Sept. 24, 1940. W. F. WEATHERS 2,215,678

DOOR OFERATING MECHANISM

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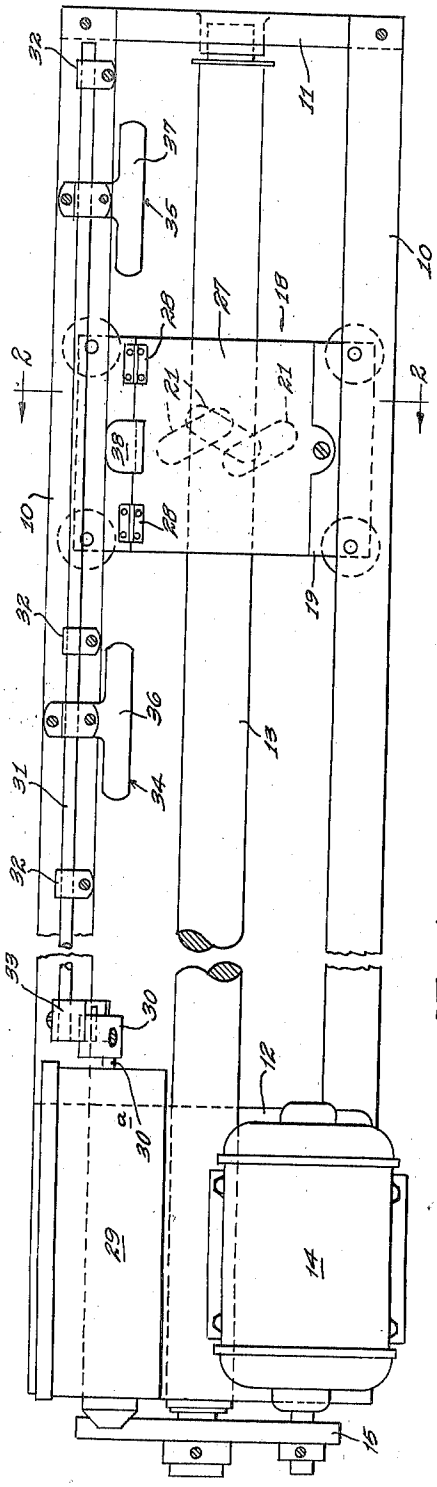


FIG. 1

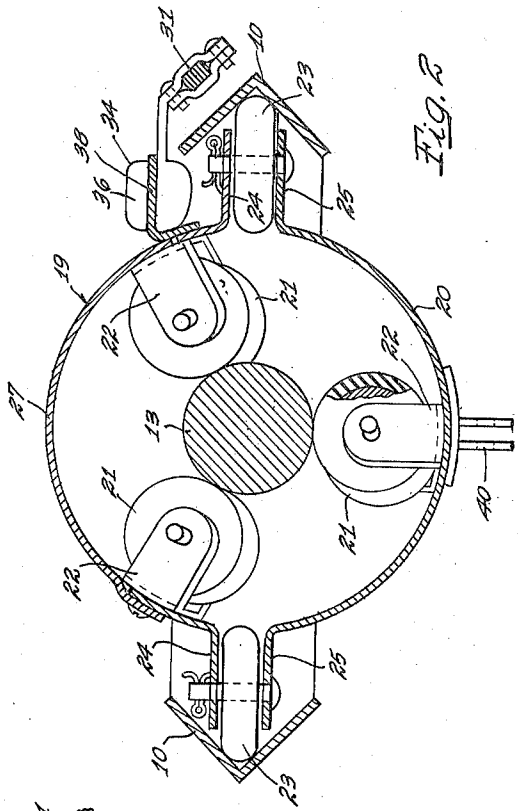


FIG. 2

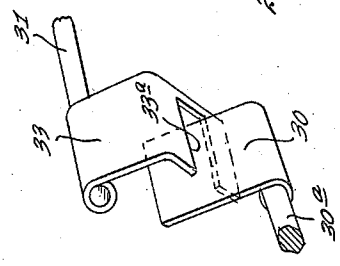


FIG. 3

Inventor
WARREN F. WEATHERS.

By

Attorneys

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DOOR OPERATING MECHANISM

Warren F. Weathers, Detroit, Mich., assignor of one-half to Louis J. Flint, Detroit, Mich.

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8 Claims. (Cl. 74—25)

This invention relates generally to door operating mechanism and more particularly to mechanism for operating an overhead type of door.

In the past, it has been the practice when installing door operating mechanism to ship the parts from the factory to the site of installation and assemble the parts at the site. Usually this was necessary due to the fact that the assembly structures were bulky and not adaptable to the requirements of various sites. As a result, to install these door operating mechanisms required the services of several skilled mechanics and consequently door operating mechanisms have been too expensive for the general public.

Accordingly, it is an object of the present invention to provide a new and improved door operating mechanism which may be readily installed as a unitary structure.

Another object of the present invention is to provide a new and improved door operating mechanism constructed in such a manner as to make it inexpensive and thus availabe to the general public.

Another object of the invention is to provide a door operating mechanism having a new and improved traveler device.

A further object of the invention resides in the provision of guide channels for guiding a driven traveler device and for preventing rotation of the traveler device.

Other objects of the invention will become apparent from the following detailed description taken in connection with the drawing in which:

Fig. 1 is a top plan view of the door operating mechanism;

Fig. 2 is an enlarged cross sectional view of the mechanism, taken along the line and in the direction of the arrows 2—2 of Fig. 1; and

Fig. 3 is a perspective view of details of the structure.

Referring to the drawing by characters of reference, the door operating mechanism includes a rectangular frame comprising spaced longitudinal frame members 10 which are rigidly secured together by end cross members 11 and 12. A drive shaft 13, extending longitudinally of and between the frame members 10, is journalled in bearings in the frame cross members 11 and 12 and is driven or rotated by an electric motor 14 which is mounted on the end cross member 12. The motor 14 drives the shaft 13 through gears enclosed in a housing 15, but any other suitable drive connection may be employed.

Carried and driven by the shaft 13, there is a carrier or traveler member 18 which includes a support, preferably comprising a pair of semi-cylindrical, upper and lower sheet metal sections 19 and 20 respectively which cooperate to form a substantially cylindrical body or casing. Within and carried by the sectional support, a plurality of radially spaced rollers 21, of which there are three in the present instance, are arranged to engage the periphery of the shaft 13 to be driven or rotated thereby. As shown, the rollers 21 are arranged with their axes of rotation angularly disposed with respect to the axis of rotation of the shaft 13 so that rotation of the shaft 13 will cause the traveler member 18 to travel longitudinally of or along the shaft 13. The rollers 21 may be secured to the sections 19 and 20 by U-shaped brackets 22, two of the rollers 22 being secured to the upper section 19 and the other roller 22 being secured to the lower section 20.

In order to prevent rotation of the traveler member 18 and to guide it in its travel along the shaft 13, the longitudinal frame members 10 serve as guide rails or channels wherein engage guide rollers 23, carried by the traveler, the frame members 18 preferably being angle members or V-shaped in cross section. The sections 19 and 20 of the traveler support are provided with oppositely disposed, outturned side flanges 24 and 25 respectively, the flanges 24 being disposed above and in spaced relation to the flanges 25. Between each of the pair of flanges 24 and 25 a pair of the rollers 23 is provided and are rotatable on vertical pins or shafts which are received in aligning apertures in the flanges 24 and 25.

In the upper section 19 of the casing there is an opening which is closed by a closure member 27 which is made of sheet metal and is hinged, as at 28, at one side edge thereof to the upper section 19. The upper rollers 22 are carried by the hinged closure member 27 so that, when the closure member 27 is drawn down tightly, all of the rollers 22 will be drawn inwardly against the shaft 13 to insure proper traction with the shaft. Preferably, the rollers 22 are rubber tired for further improving traction thereof with the shaft 13, the tires being of resilient rubber and being slightly compressed and held under compression by the closure member 27.

The electric motor 14 is of the so-called reversible type and is controlled by a three pole, double throw electric switch, designated in general by the numeral 29, the switch being mounted on the frame adjacent to the motor 14. Any suitable type of switch adapted to stop the motor and change the circuit so that the motor will reverse when again started may be employed. The pres-

ent switch is provided with a rotatable shaft 30a projecting externally of the switch casing and on the shaft 30a is secured an operating member 30. A rotatable rod 31 is mounted on one of the longitudinal frame members 10 by spaced brackets 32 and, extending longitudinally of the frame, carries an operating member 33 which is provided with a slot 33a to receive the operating member 30 to turn the latter to actuate the switch 29. Secured to the rod 31, a pair of spaced cam members 34 and 35 are provided, of which the cam member 35 has an upper convex cam surface 36, and the member 35 has an upper concave cam surface 37. Secured to and externally of the upper section 19 of the traveler member 18, there is a cam operating member 38 which, near the end of movement of the traveler member to the left, engages the cam surface 36 of the cam 34 and pivots the cam member which turns the rod 31 in one direction and through the cooperating operating members 33 and 34 actuates the switch 29 to stop the motor 14 and to reverse the motor circuit. Similarly, on movement of the traveler member in the opposite direction, or to the right, the member 38 will engage the cam surface 37 of cam 35 and rotate the rod 31 to actuate the switch 29 and stop the motor 14 and reverse the circuit thereof.

As previously mentioned, the present apparatus is adapted, among other uses, for raising and lowering so-called overhead garage doors and, when used for this purpose, a lug 40 of the traveler member 18 is connected by a connecting link (not shown) to the door. On raising or opening the door, the motor 14 is started by a suitable switch which may be a push button type. When the motor 14 is energized, it rotates or drives the shaft 13 which in turn drives the angularly disposed rollers 22 causing the traveler member 18 to move either to the right to raise or close a door. When the operating member 38 carried by the traveler member engages the cam surface 36 of the cam member 34 and depresses or pivots the cam member, rod 31 is turned, and through the cooperating operating members 30 and 33 the switch 29 is actuated to stop the motor. On lowering or closing the door, the motor 14 is started by the above mentioned switch means and now operates in the reverse direction to cause travel of the traveler member in the opposite direction. When the traveler member 18 approaches the position where the door will be substantially closed, the operating member 38 engages the cam surface 37 of the cam member 35 and, depressing the cam member, turns the rod 31 which through the cooperating member 30 and 33 actuates the switch 29 to stop the motor 14 and reverse the motor circuit.

While I have shown and described my invention in detail, it is to be understood that the same is to be limited only by the appended claims for many changes may be made without departing from the spirit and scope of the invention.

What I claim is:

1. In an apparatus of the character described, a frame including a pair of spaced longitudinally extending guide channels, a drive shaft carried by said frame and extending longitudinally of said guide channels, a reciprocal carrier member having rollers guided in said guide channels, a plurality of driven rollers carried by said carrier member and engaging the periphery of said drive shaft, said driven rollers being angularly disposed relative to the axis of rotation of said drive shaft and driven thereby to move said carrier member longitudinally thereof, and means for driving said shaft and carried by said frame.

2. In an apparatus of the character described, a frame including a pair of spaced longitudinally extending guide channels, a drive shaft mounted on said frame and extending longitudinally of and between said guide channels, a movable carrier member having rollers for traveling in said guide channels, a plurality of driven rollers carried by said carrier member and engaging the periphery of said drive shaft, said rollers being angularly disposed relative to the axis of rotation of said shaft to provide for moving said carrier member along and by rotation of said shaft, and drive means mounted on said frame for driving said shaft.

3. In an apparatus of the character described, an elongated frame including a pair of spaced substantially parallel guide channels, a drive shaft extending longitudinally of and between said guide channels, a carrier member surrounding said shaft and movable longitudinally thereof, a plurality of radially spaced rollers carried by said carrier member and yieldingly urged into engagement with the periphery of said shaft, said rollers being angularly disposed relatively to the axis of rotation of said shaft, guide rollers carried by said carrier member and traveling in said guide channels, and an electric motor mounted on said frame for controlling said motor and actuated by said carrier member.

4. In an apparatus of the character described, a traveler member comprising a casing of sectional construction, resilient rollers within said casing for engaging the periphery of a drive shaft, some of said rollers being carried by one of the casing sections and other of said rollers being carried by other of the casing sections, said sections being relatively movable, and means including said casing sections for urging the rollers against the periphery of the shaft.

5. In an apparatus of the character described, a traveler member comprising a sectionally constructed casing, said section being relatively movable, a plurality of radially spaced rollers within said casing for engaging the periphery of a drive shaft, means mounting some of said rollers on one of said sections and other of said rollers on other of said sections, and means including said relatively movable sections for urging said rollers against the periphery of the shaft.

6. In an apparatus of the character described, a traveler member comprising a casing for surrounding a drive shaft and having an opening in a wall thereof, a removable closure member closing said opening, a plurality of radially spaced rollers within said casing for engaging the periphery of the shaft, some of said rollers being carried by said casing and other of said rollers being carried by said closure member, and means securing said closure member to said casing and holding said rollers against the periphery of the drive shaft.

7. In an apparatus of the character described, a traveler device comprising a casing for surrounding a drive shaft and having an opening in a wall thereof, a closure member hinged to said casing and closing said opening, a plurality of radially spaced, resilient driven rollers for engaging the periphery of the drive shaft, some of said rollers being carried by said casing and other of said rollers being carried by said hinged closure member, and means for securing said closure member in closed position and holding said roll-

ers under compression against the periphery of the shaft.

8. In an apparatus of the character described, a traveler device comprising a casing for surrounding a drive shaft and comprising an upper section and a lower section, driven rollers mounted within said casing and arranged to engage the periphery of the drive shaft, said upper and lower sections having out-turned oppositely directed flanges, guide rollers disposed between the overlying oppositely disposed pairs of flanges, and means attaching the overlying flanges of each pair together and rotatably supporting said guide rollers.

WARREN F. WEATHERS.