

Feb. 16, 1937.

V. WEBER

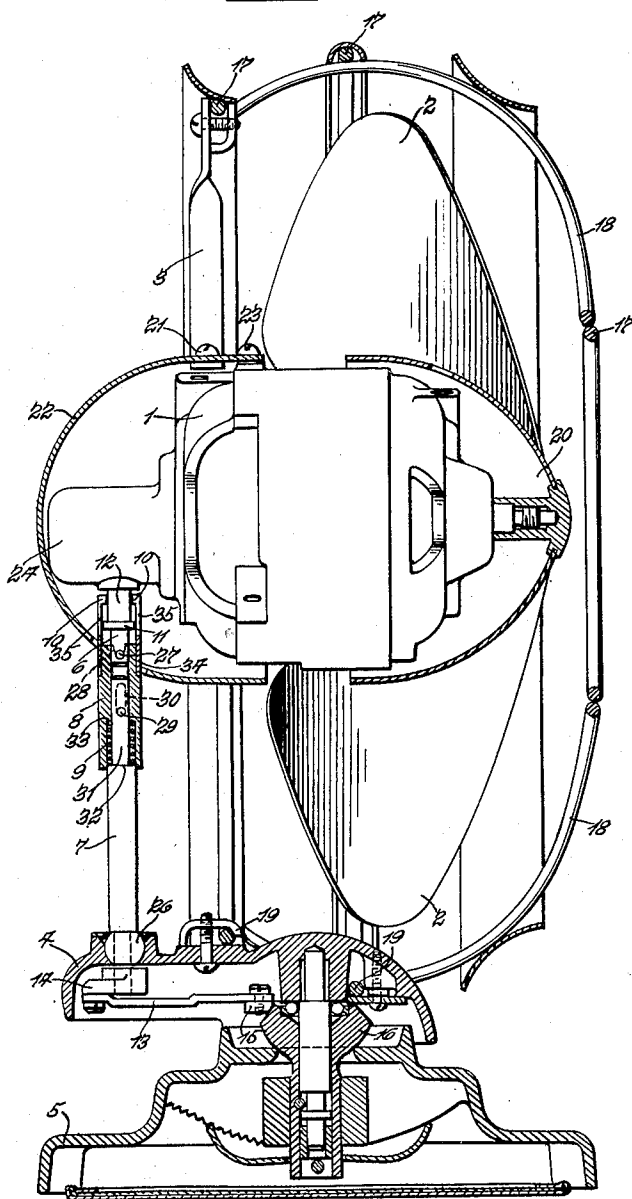
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OSCILLATING MECHANISM FOR FANS

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Fig. 1-



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Fig. 2.

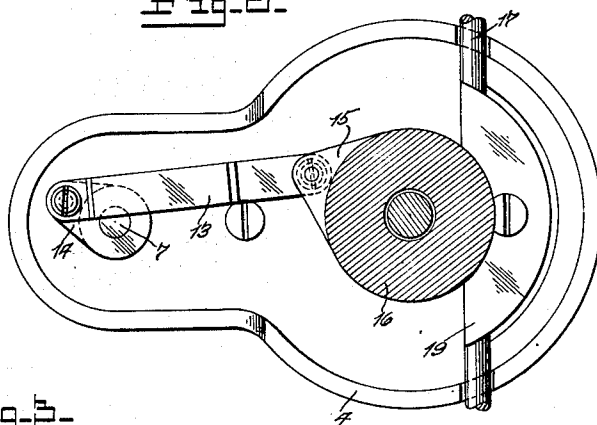


Fig. 3.

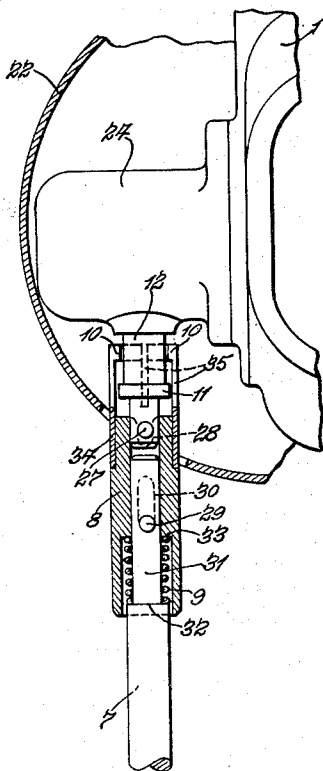
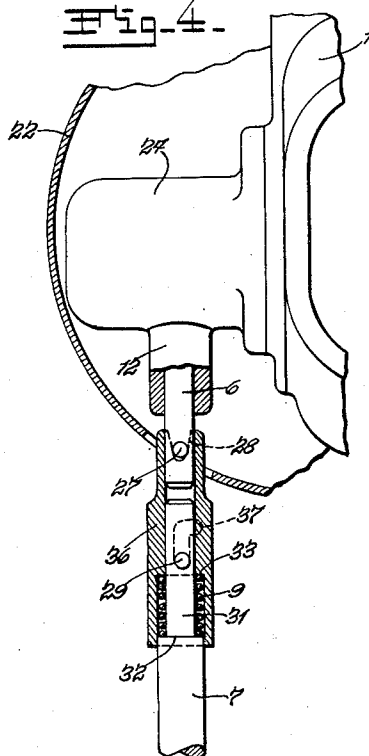


Fig. 4.



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UNITED STATES PATENT OFFICE

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OSCILLATING MECHANISM FOR FANS

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10 Claims. (Cl. 230—256)

This invention relates to oscillating mechanism for electric fans.

An object of this invention is to provide, in a fan which has a motor resiliently supported with reference to a base, connecting means for a crank shaft which will permit deflection of the motor with reference to the base without any axial deflection of the crank shaft.

Another object of the invention is to provide a connecting member for the crank shaft of oscillating mechanism which will be easily manipulated to disconnect the crank shaft from a driving shaft at will.

A further object of the invention is to provide such a connecting member mentioned in the preceding paragraph which will yieldingly hold the fan in one position when the crank shaft is disconnected.

Other and specific objects will be apparent from the following detail description, taken in connection with the accompanying drawings, which illustrate a preferred embodiment of the invention.

Fig. 1 is a vertical section of a fan structure in which the invention is employed.

Fig. 2 is an inverted sectional view showing the details of the crank, the pitman and its connections.

Fig. 3 is a detail view, partly in section, illustrating the invention.

Fig. 4 is a view similar to Fig. 3, showing a modified form of the invention, in which some of the objects are attained.

As shown in Fig. 1, a motor 1, with fan blades 2 attached to the motor shaft, is supported in a resilient manner with reference to the base by straps 3 secured to a guard fabricated of resilient elements, the guard being supported in an upstanding manner by a rigid base plate 4. The base plate is pivotally mounted on the fan base 5. It will thus be seen that the motor and fan are resiliently supported with reference to the base.

A shaft 6, driving the oscillating mechanism, extends through the gear case of the motor and is in axial alignment with a crank shaft 7, which is journaled in the base plate 4. A sleeve 8 has a pin and slot connection with the shaft 6 as well as with the shaft 7, it being urged in an upwardly direction by a spring 9. The slot connection with the shaft 6 is such that when the sleeve 8 is depressed the shaft 6 is disconnected from the crank shaft and the oscillating mechanism is thereby rendered inoperative. But when the sleeve 8 is in upward position the sleeve ro-

tatively connects the shafts 6 and 7, thereby transmitting a driving effort from the motor to the crank shaft. Resilient dogs 10 are positioned on the upper end of the sleeve 8 and are so constructed and arranged that when the sleeve 8 is depressed the dogs 10 engage an annular flange 11 on a boss 12 which extends downwardly from the gear case of the motor. The result of this arrangement is that when the sleeve 8 is depressed the shaft 7 is yieldingly held against rotation and the fan may thereby be placed in any selected position and will be held so while the oscillating mechanism is disconnected.

The above is a general description of the invention, the characteristic features of which are pointed out in the appended claims. A more detailed description of the specific embodiments of the invention, illustrated in the accompanying drawings, will presently be made in order to assist in understanding and practicing the invention.

The mounting of the fan may be generally described because this invention is particularly adapted for use in this environment. But the specific fan mounting is no part of this invention and is more particularly illustrated in a copending application by my collaborator, Herbert I. Finch, Serial No. 699,499, filed November 24, 1933.

The mounting of the fan includes the base 5, pivotally supporting a plate 4, which is adjustable with reference to the base 5 and which is adapted to oscillate by appropriate mechanism, including the crank shaft 7 which drives a pitman 13. One end of the pitman 13 is pivoted to a crank 14, secured to and rotating with the shaft 7, and the other end of the pitman is pivoted to a lug 15 on a member 16, which member 16 is a part of the base 5 and fixed against rotation with respect thereto.

The structure includes a unitary guard and support which has a plurality of circular members 17 and a plurality of transverse members 18, fabricated together in open pattern work. Two of the members 17 are securely clamped to the plate 4, as shown at 19, and the unitary guard and support is thereby secured in upstanding position with reference to the plate 4 and with reference to the base 5. The motor 1 with the blades 2, which are secured to the shaft of the motor by being attached to a hub cup 20, is supported within and by the guard, by a plurality of radial straps 3. The straps 3 have their outer ends clamped to the guard, to one of the circular members 17 as specifically shown, and have their inner ends secured directly, or in-

directly, to the motor frame. In the structure as specifically shown, the inner ends of the straps 3 are secured by screws 21 to a cup 22, which is attached by screws 23 at the rear of the motor frame.

The result of this particular construction is that the motor and blade assembly, or impeller are supported within the guard by the guard itself, and since the guard is fabricated of resilient members, the motor and impeller are thus resiliently supported so as to reduce the vibration transmitted by the motor and impeller to the base. But, since the motor is resiliently supported with reference to the base the conventional oscillating mechanism, comprising a single crank shaft journaled in the motor frame, would be unsatisfactory for two reasons. The vibration would be transmitted from the motor to the base through such a crank shaft, and a deflection of the motor relative to the base would deflect the crank shaft. Such a deflection of the crank shaft would be unsatisfactory in operation and would soon wear, decreasing the life of the device and making the oscillating mechanism noisy before it would be rendered inoperative.

The improvement comprising this invention eliminates the objectionable features which would be present in using a conventional construction with such a resiliently supported motor, as well as provides easily manipulated means for disconnecting the oscillating mechanism and for yieldingly holding the fan in any desired position.

The shaft 6 is driven by the motor 1 through appropriate speed reducing gears contained in a gear case 24. The shaft 6 extends through a boss 12, which may be integral with the gear case 24. The crank shaft 7, in alignment with the shaft 6, is journaled at its lower end by a bearing 26 in the base plate 4.

The shaft 6 carries a cross pin 27, which is adapted to engage in an open-ended slot 28 in the upper end of the sleeve 8, which, as explained before, serves to releasably connect the shaft 6 and the shaft 7. The shaft 7 has a cross pin 29 secured to it and is slidable in a closed slot 30 in the sleeve 8. The extensible spring 9 surrounds a reduced portion 31 of the shaft 7 and has its lower end bearing against a shoulder 32 on the shaft 7 and its upper end bearing against a shoulder 33 in the sleeve 8. Thus, the spring 9 tends to urge the sleeve 8 to an upward position in which the cross pin 29, which is secured to the shaft 7, rests against the bottom of the slot 30 and in which the pin 27 engages in the slot 28 at the upper end of the sleeve 8.

The dogs 10 are fixed to the upper end of the sleeve 8 and extend upwardly therefrom. These are preferably formed by using a collar 34 which has a pressed fit on the sleeve 8 and which has, at its upper end, slots 35 producing the resilient portions or dogs 10.

When the sleeve 8 is pressed downwardly until the pin 27 is out of the slot 28 the dogs 10 will engage the circumferential flange 11 on the boss 12, thus holding the sleeve in withdrawn position and holding the crank shaft against rotation.

Fig. 4 illustrates an embodiment of the invention in which some of the advantages are attained. In describing this figure like numerals are used to indicate like parts in the other embodiment. In this embodiment the driven shaft 6 extends through a boss 12 on the gear case 24 and is in axial alignment with the crank shaft 7. As sleeve 36 is designed to rotatively but releasably connect the shafts 6 and 7. The shaft

6 has a pin 27 adapted to engage in an open-ended slot 28 in the upper end of the sleeve 36, as in the preceding embodiment, and the sleeve 36 is urged to upward position by a spring 9, surrounding a reduced portion 31 of the shaft 7 and having its lower end bearing against a shoulder 32 on the shaft 7 and its upper end bearing against a shoulder 33 on the sleeve 36. In this embodiment the shaft 7 also has a cross pin 29 secured to it but here the pin 29 engages in a bayonet slot 37 on the sleeve 36. Thus, when the sleeve 36 is pushed downwardly against the spring 9 and turned, it will be held in withdrawn position and the oscillating mechanism will be disconnected.

It will be obvious that various changes may be made in the details of construction within the scope of the appended claims, without departing from the spirit of this invention.

I claim:

1. In oscillating mechanism for an electric fan having a base member and a motor resiliently supported with reference to the base member, the improvement comprising a shaft driven and supported by the motor, a crank shaft journaled in the base member, a connecting device rotatively connected to one shaft, rotatively connectable to the other shaft and axially movable with respect to both shafts, a stop for limiting the axial movement of said device, and a spring positioned and adapted to move the device against the stop, whereby the two shafts may be rotatively connected and deflection of the motor relative to the base will not cause axial deflection of the crank shaft.

2. In oscillating mechanism for circulating fan having a base member and a motor resiliently supported with reference to the base member, the improvement comprising a shaft driven by and supported by the motor, a crank shaft in alignment with said driven shaft and journaled in the base member, a sleeve rotatively connected to one shaft and axially movable with respect thereto, means on the end of the sleeve for releasably engaging the other shaft, and a spring positioned and adapted to move the sleeve to engaging position, whereby the two shafts may be rotatively connected and deflection of the motor relative to the base will not cause axial deflection of the crank shaft.

3. In oscillating mechanism for circulating fan having a base member and a motor resiliently supported with reference to the base member, the improvement comprising a shaft driven by and supported by the motor, a crank shaft in alignment with said driving shaft and journaled in the base member, a sleeve rotatively connected to one shaft and axially movable with respect thereto, a cross pin on the other shaft adapted to engage in an open slot in the sleeve, a spring positioned and adapted to move the sleeve in engaging relationship with said cross pin, whereby the two shafts may be rotatively connected and deflection of the motor relative to the base will not cause axial deflection of the crank shaft.

4. In oscillating mechanism for electric fan having a base and a motor supported for oscillation with respect to the base, the improvement comprising a shaft driven and supported by the motor, a crank shaft in alignment with said driven shaft and supported relative to the motor, a sleeve mounted on, for rotation with and slidable along the crank shaft, means for releasably engaging the sleeve with the driven shaft, and clutch mechanism for holding the sleeve out of

engagement with the driven shaft and for yieldingly holding the motor relative to the base.

5 5. In oscillating mechanism for electric fan having a base and a motor supported for oscillation with respect to the base, the improvement comprising a shaft driven and supported by the motor, a crank shaft in alignment with said driven shaft and supported relative to the motor, a sleeve mounted on, for rotation with and slid-
10 able along the crank shaft, means for releasably engaging the sleeve with the driven shaft, and clutch members on the sleeve positioned and adapted when the sleeve is out of engagement with the driven shaft to hold the sleeve in such
15 position and for yieldingly holding the motor relative to the base.

6. In oscillating mechanism for electric fan having a base and a motor supported for oscillation with respect to the base, the improvement
20 comprising a shaft driven and supported by the motor, a crank shaft in alignment with said driven shaft and supported relative to the motor, a sleeve mounted on, for rotation with and slidable along the crank shaft, means for releasably en-
25 gaging the sleeve with the driven shaft, a boss unitary with the frame of the motor and about said driven shaft, and clutch members on the sleeve positioned and adapted for yielding engagement with the boss when the sleeve is moved
30 out of engagement with the driven shaft.

7. In oscillating mechanism for electric fan having a base and a motor supported for oscillation with respect to the base, the improvement comprising a shaft driven and supported by the
35 motor, a crank shaft in alignment with said driven shaft and supported relative to the motor, a sleeve mounted on, for rotation with and slidable along the crank shaft, means for releasably engaging the sleeve with the driven shaft, a boss unitary
40 with the frame of the motor, about said driven shaft, and having a circumferential flange, clutch members extending upwardly from the sleeve, positioned and adapted for yielding engagement with the said flange when the sleeve is moved
45 out of engagement with the driven shaft.

8. In a device of the kind described, a base, a motor and an impeller mounted thereon to be driven thereby, means resiliently mounting the

motor and impeller on the base so that the former may have limited vibratory movement relative thereto, and means separate and distinct from
5 said first named means interconnecting the motor and the base to cause the motor to oscillate relative to the base, said means transmitting oscillatory forces between the two but permitting the
10 said relative vibratory movements whereby said vibratory movements are not transmitted to the base.

9. In a device of the kind described, a base, a motor, means resiliently mounting the motor on the base so that there may be limited relative movement between the two, and means adapted
15 selectively to interconnect the motor and the base to cause the motor to oscillate relative to the base, said means including a driving shaft, a driven shaft, and a sleeve mounted on one of said shafts for rotation therewith and axially movable
20 therealong, with means selectively interengaging said sleeve with said other shaft, the provision for axial movement of the sleeve on the first shaft permitting relative movement between the motor
25 and the base.

10. In a device of the kind described, a base, a motor, means resiliently mounting the motor on the base so that there may be limited relative movement between the two, and means inter-
25 connecting the motor and the base to cause the motor to oscillate relative to the base, said means including a driving shaft, a driven shaft, and a sleeve mounted on one shaft to rotate therewith,
30 said sleeve being supported on said shaft for axial movement relative thereto, means on the sleeve and the other shaft for interengaging them so that the sleeve transmits forces between said
35 shaft, and means resiliently urging the sleeve axially on its shaft toward the said interengaging means on the other shaft, the resilient means urging the sleeve to follow the shaft when
40 the same moves because of the resilient motor mounting, the axial movement of the sleeve permitting the same to be moved out of engagement with said interengagement means to disconnect
45 the oscillator, and means for maintaining the sleeve in this position of disengagement.

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