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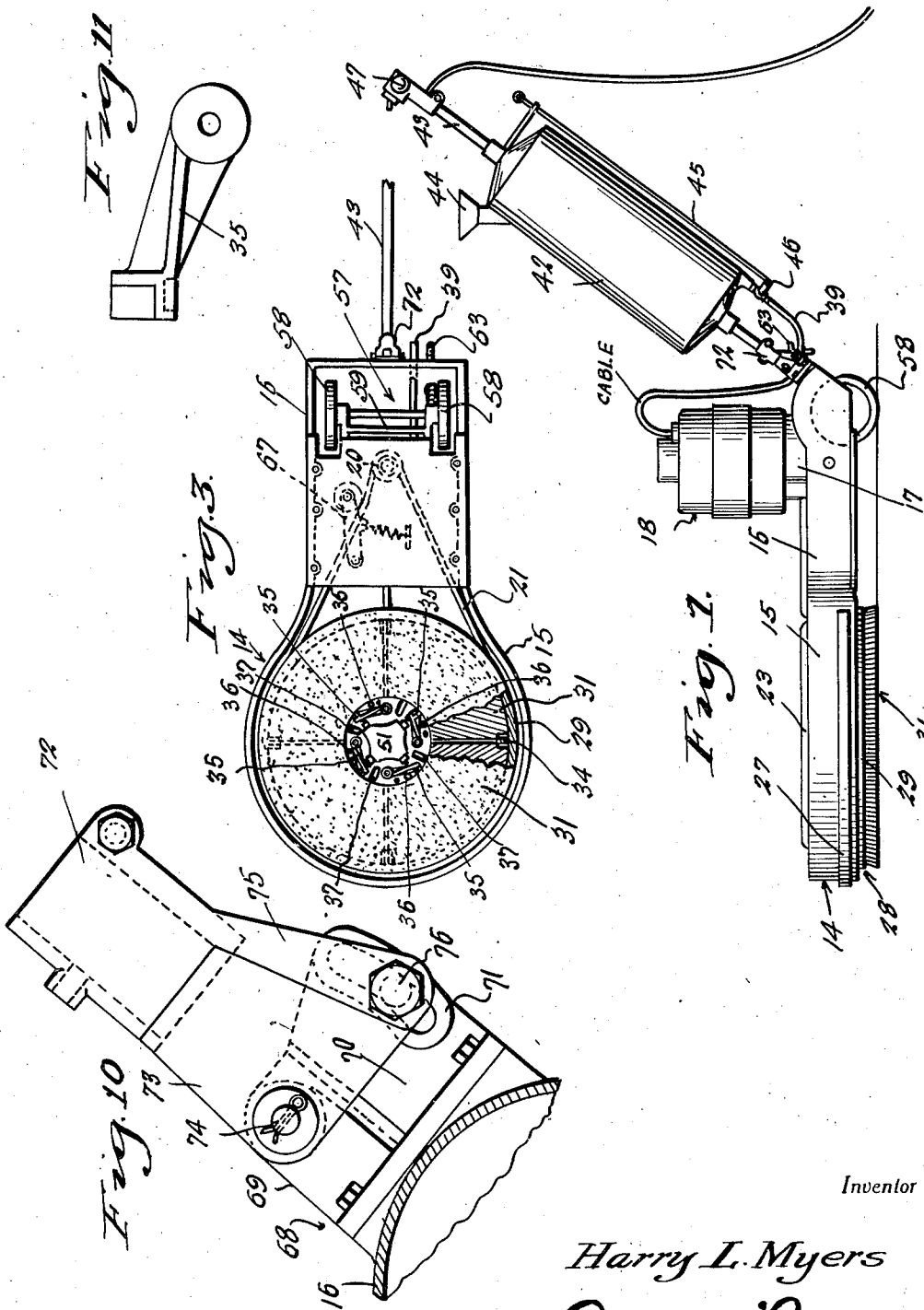
H. L. MYERS

2,079,946

FLOOR SCRUBBING, BRUSHING, AND POLISHING MACHINE

Filed Sept. 11, 1935

3 Sheets-Sheet 1



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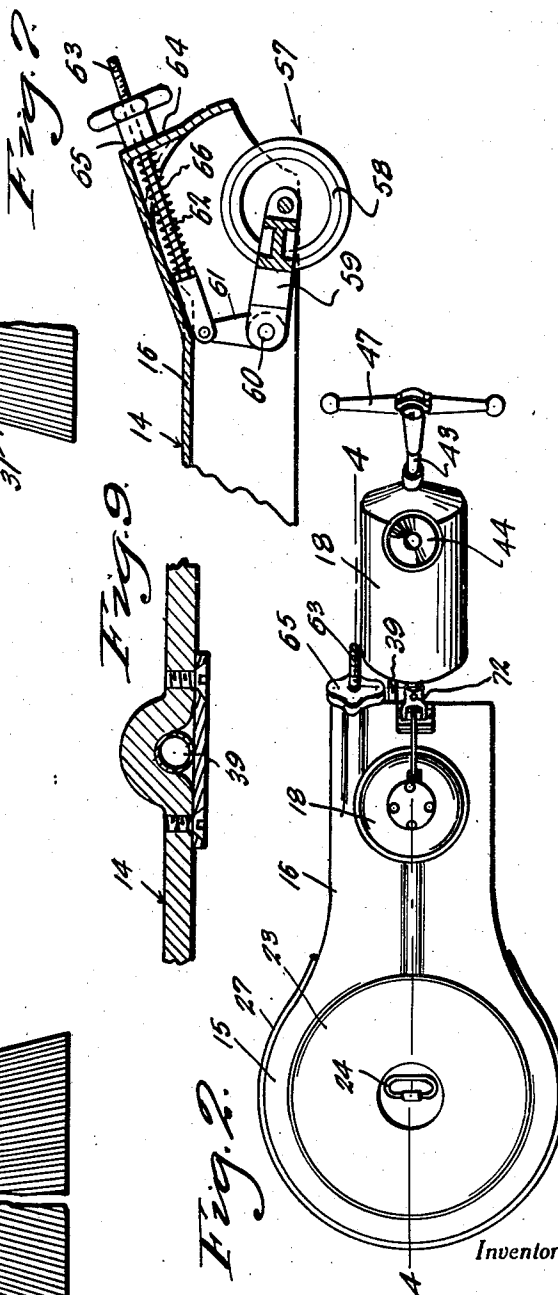
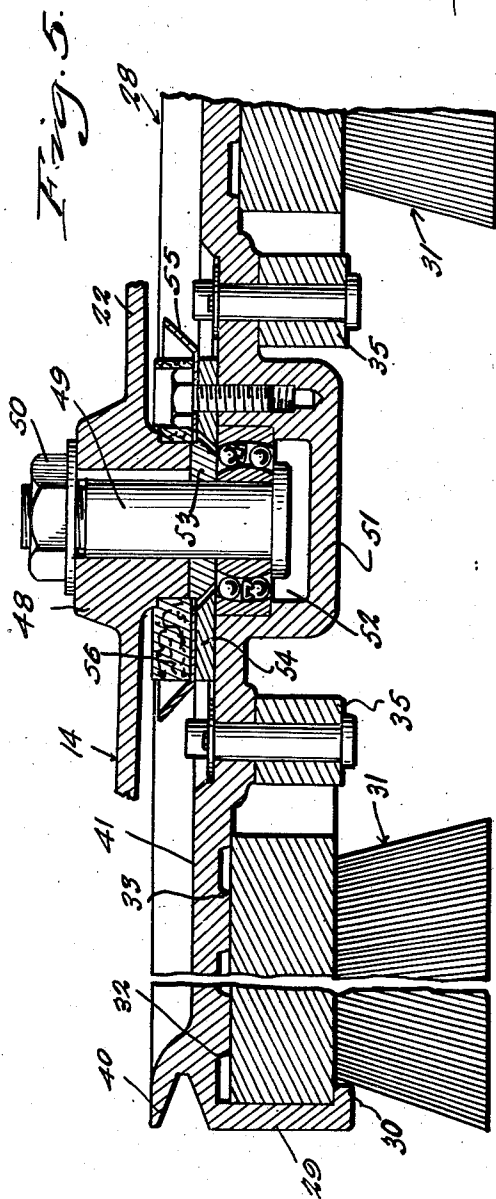
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FLOOR SCRUBBING, BRUSHING, AND POLISHING MACHINE

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3 Sheets-Sheet 2



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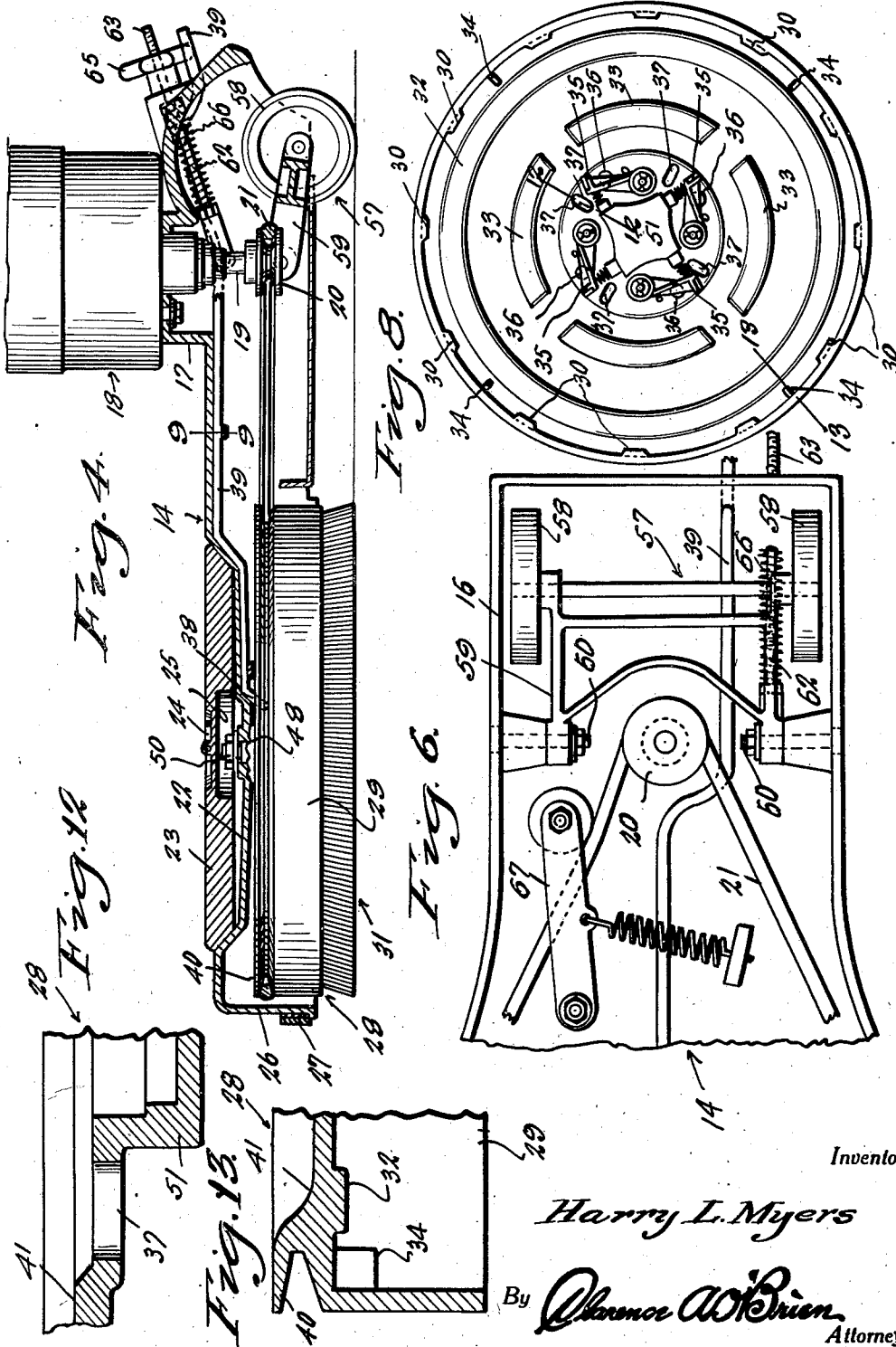
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FLOOR SCRUBBING, BRUSHING, AND POLISHING MACHINE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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FLOOR SCRUBBING, BRUSHING, AND
POLISHING MACHINEHarry L. Myers, Toledo, Ohio, assignor to The
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Application September 11, 1935, Serial No. 40,148

4 Claims. (Cl. 15-49)

This invention relates to an improved electric motor operated rotary brush machine of the type used for conditioning and maintaining floors and floor coverings, having reference in particular to a novel structural assemblage satisfactorily usable for wide range utility suitable for general polishing, heavy duty polishing and scrubbing and for severe scrubbing operations such as removing dry dirt and accumulations on office, warehouse and factory floors.

Before introducing the preliminary objects, features and advantages and to enable the reader to obtain a more comprehensive understanding of the subject matter I feel disposed to point out that the present invention embodies structure in common to that disclosed in my present co-pending application for a Floor scrubbing, brushing and polishing machine, identified as Serial No. 625,105, filed February 27, 1932.

In fact the present invention is a continuation-in-part of that covered in the preceding co-pending application which application is being voluntarily abandoned in view of the present application.

Since developing the original conception of the invention sought to be protected in the aforesaid co-pending application, the machine has been fortified with augmented features and refinements employed to advantage in taking care of certain recognized contingencies brought to light from actual commercialization of the machine.

In constant touch with the trade utilizing machinery of the type herein covered, I have discovered the need to fulfill a constant and increasing demand for silent running machines constructed low enough in height to satisfactorily get under desks and other furniture and at the same time reach far enough back under the furniture so that practically no hand work is required.

As is evident from the aforementioned copending application my primary aim and object is to provide a floor machine of the type under consideration which is especially adapted for use in offices, warehouses, hospitals and the like through whose use it is possible to do the work desired in a satisfactory and efficient manner without shifting and adjusting the various articles of furniture.

Briefly, I have accomplished what is desired by the provision of a mobile frame in the nature of a longitudinally elongated casing which serves as a support for a prime mover such as a motor and as a housing for an especially designed

pulley and belt driven rotary brush assemblage, all of these parts being especially fashioned to aptly fulfill the requirements of the average user and the trade in general.

Structurally visualized it is an object of the invention to provide the frame or casing with a unique adjustable handle which can be adjusted to any height to suit the operator whether tall or short in stature and to enable him to provide requisite leverage for easy handling while operating the machine or while transporting it from place to place.

Moreover an outstanding feature of importance is predicated upon the adoption and use of an especially designed brush holder made to accommodate a sectional brush, that is a brush made up of four companion sections designed for convenience and economy, the sections being held in place by quick acting easily accessible clamping members allowing the brushes to be changed or replaced in a moment's time.

A further feature as will be hereinafter amplified has to do with the incorporation in the casing of special compensating means for adjusting a simple two-wheeled truck, the compensating means being conveniently located at the rear of the machine so as to keep the rear portion of the machine level with the brushes as the bristles wear down whereby to overcome tendency of the machine to swerve or pull to one side or the other as the case may be.

A further feature of outstanding worth and value has to do with the special adaptation of the elongated casing fashioned at a predetermined point to provide a shallow receptacle for a handle equipped detachable pressure weight which, when in position, aids in controlling the machine and providing requisite balance and which can be readily removed when moving the machine from place to place. Added to the foregoing features and advantages is an important phase of the invention which relies for ingenuity and novelty on the adoption and use of a water containing tank mounted on the handle and provided with a delivery pipe, properly valved, and leading to a well or pan forming a part of the rotary brush holder, the rotary brush holder being provided with holes or passages so located as to permit the water to be equally distributed to drop on the floor or surface within the area surrounded by the inner periphery of the annular brush, whereby to permit the machine to be used either for straight polishing or brushing or converted for heavy duty scrubbing work.

Other features and advantages will become

more readily apparent from the following description and the accompanying illustrative drawings.

In the drawings wherein like minerals are employed to designate corresponding details or parts throughout the views:

Figure 1 is a side elevational view of a machine constructed in accordance with the principles of the present invention.

Figure 2 is a top plan view thereof.

Figure 3 is a bottom plan view with portions of the segmental brushes broken away and shown in section to disclose certain otherwise obscured details.

Figure 4 is a view on a slightly enlarged scale, the view being taken on the irregular line 4-4 of Figure 2.

Figure 5 is an exaggerated fragmentary sectional and elevational view through the front holder intended to explicitly illustrate the self-aligning bearing and lubricating means.

Figure 6 is a fragmentary bottom plan view showing the brush leveling and operating truck.

Figure 7 is a sectional view of the truck disclosing the manually regulated adjusting means therefor.

Figure 8 is a bottom plan view of the circular sectional brush mount or holder.

Figure 9 is a detail section taken approximately on the plane of the line 9-9 of Figure 4 showing the water pipe connection.

Figure 10 is a detail view of the handle connecting or mounting means.

Figure 11 is a detail of one of the latch-like brush clamping units.

Figures 12 and 13 are detail sections of a fragmentary type taken on the planes of the lines 12-12 and 13-13, respectively of Figure 8.

Referring now to the parts by distinguishing reference numerals it will be observed that the frame 14 is in the nature of a one-piece aluminum casting which is especially fashioned to provide an enclosure or casing. In top plan view it is of longitudinally elongated design and includes a low lying circular frontal portion 15 and a relatively narrow somewhat rectangular rear end portion 16. The rear end as shown in Figure 4 has a short vertical riser 17 on which the electric motor 18 is mounted. I use a vertical motor and extend the shaft 19 down into the casing where it is provided with a pulley 20 to drive V-shaped belt 21. The top of the circular front portion is formed with a shallow depression 22 having a bevelled marginal edge to accommodate the correspondingly shaped perimeter of the removable pressure weight 23. The weight is provided with a suitable handle 24 and in its bottom at the center with a clearance pocket 25. When the weight is seated in the depression the top thereof is substantially flush with the flat top of the casing. This is important to permit the machine to reach well under the furniture and avoid the presence of upstanding projections. The depending skirt or rim portion of the circular frontal part indicated at 26 and which carries a suitable bumper or buffer 27 extends well down and around and partially conceals and encloses the rotary brush mount or holder 28.

The brush holder as shown in Figure 5 comprises a single casting having an annular rim 29 provided at circumferentially spaced points with inturned retention lugs 30 for the segmental brushes 31. Incidentally, there are four duplicate brush segments and each includes a wooden back and suitable bristles. The back fits into

the annular shell portion of the holder and bears firmly against the stabilizing ribs 32 and 33, respectively. The brushes when assembled in the holder are driven through the instrumentality of circumferentially spaced properly located driving lugs 34 carried by the annular rim of the brush holder. The brush segments are assembled to form an annular brush and the spring pressed retention means for the brush segments is located in the open space of the annulus as shown in Figure 3.

Referring momentarily to Figure 8 it will be observed that the retention units are in the form of spring pressed clamp latches 35, there being one for each brush segment. It will be noted that the numeral 36 designates a socket adjacent each clamp which is designed to receive the shank of a screw driver or similar tool for forcing the latch inwardly, that is radially inwardly against the tension of the spring to permit the brush sections to be released and slipped out or replaced as desired. It will also be observed here that the numeral 37 designates circumferentially spaced equi-distant elongated slots or passages for water which is supplied thereto from the depending discharge end 38 of a water supply pipe 39 mounted in the casing as better shown in Figure 4. The end 38 of the pipe is located over the central portion of the brush holder. Moreover the brush holder is so made as shown in Figure 5 that the plate portion thereof is disposed on a plane below the marginal driven pulley 40 to serve as a water receiving pan or well 41. This facilitates trapping the water so that it can be conveyed to the floor within the limits of the surrounding brushes whenever it is desired to use the machine for floor scrubbing work. Water is supplied to the pipe 39 by way of an appropriate tank 42 mounted on the handle 43. The tank is shown provided with a filling funnel 44 and with a rod 45 to actuate the cut-off valve 46. Incidentally the handle, which is mounted in the special way to be hereinafter described, is provided at its upper end with appropriate hand grips 47 for convenient steering and operation.

Calling attention again to Figure 5 it is to be observed that the depression portion 22 of the casing is centrally provided with a suitable bearing 48 for a headed journal pin 49, the pin being provided on its top with a nut 50 which is accessible when the weight 23 is lifted off. Incidentally the clearance pocket 25 serves to accommodate the nut 50 and provides for compactness and consolidation in the construction. The headed end of the journal pin extends down into the central cup-like hub portion 51 of the brush holder. Mounted in the hub is a suitable self-aligning bearing 52 which surrounds the headed end of the pin. This provides a self-leveling and detachable connection between the brush holder and the casing.

It is to be noted that an abutment washer 53 surrounds the intermediate portion of the pin and is interposed between the self-aligning bearing and the bearing 48. It has its beveled edge spaced from the correspondingly beveled edge of a companion abutment washer 54 which is fastened to the hub portion of the brush holder. These two washers cooperate in limiting the tilting of the brush holder. Fastened to the washer 54 is a grease cup or pan 55 containing a washer 56. The washer bridges the space between the two metal washers 53 and 54 to prevent dust and dirt from passing through the space and ruining

the bearing 52. This also provides a convenient means of lubricating the bearing 52 in that the lubrication contained in the pan 55 is taken up by capillary attraction by the felt washer and is delivered down to the bearing through the space between the two stop or abutment washers 53 and 54. This is an ingenious adaptation in a structure of this type and novelty is attached thereto.

I invite attention now to the brush compensating truck structure at the rear end of the machine. As shown especially well in Figure 6 the truck is denoted by the numeral 57 and comprises a pair of wheels 58 substantially confined within the limit of the rim of the casing and carried by an axle which is in turn mounted for rotation in a special adaptor frame 59. This frame 59 is pivotally mounted as at 60 and as shown in Figure 7 is provided with a rocker arm 61 pivotally attached to an adjusting rod 62. The rod has its threaded end 63 extending through an aperture in the flattened end portion 64 of the casing, the threaded end carrying a thumb nut 65 conveniently located and bearing against the abutment surface 64. The numeral 66 designates a coiled expansion spring which surrounds the adjusting rod and provides the desired compensating and cushioning result. This adjustable truck feature in conjunction with the self-leveling brush is believed to be a novel adaptation in a machine of this type.

Although it is of incidental importance I call attention to the numeral 67 in Figure 6 which designates a spring retained belt tightener properly mounted on the under side of the casing and cooperating with the belt within the vicinity of the drive pulley 20. This keeps the belt tight around both pulleys 20 and 40 as is evident. It obviates the necessity of adjustably mounting the motor on the casing as would otherwise be necessary.

Directing attention now to Figure 10 it will be observed that the numeral 68 designates a special fixture which is removably mounted on the rear end portion of the casing and this fixture embodies a hinge lug 69 with a depending web portion having a somewhat arcuate slot 71. The handle is mounted in a socket 72 whose shank 73 is pivotally attached to the lug 69 as indicated at 74. The shank has at its bottom wing-like members 75 adjustably connected by way of a bolt 76 to the slotted portion 71. This provides practical and convenient means for adjusting the leverage and position of the handle to accommodate persons of short or tall stature.

In conclusion and by way of introduction to the following claims I would mention briefly some of the structural features exemplary of the novelty embodied in this improved floor machine. As before indicated a feature of paramount importance is the provision of a valved water supply tank 42 on the handle as shown in Figure 1 wherein this supplies water under the control of the operator by way of a pipe or hose 39 to the depending nozzle 38, the nozzle 38 being centrally located over the apertured portion of the water receiving pan of the brush holder. This supplies water uniformly and properly to the center of the brush so that the machine can be converted into a scrubbing machine if and when desired.

An important advantage is derived by using a fixedly mounted vertical motor on the rear end of the frame or casing as shown in Figure 4 to drive the belt, which belt is trained over the two

pulleys 20 and 40 respectively. By employing the simple spring-pressed belt take-up device shown in Figure 6 this keeps the belt constantly under tension and is an automatic means, so to speak, to insure proper smooth operation of the brush. The important thing to be noted however is that it is possible with this arrangement to obviate the necessity of adjustably mounting the motor on the frame as would be done if the machine were to be employed by skillful hands rather than by the average person.

The simple two-wheeled truck 57 confined in the rectangular rear portion of the casing and conjointly related to the self-leveling brush is a distinctive improvement. Novelty is thought to reside in the special adjusting means for this truck illustrated in Figure 7.

Additional novelty is predicated on the structural assemblage depicted explicitly in Figure 5. Here it will be observed that the two washers 53 and 54 cooperating with the felt washer 56 and the self-aligning bearing and hub structure 51 is an ingenious adaptation. Then too the idea of providing the brush holder and making it of a single casting to include the hub and proper mounting means for the washers and other details and incorporating therein the integral pulley 40 which defines the water pan 41 is believed to be an improvement. Furthermore the handle mounting and other features hereinbefore touched upon and described are appreciable refinements.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary.

Minor changes in shape, size, and rearrangement of details coming within the field of invention claimed may be resorted to in actual practice, if desired.

I claim:

1. A machine of the class described embodying a casing and a steering handle attached to said casing, said casing being provided with a bearing, a vertically disposed headed journal pin supported in said bearing, a rotary brush holder arranged in said casing within the vicinity of said bearing and said pin, said holder including an adaptor plate provided with a hub receiving the headed end of the pin and a self-aligning bearing seated in said hub and surrounding the pin adjacent the headed end, an abutment washer fixedly attached to the casing and surrounding the pin between the casing and self-aligning bearing, and a companion washer attached to said adaptor plate and surrounding the first named washer in concentric relation, the adjacent edge portions of said washers being beveled and spaced apart to permit a limited tilting motion of said adaptor plate in relation to the casing.

2. A machine of the class described embodying a casing, a steering handle attached to said casing, said casing being provided with a bearing, a vertically disposed headed journal pin supported in said bearing, a rotary brush mounted in said casing within the vicinity of said bearing and said pin, said holder including an adaptor plate provided with a hub receiving the headed end of the pin, a self-aligning bearing seated in said hub and surrounding the pin adjacent the headed end, an abutment washer fixedly attached to the casing and surrounding the

pin between the casing and self-aligning bearing, a companion washer attached to said adaptor plate and surrounding the first named washer in concentric relation, the adjacent edge portions of said washers being beveled and spaced apart to permit a limited tilting motion of said plate, and a lubricant containing pan fastened to said second named washer, said pan having a discharge opening in registry with the space existing between the beveled edges of said washers to expedite the delivery of lubricant to the self-aligning bearing and said hub, and a felt pad of absorbent material located in said pan, said pan encircling the bearing and covering the aforesaid space to prevent dirt and grit from entering said self-aligning bearing.

3. A low built machine especially constructed for scrubbing, brushing and polishing beneath furniture embodying a casing of longitudinally elongated dimensions having a low-lying circular front portion with a depending marginal flange of relatively short vertical height constituting a rim, said rim-equipped front portion of the casing serving as a brush enclosure, having a flat top provided with a centralized circular shallow depression defining a weight-receiving pocket, the marginal wall of said pocket being of beveled form, a flat-top pressure weight of disk-like design removably seated in said pocket and having a beveled marginal edge cooperat-

ing with the beveled wall of said pocket and having its top substantially flush with the top of said casing, a motor supported on said casing at a point remote from the weight, a rotary brush mounted in said enclosure, and an operating connection between the brush and the motor.

4. A low built floor machine especially constructed for scrubbing, brushing and polishing beneath furniture without removing the furniture, said machine embodying a casing of longitudinally elongated dimensions having a low-lying circular front portion with a depending marginal flange of relatively short vertical height constituting a rim and serving as a brush enclosure, the top of said circular front portion being substantially flat and having a central depression defining a centralized bearing, said depression formed in a centralized bearing, said depression defining a weight receiving pan, a journal pin having a screw-threaded, nut equipped end, said pin being located in said bearing with the nut equipped end arranged above the bearing in an easily accessible place, a rotary brush equipped holder located in said inclosure operatively connected to said journal pin, and a removable pressure weight seated in said pan and overlying said bearing and the nut equipped end of said journal pin, the central portion of said weight having a recess to accommodate the bearing and the nut equipped end of said pin.

HARRY L. MYERS.