

1,023,655.

Patented Apr. 16, 1912.

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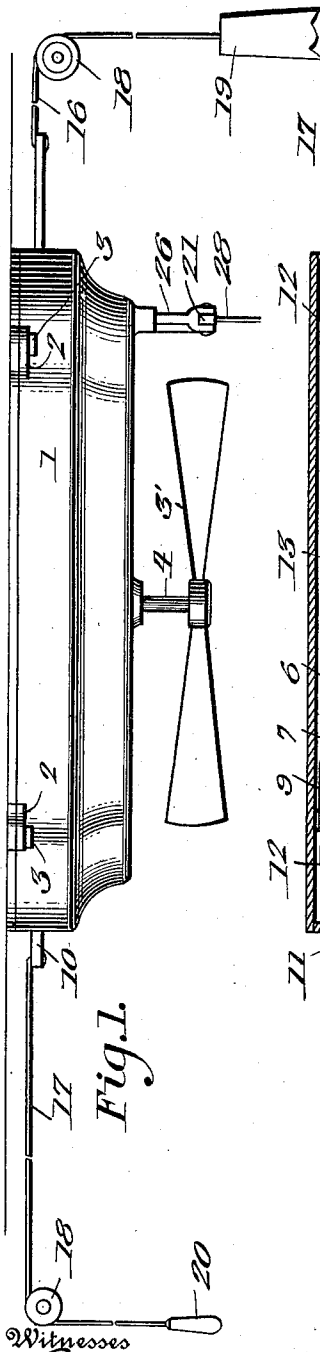


Fig. 1.

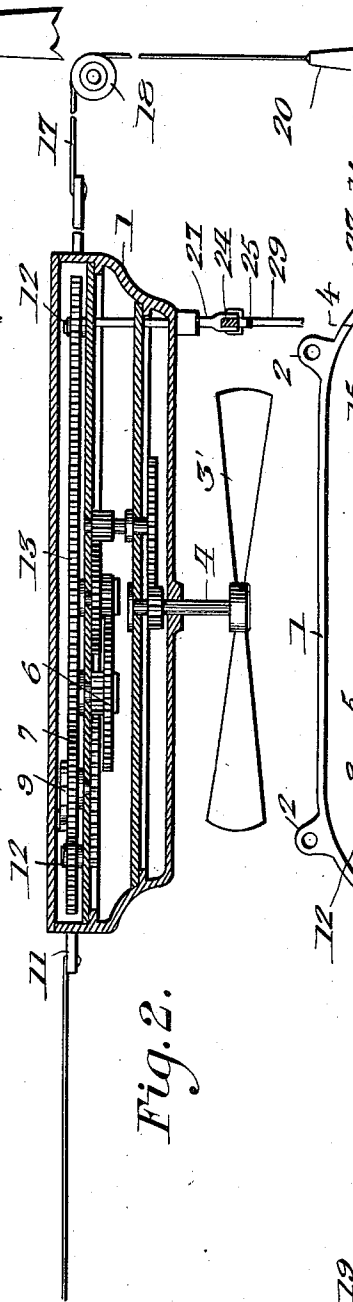


Fig. 2.

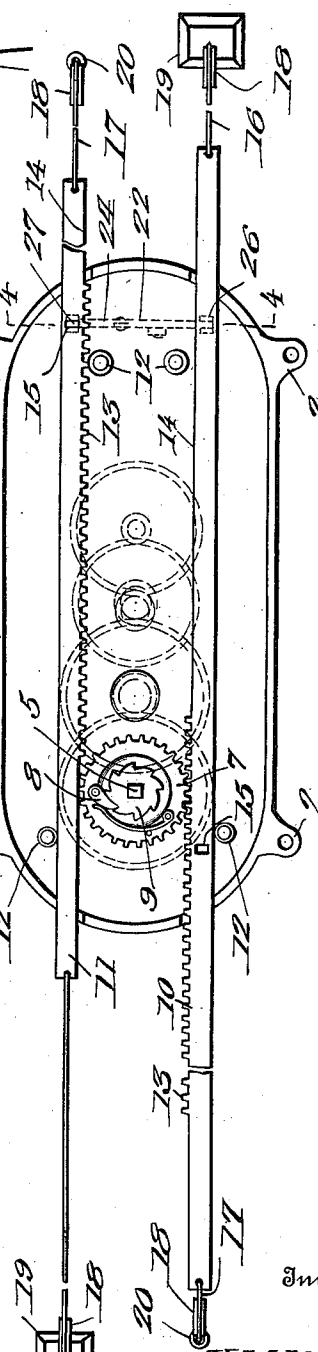


Fig. 3.

Witnesses

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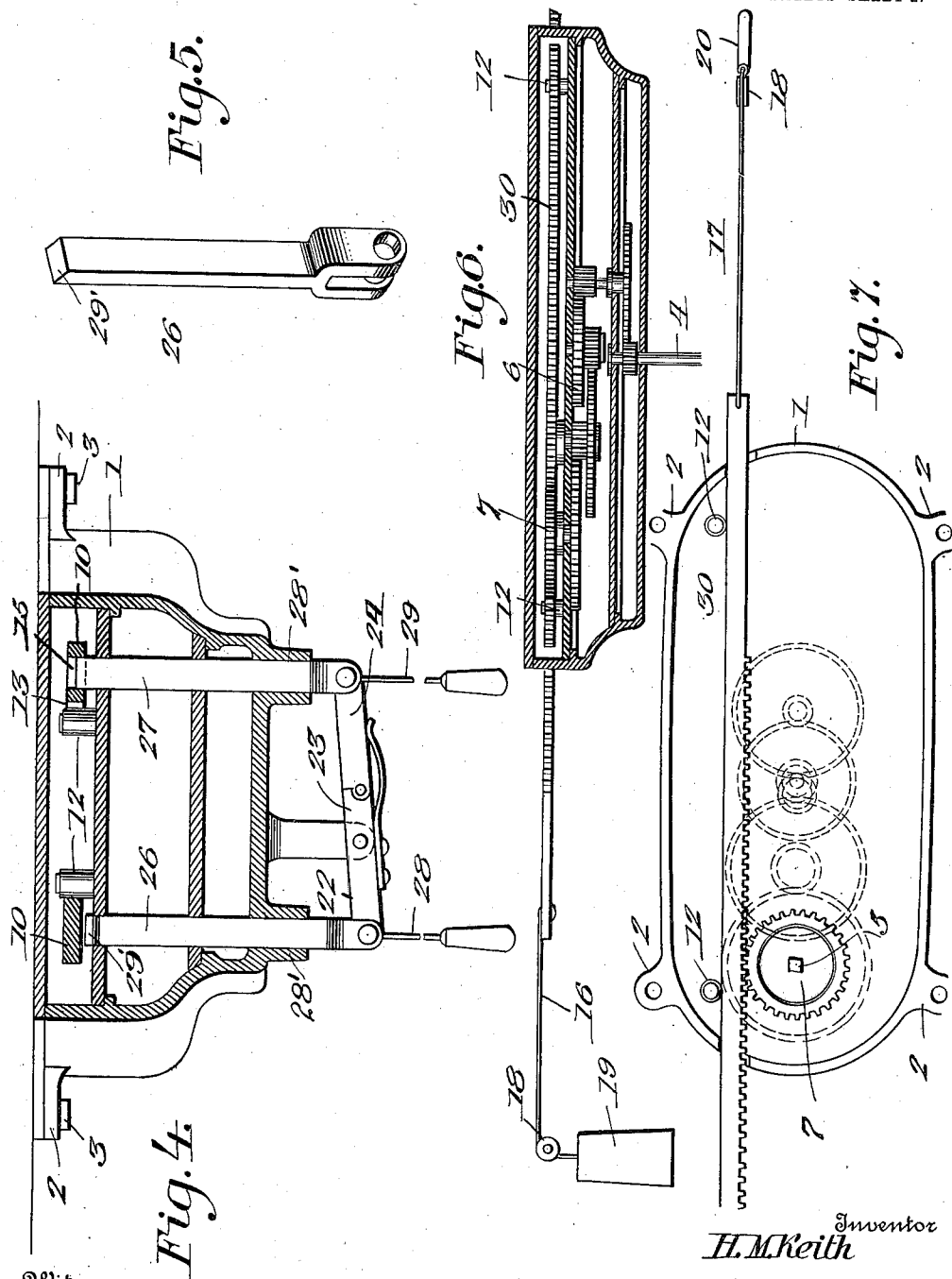
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

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FAN-DRIVING MECHANISM.

1,023,655.

Specification of Letters Patent.

Patented Apr. 16, 1912.

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To all whom it may concern:

Be it known that I, HENRY M. KEITH, a citizen of the United States, residing at Eldorado, in the county of Saline and State of Illinois, have invented new and useful Improvements in Fan-Driving Mechanism, of which the following is a specification.

This invention relates to fan driving mechanism for ceiling or wall fans, and its object is to provide a simple, reliable and efficient construction of rack gearing adapted to be easily and conveniently set for operation and to be driven by the action of a weight, to drive the fan for a maximum period and at a desired rate of speed.

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

Figure 1 is a side elevation of one form of my invention as embodied in a ceiling fan. Fig. 2 is a central vertical section thereof. Fig. 3 is a horizontal section showing one of the rack bars in action and the other locked from movement. Fig. 4 is a vertical section on the line 4—4 of Fig. 3. Fig. 5 is a detail view of one of the latches. Fig. 6 is a vertical section showing another form of the invention. Fig. 7 is a horizontal section thereof.

Referring to Figs. 1 to 5, inclusive, 1 designates a suitable casing, which may be adapted for either wall or ceiling use, and be constructed of any suitable material. In the present instance the casing is shown provided with ears or projections 2 for the passage of bolts, screws or other suitable fastenings 3, for securing it to the wall or ceiling. The fan 3' is mounted upon a driven shaft 4 receiving motion from a drive shaft 5 through a suitable train of gears 6, inclosed within the casing, which gears may be arranged and proportioned to drive the fan at any desired rate of speed upon the revolution of the shaft 5 at any designated rate of speed.

The fan gearing is adapted to be driven by a drive gearing including a gear 7 loose on the shaft 5 and carrying a spring actuated pawl or dog 8 adapted to engage a ratchet wheel 9 fixed to said shaft, whereby the gear is adapted when turned in one direction to be coupled to the shaft and transmit motion thereto, and when driven in the reverse direction to turn loosely on the shaft.

Slidably mounted in and projecting through the casing are rack bars 10 and 11, which move in guided contact with suitable idlers 12 and which are arranged in parallel relation on opposite sides of the gear 7 and are adapted to be employed independently or conjointly to drive said gear and thereby transfer motion to the fan gearing.

The rack bars are duplicates in construction, but reversed in arrangement, each having a rack toothed surface 13 and a plane surface 14 in advance of said rack toothed surface, in the direction of gear driving motion of said rack bar. Each of said rack bars is provided with a keeper opening 15, and is connected at its front and rear ends, respectively, with cords or cables 16 and 17 leading over suitable guide pulleys 18 and depending a suitable distance for effective use, the cable 16 carrying at its free end a weight 19 and the cable 17 at its free end a handle 20, whereby said cable 17 may be grasped and drawn upon 80 to slide the rack bar rearwardly and elevate the weight 19 for operation. The weight 19 is adapted to develop sufficient gravital force for power to operate the rack bar and drive the fan gearing at any desired rate of speed.

As stated, either one or both of the rack bars is or are adapted to be employed to drive the gear 7, which rack bars are accordingly arranged in reverse order and for travel in opposite directions to turn the gear in one and the same direction, in which it is connected by the pawl and ratchet to the shaft 5. In the opposite or rearward movement of the bar, when it is drawn backward by the handle 20, the pawl 8 slides over the ratchet teeth and permits the bar to be retracted and the weight 19 elevated at the end of the motion of the latter, so that the fan may continue by momentum while the rack bar is being adjusted for a further driving action.

In order to enable either one or both rack bars to be employed for a driving action, or to be used consecutively for such action, a controlling means is provided comprising a lever 21 pivotally mounted to provide long and short arms 22 and 23, the arm 23 including a pivoted arm 24 connected by a rule-joint therewith so as to have relative outward or downward motion only, and retained in normal position by the pressure of

a spring 25. Pivotally connected with the arm 22 is a sliding latch bar 26, and pivotally connected with the trip member 24 of the arm 23 is a similar latch bar 27, said latch bars being movable in suitable guides 28' and having beveled ends 29' to engage the keeper openings 15 in the rack bars 10 and 11. Pull cords or connections 28 and 29 are connected with the arm 22 and the trip member 24, whereby the lever and trip member may be tilted to control the latches, said pull cords leading downwardly through the casing to a convenient point for operation.

The cord 29 is adapted to be drawn downward to withdraw the latch 27 from engagement with the keeper opening in the rack bar 11, while the cord 28 is adapted to be pulled downwardly to withdraw the latch 26 from engagement with the keeper opening in the rack bar 10. When the keeper opening in the rack bar 10 is out of coincidence with the latch 26, the said rack bar 10 presses the latch 26 down, thus tilting the end 23 of the lever upward so as to project the latch 27 into engagement with the keeper opening in the bar 11. When, however, the keeper opening in the bar 10 comes into coincidence with the latch 26, the arm 23 is free to drop by gravity to retract the latch 27 and project the latch 26, the construction and arrangement of the two keeper openings 15 being such that when each rack bar reaches the limit of its driving action it will be engaged and locked from movement by the coacting detent, while the other rack bar which has been held in retracted position will be released by its latch for driving operation. The arm 24, however, may be drawn down by means of the pull cord 29, to retract the latch 27 when the latch 26 is retracted, so as to permit both rack bars to be thrown into operation, so that both driving weights 19 may be employed to drive the fan. It will thus be understood that each rack bar on its driving action will operate the gear 7 until its rear end passes beyond the gear, when it will be locked by the latch mechanism, while at the same time the other rack bar, which has been held latched and set for operation, will be automatically released for a forward driving action, so that after one bar has expended its driving force the other bar will be thrown into operation to drive the fan for a further period. At the end of its working motion, either bar may be retracted by pulling down upon the handle 20, thus drawing the bar backward and elevating the driving weight 19, the ratchet wheel 7 in this operation turning loosely on the shaft 5.

In the modified form of my invention shown in the Figs. 6 and 7, a single rack bar 30 is employed, and is of proper length for driving the gear 7 for any predetermined

period under the action of the weight 19. In the use of this construction it will, of course, be understood that after the bar has reached the limit of its driving motion it is drawn backward by pulling down upon the handle 20 and then allowed to feed forward under the downward movement of the elevated weight 19.

It will be observed that both forms of the invention provide a fan mechanism which is adapted to be operated by gravity to the action of a weight, and, when the force of the weight is expended, it may be retracted to raise the weight again for a succeeding working action. In practice, the gearing may be so constructed and proportioned as to be operated for a considerable period of time on each complete downward travel of the weight, thus obviating the necessity of raising the weight at frequent intervals.

Having thus described the invention, what I claim as new is:

1. In a fan driving mechanism, a fan driving gearing including a shaft, a gear loose on said shaft, a clutch connection between the shaft and gear adapted to permit free revoluble movement of the gear in one direction, a rack engaging said gear, a traveling weight for operating the bar on its feed motion, and means for retracting the bar and raising the weight.

2. In a fan driving mechanism, a casing, fan driving gearing including a shaft, a gear loosely mounted on said shaft, a clutch for connecting the gear with the shaft and permitting free revoluble movement of said gear in one direction, a rack bar slidable through the casing and meshing with said gear, a traveling weight for operating the rack bar on its feed motion, and means for retracting the bar and raising the weight.

3. In a fan driving mechanism, a fan driving gearing including a shaft, a gear loose on said shaft, a clutch for connecting the gear with the shaft and permitting free revoluble movement of said gear in one direction, rack bars movable in parallel pairs and adapted to mesh with opposite sides of the gear, traveling weights for operating said rack bars, means for retracting each rack bar and raising the weight, a latch for holding either bar inoperative while the other rack bar is in motion, and means for releasing the latch when the operating rack bar reaches the limit of its feed motion to free the other rack bar for operation.

4. In a fan driving mechanism, a fan driving gearing including a shaft, a gear having a pawl and ratchet connected with the shaft, oppositely disposed, weight-impelled rack bars adapted to mesh with the gear, means for retracting each rack bar and raising the impelling weight thereof, and means for simultaneously locking each rack bar at the limit of its feed motion and

simultaneously releasing the other rack bar for feed movement.

5 In a fan driving mechanism, a fan driving gearing including a shaft, a gear loosely mounted on and having a pawl and ratchet connected with the shaft, weight-impelled rack bars adapted to mesh with the gear, means for retracting each rack bar and resetting its actuating weight for operation,
10 latches for holding the rack bars in retracted position, said latches being automatically controlled by the rack bars to lock either

rack bar at the limit of its feed motion and release the other rack bar for operation, and means for manually controlling said 15 latches to permit either one or both rack bars to be set into action.

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

HENRY M. KEITH.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."