No. 769,700. PATENTED SEPT. 13, 1904.

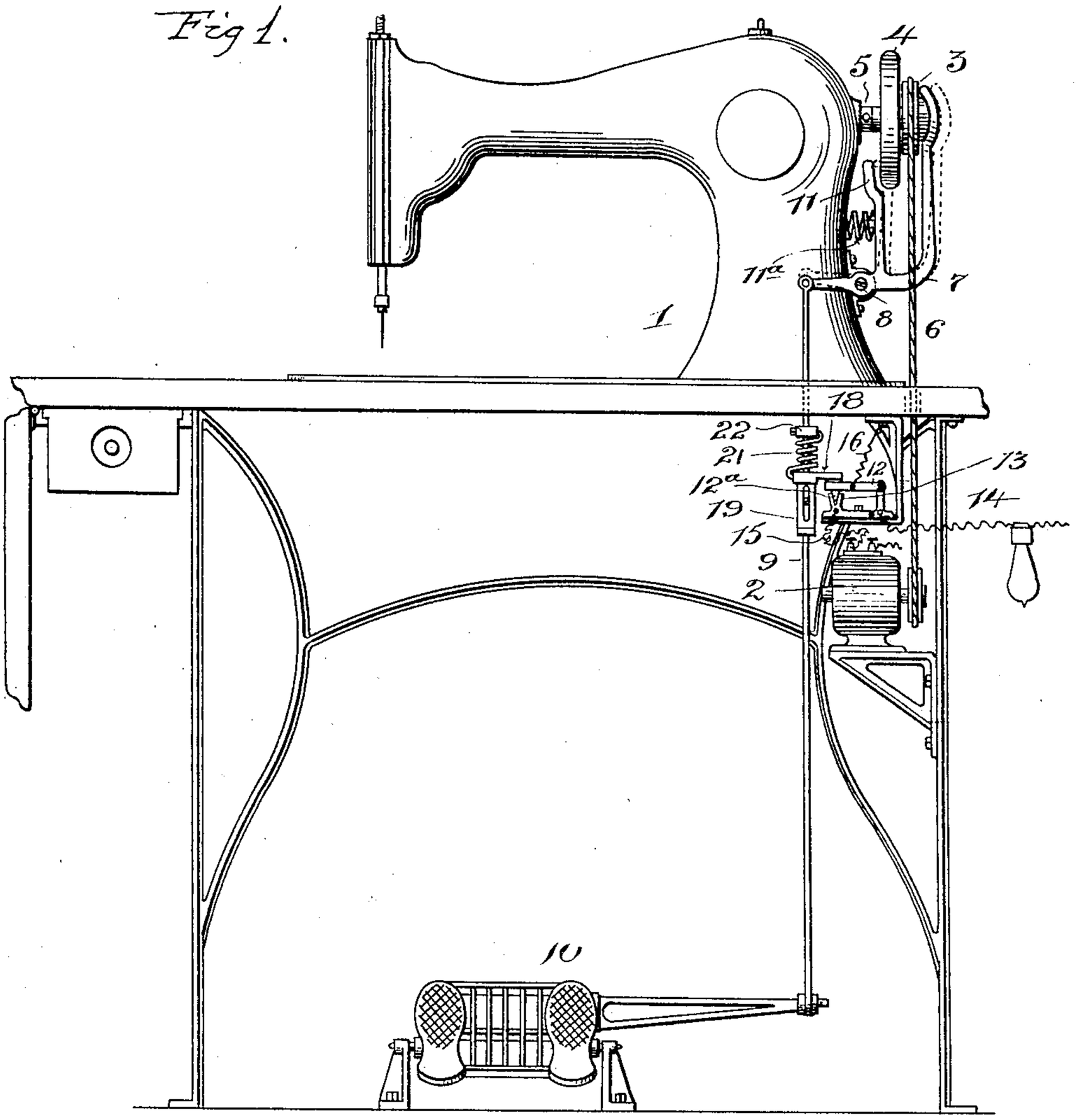
N. KRAWITZKY.

MEANS FOR OPERATING SEWING OR OTHER MACHINES.

APPLICATION FILED JAN. 9, 1904.

NO MODEL.

Fig 1.



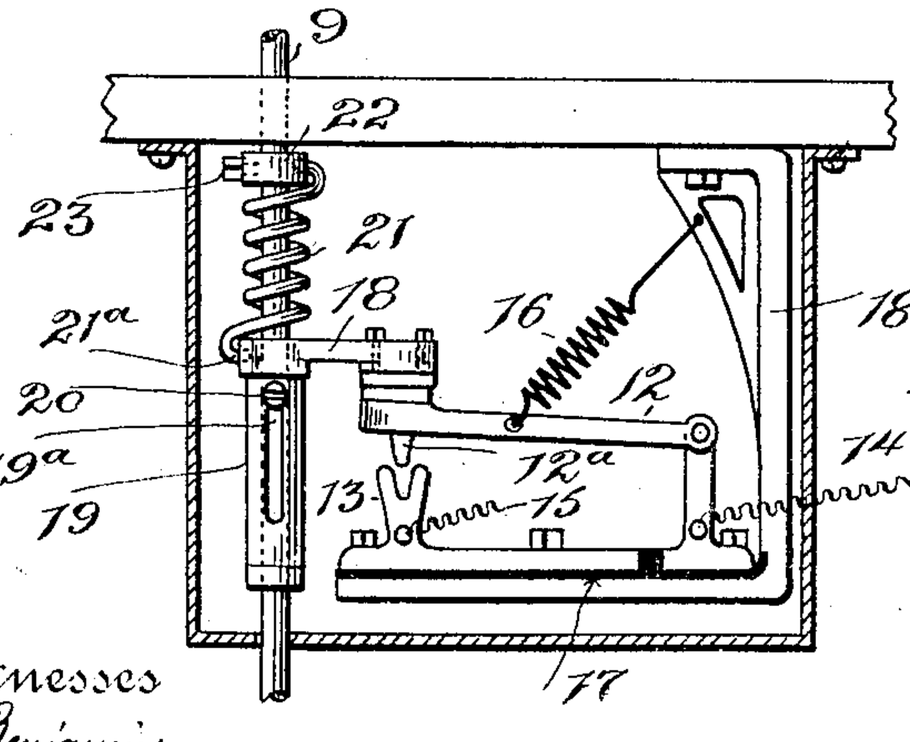


Fig. 2.

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UNITED STATES PATENT OFFICE.

NATHAN KRAWITZKY, OF NEW YORK, N. Y.

MEANS FOR OPERATING SEWING OR OTHER MACHINES.

SPECIFICATION forming part of Letters Patent No. 769,700, dated September 13, 1904.

Application filed January 9, 1904. Serial No. 188,411. (No model.)

To all whom it may concern:

Be it known that I, NATHAN KRAWITZKY, a subject of the Czar of Russia, residing in New York city, borough of Manhattan, New York, have invented certain new and useful Improvements in Means for Operating Sewing or other Machines, of which the following is a specification.

The object of my invention is to provide means to simultaneously control the flow of current to an electric motor and regulate the speed of operation of a machine driven by such motor.

My invention comprises the novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a side elevation of a sewing-machine provided with my improvements, and Fig. 2 is an enlarged detail view of part thereof.

Similar numerals of reference indicate corresponding parts in both views.

At 1 is indicated generally a sewing-machine, and at 2 is an electric motor adapted to operate the needle-bar of the sewing-machine. A pulley 3 of the machine that operates the needle-bar shaft is journaled to rotate independently of the latter, and I provide a clutch to cause said pulley to operate said shaft intermittently, as desired. To this end I provide friction-surfaces between the pulley 3 and the fly-wheel 4, which is secured to the needle-bar shaft 5, the pulley 3 being mounted to slide upon the shaft, so that when the friction-surfaces between the pulley 3 and wheel 4 are pressed together the shaft 5 will rotate at a speed proportioned to the pressure between the parts 3 4. Thus when the motor is running the belt 6 may drive the pulley 3 without operating the needle, and by pressing the pulley 3 toward the wheel 4 more or less firmly the speed of the needle will be governed by reason of the slipping of the friction between the parts 3 4. To shift the pulley 3, I provide a lever 7, shown pivotally supported upon the machine, as at 8, and connected by a rod 9 with treadle 10, so that upon depressing the treadle the pulley will be shifted against the wheel 4 to cause the needle to operate at the desired speed.

At 11 is indicated an arm or brake carried by lever 7 and adapted to bear against wheel 4 to check the rotation of shaft 5 when the pulley is uncoupled from said wheel, and this may be accomplished by causing the treadle to lift rod 9 the required distance or by a spring 11ª.

The circuit for motor 2 is controlled by the movement of treadle 10, and the arrangements are such that the circuit may be closed and the motor operated before the pulley 3 is connected with shaft 5 for rotating the latter. In the arrangements shown I provide a switch, of which the lever 12 has a contact 12ª, adapted to engage a contact 13, the wire 14 of the circuit leading to lever 12 and wire 15 leading from contact 13 to one terminal of the motor. Contacts 12ª and 13 are normally held out of engagement, as by a spring 16, connecting lever 12 with the frame. The lever 12 and contact 13 are insulated from each other and are shown carried upon insulation 17 and also shown supported by bracket 18. The contact 12ª is operated to close the circuit of the motor through the medium of treadle 10, and for this purpose I have shown the rod 9, provided with an extension 18, adapted to bear upon lever 12 to depress the same. The extension 18 is loosely connected with rod 9, so that the latter may slide therein, and to this end I have shown a sleeve 19 loosely mounted upon rod 9 and to which extension 18 is connected, a pin 20 on the rod passing through a slot 19ª in the sleeve to keep the sleeve from rotating on the rod. The extension 18 is connected with the rod 9 by a spring 21, that is shown as coiled around the rod and secured at one end thereto, as by a collar 22, attached to said spring and adjustable on the rod by a screw 23, the other end of said spring being connected with extension 18, as at 21ª. By the above-described arrangements the extension 18, through the medium of the spring 21, may move up and down with rod 9, and yet the latter may have movement independent of said extension.

When the machine is not in operation, rod 9 will be so raised that pulley 3 will be out

of contact with wheel 4, and extension 18 will have risen sufficiently high to enable circuit to be broken at 12^a 13, and current will be cut from the motor. When the machine is to operate, rod 9 will be pressed down slightly by the treadle, and thereby extension 18 will cause lever 12 to close the circuit at 12^a 13. The motor will start running, thereby rotating pulley 3 freely, and the arrangement of the parts is such that lever 7 will not then have caused pulley 3 to engage wheel 4. A further downward movement of rod 9 will cause pulley 3 to engage wheel 4 with more or less pressure, and as extension 18 is now stopped in its downward movement by reason of the engagement of contacts 12^a 13, rod 9 can continue to move downwardly because spring 21 will be compressed upon extension 18. Thus as rod 9 is free to move independently of extension 18 varying pressure exerted by lever 7 to cause pulley 3 to engage wheel 4 will cause the latter to rotate at speeds according with such pressure while the current is maintained in the motor. When different speeds of the needle are desired, the treadle can be moved more or less, spring 21 still holding extension 18 upon lever 12 and maintaining the circuit closed. By the arrangement shown the motor will continue to operate at full speed, while various speeds of the shaft 5 are permitted, and when shaft 5 is to be stopped pulley 3 will be moved out of contact with wheel 4, and then a further movement upwardly of rod 9 will cause spring 21 to lift extension 18 from lever 12, and thereby break the circuit of the motor.

The advantages of my improvements are that when the machine is not to operate there is no current running through the motor, and thereby cost of current at such time is saved, and upon the first depression of the treadle the current passes through the motor and the latter may be operated at full speed before shaft 5 starts to rotate, and the current is then kept on the motor while pulley 3 is shifted. This will be especially advantageous in sewing-machines where on certain kinds of work quite slow speed of the needle is required, then for further stitching higher speed is desired; but my invention is not limited to use in connection with sewing-machines, as it may be used with other kinds of machinery operated by electric motor where a driven part is to operate at varying speeds.

Modifications may be made in the details of improvement shown without departing from the spirit of my invention, as the wheel 4 could be shifted against pulley 3 to cause the friction-clutch to act, and spring 21 could be interposed between extension 18 and lever 12, the extension 18 then being secured to rod 9.

Having now described my invention, what I claim is—.

1. The combination of a shaft to be driven, a loose pulley, and a friction-clutch for operating the shaft by the pulley, with a motor, a belt connecting said pulley and motor, a switch to control the circuit of the motor, and means arranged to close the circuit of the motor and to cause the clutch to operate with more or less pressure while said switch is closed to vary the speed of the shaft, substantially as described.

2. The combination of a shaft to be driven, a loose pulley, and a friction-clutch to operate the shaft by the pulley, with an electric motor, a belt connecting said pulley with the motor, a switch to control the circuit of the motor, a rod connected with the pulley to shift the same, and an extension connected with the rod arranged to close the switch and to permit free movement of the rod while the switch is closed to vary the speed of the shaft, substantially as described.

3. The combination of a shaft, a pulley, and a friction-clutch to operate the shaft by the pulley, with an electric motor, a switch to control the circuit of the motor, a rod connected with the pulley to shift the same, an extension movably connected with the rod and a spring connecting the rod with said extension, said extension being arranged to close the switch and said spring being arranged to permit the rod to have movement independent of the switch while the latter is closed for varying the speed of the shaft, substantially as described.

4. The combination of a shaft, a pulley, and a friction-clutch between the shaft and pulley, a lever for operating the clutch, a treadle connected by a rod with said lever, an extension movable independently of the rod, a spring connecting the rod and extension, an electric motor for operating the pulley, and a switch to be operated by said extension, substantially as described.

5. The combination of a sewing-machine having a shaft provided with a friction-surface, a pulley mounted to rotate independently of said shaft and provided with a friction-surface, a lever to press said friction-surfaces together, a rod and treadle connected with said lever, an extension movable independently of the rod, a spring connected with said extension and rod, an electric motor to operate said pulley, and a switch to control the circuit of said motor, said switch being arranged to be operated by said extension whereby after the circuit of the motor is closed the speed of said shaft may be varied by pressing said friction-surfaces more or less firmly together, substantially as described.

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Witnesses:
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