Feb. 23, 1926. 1,574,001

J. J. ROGACH

SAWING MACHINE

Filed Nov. 25, 1924. 2 Sheets-Sheet 1

Fig. 1

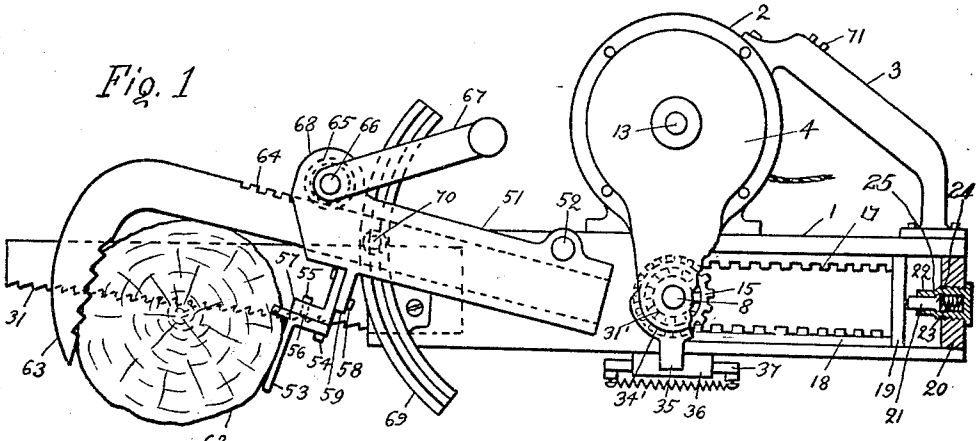


Fig. 2

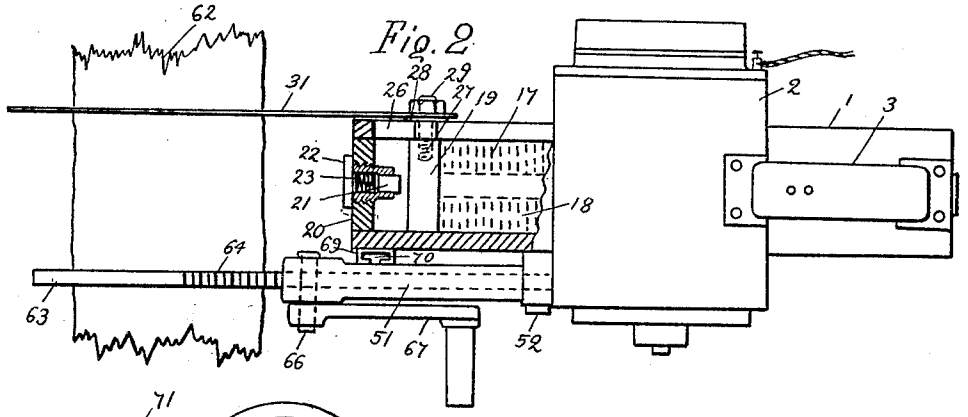
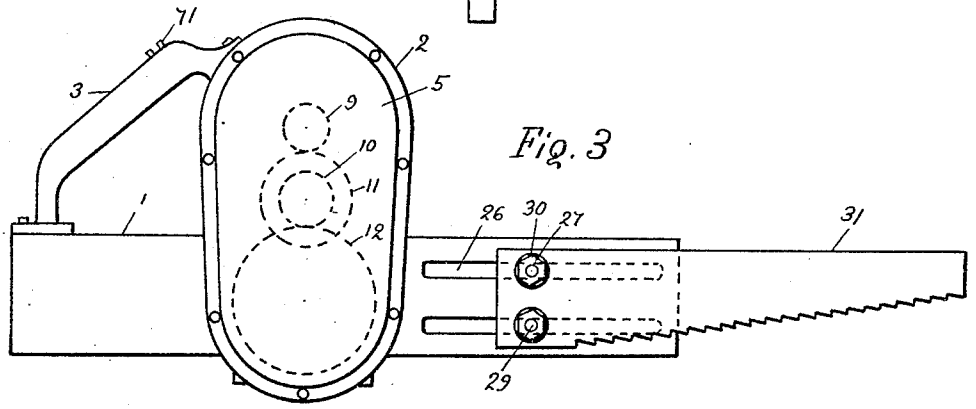


Fig. 3



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Filed Nov. 25, 1924 2 Sheets-Sheet 2

Fig. 4

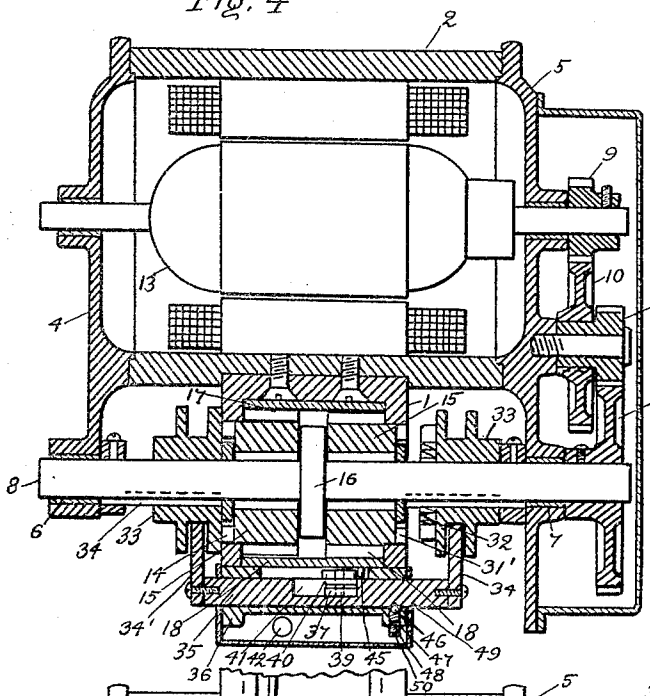


Fig. 6

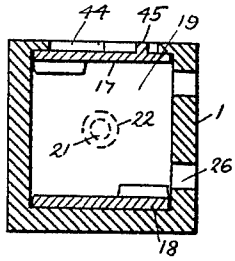


Fig. 7

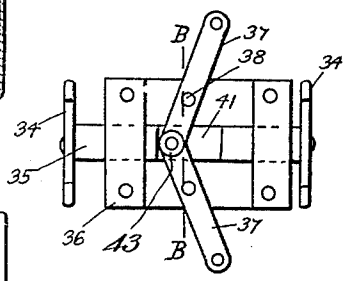


Fig. 8

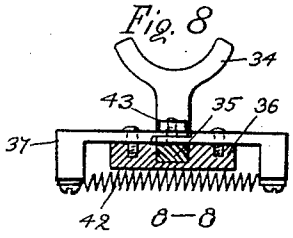


Fig. 5

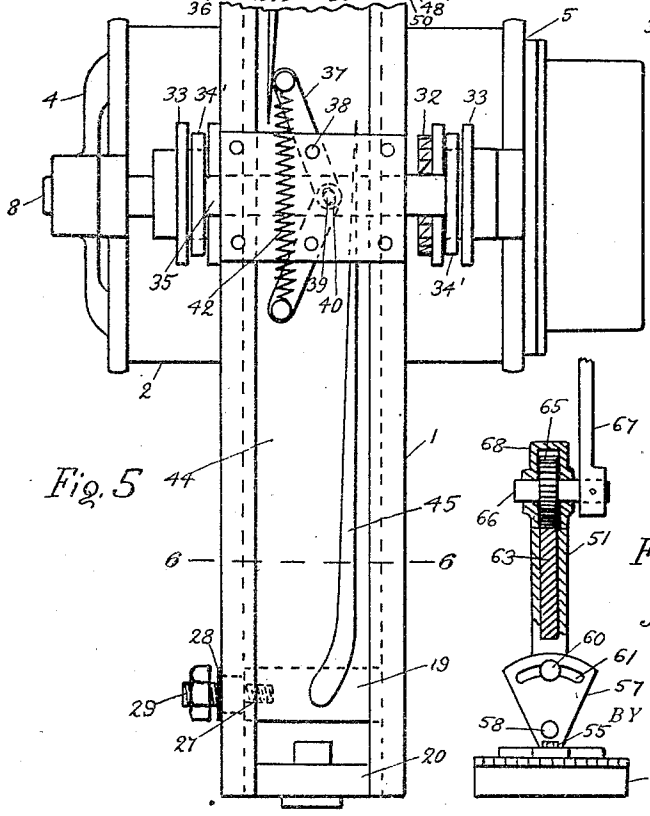


Fig. 9

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Patented Feb. 23, 1926. 1,574,001

UNITED STATES PATENT OFFICE.

JOSEPH J. ROGACH, OF BROOKLYN, NEW YORK.

SAWING MACHINE.

Application filed November 25, 1924. Serial No. 752,137.

To all whom it may concern:

Be it known that I, JOSEPH J. ROGACH, citizen of Russia, and resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Sawing Machines, of which the following is a specification.

My invention relates to sawing machines and has a particular reference to machines operated by electric power.

The object of my invention is to provide a sawing machine of a light and portable type, adapted to be easily clamped against the work and provided with an electric motor for imparting the necessary reciprocating motion to the sawing blade. The rotary motion of the motor armature is transmitted to a shaft with clutches, alternately engaging one of the two pinions in mesh with corresponding racks on a sliding carriage supporting the saw blade. By automatically controlling the clutches I obtain a simple and efficient mechanism for the reciprocating motion of the saw blade.

My invention is more fully described in the accompanying specification and drawing in which—

Fig. 1 is an elevation partly in section, Fig. 2 is a plan view, Fig. 3 is an elevation on the other side, Fig. 4 is a sectional view of the motor with driving mechanism, Fig. 5 is a partial bottom view of the mechanism, Fig. 6 is a section on the line 6—6 in Fig. 5. Fig. 7 is a view of the controlling links, Fig. 8 is a sectional view of the controlling links with their housing, and Fig. 9 is a front view of the clamp jaws.

My sawing machine consists of a housing 1 with an electric motor 2 attached to the upper side and with a handle 3 for holding the device. The end brackets 4 and 5 of the motor extend down and are provided with bearings 6 and 7 for a drive shaft 8. Gears 9, 10, 11 and 12 connect the motor armature 13 with the shaft 8. The shaft is passed through the central portion of the housing 1 the sides of which are provided with circular apertures 14 for the shaft and for pinions 15 loosely mounted on the shaft. A collar 16 on the shaft separates these two pinions. The pinions 15 are in mesh with upper and lower racks 17 and 18. These racks are connected with plugs 19 on the ends and form a cage adapted to slide inside of the housing 1. Spring bumpers at the end plugs 20 of the housing 1 provide stops for the extreme positions of the cage inside. The bumpers consist of sliding plugs 21 in bushings 22 screwed into end plates or plugs 20. Springs 23 tend to push the plugs outwards, the latter being retained in their working positions by means of shoulders 24 in an engagement with inner recesses 25 in the bushings 22.

One side of the housing 1 is provided with longitudinal slots 26. Studs 27 pass through these slots and are screwed into the end plugs or plates 19 and are provided with outside shoulders 28 and threaded extensions 29 with nuts 30. A saw blade 31 is fitted over these studs and is clamped with nuts 30.

The pinions 15 are provided with clutch teeth 31′ on their sides, adapted to mesh with corresponding clutch teeth 32 on the sides of clutch bushings or collars 33. These collars slide on the shaft 8 and on keys 34 thereby being forced to rotate with the shaft.

The collars 33 can be shifted in and out of engagement with pinions 15 by means of shifting forks 34 attached to a common shifting bar 35, so that if one collar is shifted into the engagement with the corresponding pinion, the other pinion is at the same time disengaged.

The shifting bar 35 is slidingly fitted into a bridge 36 attached to the lower side of the housing 1. Shifting levers 37 are pivotally mounted on the bridge with pins 38. A pin 39 is attached to the end of one lever, the other lever being provided with an elongated aperture for this pin. This pin forms a hinged connection between the ends of the levers, which are placed in a recess in the shifting bar 35, so that this bar may be moved one way or the other by turning the levers on pins 38. The free ends of levers are connected together by means of a spring 42. A roller 43 is mounted on the end of the pin 39.

The lower side of the housing 1 is provided with an open slot 44 into which the roller 43 extends almost coming in a contact with the back side of the lower rack 18. This rack is provided with cam shaped ribs 45 adapted to engage the rollers 43.

The shifting bar 35 is retained in its extreme positions by means of a steel ball 46 adapted to slide in a hole 47. A spring 48 back of the ball tends to keep the ball in an

engagement with notches 49 in the bar. A screw plug 50 keeps the spring tightened against the ball.

The housing 1 is provided with a holding attachment consisting of a flat tubular frame 51 pivotally supported on a stud 52, this stud being attached to the side of the housing 1. The front end of the frame 51 is provided with an adjustable jaw 53 which can swing on a bolt 54 and can be clamped in any desired position by means of a bolt 55 passing through a slot 56 in an adjustable bracket 57. This bracket is pivotally mounted on a bolt 58 attached to a stationary bracket or lug 59 on the frame 51. The bracket 57 can be clamped in any position by means of a bolt 60 passing through a slot 61 in the adjustable bracket 57 and screwed into the lug 59. With this arrangement the adjustable jaw 53 can be clamped in any position to suit the shape of the work 62.

A sliding jaw 63 is placed inside of the frame 51 and is provided with rack teeth 64 on the upper edge. These teeth are in an engagement with a pinion 65 on a shaft 66, provided with a tightening handle 67. The shaft 66 is journaled in the sides of the housing 68, formed on the upper side of the frame 51.

A guiding frame 69 is attached to the housing 1. It has a section of a partly closed channel adapted to engage the head of a bolt 70 screwed into the side of the frame 51. With the swinging of the holding frame around the bolt 52 the bolt 70 slides in the slot of the guiding frame, thereby maintaining the proper alignment between the housing 1 and the clamping frame 51.

The operation of my device is as follows. The clamping device is placed over the work 62, and the movable jaw 63 is drawn tightly over it by turning the handle 67. The saw is then placed over the work and the motor started by closing the switch 71.

The rotation of the motor shaft is transmitted to the saw shaft 8 by means of train of gears 9, 10, 11 and 12. One of the pinions 15 turns on the shaft, but the other rotates with the shaft, being connected through the clutch member 33, the clutch teeth being in mesh with the teeth on the pinion 15. The pinion, being in mesh with the rack 17, moves the sliding member, formed of two racks 17 and 18 and end plates 19, thereby moving the saw over the work 62.

The cam 45, when the sliding member approaches one end of its travel, begins to touch the roller 43, pushing it towards the center of the housing, against the spring tension (spring 42). At a certain moment, just when the levers 37 pass beyond an alignment, the tension of the spring 42 will cause them to snap in the opposite direction, thereby rapidly shifting the shifting member 35, forks 34 and the clutches 33, so that the first pinion becomes disengaged and the other engaged. The rack 18 becomes now engaged, and the sliding member with the saw will move in the opposite direction, the change of engagement taking place again at the end of the travel.

The sliding member, accordingly, with the saw will rapidly move back and forth, causing the saw blade to cut the work 62. The pressure on the saw can be controlled by turning the frame 1 on the pivot 52 by means of the handle 3.

Important advantages of my device are that it can be made light and portable, can be used to operate any kind of work, also that it keeps itself properly aligned in relation to the work.

I claim as my invention:

1. In a sawing machine, the combination with a housing, a sliding member in said housing, slots in the side of said housing, studs passing through said slots and attached to said sliding member, a saw blade attached to said studs, an electric motor on said housing, a shaft passing transversely through said housing, a plurality of gears between said motor and said shaft, racks on the upper and on the lower sides of said sliding member, pinions rotatively mounted on said shaft and adapted to engage said racks, clutches on said shaft adapted to engage one or the other of said pinions, a shifting fork adapted to operate said clutches, a shifting member for said fork, and cam members on said sliding member, said cam members being adapted to operate said shifting member and said fork.

2. In a sawing machine, the combination with a housing, a sliding member in said housing, a saw blade attached to said sliding member, an electric motor on said housing, a shaft passing transversely through said housing, an operative connection between said shaft and said motor, pinions on said shaft, racks on the upper and on the lower sides of said sliding member adapted to be engaged by said pinions, clutches on said shaft adapted to alternately engage said pinions, a shifting member for said clutches, means to operate said shifting member from said sliding member, and means to accelerate the movement of said shifting member for the extreme positions of said sliding member.

Signed at Brooklyn in the county of Kings and State of New York this 10th day of November A. D. 1924.

JOSEPH J. ROGACH.