No. 710,465. Patented Oct. 7, 1902.

G. KAISER.

MECHANICAL FAN.

(Application filed Oct. 8, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

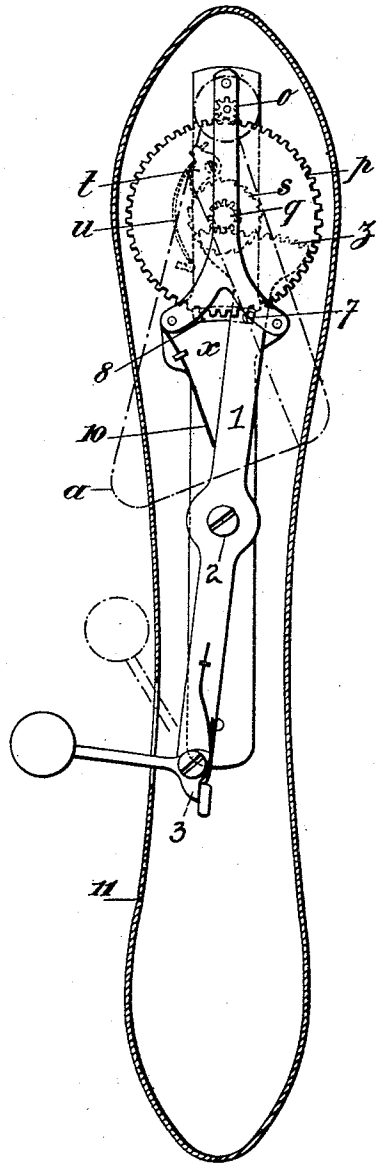
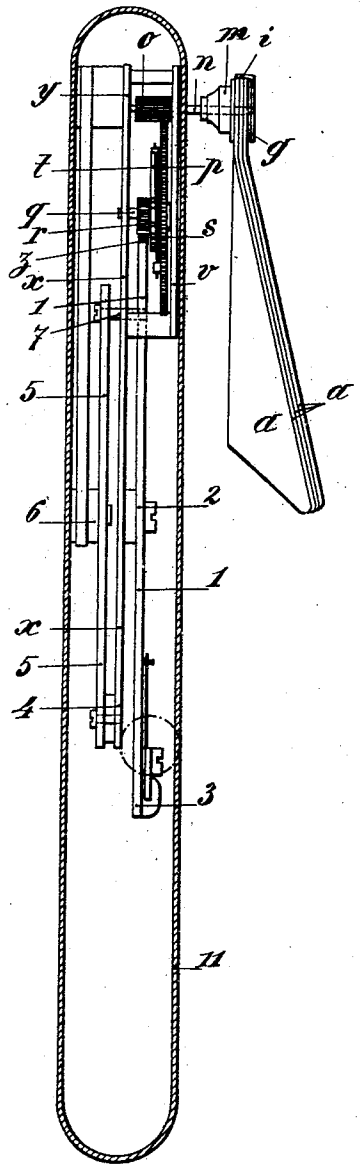


Fig. 2.



Witnesses:
C. B. Kolton
Chas. M. Aldous

Inventor:
Gabriel Kaiser
By Richards & Co.
his Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 4.

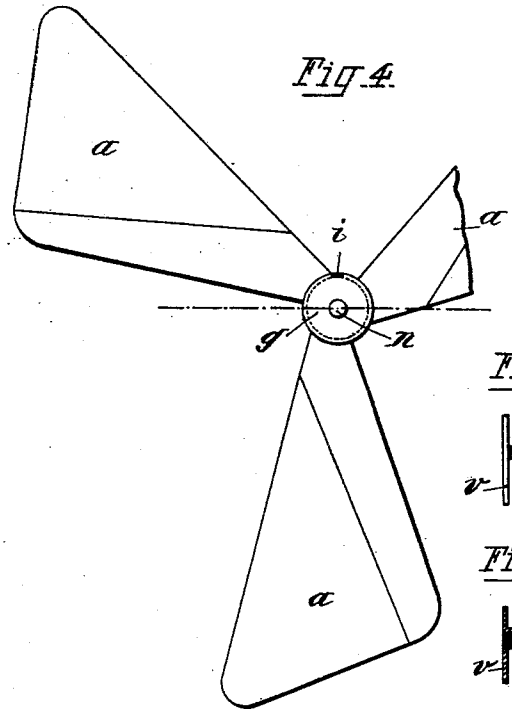


Fig. 7.



Fig. 8.



Fig. 5.

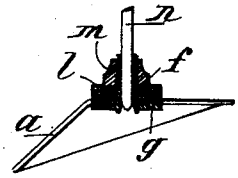
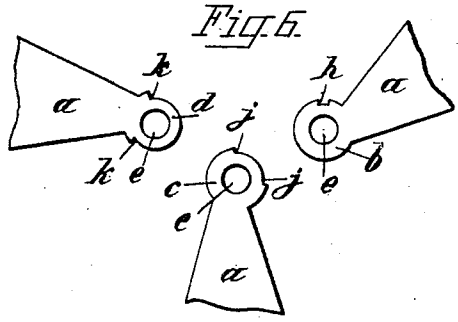
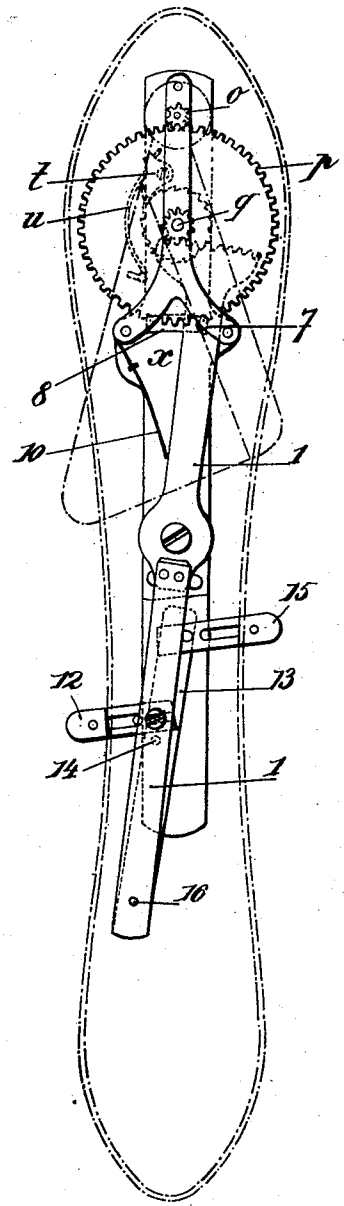


Fig. 6.



Witnesses:
E. P. Bolton.
Chas. W. Aldow Jr.

Fig. 3.



Inventor:
Gabriel Kaiser
By Richards & Co
his Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GABRIEL KAISER, OF PARIS, FRANCE.

MECHANICAL FAN.

SPECIFICATION forming part of Letters Patent No. 710,465, dated October 7, 1902.

Application filed October 8, 1901. Serial No. 77,981. (No model.)

To all whom it may concern:

Be it known that I, GABRIEL KAISER, manufacturer, of 12 Boulevard St. Martin, in the city of Paris, Republic of France, have invented Improvements Relating to Mechanical Fans, of which the following is a full, clear, and exact description.

This invention relates to mechanical fans; and in order that my said invention may be readily understood and carried into effect I will describe the same fully with reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation of my improved mechanical fan, the section being taken through the middle of the sheath or casing forming the handle. Fig. 2 is a sectional elevation taken at right angles to the former. Fig. 3 shows a modified form of mechanism. Figs. 4, 5, and 6 are detail views of the wings or blades of the fan. Figs. 7 and 8 show two modified forms of mounting the wings or blades on the fan.

In the various figures the same characters of reference designate the same parts.

According to my invention each of the three wings or blades *a* of my improved fan is formed with a different boss or hub *b c d*, respectively; but all these hubs are drilled with a hole *e* and are adapted to be mounted upon a central sleeve *f*, having a flange-like head *g*. The hub *b* of the first blade is formed with a small notch *h*, in which engages a tongue *i*, Figs. 2 and 4, integral with the head *g*. The tongue *i* also arrests the hub *c* of the second wing or blade by striking against the shoulders *j*. Lastly, the hub *d* of the third blade is arrested by the shoulders *k*. This arrangement has for its object to impart a certain free motion to the blades, so as to permit them to range themselves behind one another when at rest by their own weight and to take up such a position in respect of each other by the action of centrifugal force as to be equidistant one from the others during the operation of the fan, Fig. 4.

I may of course provide a larger number of blades—say four—if desired, and distribute them in a similar manner.

The blades are retained on the tube by means of a washer *l* and nut *m*, the tube *f* being screw-threaded for this purpose over a certain part of its length.

In order that the blades may receive motion, the tube *f* is fitted upon a spindle *n*, integral with a pinion *o*. The tube *f* could be internally tapped to enable it to be secured upon a left-threaded rod *n'*, as shown in Fig. 7. The tube *f* could also end into a left-threaded rod, which would screw into a tapped part *n''*, integral with the spindle *n*. This pinion *o* receives motion from a toothed wheel *p*, fast on an arbor *q*. Upon the arbor *q* are also mounted loose a pinion *r* and a ratchet-wheel *s*, in which engages a pawl *t*, retained by a spring *u*. The ratchet *s* is fixed to and moves with the pinion *r* and is consequently loose on the arbor *q*. The said wheel-train is lodged between two plates *v x*, and the whole is adapted to oscillate at *y*, as will be hereinafter described. The pinion *r* is in gear with a toothed sector *z*, formed at the end of a lever 1 of the first order, having its fulcrum at 2 and the power at 3. As the plate *x* is pivoted at *y* and as the fulcrum of the lever 1 is arranged upon the said plate at 2, this plate acts as a lever of the third order, having its fulcrum at *y*, its power at 2, and its resistance at 4, which is the pivoting-point of another lever 5 of the first order. The lever 5 of the first order has its power at 4, its fulcrum at 6, and its resistance at 7, at which point it is coupled to the lever 1 of the first order. A slot 8, formed in the plate *x*, permits of the passage of the screw 7, assembling the two levers 1 and 5. The combination of the three levers 1, *x*, and 5 insures a relatively great power without necessitating a large stroke for the power-lever 9. A spring 10 returns the lever 1 to rest. The whole is inclosed in a casing 11, forming a flat handle.

The combination of the pinion *o*, the wheel *p*, with ratchet *s*, the pinion *r*, and the sector *z* has for its object to impart a quick motion to the blades of the fan in one direction and to disengage the operating means for the return of the sector.

In Fig. 3 of the drawings is shown a modification of my improved mechanical fan in which the lever 1 of the first order is operated by means of a slide 12. Another lever 13 of the first order has its fulcrum at 14, its power upon the slide 15, and its resistance at 16, constituted by an articulation disposed at the extremity of the lever 1. Therefore in

order to actuate the entire mechanism the two slides 12 and 15 are operated.

The forms, details, accessories, materials, and dimensions of my system of mechanical fan may of course be varied without altering the nature of my invention.

I claim—

1. A mechanical fan comprising a series of blades adapted to fold when at rest one upon the other and adapted to separate automatically by centrifugal force, a spindle n upon which the blades are mounted, a pinion o on the said spindle, a gear-wheel p for driving the pinion o, a pawl and ratchet and a pinion r for driving the gear-wheel p, a toothed sector z for driving the pinion r, a compound system of levers for operating the pinion r and means for operating the levers, substantially as described, the levers of the compound system overlying each other.

2. A mechanical fan comprising a series of blades adapted to fold when at rest one upon the other and adapted to separate automatically by centrifugal force, a spindle n upon which the blades are mounted, a pinion o on the said spindle, a gear-wheel p for driving the pinion o, a pawl and ratchet and a pinion r for driving the gear-wheel p, a toothed sector z for driving the pinion r, a compound system of levers for operating the pinion r and means for operating the levers, said compound lever system comprising the two levers 1 and 5 of the first order and one x of the third order, substantially as described, the levers of the compound system overlying each other.

The foregoing specification of my improvements relating to mechanical fans signed by me this 23d day of September, 1901.

GABRIEL KAISER.

Witnesses:
J. ALLISON BOWEN,
MAURICE H. PIGNET.