W. DUCHEMIN.
Automatic Fan

No. 207,022. Patented Aug. 13, 1878.

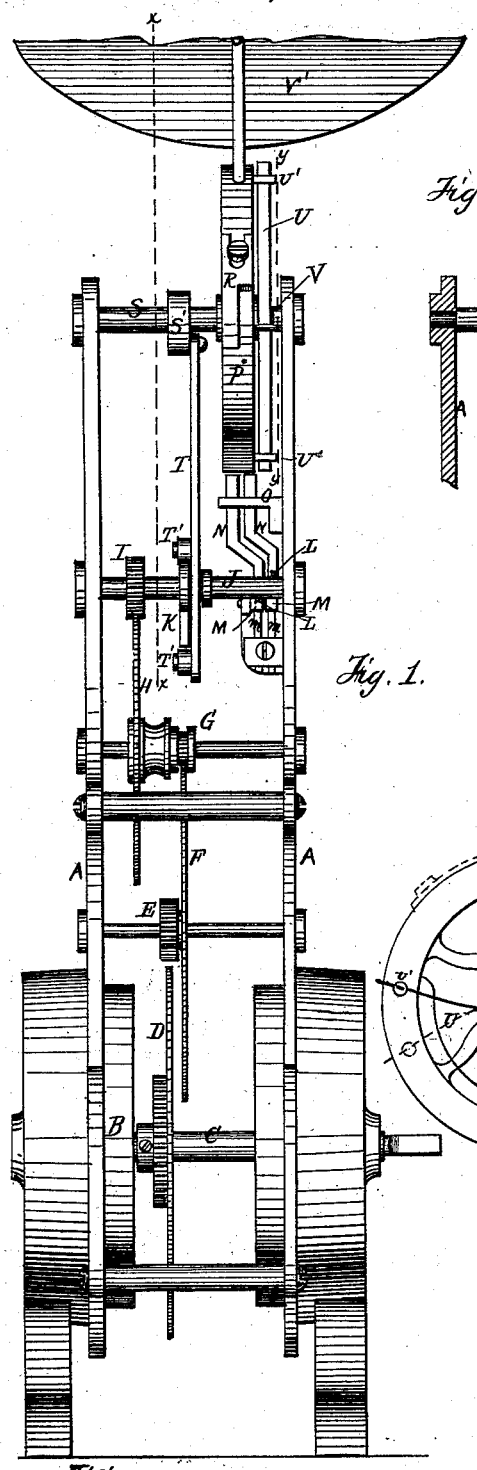

Fig. 1.

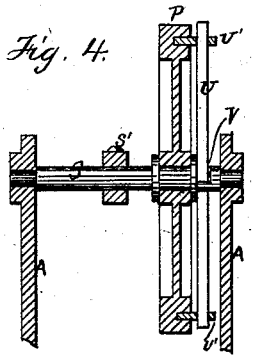

Fig. 4.

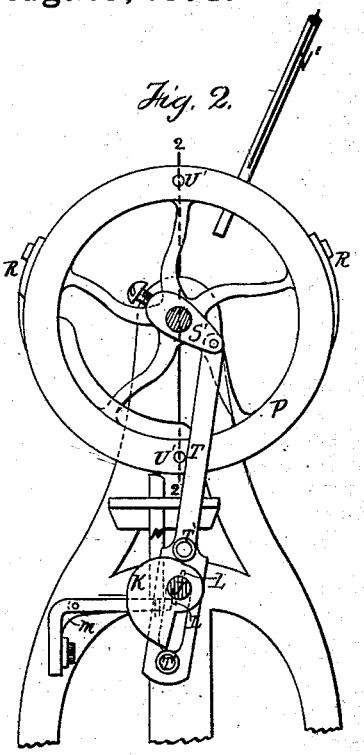

Fig. 2.

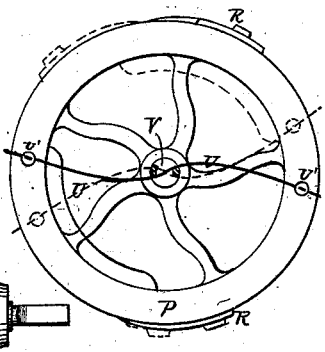

Fig. 5.

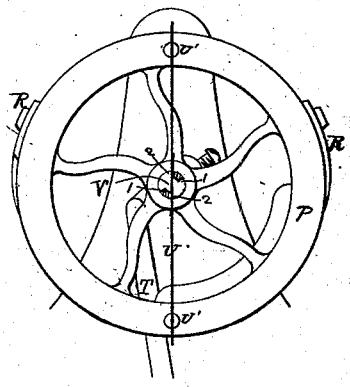

Fig. 3.

Witnesses.
Geo. W. Pierce
E. B. Fairchild

Inventor.
Wm Duchemin
by Wright Brown Attys.

UNITED STATES PATENT OFFICE.

WILLIAM DUCHEMIN, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN AUTOMATIC FANS.

Specification forming part of Letters Patent No. **207,022**, dated August 13, 1878; application filed May 24, 1878.

To all whom it may concern:

Be it known that I, WILLIAM DUCHEMIN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Automatic Fans, of which the following is a specification:

This invention has for its object to provide a simple, compact, portable, and effective motor for giving a forcible vibration to a fan, and thereby creating a comparatively strong current or agitation of the air.

My invention consists in the means employed for converting continuous rotary motion produced by a train of spring-impelled gearing into a strong vibratory motion, as I will now proceed to describe.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front view of an apparatus embodying my invention. Fig. 2 represents a section on line *x x*, Fig. 1, looking at one side of the fly-wheel P. Fig. 3 represents a section on line *y y*, Fig. 1, looking at the other side of the fly-wheel P. Fig. 4 represents a section on line 2 2, Fig. 2; and Fig. 5 represents a view similar to Fig. 3, but showing the fly-wheel at the end of one of its vibrations.

Similar letters of reference indicate like parts.

In the drawings, A represents a frame-work of any suitable construction, for supporting the several shafts of a train of gearing, D E F G H I, and a rocking shaft S, to be hereinafter described.

The train is impelled by a suitable main-spring, B, which is also supported in the frame A. The last wheel I of the train is located on a shaft, J, which is provided with a surface-cam, K, and with two pins, L L, projecting from opposite sides.

S represents a shaft, which is provided with a crank, S′.

T represents a connecting-rod, which connects the crank S′ with the shaft J. The rod T is slotted at its lower end, (the shaft J passing through the slot,) and is provided with two friction-rolls, T′ T′, which bear upon the periphery of the cam K, as shown in Figs. 1 and 2, so that the rotation of the shaft J and cam K will cause the connecting-rod to reciprocate lengthwise, and thus impart a rocking motion to the shaft S.

P represents a fly-wheel, which is journaled to turn loosely on the shaft S.

U represents a flat spring, which passes loosely through a peculiarly-formed slot, V, in the shaft S, and is attached to pins or studs U′ U′ on the side of the rim of the wheel P. The slot V is so formed as to admit of the partial vibration of the spring therein, stops 1 1 and 2 2 being formed in the slot to limit the vibrations of the spring, as shown in Fig. 5.

R R represent wedges or cams arranged on the periphery of the fly-wheel P, to operate devices for releasing the shaft J. These devices consist of levers M M, pivoted to the frame A and supported by springs *m*, in such position that the downwardly-projecting pin L of the shaft J will be arrested by the end of one of the levers M, as shown in Figs. 1 and 2. Each of the levers M is provided with a vertical rod or extension, N. These extensions project upwardly close to the periphery of the wheel P, and are depressed by the cams or wedges R, as described hereinafter.

The operation of the apparatus is as follows: The train of gearing being set in motion, a rocking motion is imparted thereby to the shaft S, as before described, about one-eighth of a complete revolution being given the shaft S in each direction. This rocking motion causes the stops 1 1 and 2 2 in the slot V to give the spring U a vibrating motion, the stops 1 1 striking the spring simultaneously and impelling it in one direction, and the stops 2 2 impelling the spring in the opposite direction. The impulses thus given the spring cause the vibration or oscillation of the wheel P on the shaft S; but as the slot V is formed to allow the spring to make about a quarter of a complete rotation between the stops, or about twice the rotation that is imparted to the shaft S, as before mentioned, it will be seen that the vibration of the wheel P will be of increased length.

The stops of the slot V at the end of each vibration of the shaft S curve the spring U and give it a tendency to rotate the fly-wheel P in the opposite direction, and thus cause the spring to accelerate the reverse movement

of the fly-wheel produced by the reverse movement of the shaft S. The fly-wheel is thus vibrated under the combined influence of the spring U and the spring-impelled shaft S, and a strong impulse is given it in each direction, enabling it to vibrate the fan V′ with considerable force, the fan V′ being attached to the wheel, as shown.

The wedges or cams R R and the levers M M regulate the vibrations of the shaft S by first depressing one lever M and then another, each depression of a lever releasing the shaft J and allowing it to rotate until its other stop, L, strikes the other lever, M. The wedges R R are arranged to operate the levers M M alternately when the wheel P has reached one extreme or the other of its movement, one wedge operating one lever and the other the other lever.

By the means described an effective escapement is produced which governs the rotation of the train of gearing.

I claim as my invention—

1. In an automatic fan, the combination of the shaft S, means, substantially as described, for imparting a rocking motion thereto, and the fly-wheel P loose on said shaft and carrying a fan, V′, and the spring U whereby the rocking motion of the shaft is imparted in an increased form to the fly-wheel, as set forth.

2. The combination of the shaft J, rotated by suitable power and provided with pins L L, the shaft S, arranged to receive a rocking motion from the shaft J, the fly-wheel P, connected to the shaft S by spring U and provided with the wedges or cams R R, and the intermediate stops M M, adapted to arrest the rotation of the shaft J and to be depressed by the wedges R R, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses this 22d day of May, 1878.

WILLIAM DUCHEMIN.

Witnesses:

B. F. EREBETH,

C. T. BROWN.