J. D. KARLE.

MECHANICALLY DRIVEN FAN.

APPLICATION FILED APR. 25, 1919.

1,435,477. **Patented Nov. 14, 1922.**

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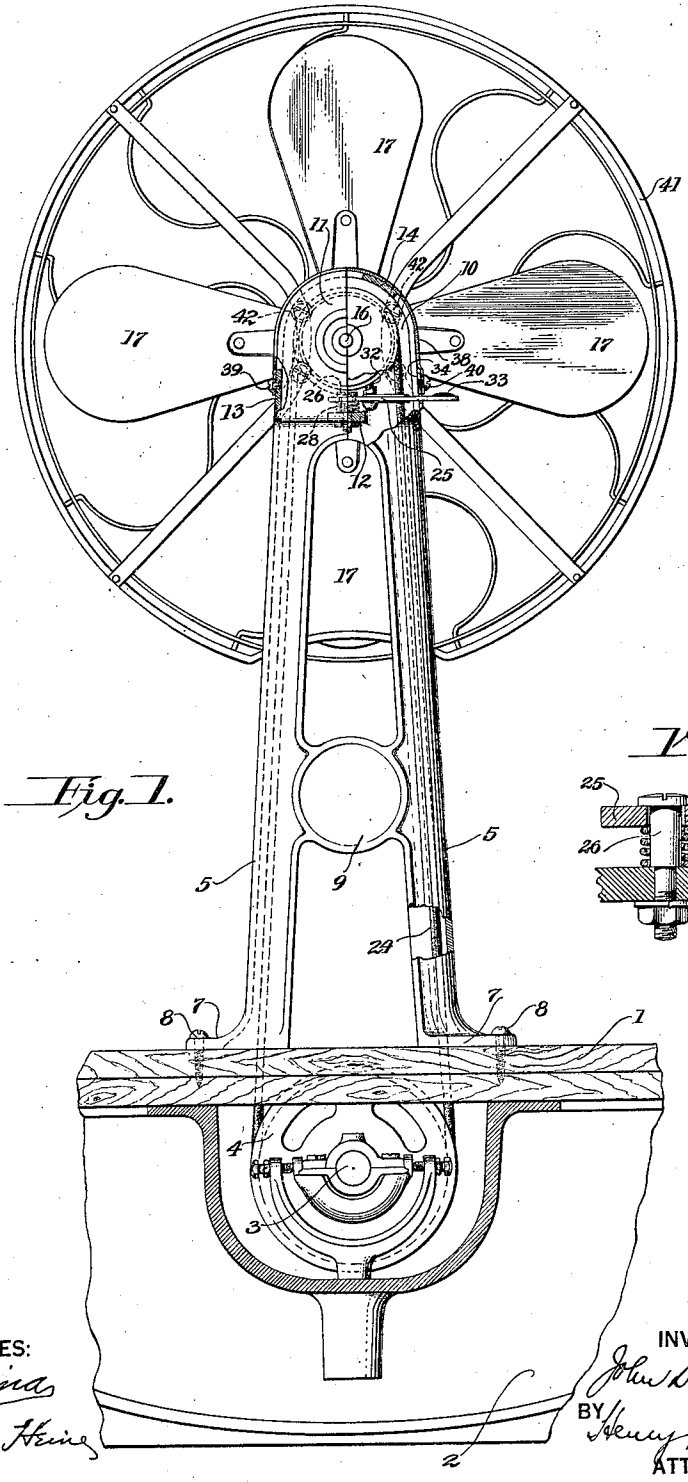
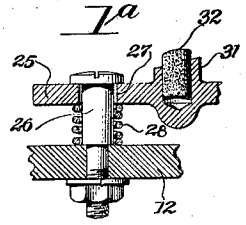


Fig. 1.



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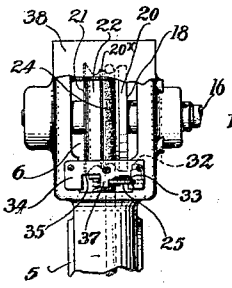
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2 SHEETS—SHEET 2.

Fig. 3.



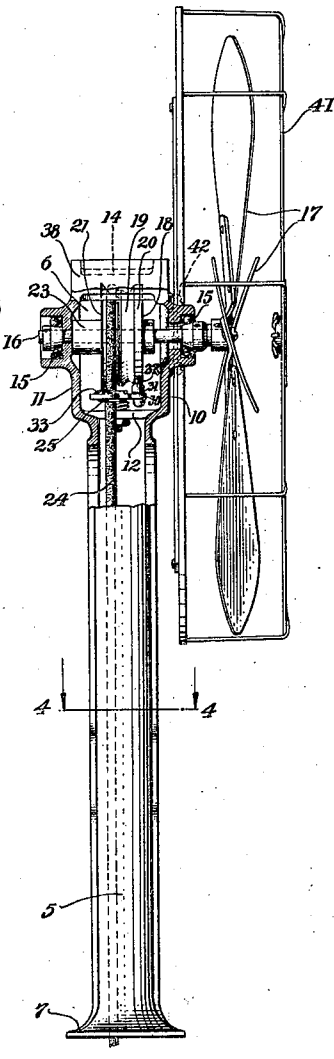
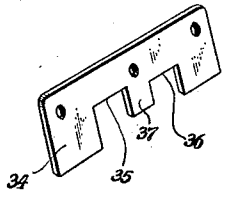


Fig. 2.

Fig. 6.



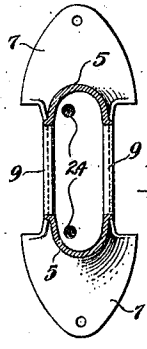


Fig. 4.

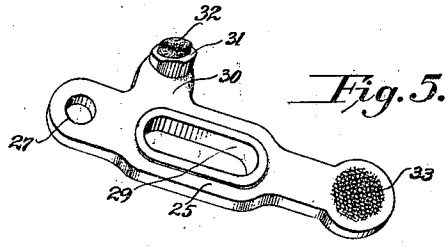


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN D. KARLE, OF ROSELLE PARK, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

MECHANICALLY-DRIVEN FAN.

Application filed April 25, 1919. Serial No. 292,603.

To all whom it may concern:

Be it known that I, JOHN D. KARLE, a citizen of the United States, residing at Roselle Park, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Mechanically-Driven Fans, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to mechanically driven fans, more particularly of the type adapted to receive power through a driving belt, and has for an object to provide a fan which may be readily started and stopped and which will not require the installation of additional protective devices for the driving mechanism.

A further object of the invention is to provide a power fan of simple construction which is adapted for mounting upon a power table of the type commonly used to support sewing or other small machines in factory installations.

Further objects of the invention will appear from the following description and claims.

In the present embodiment of the invention, the fan receives power through a driving belt and to avoid the necessity of providing additional guarding means therefor, the fan is provided with a supporting standard including a pair of legs which are channeled to receive and protect the limbs of the driving belt. The legs support a hollow head having bearings for a fan-shaft which carries a tight and a loose pulley. A belt-shifting device is mounted mainly within the hollow head but includes a finger-piece which projects externally of said head and may be readily manipulated to shift the belt from one to the other of the pulleys. The fan-shaft carries the usual propeller blades which are protected by a suitable guard.

In the accompanying drawings, Fig. 1 is a rear end elevation of the power fan of my invention. Fig. 1ª is a sectional view illustrating in detail how the belt shifting device of Fig. 1 is mounted. Fig. 2 is a side elevation of the complete fan, partly in section, showing the driving belt of the loose pulley. Fig. 3 is a fragmentary side elevation showing the belt on the tight pulley. Fig. 4 is a horizontal section of the standard through the line 4—4, Fig. 2. Fig. 5 is a perspective view of the belt-shifting lever and Fig. 6 is a perspective view of the plate which holds the belt-shifting lever in either running or non-running position.

While the present fan may be put to a variety of uses, it will be described as applied to a power-table, preferably such as disclosed in the application of Oliver L. Dosch, Serial No. 173,083, filed June 6, 1917, and including a table-top 1, carried by suitable supporting iron-work 2 in which the continuously running power or line-shaft 3 is suitably journaled; said line-shaft being provided in the present instance with a driving pulley 4. The fan proper, in its preferred embodiment, is formed with a frame shaped like the letter A and including the legs 5—5 which carry the hollow head 6. The legs 5—5 are each of channel formation; that is, they are concavo-convex or substantially U-shaped, in cross-section, as shown in Fig. 4. At their lower ends the legs 5—5 are flared outwardly to form feet 7—7 through which suitable screws 8—8 may be passed to secure the frame of the fan to the table-top 1. It will be noted that the legs 5—5 are arranged with their hollow or concave sides facing each other and that they are connected above the feet 7—7 by the spaced braces or transverse members 9—9.

The hollow head 6 of the frame is formed with spaced front and back walls 10 and 11, respectively, which are connected by a lower brace 12, a side brace 13 and a top brace 14. Journaled horizontally in suitable ball-bearings 15—15 in the walls 10 and 11 is the fan-shaft 16 having an outboard projection carrying the fan-blades 17.

Fixed to the fan-shaft 16, within the head 6, is the tight belt-pulley 18 having a belt-groove 19 and a peripheral braking surface 20. Mounted to turn upon the fan-shaft 16, alongside the tight pulley 18, is a loose pulley 21 having a belt-groove 22 and an elongated hub 23 affording an extended bearing surface upon the shaft 16. The adjacent side walls of the grooves 19 and 22 form a sort of central ridge 20ˣ, Fig. 3, between the two pulleys, over which the belt 24 may be readily shifted from one pulley to the other by a manually controlled belt-shifting device, preferably in the form of a lever 25.

The belt-shifting lever 25 is freely pivoted upon the headed vertical screw-pin 26 fixed to the brace 12; the lever 25 being formed

at its pivoted end with a hole 27 which is larger than the pin 26 which passes through it. A spring 28 surrounding the pin 26 and interposed between the lever 25 and brace 12 serves to yieldingly hold the lever 25 horizontally in engagement with the under surface of the head of the pin 26. It will be understood that by virtue of the above construction the lever 25 may be depressed but when released will tend to assume a horizontal position.

The lever 25 is formed between its ends with a belt-guiding slot 29, Fig. 5, and with a laterally projecting ear 30 which is formed with a socket 31 holding a brake-shoe 32 of some suitable material, such as leather. This brake-shoe is adapted to bear yieldingly upon the peripheral braking surface 20 of the tight pulley 18 when the belt-shifting lever is thrown to the left or non-running position, Fig. 2. When the lever 25 is shifted to running position, Fig. 3, the brake-shoe 32 is carried to one side of the surface 20.

To facilitate manual control of the lever 25, its free end is extended to the exterior of the head 6 and formed with a roughened handle or finger-piece 33. The belt-shifting lever 25 is held against lateral movement in either of its extreme positions by means of a retaining plate 34 having the retaining slots 35—36, separated by tooth 37. In shifting the lever from one of these slots to the other, it must be depressed below the tooth 37, thus insuring that the brake-shoe 32 will be depressed below the surface 20, before it is brought into position to be applied to such surface. It will be noted that the spring 28 serves the double function of forcing the brake-shoe 32 against the braking surface 20 of the pulley 18, and of yieldingly maintaining the lever 25 in one or the other of the slots 35, 36.

An inverted U-shaped cover-plate 38 is applied to the head 6 to close the sides and top of the latter. This plate is held in place by screws 39 and 40, applied to the brace 13 and retainer plate 34, respectively. A wire guard 41 of common form is preferably secured to the side wall 10 of the head 6 by means of screws 42.

From the foregoing it will be readily understood that the driving belt 24 is effectively housed within the legs 5 and head 6 of the standard which supports the fan to be driven. In other words the fan itself is inherently capable of protecting its driving belt, and no additional protective devices are required.

By virtue of the ridge $20^{\times}$ formed by the adjacent side walls of the grooved belt-pulleys 18 and 21, the driving belt will tend to snap over to the pulley toward which it is being shifted as soon as said belt is shifted past the center line of said ridge. For this reason, if the belt shifting lever 25 is not moved the entire distance from one of the slots in the plate 34 to the other, but is released while in contact with the extremity of the tooth 37, it will be thrown over into one or the other of said slots, depending upon which side of the center line of the ridge the belt 24 happens to be when the belt shifting lever 25 is released.

Having thus set forth the nature of the invention, what I claim herein is—

1. A belt-fan having, in combination, a fan-shaft, tight and loose belt-pulleys and fan-blades mounted on said shaft, and a standard transversely of which said shaft is journaled, said standard having a pair of hollow spaced legs substantially enveloping the limbs of a driving belt and means for shifting the belt.

2. A belt-fan comprising, in combination, a standard, a fan-shaft journaled in and transversely of said standard adjacent the upper end of the latter, tight and loose belt-pulleys carried by said fan-shaft, a belt-shifting device carried by said standard adjacent said pulleys, and means for arresting rotation of the fan-shaft when the belt is shifted onto the loose pulley.

3. A belt-fan comprising, in combination, a standard, a fan-shaft journaled in and transversely of said standard adjacent the upper end of the latter, tight and loose belt-pulleys carried by said fan-shaft, a belt-shifting lever fulcrumed in said standard, and a brake-shoe carried by said lever and adapted to bear upon said tight pulley when the belt is shifted onto the loose pulley.

4. A belt-fan comprising, a frame including supporting legs and a hollow head, a fan-shaft journaled in said head, tight and loose pulleys carried by said shaft within said head, and a belt-shifting device mounted mainly within said head and including a finger-piece extending exteriorly thereof.

5. In a belt-fan, a supporting standard comprising a pair of hollow legs each of which is substantially U-shaped in cross-section, said legs being disposed with their hollow sides facing each other, a hollow head carried by said legs, a fan-shaft journaled in said head and a belt-pulley fixed to said shaft within said head.

6. In a belt-fan, a supporting standard comprising a pair of hollow legs each of which is substantially U-shaped in cross section, said legs being disposed with their hollow sides facing each other, a hollow head carried by said legs, a fan-shaft, tight and loose belt-pulleys carried by said shaft within said head, and a device for shifting the belt from one to the other of said pulleys.

7. In a belt-fan, a supporting standard comprising a pair of hollow legs each of which is substantially U-shaped in cross-section, said legs being disposed with their

hollow sides facing each other, a hollow head carried by said legs, a fan-shaft, tight and loose belt-pulleys carried by said shaft within said head, a device for shifting the belt from one to the other of said pulleys, and braking means for arresting rotation of the fan-shaft when the belt is shifted onto the loose pulley.

8. In a belt-fan, a supporting standard comprising a pair of hollow legs each of which is substantially U-shaped in cross-section, said legs being disposed with their hollow sides facing each other, a hollow head carried by said legs, a fan-shaft, tight and loose belt-pulleys carried by said shaft within said head, a device for shifting the belt from one to the other of said pulleys, and means carried by said device for arresting rotation of the fan-shaft when the belt is shifted onto the loose pulley.

9. In a belt-fan, a supporting standard comprising a pair of hollow legs adapted to envelop the limbs of a driving belt, a hollow head carried by said legs, a fan-shaft journaled horizontally in said head, and a belt-pulley fixed to said shaft within said head.

In testimony whereof, I have signed my name to this specification.

JOHN D. KARLE.