No. 892,867. PATENTED JULY 7, 1908.

J. C. MORGAN.

FAN.

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Fig. 1.

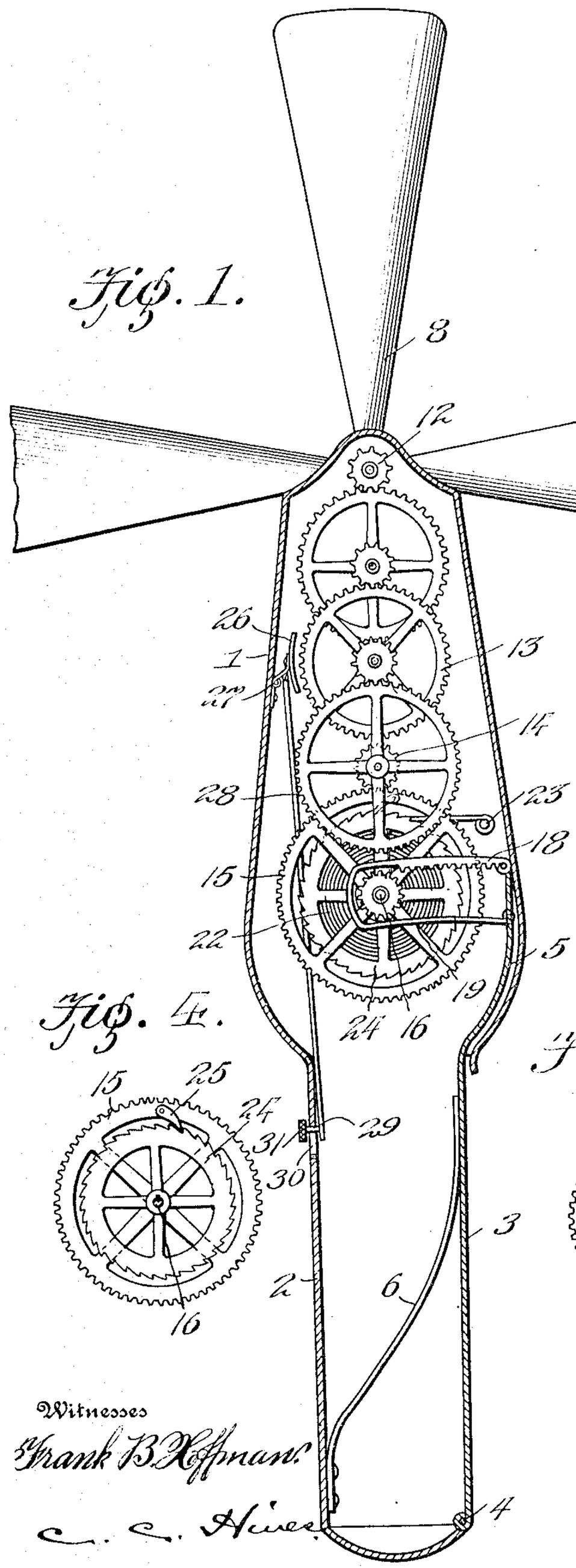


Fig. 2.

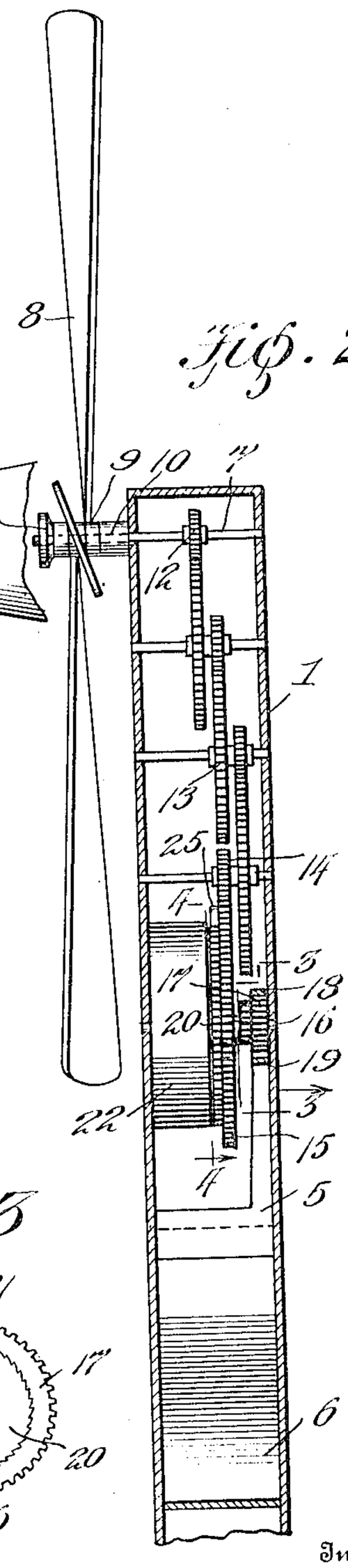
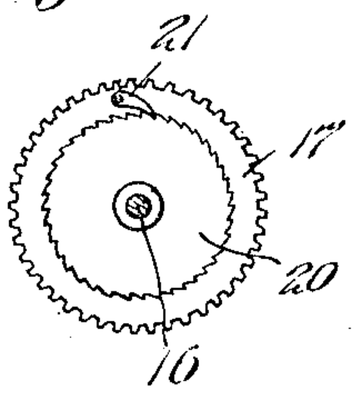


Fig. 4.

Fig. 3.



Witnesses

Frank B. Hoffman

C. C. Hines

Inventor

Jack C. Morgan

By Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

JACK C. MORGAN, OF FRANKFORT, KENTUCKY.

FAN.

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To all whom it may concern:

Be it known that I, JACK C. MORGAN, a citizen of the United States, residing at Frankfort, in the county of Franklin and State of Kentucky, have invented new and useful Improvements in Fans, of which the following is a specification.

This invention relates to fans, contemplating particularly a hand fan having spring gearing adapted to be energized or rewound by a controlling device on the handle of the fan.

The primary object of the invention is to provide a fan of this character having a novel construction of spring propelling mechanism and rewinding means therefor, whereby the blades of the fan may be propelled a considerable period without rewinding.

A further object of the invention is to provide a fan having a novel brake device which may be set to stop or control the speed of the fan blades at will.

A still further object is to provide a fan in which the blades may be folded to allow the fan to be compactly stored and carried.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawing, in which:—

Figure 1 is a longitudinal section through the casing of the fan showing the remaining elements in side elevation. Fig. 2 is a sectional elevation taken at right angles to Fig. 1. Fig. 3 is a detail section on line 3—3 of Fig. 2. Fig. 4 is a similar view on line 4—4 of Fig. 2.

Referring to the drawing, the numeral 1 represents the casing of the fan mechanism which may be formed of sheet metal or other suitable material, and preferably tapers longitudinally toward its base, from which projects a handle section 2 open at one side for the convenient insertion of the parts of the inclosed gearing in assembling the elements of the fan and the removal of said parts in effecting repairs. The open side of the handle is closed by a movable section 3, said section constituting an operating lever pivoted at its lower end to the body of the handle, as indicated at 4. The pin of the pivotal connection may be detachable so that the combined lever and closure 3 may be conveniently removed when occasion requires. The upper end of the lever 4 projects upwardly into the casing in the form of a curved extension 5, which carries a primary actuating device for the propelling gearing of the fan mechanism, as hereinafter described, and secured to the body of the handle is a spring 6 which, in the form shown, is a curved plate spring bearing at its free end upon the lever 3 to hold it out-pressed or in normal position. Any other type of spring for this purpose may, however, be employed. The extension of the lever is adapted to abut against the casing to limit the outward movement of said lever under the pressure of the spring.

Arranged at the upper end of the casing is a fan shaft 7, which extends transversely across the casing and is journaled in the side walls thereof, one end of said shaft being extended beyond the casing, as shown in Fig. 2. Fan blades 8, of which any suitable number may be employed, are mounted upon the extended end of the shaft and may be fixed or pivotally connected thereto as desired. In the present instance, each fan blade is shown as provided at its inner end with a collar or sleeve 9 loosely engaging the shaft and pivotally connecting the blades thereto so that said blades may be folded in lapping relation and in a plane parallel with the casing, thus enabling the fan as a whole to be folded or collapsed in close compass for convenience in storage or transportation or carrying the same in the pocket. A spacing sleeve 10 is arranged on the shaft, against which the collar on the inner fan blade bears, and the outer end of the shaft extension is threaded to receive the securing nut 11 by which the collars may be clamped in position and loosened for adjustment to fold the blades to collapsed position.

A pinion 12 is fixed on the shaft 7 within the casing 1 and is driven by a train of gears 13, including a primary pinion 14. Meshing with this pinion is a power transmitting gear 15 loosely mounted on a transverse shaft 16, on which is also loosely mounted a drive gear or pinion 17. The drive gear or pinion 17 is adapted to be engaged and turned in a counter-clockwise direction by a rack bar 18 formed by one of the arms of a yoke 19 carried by the lever extension 5, the yoke operating to guide the upper end of the lever in its movements and maintain the rack bar in proper position for engagement with the pinion. By this means the use of an auxiliary guide for the rack upon a frame or extension from the casing is avoided, and

hence all the parts exclusive of the rack may be mounted directly upon the casing.

Fixed on the shaft 16 along side the drive gear 17 is a ratchet wheel 20, whose teeth extend in a clockwise direction and are adapted to be engaged by a pawl or dog 21 on the gear 17 when the latter is rotated forward and to ride loosely over said teeth on the rearward or clockwise movement of said gear.

The shaft is adapted to be propelled by a coil spring 22 fixed at one end thereto and at its opposite end to the casing, as indicated at 23, thus forming a spring motor for the gear train 13. The gear 17 and ratchet wheel 20 constitute means for winding up the spring to energize the motor for action in driving the gearing. On the shaft 16 is also fixed a ratchet wheel 24, having its teeth extending in a counter-clockwise direction for engaging a pawl or dog 25 on the power transmitting gear 15, which is loose upon the shaft, the arrangement being such that in the operation of the lever 3 motion will be communicated to the gear 17 to wind up the spring, which will be permitted to simultaneously operate to transmit motion to the ratchet wheel 24 and thence to the gear 15 through the instrumentality of the dog 25 to drive the fan operating gearing.

When the lever 3 is pressed inwardly by the action of the hand grasping the handle 2, the rack bar 18 will mesh with the gear 17 and transfer counter-clockwise motion thereto under which the dog 21 will engage and turn the ratchet wheel 20 to wind up the spring 22. Upon the return of the rack bar to normal position by the retraction of the lever 3 through the spring 6, the gear 17 will be rotated in the reverse direction and the pawl 21 will slide directly over the teeth of the ratchet wheel 20. The spring in expanding will transfer motion to the shaft 16 which will rotate the ratchet wheel 24 fixed thereto, which wheel on its counter-clockwise movement will turn without operating the dog 25 and upon its reverse movement will engage the dog and transfer motion to the gear 15 by which the train 13 will be driven to rotate the fan shaft 7 and the blades carried thereby. The form, proportion and arrangement of the spring, motor and ratchet mechanism may be such that one movement of the lever 3 will wind up the spring to operate the fan blades for a considerable period, thus obviating the necessity of constantly manipulating the lever.

In order to stop the gearing when desired and to control the speed of operation thereof, a brake shoe 26 is provided to engage one of the gears of the train, said shoe being pivotally mounted upon the casing as indicated at 27. Pivotally connected at its upper end of the shoe is a rod 28, extending downward into the handle 2 and carrying at its lower end a stem 29 movable in a slot 30 in the handle, said stem having an exterior finger piece or button by which it may be moved longitudinally in one direction or the other in said slot to impart corresponding motion to the rod, whereby the brake shoe may be thrown into and out of action to entirely stop or control the speed of rotation of the gearing as desired. The convenience of this part of a device will be manifest.

It will be understood, of course, that the fan when used is held in the hand and the lever 3 vibrated at intervals to energize the motor, but the form of the handle 2 is such as to adapt it to be mounted upon a suitable support for convenience of the operator.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:—

1. A portable fan comprising a hollow inclosing casing having a hollow handle forming a continuation thereof, said handle being formed at one side with a longitudinal opening, an operating lever pivotally mounted upon the lower end of the handle and forming a closure for said opening, said lever having an extension at its upper end projecting into the casing and adapted to abut against the same to limit its outward movement, a spring arranged within the handle between the body thereof and lever and bearing on the lever to normally hold the same outward in retracted position, fan-operating mechanism inclosed within the casing, a spring motor for driving said mechanism, rewinding clutch mechanism for the motor including a pinion, and a yoke carried by the said extension of the lever, said yoke forming an inclosing guide or runway for the pinion and being provided upon one of its longitudinal arms with rack teeth to engage the same, said rack-toothed arm being maintained by the yoke in engagement with said pinion.

2. A portable fan comprising a hollow inclosing casing having a hollow handle forming a continuation thereof, said handle being formed at one side with a longitudinal opening and at its opposite side with a longitudinal slot, an operating lever pivotally mounted upon the lower end of the handle and forming a closure for said opening, said lever having an extension at its upper end projecting into the casing and adapted to abut against the same to limit its outward movement, a spring arranged within the handle between the body thereof and lever and bearing upon the lever to normally hold the same outward in retracted position, fan operating gearing inclosed within the casing, a spring motor for driving said gearing, rewinding clutch mechanism for the motor including a pinion, a yoke carried by the extension of the lever and forming an inclosing runway for said pinion, one of the arms of said yoke being rack-toothed to mesh with the pinion, a brake pivotally mounted within

the casing to operate upon one of the gears of the operating mechanism, a rod connected at one end with the brake and extending at its opposite end into the handle, and an operating device for said rod projecting through and movable in the longitudinal slot in the handle.

3. A portable fan comprising a casing, fan mechanism including drive gearing inclosed within the casing, the latter being provided with a handle formed with a slot therein, a controlling member on the handle for energizing the fan gearing, a brake controlling said gearing pivotally mounted within the casing, a rod pivotally connected with the brake and extending into the handle, and an operating stem connected with said rod and movable in the slot in the handle.

In testimony whereof, I affix my signature in presence of two witnesses.

JACK C. MORGAN.

Witnesses:

J. MORGAN CHINN,

W. B. O'CONNELL.