April 14, 1925. 1,533,652

G. E. LE COUNT

PREPAYMENT ELECTRIC FAN

Original Filed Aug. 24, 1922 2 Sheets-Sheet 1

Fig. 1.

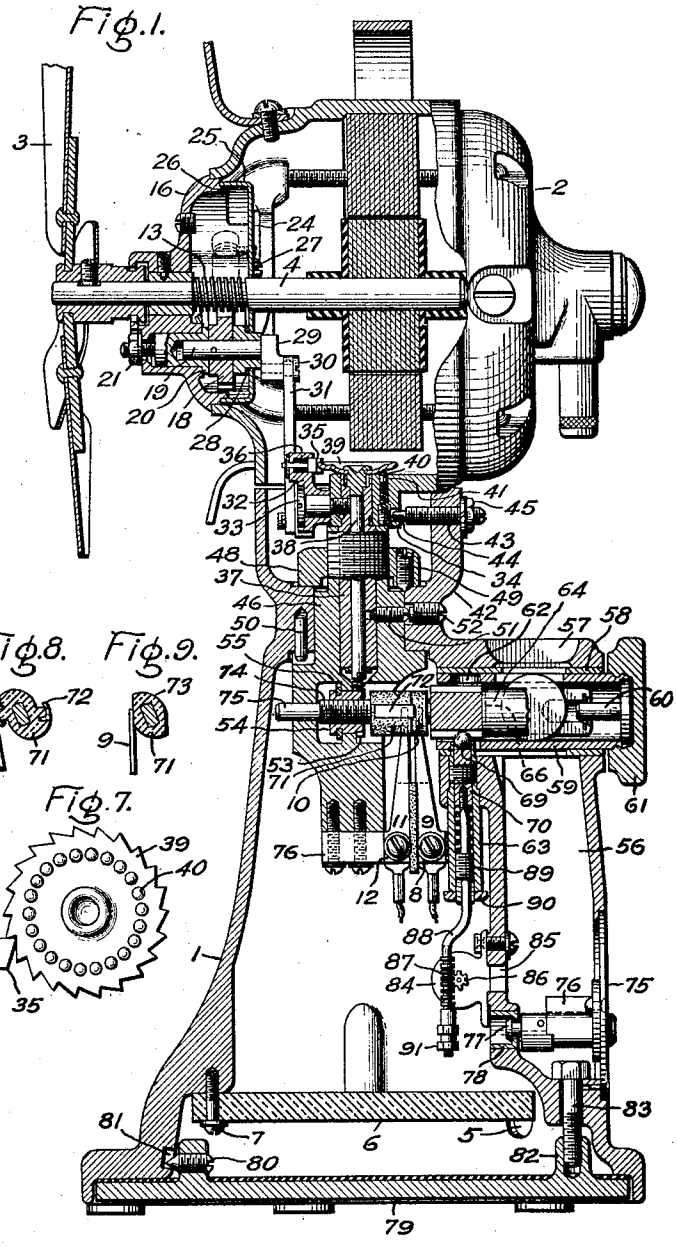


Fig. 2.

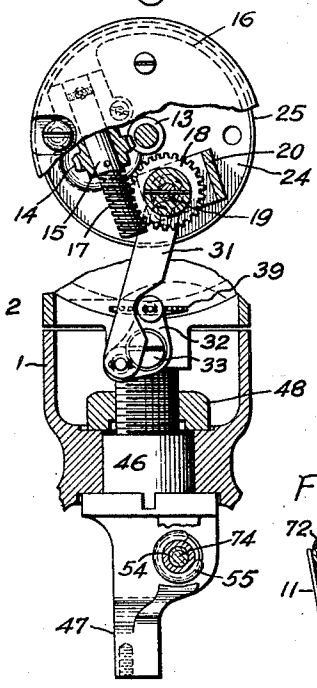


Fig. 8.

Fig. 9.

Fig. 7.

Fig. 3.

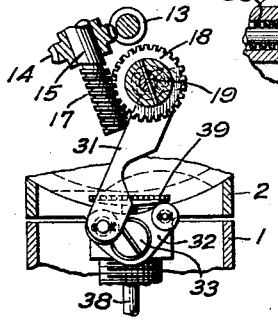


Fig. 4.

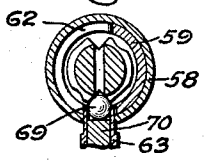


Fig. 5.

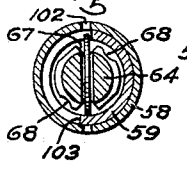
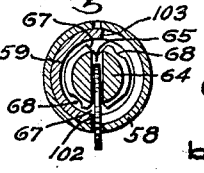


Fig. 6.



Inventor:
George E. Le Count,
by Alexander S. Lunt
His Attorney.

April 14, 1925. 1,533,652

G. E. LE COUNT

PREPAYMENT ELECTRIC FAN

Original Filed Aug. 24, 1922 2 Sheets-Sheet 2

Fig.10.

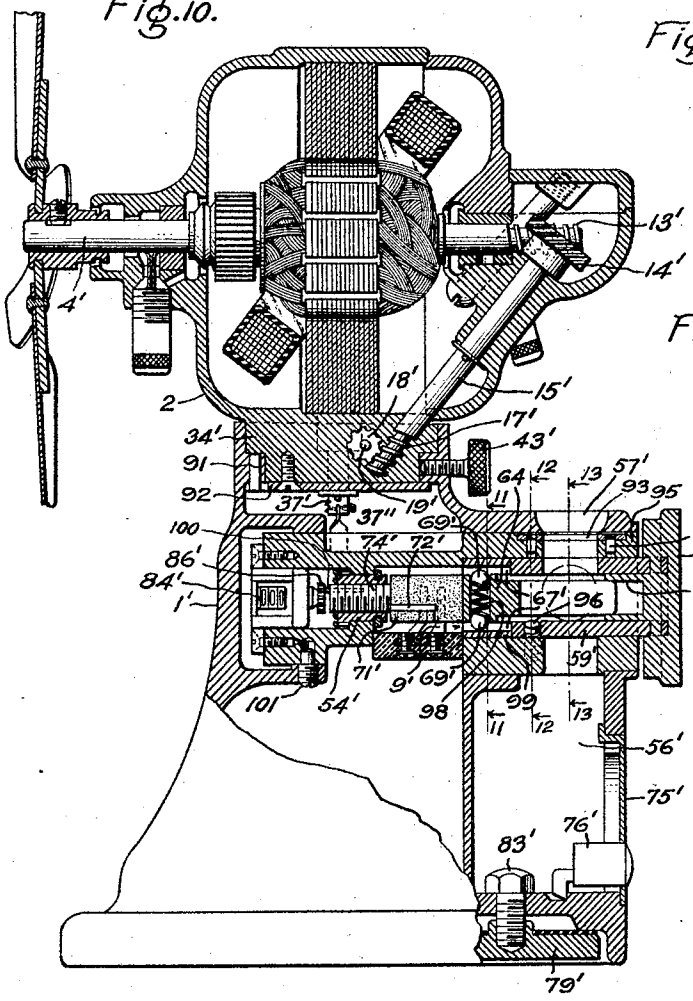


Fig.11.

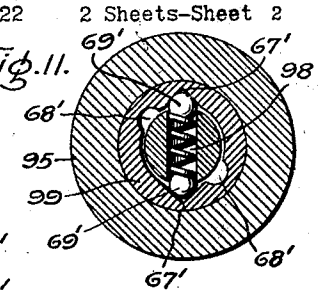


Fig.12.

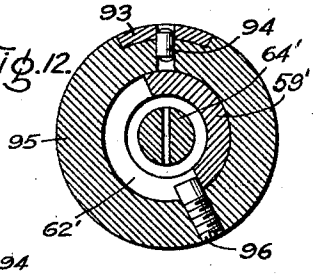


Fig.13.

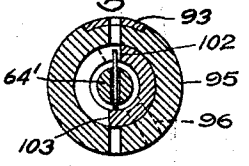


Fig.14.

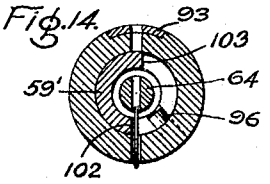
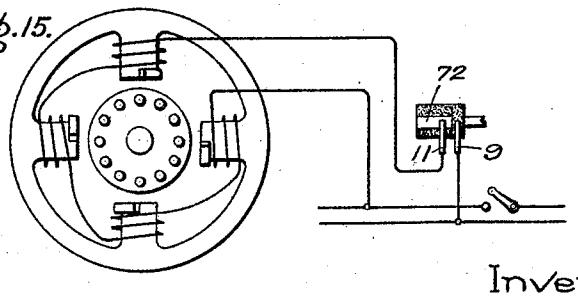


Fig.15.



Inventor:
George E. LeCount,
by Alexander S. Lunt
His Attorney.

Patented Apr. 14, 1925. 1,533,652

UNITED STATES PATENT OFFICE.

GEORGE E. LE COUNT, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

PREPAYMENT ELECTRIC FAN.

Original application filed August 24, 1922, Serial No. 583,960. Divided and this application filed May 24, 1924. Serial No. 715,704.

To all whom it may concern:

Be it known that I, GEORGE E. LE COUNT, a citizen of the United States, residing at Pittsfield, county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Prepayment Electric Fans (division of my application filed August 24, 1922, Serial No. 583,960), of which the following is a specification.

The present invention relates to electric fans and more especially to prepayment fans whereby use thereof may be had for a predetermined period of time upon the insertion of the prescribed coin.

The object of my invention is to provide a high grade prepayment fan in which all the functioning parts, with the exception of the fan blades, shall be encased and protected from injury by the iron shell or housing thereof, and shall be practically immune from picking or beating of the coin-controlled apparatus.

For an understanding of the invention, reference may be made to the accompanying drawings forming a part of this application in which Fig. 1 is a vertical section of a prepayment fan embodying one form of the invention; Fig. 2 is a sectional elevation showing the reduction gear train between motor shaft and ratchet drive of the timing means; Fig. 3 is a similar view with parts shown in Fig. 2; Figs. 4, 5 and 6 are cross sections of the coin barrel; Fig. 7 is a plan view of the pawl and ratchet of the timing train; Figs. 8 and 9 are cross sections of the timing plunger taken through the bridging contacts and the adjacent reduced portion; Fig. 10 is a vertical section of a modified embodiment of my invention; Fig. 11 is a cross section of the coin barrel taken on line 11—11, Fig. 10; Fig. 12 is a similar view on line 12—12; Figs. 13 and 14 are similar views on line 13—13 showing the progress of a coin through barrel; and Fig. 15 is a diagram of the electric circuit.

In the embodiment of the invention shown in Figs. 1 to 9, a cast iron pedestal 1 supports at its upper end an electric motor 2 of well known general construction with blast impelling blades 3 secured to one end of the armature shaft 4. The lead wires enter an aperture 5 near the lower end of the pedestal and one of them is connected to a contact of a hand switch (not shown) carried by an insulating disk 6 secured to the inner lower portion of the pedestal by set screws 7, and the other wire is connected to a binding post 8 on a spring contact 9 of the timing switch 10. A second spring contact 11 of the timing switch has a binding post 12, to which the end of one motor lead wire is connected, while the other motor wire is connected to a second contact of the hand switch on the disk 6. These motor lead wires pass through the neck of the pedestal and connect with the motor terminals in the usual manner, but for the sake of clearness of illustration of the mechanism they have not been shown in the drawing.

In order that the timing switch 10 may be actuated automatically to cut off the current after the fan has rendered a prescribed service, a train of speed reduction gearing is arranged in the motor 2 and consists of a worm 13 formed on the armature shaft 4 which meshes with a worm wheel 14 fast on a stub shaft 15 journalled in the front end plate 16 of the motor. This shaft has formed thereon a second worm 17 which meshes with a second worm wheel 18 fast upon a shaft 19 journalled parallel to the motor shaft 4 in a bracket 20 held in a recess in the end plate 16 by a nut 21. In order to retain grease about the reduction gearing, a shell 24 with a peripheral flange 25 is arranged to tightly engage a corresponding shoulder 26 on the end plate 16 and held thereto by screws 27, the inner end of the bracket 20 passing through the shell 24 and the joint being sealed by a packing washer 28.

To the inner end of the second shaft 19 of the reduction gearing is attached a crank 29, to which is attached by a screw 30 the upper end of a link 31. The lower end of the link is pivotally connected to one end of a wrist plate 32 pivoted on a set screw 33 tapped into a boss 34 on the lower side of the motor frame. The opposite end of the wrist plate 32 has a recess in which is seated a pawl 35 and its spring 36. Extending axially through the boss 34 is a hollow pivot shaft 37 held in fixed relation thereto by the inner end of the set screw 33, and journalled in the hollow shaft 37 is a worm shaft 38 having fixed to its upper end a

ratchet disk 39 adapted to be engaged and stepped around by the pawl 35, and in order to prevent retrograde movement thereof it is provided with a circular series of indentations 40 with which engages a spring plunger 41 seated in the boss 34 parallel to the axis thereof.

The pedestal is provided at its upper end with a crown flange 42 having rabbitted engagement with a circular shoulder on the motor frame and a radial set screw 43 tapped into the wall thereof and adapted to engage a notch 44 in the periphery of the boss 34 to lock the motor in fixed relation therewith. The outer end of the set screw is provided with a lock nut 45 to prevent it from working loose.

The neck of the pedestal is bored out vertically for the reception of the shank 46 of a bearing support or bracket 47 having a longitudinal bore for the reception of the hollow shaft 37 and its upper end threaded for the reception of a nut 48 by which it is firmly secured from vertical movement and the latter is locked in position by a set screw 49. To prevent rotary movement of the bracket 47, a dowel pin 50 is provided and to lock the hollow shaft 37 therein a radial set screw 51 is tapped through the wall of the shank 46 and entered in a notch formed in the side of the hollow shaft and this set screw 51 is concealed and locked by a second set screw 52 tapped through the wall of the neck of the pedestal.

The vertical worm shaft 38 meshes at its lower end with a worm wheel 53 formed integrally with a lead nut 54 horizontally journalled in the bracket 47 and retained from axial movement by a split collet 55 engaging a peripheral groove therein. It will be observed that this nut is at the end of the speed reduction gear train, by virtue of which it is given one rotation in several hundred thousand rotations of the fan blades and extending over a time period of one or more hours according to gear ratios employed.

The coin-controlled means is arranged in a side enlargement of the pedestal 1 in which is formed a pocket or coin receptacle 56 and a coin slot 57. Extending horizontally across the upper end of the receptacle and below the coin slot is the means whereby upon the insertion of a proper coin the electric circuit may be closed for actuation of the fan for the prescribed period of time. This means comprises a bearing sleeve 58 having coin detector slots in top and bottom walls, the upper slot being of a length and width to exclude an oversize coin. Journalled in the sleeve 58 is the hand operated coin barrel 59 in the form of a tubular sleeve having only one coin slot therein and provided at its outer end with an inwardly extending stub shaft 60 and a handle or knob 61, while near its inner end is provided an arcuate slot 62 of more than a half circle, as indicated in Fig. 4, to permit it to be rotated through 180° without interference with the means for retaining it against axial movement consisting of the vertical guide tube 63. The coin barrel 59 has an internal bore of a diameter such that when a proper sized coin is entered therein it will, while resting on the lower inner wall, extend outwardly in the slot but just within the outer periphery of the barrel so as to clear the side of the slot in the sleeve 58 and permit the barrel and coin to be rotated without interference therefrom, as indicated in Fig. 1.

Disposed concentrically of the coin barrel 59 is the coin plunger 64 capable of axial and rotary movement therein. The plunger 64 has a longitudinal cross slot 65 at its outer end and extending to the dotted line 66, and accordingly in excess of what is needed for the entrance of a single coin but for a purpose to be set forth below. The outer end of the plunger is bored out to receive the stub shaft 60 upon which it is journalled. The coin plunger 64 has at its center pairs of longitudinal grooves 67 and 68 with which engages a yieldable brake member in the form of a steel ball 69 forced upwardly by a spring plunger 70 in the guide tube 63 threaded into a tapped hole in the pedestal. When a coin is inserted, as indicated in Figs. 1 and 5, it locks the barrel 59 to the plunger 64 so that the latter may be rotated against the opposition of the yieldable brake through a half turn where the coin is free to pass out through the lower slot in the bearing sleeve 58, as indicated in Fig. 6, and enter the coin receptacle 56.

The coin plunger 64 is also provided near its center with the timing switch 10 comprising an insulated block 71 having part of its length formed into cam surfaces with longitudinal contact bars 72 moulded therein, as shown in Figs. 1 and 8, while its outer end 73 beyond the ends of the contact bars is reduced in diameter, as indicated in Figs. 1 and 9, so that when the plunger 64 has moved to the left, as shown in Fig. 1, far enough to displace the active contact bar 72 from under the spring switch contact 9, the latter drops down upon the reduced end 73 and breaks the circuit with a snap action.

Just beyond the switch block 71 the plunger is provided with a thread 74 for engagement with the lead nut 54 at the end of the timing gear train, while the extreme end 75 of the plunger is turned cylindrically and journalled in the bearing bracket 47, which latter also carries at its lower end a horizontal bar 76 of insulation on which the spring contacts 9 and 11 are supported.

It will be understood that each time the plunger 64 is coupled to the coin barrel 59 by a coin and rotated counterclockwise

therewith to the discharge of the coin, it will be unscrewed from the lead nut 54 a corresponding half turn of the threads 74, the friction clutch operating to hold the plunger at the end of each half turn from being returned with the return movement of the coin barrel. This operation may be repeated a number of times in succession for the insertion at one time of five or six coins until the plunger has been unscrewed from the lead nut sufficiently to bring the end 66 of its coin slot into position to interfere with the passage of additional coins. The operation of the fan through the timing gear upon the lead nut 54 acts to draw the plunger 64 back to the position indicated in Fig. 1 and, of course, the time of operation will correspond to the number of half turns given the plunger 64 through entrance of coins.

The coin receptacle 56 has in the outer wall thereof a displaceable trap door 75 in the form of a steel disk having on its inner wall a suitable lock 76 with a spear head 77 arranged to enter an oblong hole in an escutcheon 78 fixed in the rear wall of the receptacle and interlocked therewith.

The lower end of the pedestal is enclosed by an iron plate 79 having a spur 80 adapted to enter a notch 81 in the inner wall of the pedestal opposite the coin receptacle, and near its opposite edge is a tapped boss 82 adapted to be engaged by a set screw 83 extending through the bottom of the coin receptacle so that it can be manipulated only when the latter is open and thus prevent access to any of the operative parts by unauthorized persons.

A coin or operation counter gear 84 in the form of a cyclometer is secured to the inner wall of the coin receptacle over a window aperture 85 cut therein opposite the trap 75, so that when the latter is open the counter may be read. The counter is provided with the usual ratchet wheel 86, with which engages a reciprocating rack 87 connected at the upper end of is stem 88 to the spring plunger 70, so that it is depressed each time the coin plunger 64 is operated in the entrance of a coin as above set forth. The rack stem 88 is square in cross section and guided in a correspondingly apertured bushing 89 threaded into the lower end of the guide tube 63 and fixed by a lock nut 90. The rack 87 is in the form of a nut threaded upon its stem and its teeth are in the form of spaced collars so that it may be rotated while maintaining continuous engagement with the ratchet wheel 86 and it is fixed in adjusted position by a lock nut 91.

In the modified construction shown in Figs. 10 to 14, the motor shaft 4′ is provided with a worm 13′ at the rear end thereof which meshes with a worm wheel 14′ fast on a shaft 15′ extending diagonally to the neck of the motor where it is provided with a second worm 17′ meshing with a second worm wheel 18′ fast on a shaft 19′ having a third worm and worm wheel engagement with a vertical shaft 37′ provided at its lower end with a slot and cotter pin connection with a worm shaft 37″ which meshes with a lead nut 54′.

In this modification the motor frame 2 is provided at its lower side with a large boss 34′ adapted to seat upon an internal shoulder 91 in the neck of the pedestal 1′ where it is secured by a plate 92 screwed thereto and underriding the internal shoulder 91. A radial thumb screw 43′ operates to clamp the motor frame in adjusted position relative to the pedestal.

The pedestal 1′ and coin receptacle 56′ are arranged similar to the construction first described. In the place of a bearing sleeve 58 an arcuate detector plate 93 provided with dowel pins 94 is positioned within the coin slot 57′ in a seat cut in a cylindrical bearing support 95 for the coin barrel 59′, the coin plunger 64′, worm shaft 37″ and counter 84′.

The coin barrel 59′ is held against axial movement by a set screw 96 tapped through the wall of the support 95 and projecting at its inner end into an arcuate slot 62′.

The coin plunger 64′ is journalled at its outer end in a bearing 97 formed in the inner end of the handle or knob 61′, while its opposite end is provided with a screw thread 74′ in engagement with the lead nut 54′.

The friction clutch for the coin plunger comprises two steel balls 69′ disposed in a transverse aperture in the plunger and yieldingly pressed outward by a spring 98 disposed between them. These balls normally engage V-shaped grooves 67′ formed internally of a ring 99 fixed in the bearing support 95. Other slots 68′ are also provided for a purpose to be set forth below.

The switch block 71′ and contacts 72′ are the same as in the construction first described. The stationary contacts 9′ and 11′ differ only in that they are made somewhat shorter and are supported on an insulating block 76, secured transversely to the bearing support 95.

The counter gear 84′ is secured by screws across the inner end of the bearing support and extending into the bore thereof with its ratchet wheel 86′ in position to be engaged by an eccentric finger 100 slidable in the end of the coin plunger 64′.

The bearing support is detachably secured in position by a set screw 101 extending through an interior wall of the pedestal and engaging a notch formed in the periphery of the support.

Referring to Figs. 5, 6, 13 and 14, it will be noted that the coin slot in the coin barrel 59 or 59′ is formed by the removal of an arcuate segment of nearly 180° and a length

greater than the diameter of the coin and so positioned relative to the slot 62 or 62′ that the upper or leading edge 102 thereof will normally stand clear of the detecting or entrance slot for the coin, while its lower edge 103 is positioned to close the exit slot and provide a step on which the coin rests, while the coin barrel is being given its half turn, as indicated in Figs. 5 and 13. Upon completion of the half turn of the coin barrel, the parts will be positioned, as indicated in Figs. 6 and 14, so that the coin is free to pass out through the lower slot into the coin receptacle 56 or 56′.

It is to be noted that the leading edge 102 of the coin barrel slot passes the detector slot and shuts it before the coin plunger has been moved to release the clutch ball 69 or 69′ from engagement with the coacting groove 67 or 67′, and in case the coin barrel be turned in the opposite direction before the coin plunger has been rotated far enough to bring its opposite V groove into contact with the clutch ball, it cannot positively return the coin plunger, and in case of those parts being frictionally engaged by gum or grit the plunger will be arrested by a shallow groove 68 or 68′ engaging with the clutch ball before the coin is brought near the entrance slot, although the edge 102 of the barrel slot may have been moved back sufficiently to clear the entrance slot.

While I have shown and described the best embodiment of the invention known to me, I do not desire to be restricted thereto.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. A prepayment electric fan with a hollow pedestal having housed therein an electric switch, coin controlled setting means therefor, a timing gear train, and electric connections between said motor and said switch.

2. A prepayment electric fan having a supporting pedestal, a timing gear train driven by the fan motor and extending into said pedestal, an electric switch having a rotary shaft, a common bearing support for said shaft and the end member of said gear train, and coin-controlled means for setting said electric switch in said pedestal.

3. A prepayment electric fan having a supporting pedestal, a lead nut disposed in said pedestal, a timing gear train driven by the fan motor and driving said lead nut, a coin-controlled switch shaft engaging said lead nut, and a common bearing support for said nut and said shaft.

4. A prepayment electric fan having a supporting pedestal pivotally and detachably connected thereto, a timing gear train driven by the fan motor and extending into said pedestal, an electric switch for controlling the motor located in said pedestal and actuated in one direction by said gear train, and coin-controlled means for setting said switch in the opposite direction.

In witness whereof, I have hereunto set my hand this 22nd day of May, 1924.

GEORGE E. LE COUNT.