

N. H. HAWK.  
ROTARY FAN.

(Application filed Nov. 8, 1900.)

(No Model.)

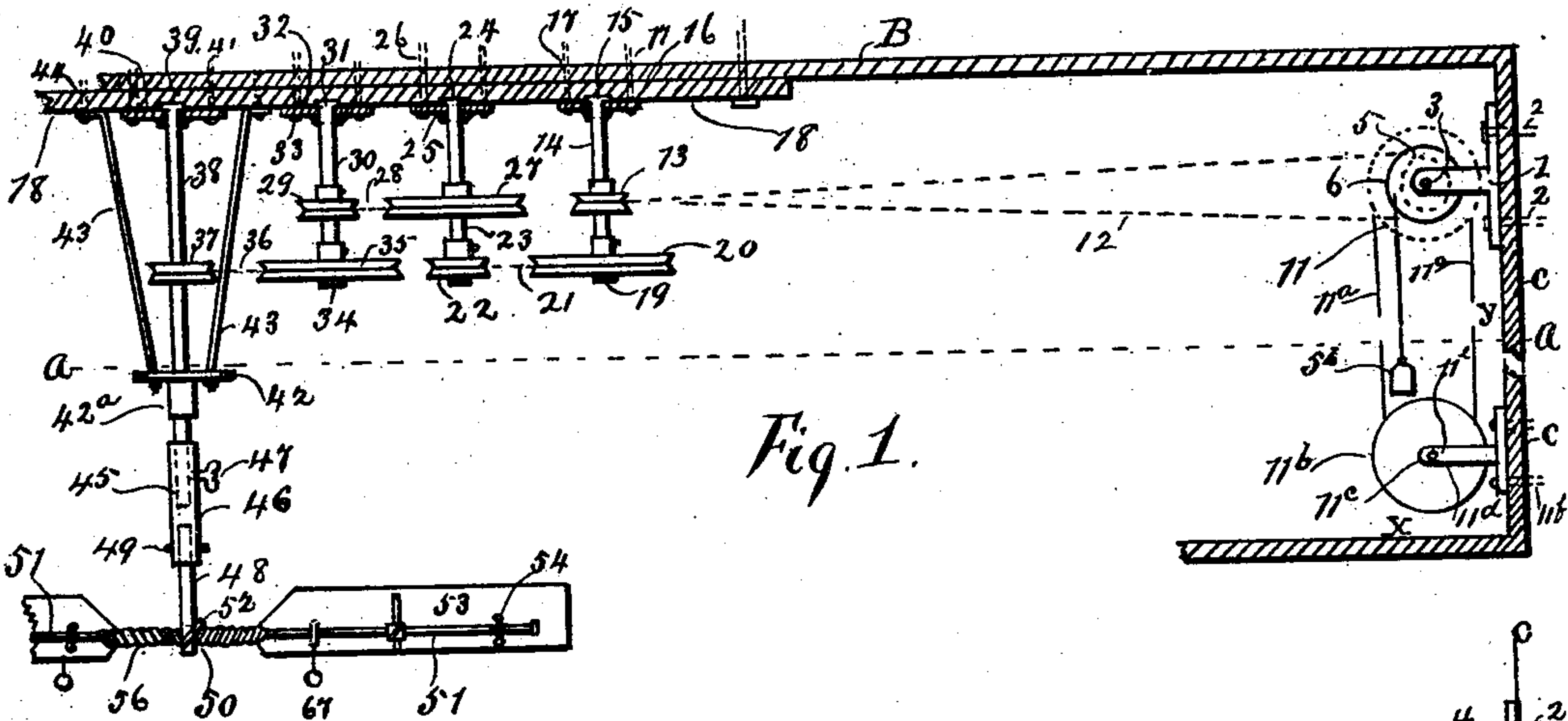


Fig. 1.

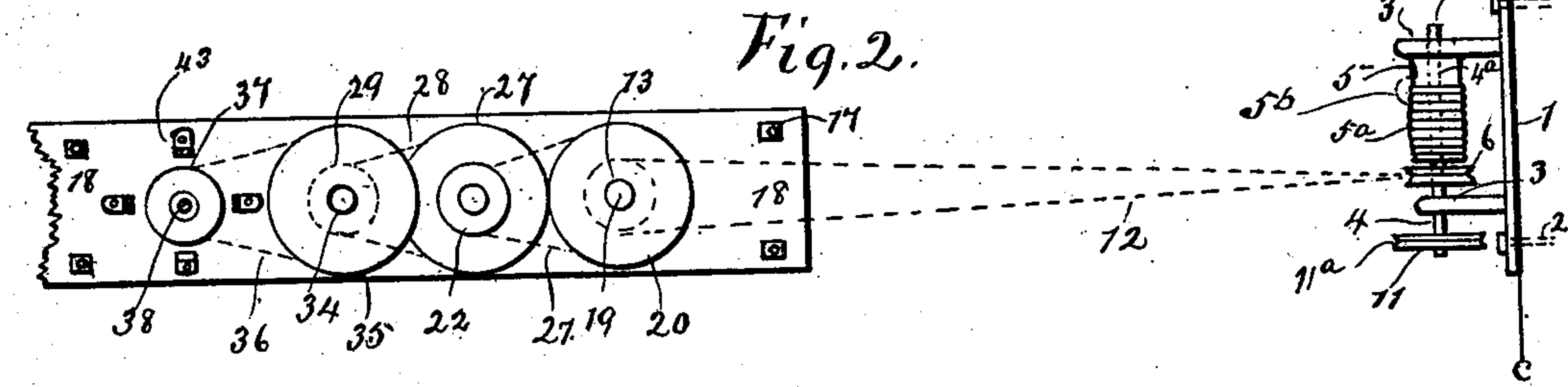


Fig. 2.

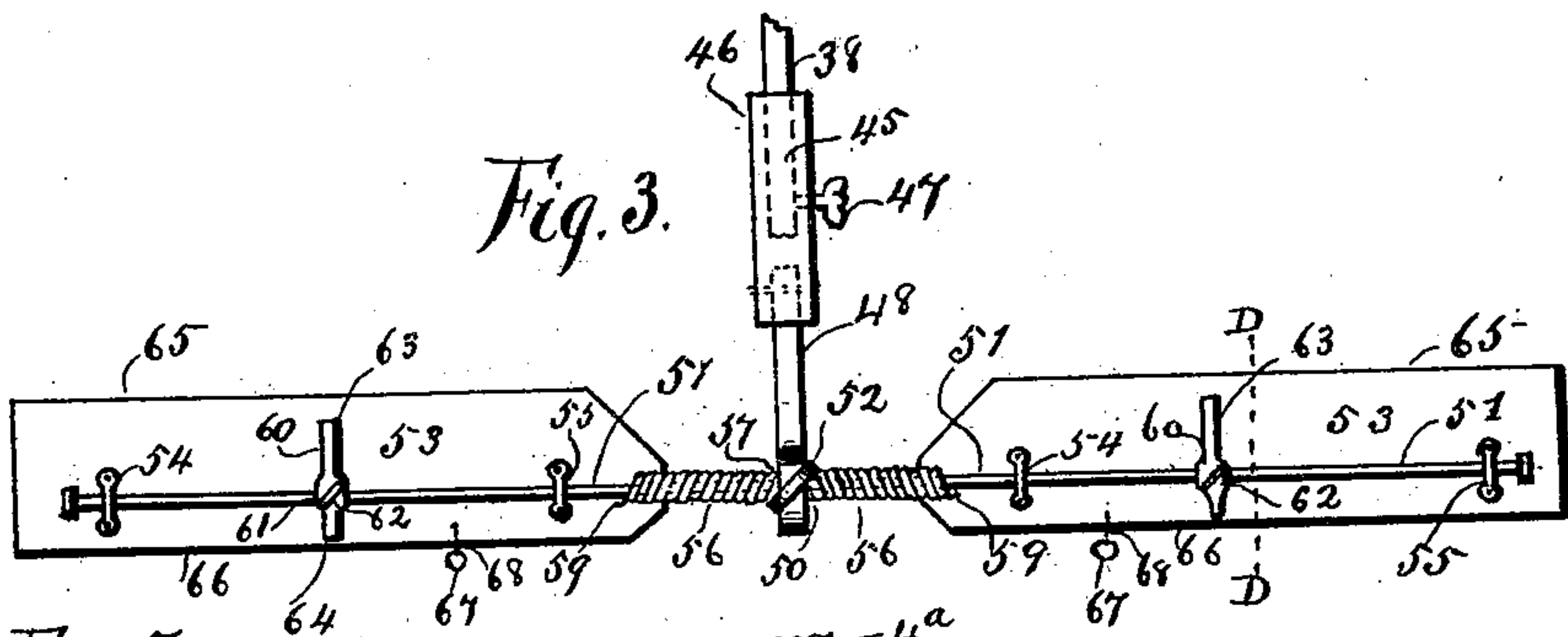


Fig. 3.

Fig. 5.

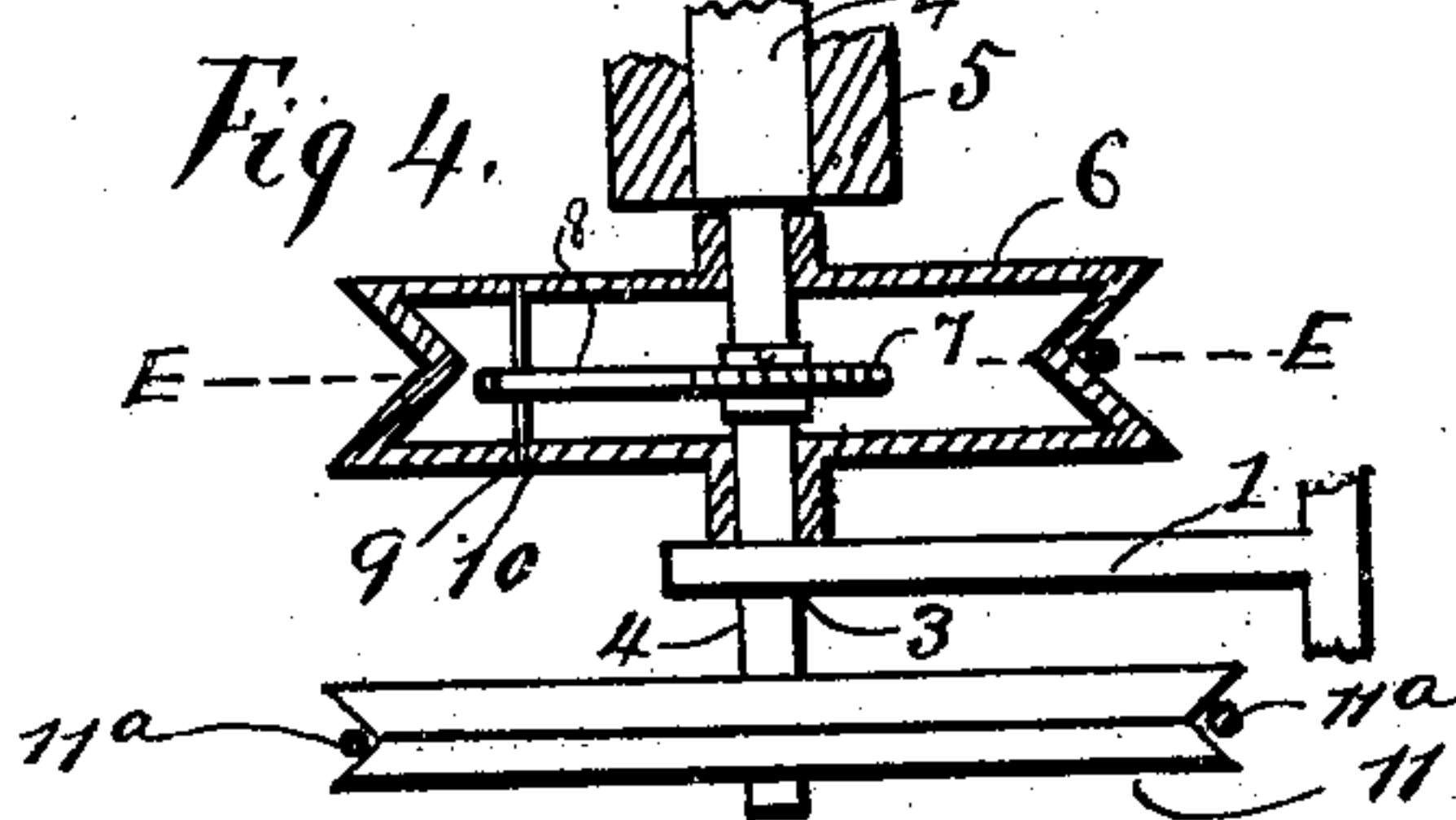
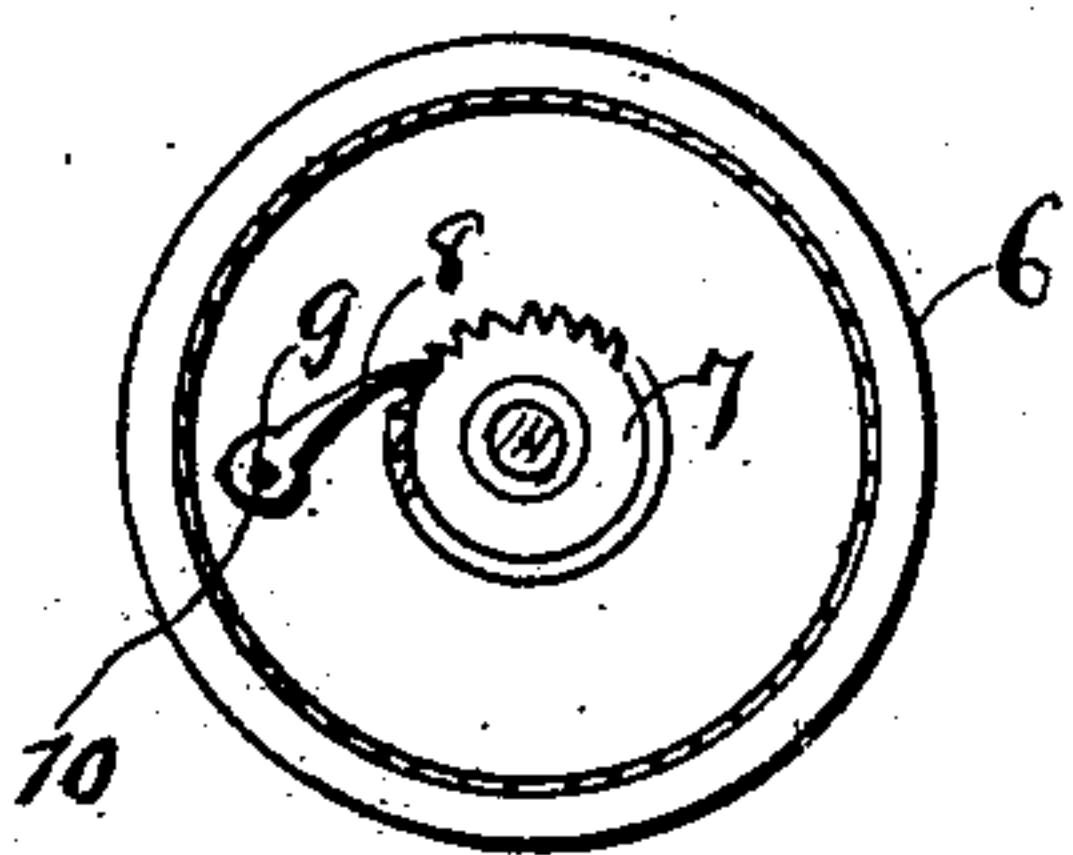


Fig. 4.

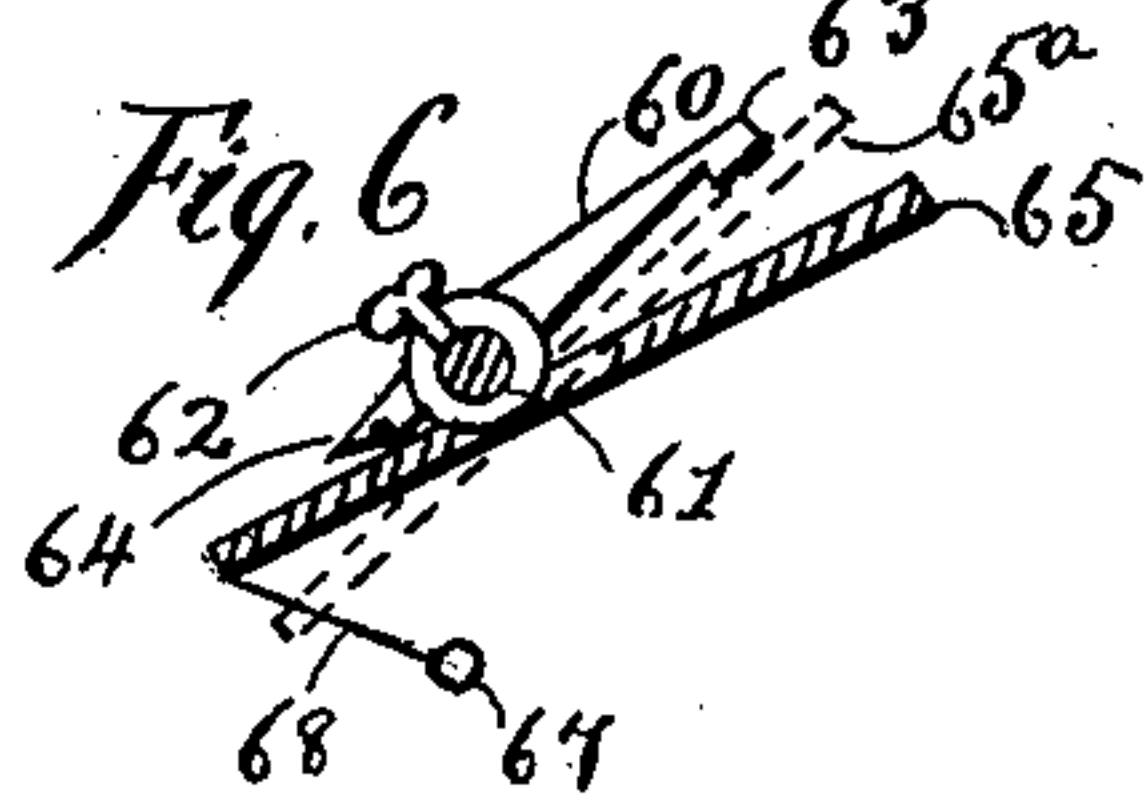


Fig. 6.

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# UNITED STATES PATENT OFFICE.

NATHANIEL H. HAWK, OF DESOTO, TEXAS.

## ROTARY FAN.

SPECIFICATION forming part of Letters Patent No. 712,790, dated November 4, 1902.

Application filed November 8, 1900. Serial No. 35,875. (No model.)

*To all whom it may concern:*

Be it known that I, NATHANIEL H. HAWK, a citizen of the United States of America, residing at Desoto, county of Dallas, State of Texas, have invented a new and useful Improvement in Rotary Fans, of which the following is a specification.

My invention relates to improvements in fly-fans, in which a series of band-wheels and pulleys connected by bands (propelled by a weight) operates the shaft to which the fans are attached; and the objects of my improvement are, first, to provide an inexpensive motive power for propelling the fans, and, second, to do away with the expensive mechanism usually employed in other fly-fans. I obtain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the device complete, partly suspended from the ceiling B and partly secured to the side wall C. Fig. 2 is an inverted view of Fig. 1 or as it appears in looking upward toward the ceiling. Fig. 3 is a side view of the lower end of the fan-shaft, showing the manner in which the fans are attached thereto. Fig. 4 is a section through the diameter of the ratchet-pulley, showing the arrangement of the ratchet-wheel and pawl. Fig. 5 is also a section through the ratchet-pulley from a point shown in Fig. 4 from E to E, and Fig. 6 is a section through one of the fans from D to D looking to the left, showing the manner in which the fan-stops are arranged upon the fan-rod.

Similar characters refer to similar parts throughout the several views.

The numeral 1 is the cable-drum frame, rigidly secured to side wall C by screws 2, said frame having bearings 3, which engage ends 4 4 of the cable-drum shaft 4<sup>a</sup>, the shaft having rigidly secured thereon a cable-drum 5, the same being provided with a cable 5<sup>a</sup>, (with one end secured to the drum, and to the other end is secured a weight 5<sup>b</sup>.)

6 is a band-pulley loosely engaging the cable-drum shaft 4<sup>a</sup>, to which is secured a ratchet-wheel 7, which engages a pawl 8, which has a bearing 9 on an axle 10, made fast to the band-pulley. One end of the cable-drum shaft is provided with a band-pulley 11, which engages a band 11<sup>a</sup>, which engages a

pulley 11<sup>b</sup>, which is secured to a shaft 11<sup>c</sup>, which has a bearing 11<sup>d</sup> on a frame 11<sup>e</sup>, made fast to wall C by screws 11<sup>f</sup>, the purpose of which will hereinafter be described. The pulley 6 engages a band 12, which engages a pulley 13, which is rigidly secured to a shaft 14, which has a bearing 15 in a wall-plate 16, which is secured by screws 17 through a board 18 into the ceiling B. At the lower end 19 of the shaft 14 is rigidly secured a larger band-pulley 20, which has a band 21, which engages a smaller pulley 22, which is rigidly secured to a shaft 23, which has a bearing 24 in a wall-plate 25, which is secured by screws 26 through the board 18 into the ceiling B. The shaft 23 has rigidly secured thereon a larger band-pulley 27, which engages a band 28, which engages a pulley 29, which is rigidly secured to a shaft 30, which has a bearing 31 in a wall-plate 32, which is rigidly secured (to the ceiling B through board 18) by screws 33. At the lower end 34 of the shaft 30 is rigidly secured a larger pulley 35, which engages a band 36, which engages a smaller pulley 37, which is rigidly secured to the fan-shaft 38, which has a bearing 39 (at the upper end) in a wall-plate 40, which is rigidly secured to the ceiling by screws 41. The fan-shaft is further provided with a plate 42, which has a cuff 42<sup>a</sup> rigidly secured thereto, to which is rigidly secured a number of braces 43, which are secured by screws 44 to board 18. The lower end 45 of the fan-shaft is provided with a hollow cylinder 46, which can be attached to the end of the shaft by thumb-screw 47. The lower end of the hollow cylinder is rigidly secured to the lower section 48 of the fan-shaft by rivet 49. At the lower end of the lower section of the fan-shaft is a round hole 50 just large enough to receive the fan-rod 51, which can be secured therein by the thumb-screw 52. The fans or blades 53 are provided with collar-form bearings 54, which receive the respective radial fan-rods 51, so that each blade is movable longitudinally along its rod inward and outward radially with respect to the central shaft. Each blade 53 is connected to the central shaft by a helical spring 56, surrounding the rod 51 of said blade, these springs tending to withdraw the said blades against centrifugal action. Each blade has also a weight 67 on



the end of a short stem 68, extending forward from the lower edge of said blade and tending to hold the latter in an inclined position, as shown in solid lines in Fig. 6, to drive the air downward. Stop-bars 60 are arranged one on each fan-rod behind the blade, the upper end 63 of the bar checking the upper part of the blade from turning back too far and the lower end 64 performing the same service for the lower part of said blade. When the speed of rotation tends to increase, the blades begin to slide outward by centrifugal action, thus increasing the inertia which has to be overcome in rotating each blade, and the weights 67, moving with the blades, add to this effect. Furthermore, the increased rotary motion by increasing the resistance of the air causes the blades to turn toward the position shown in dotted lines in Fig. 6, thus presenting them at a less angle to the air and still further increasing resistance. These two automatic compensations keep the rotary fan governed in its speed. At any lessening of centrifugal action the springs draw the blades inward, and the weights tend to restore them to their first position.

As to the operation of my device, the bearing-frame 11<sup>a</sup> is secured to the wall C at a suitable height from the floor *x*, so that the band 11<sup>a</sup> can be conveniently reached and pulled downwardly by hand, (the letter *y* indicates the point where the band must be caught hold of.) At the same time the weight 5<sup>b</sup> must be raised upwardly by the other hand (simultaneously the cable will be wound up on the cable-drum) to the required height, when the pawl 8 will engage the ratchet-wheel 7, which will prevent the rapid descent of the weight in direction of the floor. When the device is wound up, as above stated, the weight will cause a slow revolution of the cable-drum toward the left, (and gradually letting down the weight,) and at the same time the band 12, engaging pulleys 6 and 13, will cause a revolution of the whole system of pulleys and bands, including the fan-shaft, each pulley toward left revolving faster than the one toward right, so that considerable speed is had in the band-shaft to which the fans are attached. While in operation the fans will automatically adjust themselves on

the fan-rods, the pressure of the air on the lower surface of each fan will cause the upper edge to move upwardly to dotted line 65<sup>a</sup> of the said fan, when the arm 63 will prevent its moving farther in that direction, while the arm of the fan-stop 64 will prevent the upper edge of the fan from lowering. The action of the weights 67 and springs 56 will need no further explanation.

A suitable angle of the fans on the rods can be attained by use of the set-screw 62, and the required height of the fans from the floor can be had by the adjusting of the same with the thumb-screw 47.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a rotary fan-shaft and a series of radial fan-rods carried thereby a series of blades, or fans capable of sliding longitudinally on the said rods and pivoted thereon at one side of their longitudinal centers and springs for automatically returning them after such outward motion substantially as set forth.

2. In combination with a rotary fan-shaft and a series of radial fan-rods carried thereby, a series of blades or fans capable of sliding longitudinally on the said rods and pivoted thereon at one side of their longitudinal centers, means for automatically returning them after longitudinal movement outward, and weights attached to the said blades or fans at one edge thereof.

3. In combination with a rotary fan-shaft and a series of radial fan-rods carried thereby, a series of fans or blades having longitudinal motion on the said rods, a series of springs connecting the said blades to the said shaft and resisting the outward movement of the said blades, a series of arms extending forward from the said blades or fans and a series of weights on the forward ends of the said rods substantially as set forth.

In testimony whereof I have signed my name in the presence of two witnesses.

NATHANIEL H. HAWK.

Witnesses:

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C. COLLINS.