J. F. WEBER.

FLOOR POLISHER.

APPLICATION FILED JUNE 1, 1908.

913,863.

Patented Mar. 2, 1909.

3 SHEETS—SHEET 1.

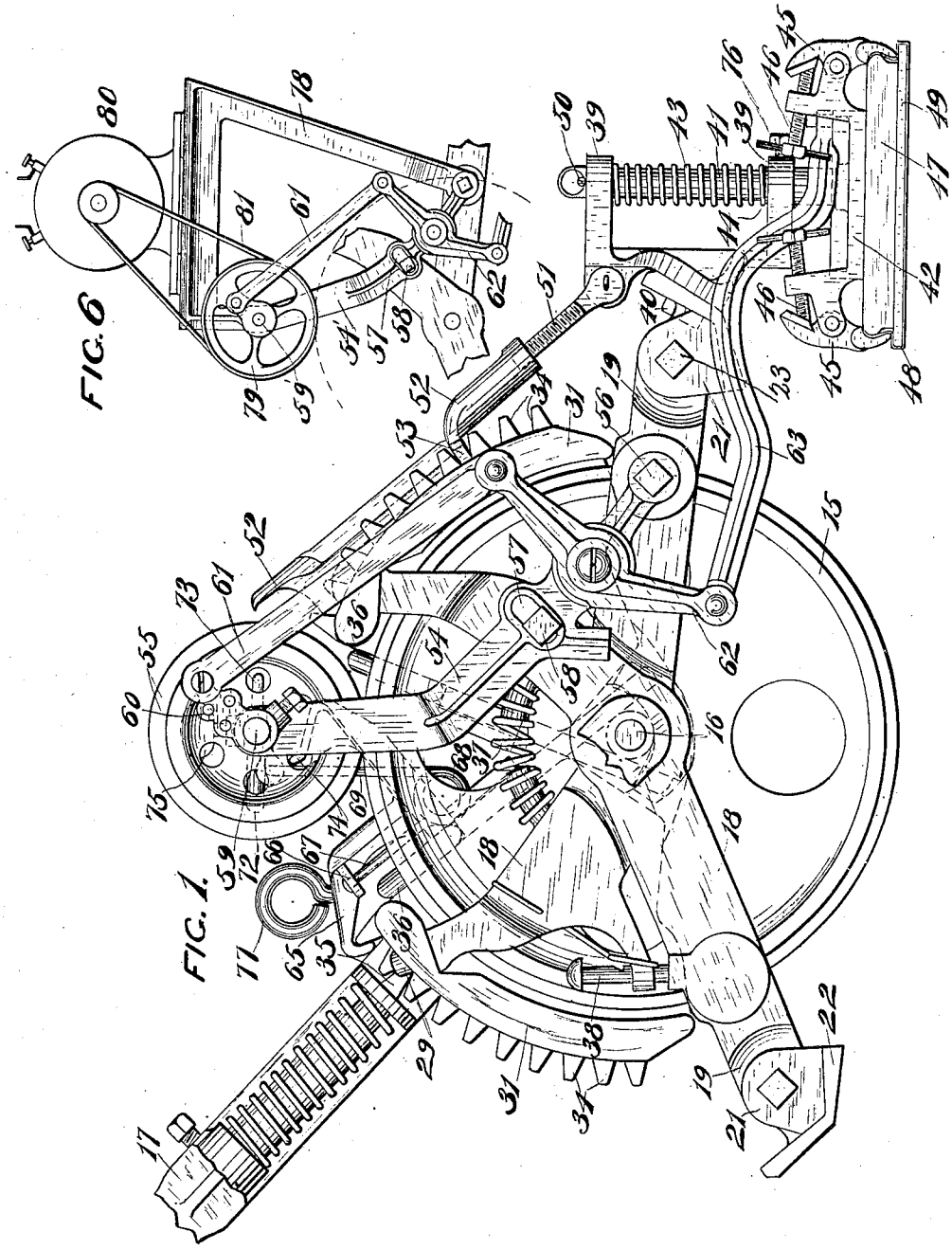


FIG. 6

FIG. 1.

WITNESSES.

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3 SHEETS—SHEET 2.

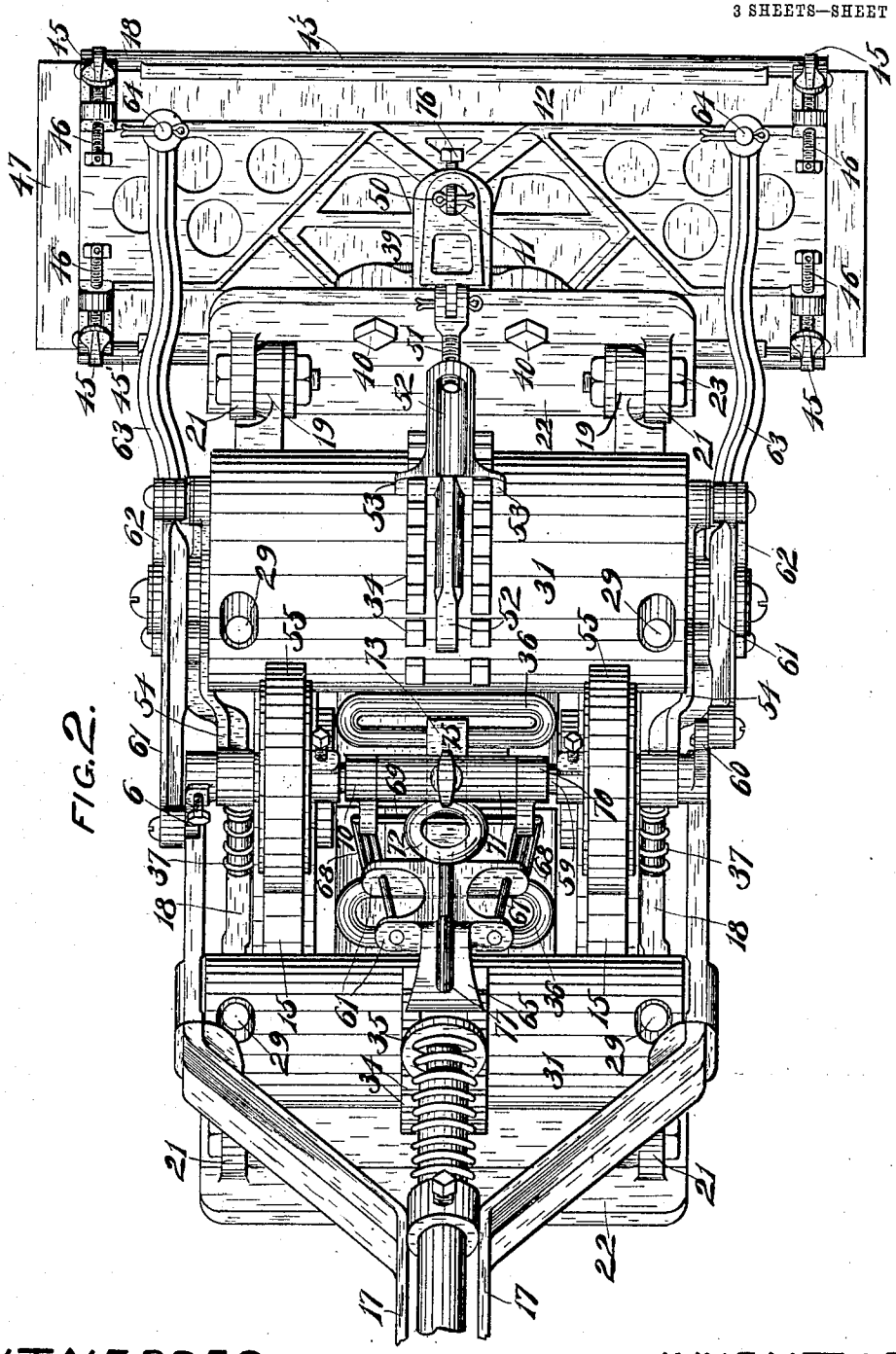


FIG. 2.

WITNESSES.

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3 SHEETS—SHEET 3.

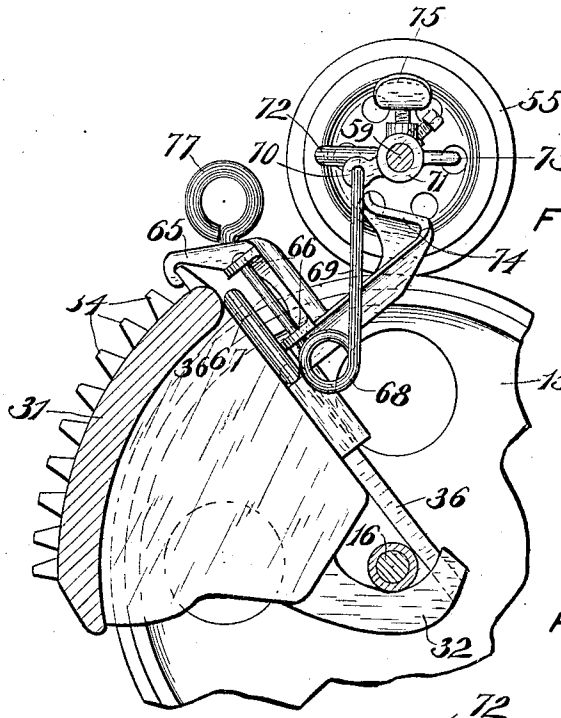


FIG. 3.

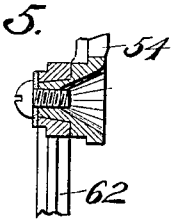


FIG. 5.

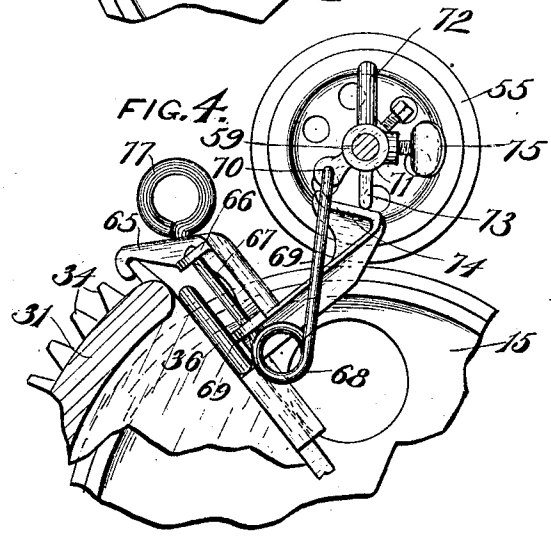


FIG. 4.

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FLOOR-POLISHER.

No. 913,863. Specification of Letters Patent. Patented March 2, 1909.

Application filed June 1, 1908. Serial No. 436,106.

To all whom it may concern:

Be it known that I, JOHN F. WEBER, residing in West Allis, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Floor-Polishers, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention has for its object to provide a sand papering or polishing device for floors, adapted to be moved over the surface of the floor and to bear on the floor with a movable sand papering or polishing head to produce a finished surface on the floor, especially on newly scraped floors.

Another object of the invention is to provide such a floor polishing machine in the form of an attachment for a floor scraper such as the floor scraper and planer covered by my copending application bearing Serial Number 383,263, filed July 11, 1907, though the invention is not confined to the device as an attachment, but may constitute a machine complete in itself.

Another object of this invention is to provide such a floor polishing machine of a construction which may receive the desired movements of the polishing head from the motion of the machine or from a mechanical motor provided for that purpose.

Another object of this invention is to improve upon details of construction of a floor polishing machine.

With the above and other objects in view the invention consists in the floor polishing machine herein claimed, its parts and combinations of parts and all equivalents.

Referring to the accompanying drawings in which like characters of reference indicate the same parts in the several views; Figure 1 is a side elevation with parts broken away of a floor polishing machine constructed in accordance with this invention; Fig. 2 is a plan view thereof; Fig. 3 is a sectional elevation of a portion thereof showing the means for driving the polishing head in operative engagement; Fig. 4 is a similar view thereof with the parts shown out of operative engagement; Fig. 5 is a sectional view of the pivotal connection for the operating lever of the polishing head; and, Fig. 6 is a side elevation of a portion of the machine showing an electric motor mounted thereon for producing the motions of the polishing head.

In these drawings 15 indicates a pair of wheels, which are preferably rubber tired and which are loosely mounted on an axle 16 carried by the yoked arms of a forked handle member 17. A pair of cross rods 18 are formed and fitted together like the members of a pair of shears and are loosely mounted on the axle 16 at each end thereof between the wheels 15 and the ends of the handle 17. Each member 18 has a half ball shaped lower end 19, which fits within a concave recess or socket in end ears 21 of a pair of plates 22 with bolts 23 passing therethrough so that the plates 22 form connections for the lower ends of the members 18. Each of the members 18 also has its upper end curved upwardly and terminates in a shouldered pin 29 to loosely fit within an opening in the upper corner of a sector shaped weight 31, there being one of these weights suspended in this manner on each side of the axle. Each weight 31 has a hook shaped extension 32 passing beneath the axle 16 and is provided with one or more series of stops or rack teeth 34 on its curved upper surface concentric with the axle, to be engaged by a spring pawl 35 carried by the handle 17.

So much of the structure as has been described is similar to the structure covered by my copending application above referred to, and the parts mentioned only differ from those in the copending application in details of construction, such as the sliding lock bars 36 on the weights entering openings in the hooks 32 for locking them against accidental disengagement from the axle, and the coil springs 37 confined between lugs on the crossed rods 18 to form a yielding connection between them and the spring locked adjustment pins 38 on two of the rods 18 bearing against the other rods 18 to determine their position with relation to each other by limiting the movement caused by springs 37.

The angular plate 22 of the members 18 carrying the weight 31 with which the handle is engaged has a frame or double bracket 39 secured thereto by means of bolts 40 and constituting a guide for a vertical stem 41 of a polishing head 42, there being a coil spring 43 surrounding the stem 41 between the two arms of the double bracket and bearing at its upper end against the upper arm of the double bracket and at its lower end against a shoulder 44 of the stem 41 formed by a change in the diameter thereof. As shown in the plan view, Fig. 2, the polishing head

42 consists of an elongated rectangular frame having clamp members 45 pivoted thereto at its corners and operated by hand screws 46 to engage their hook shaped lower ends and the clamping bars 45′ which connect them against the rounded edges of a bearing block 47, or against the sheet of sand paper 48 with its edges held therebetween. The sand paper is stretched around a cushioning pad 49 of rubber or other yielding material. By means of the clamps 45 the sand paper is tightly held upon the block 47 and the block is held firmly against the bottom of the polishing head 42.

The stem 41 of the polishing head is free to turn in the double bracket 39 and is held against disengagement therefrom by means of a cotter pin 50 through its upper end. To hold the double bracket 39 in place against movement on the members 18, an adjustable brace is provided between the upper end of said double bracket and the weight 31 nearest thereto, said adjustable brace comprising a threaded rod 51 pivoted to an ear on the upper end of the double bracket 39 and threading into the lower end of a latch 52 which extends between the double row of rack teeth 34 on the weight 31 and has laterally projecting lugs 53 to engage between said ratchet teeth. Thus, when the said weight 31 is lifted slightly and the adjustable latch is in its proper adjustment it is engaged between two of the rack teeth as shown in Fig. 1 and the play of the parts is taken up by the action of the weight 31, so that the double bracket 39 is held rigidly in position even when pressure is applied thereto by lifting the handle 17 so as to transfer the pressure of the weights 31 from the wheels 15 to the polishing head through the compression of spring 43. At such times the polishing head remains in its proper position with relation to the floor without tilting by reason of the pivotal connection of the double bracket frame 39 with the members 18 and with the adjustable brace and by reason of the yielding nature of the weight 31 with which said brace is connected. By this arrangement the sand paper is kept flat on the floor whatever pressure is brought to bear thereon and the adjustable brace also prevents tilting of the polishing head in event of its meeting with a resistance.

A means is provided for swinging the polishing head on its swivel mounting, and preferably comprises the automatic driving mechanism shown in Figs. 1 to 4 inclusive, though motor driving means such as shown in Fig. 6 may be employed for the purpose. In the former construction a pair of swinging side frames 54 carrying driving rollers 55, preferably with rubber treads to engage the rubber treads of the wheels 15, are pivotally mounted at their lower ends upon bolts 56 in those members 18 on which the polishing head is mounted. The side frames are guided in their swinging movements by having elongated slots 57 riding on the headed bolts 58 on the upper parts of the other members 18. The upper ends of the swinging side frames are connected by a shaft 59 journaled therein and having the rollers 55 fixed thereon. The two ends of the shaft 59 also have fixed thereon oppositely extending crank arms 60, in various positions on which connecting rods 61 are adapted to have their upper ends connected, their lower ends connecting with bell crank levers 62 which are pivotally mounted on the side frames 54, as shown in Fig. 5. The other ends of said bell crank levers 62 are connected by connecting rods 63 with studs 64 on the ends of the polishing head 42. Thus the motion of shaft 59 received by the engagement of its rollers 55 with the wheels 15 of the machine is transmitted through the crank arms 60 and the connecting rods 61, the bell crank levers 62 and connecting rods 63 to the polishing head 42, causing it to oscillate back and forth around its swivel connection and thereby give a swinging motion to the sand paper as it is moved across the surface of the floor.

The rollers 55 are held upon the wheels 15 by spring pressure, there being a hook 65 engaging the rack teeth 34 of the weight with which the operating handle is engaged and forming, by means of a pair of parallel cross arms 66, a double engagement for both ends of a spring 67, which after passing therethrough is bent to form coils 68 and then a loop 69 passing through lugs on a pair of collars 70 loosely mounted on the shaft 59. A sleeve 71 is also loosely mounted on the shaft 59 and is located between the collars 70 and carries a loop handle 72 by means of which it may be turned to bring a projection 73 which extends therefrom opposite the handle into engagement with a cam projection 74 of the hook member 65. The spring 67 serves to pull the shaft 59 toward the hook 65 and as said shaft is carried by the side frames 54 which move upon their pivotal connections 56, this tendency serves to draw the rollers tightly in engagement with the wheels 15. When the loop handle 72 is raised to the position shown in Fig. 4 the projection 73 rides upon the cam extension 74 of the hook member to lift the shaft 59 and remove the rollers 55 from their engagement with the wheels 15 to stop the operation of the mechanism for imparting movement to the polishing head. At such times, in order to prevent an accidental movement of the polishing head, due to a greater frictional resistance on one side thereof than on the other or to any other cause, a set screw 75 which is threaded in the sleeve 71 is tightened upon the shaft 59, and as the sleeve is then held against turning by the engagement of its projection 73 with the cam 74

this clamping effect serves to prevent the shaft turning and thereby prevent the movement of the parts. As a further means for preventing turning of the polishing head when it is not desired, a set screw 76 is threaded through the lower bearing of bracket 39 and is adapted to be tightened against the stem 41. The movements of the frames 54 caused by the engagement and disengagement of the rollers 55 with the wheels 15 is permitted by the elongated slots 57 through which they are connected with the bolts 58.

The hook member 65 is provided with a loop handle 77 by means of which it may be released from its engagement with the rack teeth 34 for disconnecting the automatic driving mechanism and substituting an independent motor driving mechanism. At such times a bracket 78 having a counterpart 54′ for the side frames 54 is substituted for said side frames with its shaft and rollers and cranks, and the bell crank levers 62 are connected thereto with their links 61 connecting with crank pins on a grooved pulley 79 which is mounted on a shaft 59′ corresponding to shaft 59, the crank pins at the opposite ends thereof being oppositely set as before. An electric motor 80 or other operating means is mounted on the bracket 78 and drives the grooved pulley 79 by means of a belt 81. A suitable flexible wiring may be connected with the motor to supply it with current during the movements of the machine across the floor. The weight of the motor and the parts connected therewith is sufficient to replace the weight 31 on the front of the machine, which is therefore removed and the hook shaped handle member 52 of the brace 51 for the double bracket 39 is swung between the wheels 15 and engaged with the axle 16 to secure the bracing effect for the double bracket to hold the same rigidly in position. When operating the machine by means of the motor 80 the movements of the polishing head are produced as before, the only difference being that instead of depending upon the motion of the machine for its driving power the motor furnishes the same. While the machine is connected up for driving the polishing head by means of the motor and the weight 31 is removed from one pair of the crossed arms 18, as explained, the engagement of bolts 59 and slots 57 holds said arms in place against dragging on the floor.

By means of this invention the operation of sand papering or polishing a floor may be performed with ease, it being only necessary to push the machine back and forth across the floor while its polishing head either remains fixed or is oscillated by the automatic driving mechanism of the machine or by the independent motor, the movements of the polishing head greatly facilitating its action in sand papering or polishing the floor. By reason of the brace connection 51 between the double bracket 39 and the weight 31 the pressure of said weight normally is applied to the polishing head, but this may be increased by lifting on the operating handle so as to transfer the pressure of the other weight from the wheels 15 to the polishing head, the spring 43 permitting such pressure upon the polishing head at all times without necessitating the removal of the operating wheels 15 from the floor which would result in the stoppage of the automatic driving mechanism for the polishing head.

By reason of the construction of the polishing head and its clamping means, it is obvious that when the operation is completed with the sand paper, such sand paper can be removed and wood shavings or the like clamped in position on the polishing head by means of said clamping means and then on operating the machine as before a very high polish may be given to the surface of the floor.

What I claim as my invention is;

1. A floor polisher, comprising a carrier, a polishing head swiveled thereto and bearing on the floor, and means for oscillating the polishing head.

2. A floor polisher, comprising a wheeled carrier, a frame pivotally mounted thereon, a polishing head having a swiveling connection in the frame, a brace connecting the frame with the carrier, and means on the carrier for oscillating the polishing head on its swivel connection.

3. A floor polisher, comprising a wheeled carrier, a frame pivotally mounted thereon, a polishing head having a swiveling connection in the frame, a yielding compression spring for said swiveling connection to receive the pressure imparted to the polishing head from the carrier, a brace connecting the frame with the carrier, and means on the carrier for oscillating the polishing head on its swiveling connection.

4. A floor polisher, comprising a wheeled carrier, a frame pivotally mounted thereon and forming a double bracket, a polishing head provided with a shouldered stem swiveled in the double bracket, a coil spring surrounding the stem and bearing against the frame and against the shoulder of the stem, a brace connecting the frame with the carrier, and means on the carrier for oscillating the polishing head on its swivel connection.

5. A floor polisher, comprising an axle, a pair of wheels mounted thereon, pairs of crossed arms mounted on the axle, weights carried by the crossed arms on opposite sides of the axle, an operating handle having connection with the axle and engaging one of the weights, a frame pivotally connected to the crossed arms which support said weight, a polishing head having a swivel connection with the frame, a brace connecting the frame

with the other weight, and means supported by the crossed arms for oscillating the polishing head on its swivel connection.

6. A floor polisher, comprising an axle, a pair of wheels mounted thereon, pairs of crossed arms mounted on the axle, weights carried by the crossed arms on opposite sides of the axle, an operating handle having connection with the axle and engaging one of the weights, a frame pivotally connected to the crossed arms which support said weight, a polishing head having a swivel connection with the frame, an adjustable brace connecting the frame with the other weight said other weight being removable and the adjustable brace being then adapted to engage the axle, and means supported by the crossed arms for oscillating the polishing head on its swivel connection.

7. A floor polisher, comprising an axle, a pair of wheels mounted thereon, pairs of crossed arms mounted on the axle, weights carried by the crossed arms on opposite sides of the axle, an operating handle engaging one of the weights, a frame pivotally mounted on the crossed arms supporting said weight, a polishing head having a swivel connection with the frame, a brace between the frame and the other weight, side frames pivotally mounted on the said crossed arms, a shaft carried by the side frames, a roller on the shaft engaging one of the wheels to receive motion therefrom, a crank arm on the shaft, a suitable lever pivoted to the side frame, a link connecting the crank arms with the lever and a link connecting the lever with the polishing head.

8. A floor polisher, comprising an axle, a pair of wheels mounted thereon, pairs of crossed arms mounted on the axle, weights carried by the crossed arms on opposite sides of the axle, an operating handle engaging one of the weights, a frame pivotally mounted on the crossed arms which support said weight, a polishing head having a swivel connection with the frame, a brace between the frame and the other weight, side frames pivotally mounted on the said crossed arms having a sliding connection with the other crossed arms, a shaft carried by the side frames, rollers on the shaft engaging the wheels to receive motion therefrom, crank arms on the shaft in opposite positions, bell crank levers pivoted to the side frames, links connecting the crank arms with the bell crank levers and links connecting the bell crank levers with the opposite ends of the polishing head.

9. A floor polisher, comprising an axle, a pair of wheels mounted thereon, pairs of crossed arms mounted on the axle, weights carried by the crossed arms on opposite sides of the axle, an operating handle engaging one of the weights, a frame pivotally mounted on the crossed arms which support the weight, a polishing head having a swivel connection with the frame, a brace between the frame and the other weight, side frames pivotally mounted on the said crossed arms and having a sliding connection with the other crossed arms, a shaft carried by the side frames, rollers on the shaft engaging the wheels to receive motion therefrom, crank arms on the shaft in opposite positions, bell crank levers pivoted on the side frames, links connecting the crank arms to the bell crank levers, links connecting the bell crank levers with the opposite ends of the polishing head, a hook member engaging the weight with which the operating handle is engaged, a cam extension on the hook member, a spring secured to the hook member, collars loosely mounted on the shaft and engaging the spring whereby the spring serves to hold the rollers in engagement with the wheels, a sleeve loosely mounted on the shaft, and a projection on the sleeve adapted to engage the cam extension of the hook for forcing the shaft away from the wheels against the action of the spring to disconnect the rollers from the wheels.

10. A floor polisher, comprising an axle, a pair of wheels mounted thereon, pairs of crossed arms mounted on the axle, weights carried by the crossed arms on opposite sides of the axle, an operating handle engaging one of the weights, a frame pivotally mounted on the crossed arms which support the weight, a polishing head having a swivel connection with the frame, a brace between the frame and the other weight, side frames pivotally mounted on the said crossed arms and having a sliding connection with the other crossed arms, a shaft carried by the side frames, rollers on the shaft engaging the wheels to receive motion therefrom, crank arms on the shaft in opposite positions, bell crank levers pivoted on the side frames, links connecting the crank arms to the bell crank levers, links connecting the bell crank levers with the opposite ends of the polishing head, a hook member engaging the weight with which the operating handle is engaged, a cam extension on the hook member, a spring secured to the hook member, collars loosely mounted on the shaft and engaging the spring whereby the spring serves to hold the rollers in engagement with the wheels, a sleeve loosely mounted on the shaft, a projection on the sleeve adapted to engage the cam extension of the hook for forcing the shaft away from the wheels against the action of the spring to disconnect the rollers from the wheels, and a set screw on the sleeve for engaging the shaft to prevent movements of the polishing head when the rollers are out of engagement with the wheels.

11. A floor polisher, comprising an axle, a pair of wheels mounted thereon, pairs of crossed arms mounted on the axle, weights carried by the crossed arms on opposite sides of the axle, an operating handle engaging one

of the weights, a frame pivotally mounted on the crossed arms which support said weight, a polishing head having a swivel connection with the frame, a brace between the frame and the carrier formed by the other parts, a bracket mounted on the crossed arms, a motor on the bracket, a grooved pulley driven by the motor, crank arms operated by the grooved pulley, bell crank levers mounted on the bracket, links connecting the bell crank levers with the crank arms, and links connecting the bell crank levers with the ends of the polishing head.

In testimony whereof, I affix my signature, in presence of two witnesses.

JOHN F. WEBER.

Witnesses:
R. S. C. CALDWELL,
ANNA F. SCHMIDTBAUER.