized, however, that, while the treadle-operated devices for shifting the driving element lengthwise of its axis are movable various distances corresponding to the ratio of movement desired, this movement does not impose an excessive strain upon the treadle-operated circuit-controller or switch which governs the motor-circuit, although it does serve to maintain the terminals of the circuit-controller in contact and prevent interruption of the circuit.

Other features of our invention not hereinbefore referred to will be hereinafter described and are illustrated in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation, partly in section, of a power-transmitting mechanism and coacting driven machine and illustrates the parts in their normal or idle positions. Fig. 2 is an end elevation of the same as viewed from the right in Fig. 1 with the supporting-table of the mechanism in section. Fig. 3 is an enlarged detail illustrating in front elevation a carbon-contact device for controlling the circuit of the motor. Fig. 4 is a plan of the same with the adjacent parts in section. Fig. 5 is an enlarged plan of the upper portion of the power-transmitter and the coacting driven member. Fig. 6 is a sectional detail of the motor-shaft.

Similar characters designate like parts in all the figures of the drawings.

In said drawings, 1 indicates a power-machine table of ordinary construction; 2, a sewing-machine head supported upon said table; 3, the usual hand wheel or disk which is made fast upon the end of the driving-shaft of said machine, and 4 suitable supports for the table 1. The main driving means for supplying power to the wheel or disk 3 and operating the same intermittently, as may be desired, is preferably an independent electric motor of any suitable type, (designated generally by the numeral 5.) This motor is in the present construction supported by a U-shaped bracket, such as 6, fastened to and depending from the under side of the table 1. The casing of the motor is so formed as to permit it to be piv-

oted in the U-shaped bracket 6, and it is mounted in said bracket and securely held in position by means of suitable pivot-screws and check-nuts, such as 7 and 8. The motor 5 and its armature-shaft, which in the construction shown extend upward substantially vertically toward the wheel 3, constitute in this case the primary elements of the power-transmitting means and are oscillatory in unison about the axis of the pivot-screws 7, and hence the upper end of said shaft is shiftable toward and from said wheel or disk 3. In the construction shown the armature-shaft is made in two parts, (designated by 10 and 10′, respectively,) and these are journaled in bearings in a pivoted frame or bracket, such as 12, which is fixed to the motor 5 and moves therewith. This frame or bracket is preferably a tubular one cut away at one side, as indicated at 13, and having at its upper end separated bearings, such as 14 and 15, which provide two bearings at opposite sides of a friction-disk, such as 20, by means of which the movement of the motor is imparted to the driven wheel 3. The bearings 14 and 15 are connected by an offset 16, substantially semicircular, which constitutes, with the bearing members 14 and 15, a casing or guard for protecting the friction-disk 20. The friction-disk 20 coöperates in the usual manner with the side 21 of the wheel 3, which side constitutes a complementary friction-disk. The friction-disk 20 may be adjusted to any desired position within limits on the section 10′ of the armature-shaft between the bearings 14 and 15 and may be moved up and down with said shaft-section to vary the ratio of movement between the friction-disks 20 and 21. Provision for obtaining this vertical movement of the upper shaft-section 10′ may be made by providing a coupling-sleeve 25, which is made fast to the section 10′ of the shaft, and is splined to the section 10 by a pin-and-slot connection 26 27 therewith, as most clearly shown in Fig. 6. This sleeve 25 has a peripheral groove 28, in which operates an antifriction-roll 30, carried by a shifting-lever 31, pivoted at a suitable point and under the control of the operator, it being connected in this construction by means of a short angular connecting-rod 32 to a rock-arm 33, fastened to a rock-shaft 34, journaled in bearings 35, rising from the table 1. The rock-arm 33 is in this construction connected directly to the usual rod or pitman leading to the treadle, this being, as is shown, a two-part rod 37, connected at its lower end to a treadle 38 and having near its upper end connection with a retracting spring 39. This rock-shaft 34 also carries another rock-arm, which is designated by 40, and at its free end this rock-arm has an oblique portion 41, constituting a cam which coacts with an antifriction-roll 42 on the bracket or frame 12 (see Fig. 1) for shifting the same toward the wheel 3 to carry the friction-disk 20 into engagement with the coacting friction-disk 21 substantially in the usual manner. The rock-arm 40 moves in unison with the rock-shaft 34, and hence is also controlled by the connections to the treadle 38.

In power-transmitting mechanism of this type it is important to operate the driving means quickly at a high rate of speed and to provide for increasing the speed of the driven member as the pressure on the treadle of the machine is increased. In the construction shown the circuit of the motor 5 is controlled by a switch embodying carbon contacts or terminals which may be pressed firmly into engagement, two carbon contacts, preferably in the form of contact-rolls, such as 50, being shown as mounted on a suitable support, and a third-roll, such as 51, moving between the first two to make contact with both of them, the two rolls 50 being separated by a space less than the diameter of the roll 51. The two rolls 50 constitute the terminals of the motor-circuit, in which they are connected by conductors 52, the motor receiving current from suitable line-wires, (indicated at 53.) When the roll 51 is in contact with the rolls 50, the circuit of the motor will be closed and the motor will be operated. The roll 51 is preferably operated directly from the treadle 38 by means of a switch in the form of a lever 55, pivoted on the bracket 6 and connected directly to the upper part of the rod 37, as indicated at 56. From this it will be seen that the greater the pressure applied to the treadle 38 to depress the rod 37 the greater will be the pressure exerted by the roll 51 on the rolls 50. In order to prevent injury to the rolls 50 should excessive pressure be applied to the treadle, we prefer to mount said rolls yieldingly, and in the construction shown they are supported at one end of a spring-arm 60, secured to the under side of the table 1. This spring yields when excessive pressure is applied to the treadle in shifting the driving-wheel 20 to increase the ratio of movement between the driving and driven wheels.

From the foregoing description it will be clear that the treadle 38 and the rod connected thereto control the starting of the motor, besides controlling the ratio of movement between the driving and driven wheels 20 and 21, the increase in the speed of the driven member depending upon the raising of the wheel 20 by a movement in the direction of its axis, which results in increasing the ratio of movement between the parts 20 and 21. In this construction, as in other mechanisms of this type, a friction-brake, such as 61, is employed for quickly releasing and engaging the driven wheel in starting and stopping. This friction-brake is indicated at 61 (see Fig. 1) and is secured to the rock-arm 33. The parts are so organized that when the treadle

is operated to depress the rod 37 the circuit of the motor will be made by the rolls 50 and 51 and the armature-shaft and the driving-wheel 20 will start rotating and will be rotated at high speed before the wheel 20 comes into contact with the driven wheel 21. In the descent of the rod 37 the motor, the frame 12, and the parts carried thereby are rocked about the pivot 7 by the cam 41, so as to effect operative contact between the driving and driven wheels, and at the same time the upper section 10′ of the armature-shaft is raised, and with it the driving-wheel 20, the distance of the driving-wheel from the axis of the driven wheel decreasing as the downward pressure on the rod 37 increases and resulting in an increase in the ratio of movement between the driving and driven members. After the driving-wheel 20 has been brought into operative contact with the driven wheel 21 through the action of the cam 41 further movement of the same toward and from the axis of the driven wheel, as controlled by the treadle, is permitted without varying the pressure between the contacting wheels by forming the cam 41 with a straight portion 41′, arranged in a plane substantially parallel with the face of the driven wheel 21, on which the roll 42 will ride.

What we claim is—

1. In a power-transmitting mechanism, the combination with a driven wheel, of a movable frame, a driving-wheel carried by said frame and movable therewith into and out of engagement with the driven wheel, an electric motor for operating the driving-wheel also carried by said frame, a switch for controlling the motor-circuit, and a common actuator for operating the said frame and the said switch.

2. In a power-transmitting mechanism, the combination with a driven wheel, of a movable frame, a driving-wheel carried by said frame and movable therewith into and out of engagement with the driven wheel, an electric motor for operating the driving-wheel also carried by said frame, a switch for controlling the motor-circuit, and a treadle having operative connection with both the said frame and the said switch for operating the same.

3. In a power-transmitting mechanism, the combination with a driven wheel, of a movable frame, a driving-wheel carried by said frame and movable therewith into and out of engagement with the driven wheel and also movable in the direction of its axis to vary the ratio of movement between it and the driven wheel, an electric motor for rotating the driving-wheel also carried by said frame, a switch embodying a yielding element for controlling the motor-circuit, and a treadle having operative connection with the said frame, the switch and the driving-wheel for operating the same, substantially as set forth.

4. In a power-transmitting mechanism, the combination with a driven wheel, of a movable frame, a driving-wheel carried by said frame and movable therewith into and out of engagement with the driven wheel, an electric motor for operating the driving-wheel, a switch for controlling the motor-circuit, and actuating means for operating the said frame and the said switch, the said parts being so organized that movement will be imparted to the driving-wheel prior to its engagement with the driven wheel upon the starting of the transmitting mechanism.

5. In a power-transmitting mechanism, the combination with a driven wheel, of a pivoted frame, a driving-wheel carried by said frame and movable therewith into and out of engagement with the driven wheel and also movable in the direction of its axis to vary the ratio of movement between it and the driven wheel, and an electric motor for operating the driving-wheel also carried by said frame.

WILLIAM McHAFFIE.
GEORGE D. BEINERT.

Witnesses:
CHAS. F. DANE,
E. M. FAITH.