No. 840,230. PATENTED JAN. 1, 1907.

L. MYERS.

DRAFT PRODUCING FAN.

APPLICATION FILED JAN. 27, 1904. RENEWED OCT. 9, 1906.

6 SHEETS—SHEET 1.

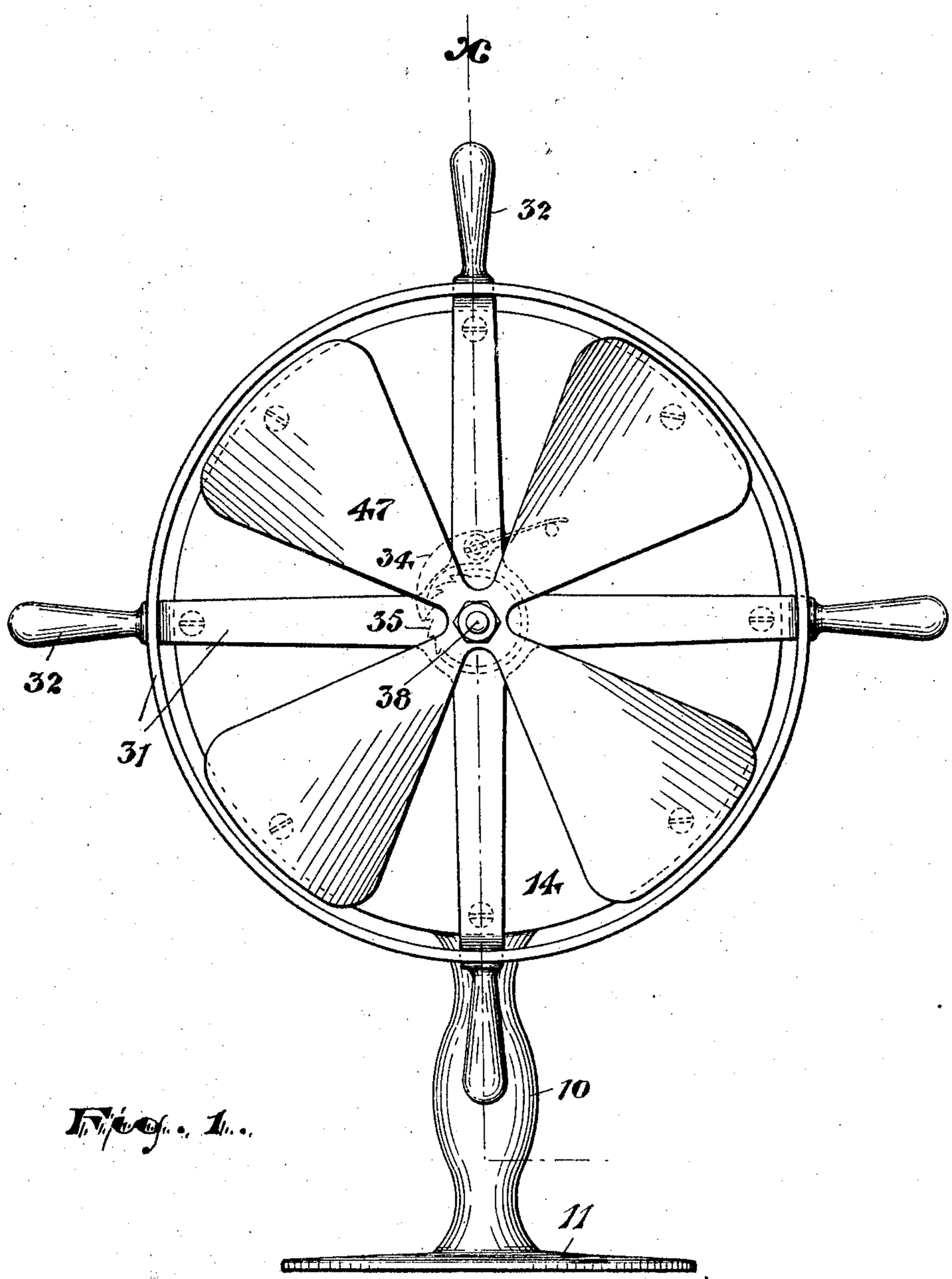


Fig. 1.

WITNESSES:

Ralph Lancaster

Russell M. Everett.

INVENTOR

Louis Myers.,

BY

Barnett Lee

ATTORNEY.

No. 840,230. PATENTED JAN. 1, 1907.

L. MYERS.

DRAFT PRODUCING FAN.

APPLICATION FILED JAN. 27, 1904. RENEWED OCT. 9, 1906.

6 SHEETS—SHEET 2.

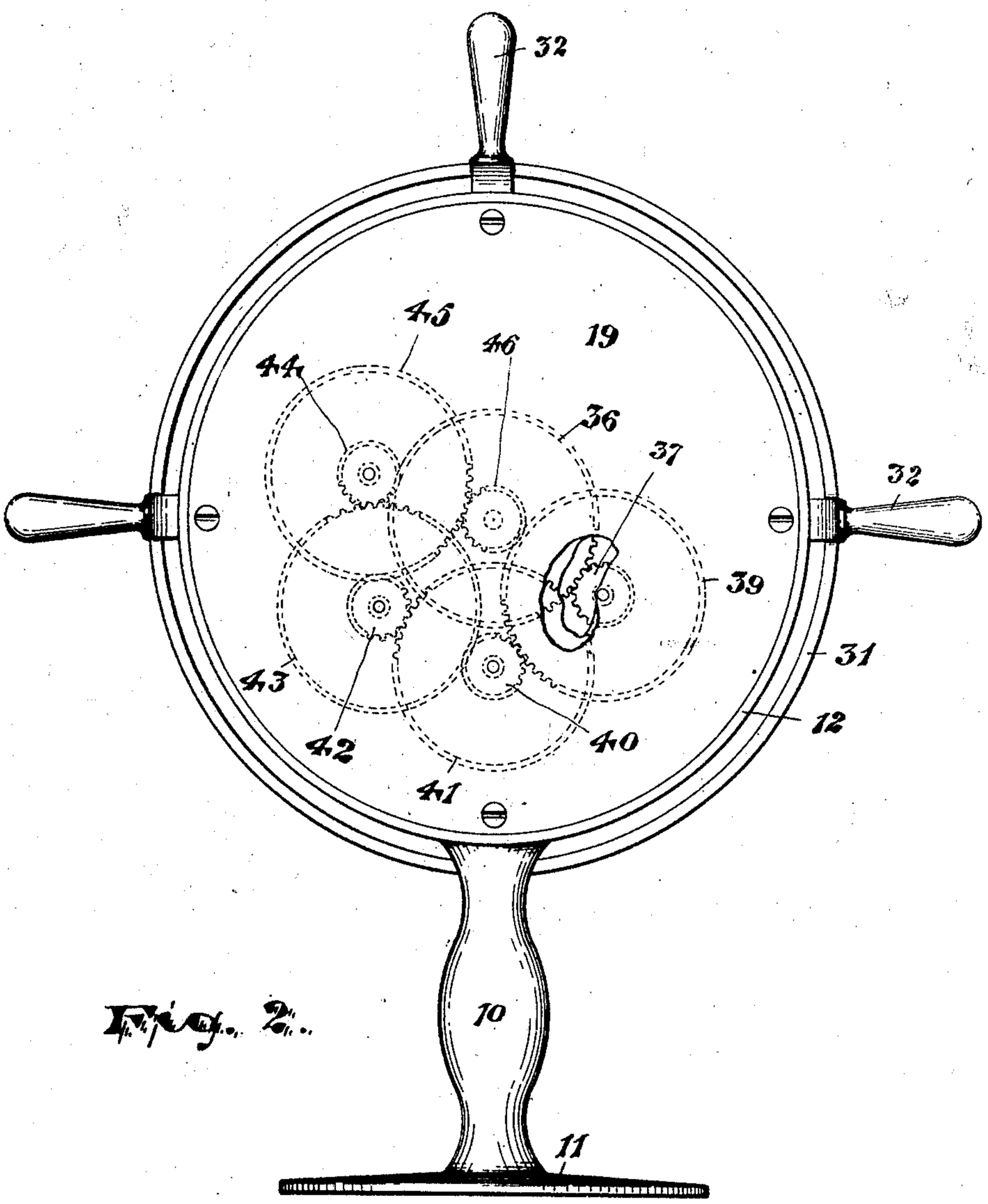


Fig. 2.

WITNESSES:

Ralph Lancaster

Russell M. Everett

INVENTOR:

Louis Myers.

BY

Charles H. Lee

ATTORNEY.

No. 840,230. PATENTED JAN. 1, 1907.

L. MYERS.

DRAFT PRODUCING FAN.

APPLICATION FILED JAN. 27, 1904. RENEWED OCT. 9, 1906.

6 SHEETS—SHEET 3.

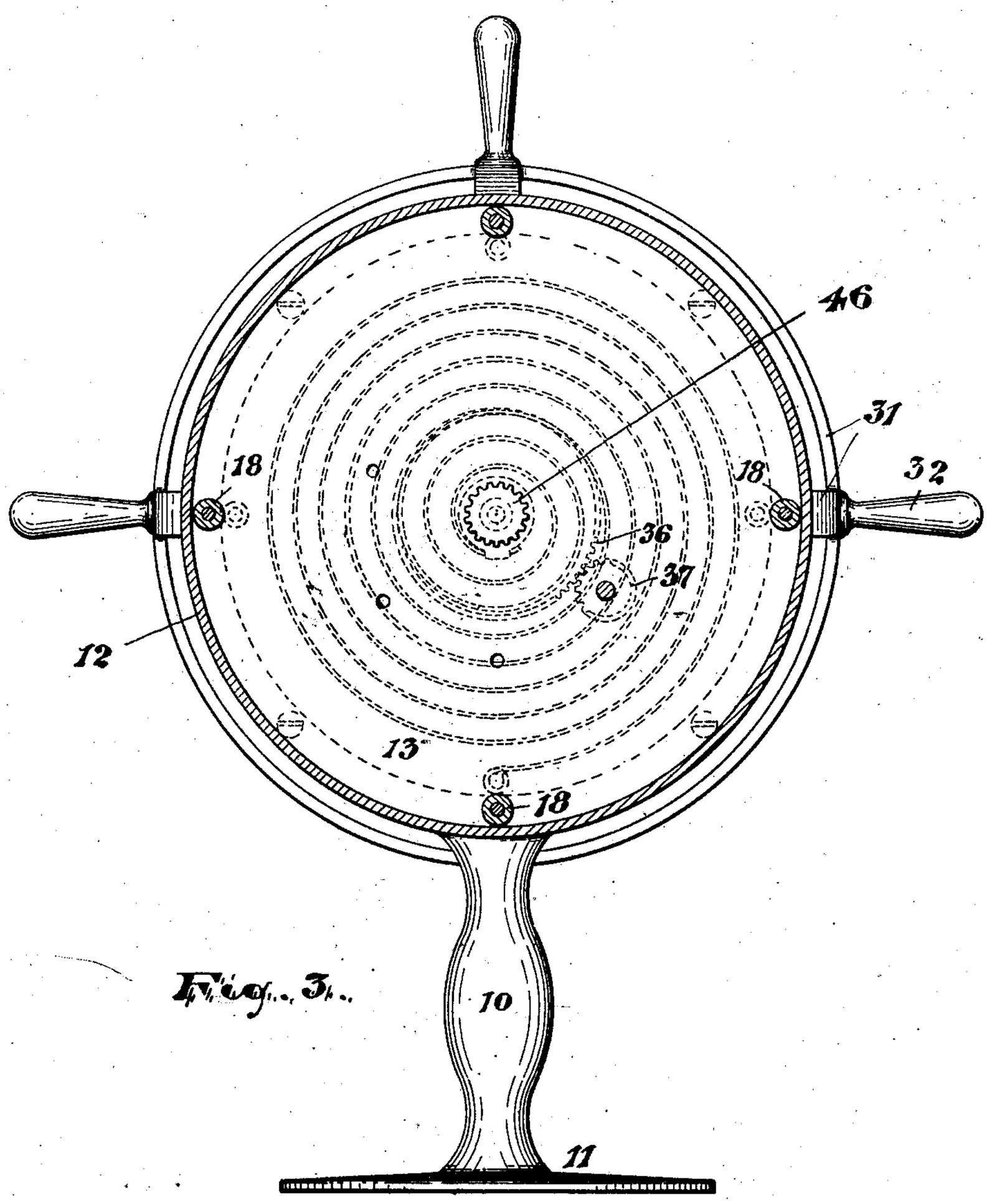


Fig. 3.

WITNESSES:

Ralph Lancaster

Russell M. Everett.

INVENTOR:

Louis Myers,

BY

Charles A. Pell

ATTORNEY.

No. 840,230. PATENTED JAN. 1, 1907.

L. MYERS.

DRAFT PRODUCING FAN.

APPLICATION FILED JAN. 27, 1904. RENEWED OCT. 9, 1906.

6 SHEETS—SHEET 4.

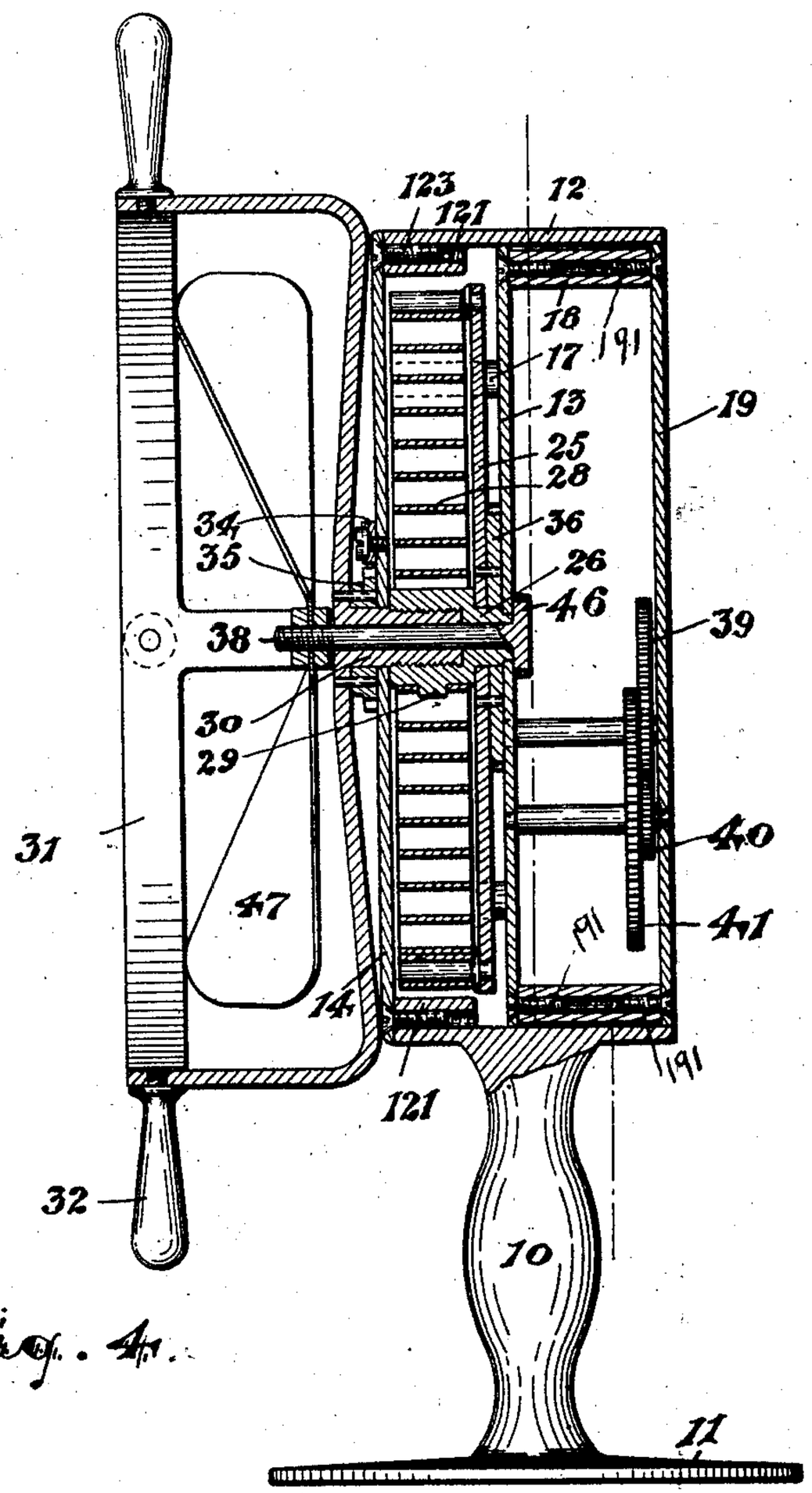


Fig. 4.

WITNESSES:

Ralph Lancaster

Russell M. Everett.

INVENTOR:

Louis Myers,

BY

Charles A. Lee

ATTORNEY.

No. 840,230.

PATENTED JAN. 1, 1907.

L. MYERS.

DRAFT PRODUCING FAN.

APPLICATION FILED JAN. 27, 1904. RENEWED OCT. 9, 1906.

6 SHEETS—SHEET 5.

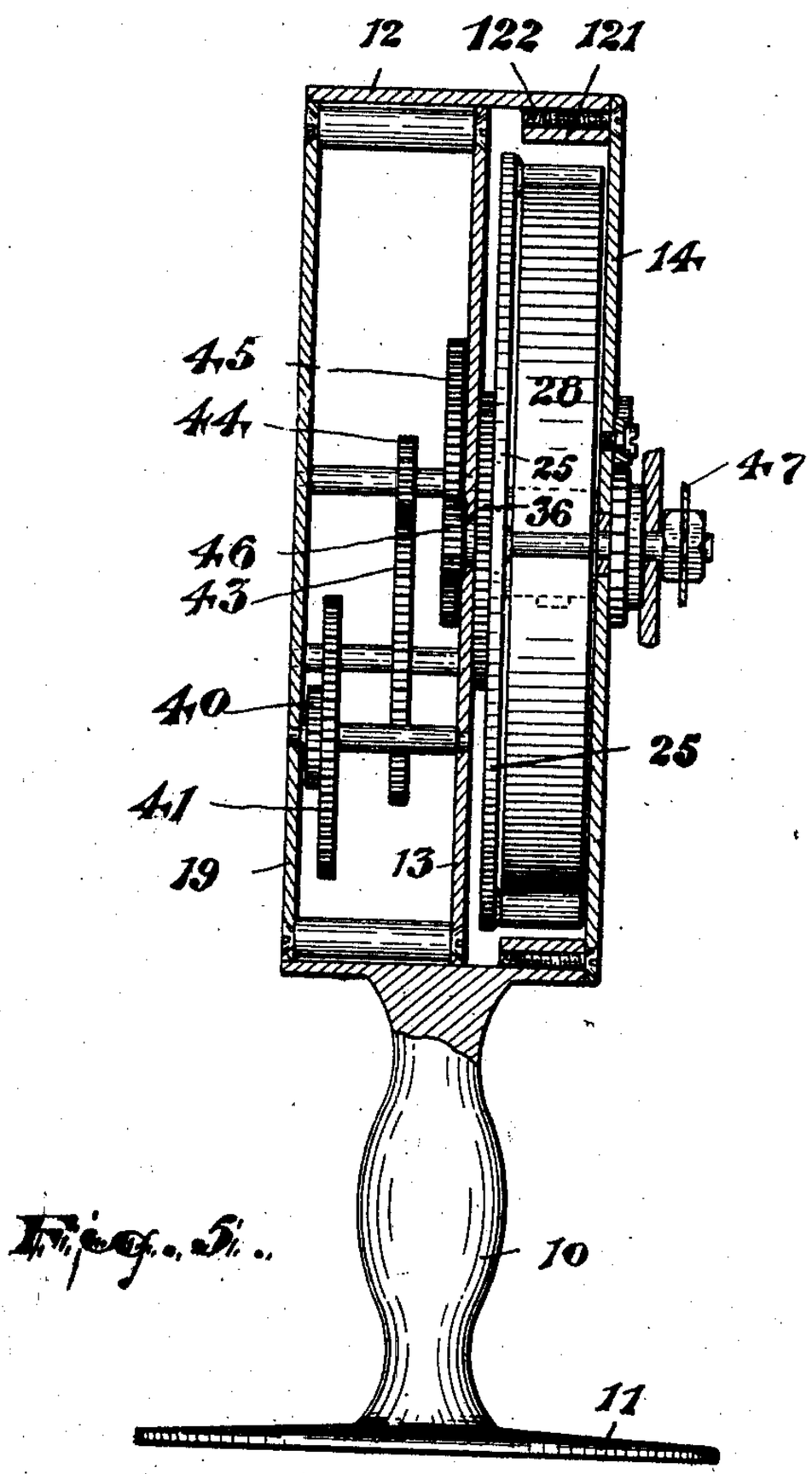


Fig. 5.

WITNESSES:

Ralph Lancaster

Russell M. Everett.

INVENTOR:

Louis Myers.

BY

Charles H. Peck

ATTORNEY.

No. 840,230. PATENTED JAN. 1, 1907.

L. MYERS.

DRAFT PRODUCING FAN.

APPLICATION FILED JAN. 27, 1904. RENEWED OCT. 9, 1906.

6 SHEETS—SHEET 6.

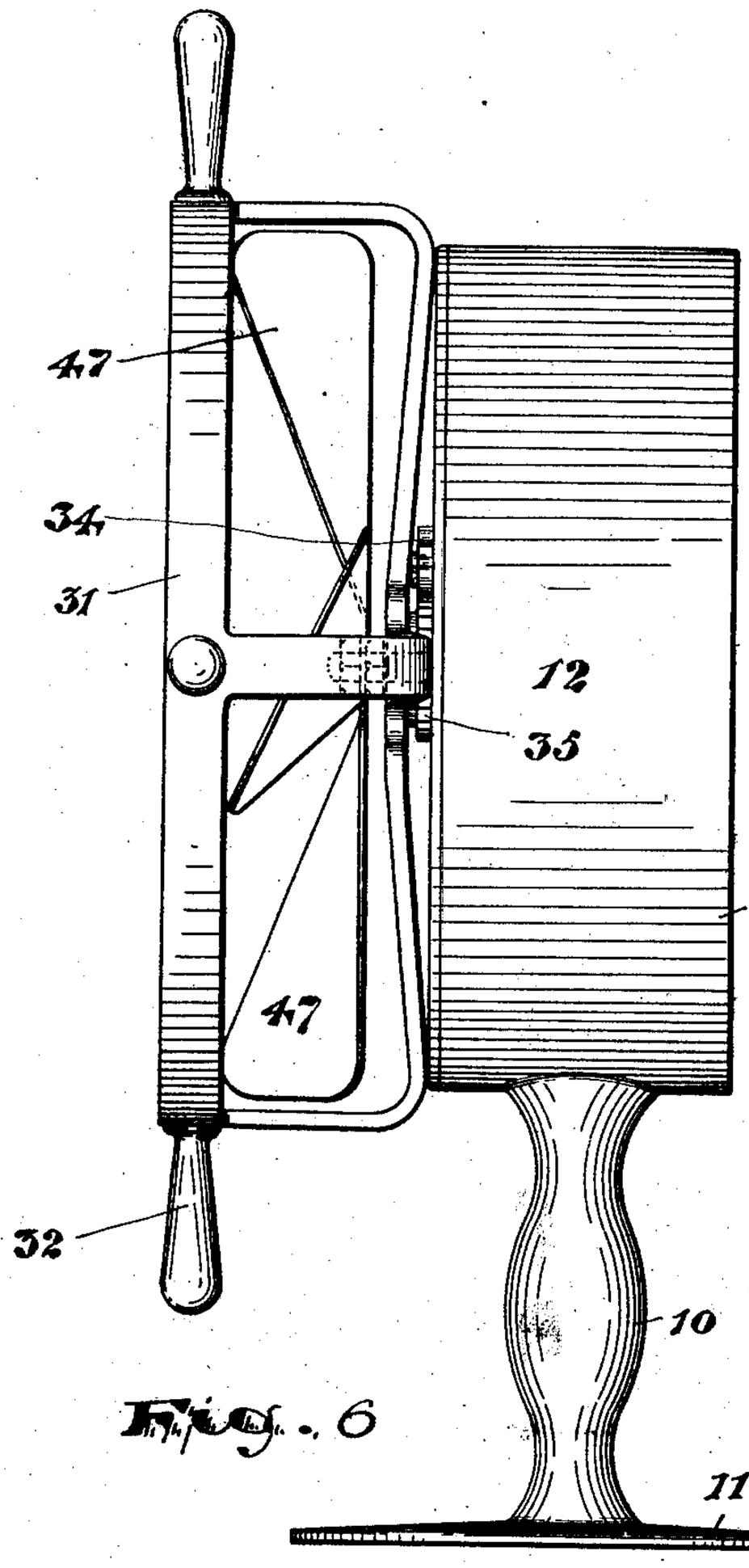
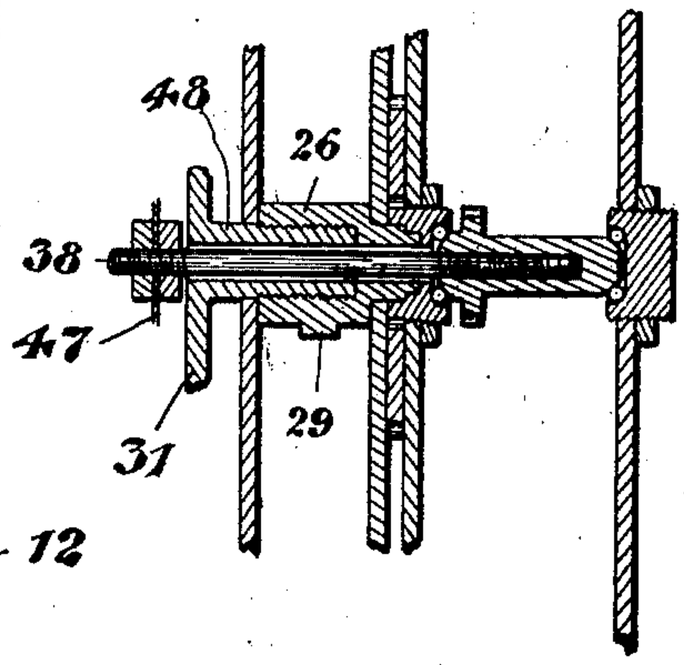


Fig. 6.

Fig. 7



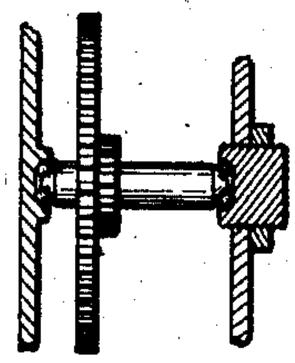


Fig. 8.

WITNESSES:

Ralph Lancaster

Russell M. Everett

INVENTOR:

Louis Myers,

BY

Church & Lee

ATTORNEY.

UNITED STATES PATENT OFFICE.

LOUIS MYERS, OF NEWARK, NEW JERSEY.

DRAFT-PRODUCING FAN.

No. 840,230. Specification of Letters Patent. Patented Jan. 1, 1907.

Application filed January 27, 1904. Renewed October 9, 1906. Serial No. 338,183.

To all whom it may concern:

Be it known that I, LOUIS MYERS, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Draft-Producing Fans; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

The objects of this invention are to economize power in the operation of fans employed more especially in securing a circulation of air in a room or apartment; to provide a more inexpensive and durable structure and one which may be readily kept in repair; to secure a device that can be conveniently transported from place to place, and thus to enable a movement of air to be directed to points where a draft is especially needed; to avoid the use of connections with distant sources of power, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved portable fan and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like numerals of reference indicate corresponding parts in each of the several figures, Figure 1 is a front elevation of my improved device. Fig. 2 is a rear elevation of the same. Fig. 3 is a view showing certain parts of the interior construction, the front plate, fan, spring, and immediate connections being removed. Fig. 4 is a sectional view taken at line *x*. Fig. 5 is a similar sectional view looking in the reverse direction. Fig. 6 is a side elevation of the device, and Figs. 7 and 8 are detail views illustrating certain ball-bearings which may be employed and which preferably are employed under certain conditions.

In said drawings, 10 indicates a post or stand having a broad base-plate 11 or legs adapted to hold the device erect upon a table, shelf, or similar support and having at its upper end a casing 12, which is preferably round in front elevation. Said casing 12 is preferably cast integral with the post 10 and provides interiorly, at the front thereof, bosses 121, having female threads 122, to which the front plate 14 of the case is secured by means of screws 123 or otherwise. The said front plate supports the center plate 13 by means of studs or posts 17 and coöperating screws, (not shown in full lines,) and the rear plate 19 is separably secured to said center plate 13 by similar hollow posts or studs 18 and screws 191. The plates 13, 14, and 19, with their posts or studs and screws, form a frame of removable parts. The wheel 47 and front winding means being first detached and the front plate 14 being detached from the casing 12, the rear plate 19, center plate 13, and spring-carrying plate 25 can be removed from behind through the rear opening of the casing. Between the front plate 14 and the center plate 13 of the said removable frame is a spring-carrying plate 25, arranged loosely on a hub or shaft 26, extending forward from a bearing at the center of the center plate. Said hub is stepped, as shown in Fig. 4, the smaller end lying in the center plate, the next larger step providing a pivot for the spring-carrying plate, and the enlarged part of the hub being within the spring 28 and having a pin or arm 29, to which the inner end of the spring is secured. The said hub 26 is provided at the axial center with a female thread to receive a pivotal extension 30 of a winding device 31, having radial handles 32, the said winding device being preferably a frame-like structure adapted to lie around and a little away from the periphery of the fan-wheel 47 to protect the same in service, the said frame serving to guard the wings of the fan-wheel from injury or from injuring the hands of a person handling the device in transportation or otherwise. The winding device 31 when turned in one direction serves to turn the hub 26 and wind up the spring 28. When turned in the reverse direction, it unwinds the spring, and if turning is continued it is simply unscrewed from the hub, so as to be removed when disassociating the parts.

The front plate 14, preferably at the front side thereof, is provided with a pawl 34, adapted to engage a ratchet-wheel 35, fixed upon the pivotal arbor 30 of the winding device or to said winding device. Thus under ordinary circumstances or when the pawl 34 is in engagement with the ratchet-wheel 35 the winding device can be turned in but one direction—to wind the spring 28; but by

raising the pawl from the ratchet-wheel the said winding device can be unscrewed and unwound, as above referred to.

On the hub 26 on one of its rearward steps is preferably arranged in connection with the spring-carrying plate 25 a gear-wheel 36, which turns on the hub with said spring-carrying plate and transmits power, in connection with a train of gear-wheels, to a pinion 37 on the fan-wheel shaft 38. The power of the spring 28 is thus transmitted, through said carrying-plate 25, gear-wheel 36, and the series or train of coöperating gear-wheels 37, 39, 40, 41, 42, 43, 44, 45, and 46, to a central fan-carrying shaft 38, upon which the fan-wheel 47 is stationed, the hub 26 and its pivotal or stepped extension and the pivotal and threaded shaft 48 of the winding device 31 being each hollow to permit a passage to said fan-carrying shaft. By this construction the power of the spring 28 is transmitted to the fan-wheel 47, and because of the series or train of gear-wheels the movement of the fan-wheel is greatly quickened, so that it rotates at a very high rate of speed to effect the desired propulsion or circulation of air.

It may be noted here that by simply unscrewing the front plate 14 from the annular casing 12, integral with the stand, and removing the fan-wheel and winding device at the front of said front plate the interior working parts can be withdrawn from said casing and be thus exposed, so that the same can be easily lubricated, cleaned, or otherwise manipulated, thus conducing to convenience in repair, cleaning, or lubricating.

I am aware that various and numerous detail changes may be made in the construction of my device without departing from the spirit or scope of my invention, and, while I have in positive terms detailed the preferred construction I do not wish to be understood as limiting myself by such positive descriptive terms; but, on the contrary, I wish my claims to be understood in their broadest interpretation, only restricted by the state of the art.

It is obvious that to reduce friction certain of the parts may be provided with ball-bearings, which may form the subject of further application, and similar changes may be made, as above indicated, without departing from the invention.

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

1. In a rotary fan, the combination with a portable casing of a removable front plate, a center plate and a rear plate fastened together, a spring-carrying plate inserted between said front plate and center plate, a hub arranged between the front plate and center plate and having in connection therewith a spring and winding means, the spring-carrying plate being pivoted on said hub, and a train of gear-wheels arranged between the center plate and rear plate and transmitting power to the rotary fan and said rotary fan arranged outside of said front plate concentric with said hub and in connection with said train of gearing, substantially as set forth.

2. In a rotary fan, the combination with a portable casing open at the front and back, of a front plate, rear plate and center plate separably joined together, a hub having bearings in said center plate and extending forward therefrom to the front plate, a spring-carrying plate between the front plate and center plate on said hub, a spring in connection with said hub and carrying-plate, means for winding said spring, a train of gear-wheels arranged in bearings of the center plate and rear plate and receiving power from said spring-carrying plate, and a fan-wheel arranged on a shaft concentric with said hub and receiving power from said train of gear-wheels, substantially as set forth.

3. In a draft-producing fan, the combination with a casing open at the front and rear, of a front plate, a rear plate and center plate separably fastened together and having bearings for the working parts, a spring-carrying plate arranged loosely on a hub extending forward from the center of the center plate, said hub being stepped and the smaller end thereof lying in the said center plate, the next larger end providing the pivotal center on which the said spring-carrying plate loosely turns, and the large part of the hub lying within the motive spring secured thereto, said hub at its axial center being bored out and provided with a female thread to receive an extension of winding means, said extension being provided with said winding means outside the front plate, a pawl and ratchet-wheel to prevent the winding means and spring from unwinding, a train of gear-wheels arranged between the center plate and rear plate in communication with the said spring-carrying plate and rotary fan and said fan arranged on a fan-carrying shaft which extends through the hub and the extension thereof, from the train of gear-wheels, substantially as set forth.

4. The combination with a portable casing inclosing a spring and having a fan in connection with said spring, of a frame-like spring-winding device serving as a guard for said fan, substantially as set forth.

5. The combination with a portable casing inclosing a spring and having a fan in connection with said spring, of a frame-like winding device for the spring, inclosing the spring and guarding the same in its movements and having handles whereby said winding device may be conveniently turned to wind the spring.

6. In a draft-producing fan, the combination with a loose spring-carrying plate and the spring mounted thereon, a hollow hub,

means for turning the hub and winding the said spring connected with said hub, a train of gear-wheels in connection with said spring-carrying plate, a fan-wheel shaft in connection with said train of gear-wheels and extending through said hollow hub, and a fan-wheel arranged on said shaft concentric with the winding means, substantially as set forth.

7. In a draft-producing fan, the combination with a loose spring-carrying plate and the spring mounted thereon, a hollow hub, a hub extension screwed upon said hub and separable therefrom, means for turning the hub and winding the said spring connected with said hub, a train of gear-wheels in connection with said spring-carrying plate, a fan-wheel shaft in connection with said train of gear-wheels and extending through said hollow hub and separable hub extension, and a fan-wheel arranged on said shaft concentric with the winding means, substantially as set forth.

8. The improved rotary fan herein described comprising an annular frame, open at front and rear to receive front and rear plates, said front and rear plates and an intermediate plate separably fastened to one another and providing bearings for the movable parts, a hollow pivotal hub arranged at the center of the annular frame and extending from the intermediate plate to the front plate, a movable spring-carrying plate arranged on the pivotal hub, a spring attached to said hub and to said spring-carrying plate, a rotary fan and a winding-frame concentrically arranged at the outside of said front plate in connection with a train of gear-wheels and said hub respectively, said train of gear-wheels adapted to transmit power from the spring-carrying plate to the rotary fan, and means to prevent the winding device from moving backward, substantially as set forth.

9. The improved rotary fan herein described comprising an annular frame, open at front and rear to receive front and rear plates, said front and rear plates and an intermediate plate separably fastened to one another and providing bearings for the movable parts, a hollow pivotal hub arranged at the center of the annular frame and extending from the intermediate plate to the front plate, a movable spring-carrying plate arranged on the pivotal hub, between the front and intermediate plates and having at its side toward the intermediate plate a gear-wheel rotating therewith, a pinion meshing with said gear-wheel, and gear-wheels between said intermediate plate and the rear plate in train with said pinion, and transmitting movement to the rotary fan, said rotary fan and a winding-frame lying adjacent to and concentric with said fan and adapted to be turned by hand to wind up said spring, and means to prevent an ineffective unwinding of said spring, substantially as set forth.

10. The combination with a portable casing inclosing a spring and having a fan in connection with said spring, of a spring-winding device arranged at the front of said fan and adapted to be turned by hand on a center concentric with the axis of said fan, substantially as set forth.

11. In a rotary fan, the combination with a portable casing, of a front plate removable from said casing, a center plate and a rear plate separably fastened together and together removable from the front plate, a spring-carrying plate inserted between said front plate and center plate, a hub arranged between the front plate and center plate and having in connection therewith a spring and a spring-winding means, the spring-carrying plate being pivoted on said hub, a train of gear-wheels arranged between the center plate and rear plate and transmitting power to the rotary fan and said rotary fan arranged outside of said front plate concentric with said hub and in connection with said train of gearing, the said spring-winding means having a hollow pivotal extension arranged on the axis of the fan and having hand-operable means adapted to be turned to wind the spring, substantially as set forth.

12. A draft-producing fan apparatus comprising a hollow casing mounted on a suitable stand, a helical spring and train of gearing driven thereby, contained in said casing, a rotary fan-wheel in front of the casing mounted on a horizontal driving-shaft driven by the said spring through the medium of said gearing and a winding device surrounding the fan-wheel and connected with the hub of the spring for winding the same substantially as shown and described.

13. A draft-producing fan apparatus comprising a hollow casing mounted on a suitable stand, a helical spring and train of gearing driven thereby, contained in said casing, a rotary fan-wheel in front of the casing mounted on a horizontal driving-shaft driven by the said spring through the medium of said gearing, a hollow hub surrounding said driving-shaft and connected with the inner end of the spring, a winding device surrounding the fan-wheel and connected with the hollow hub for winding the spring and a pawl-and-ratchet device to secure the winding device against reverse movement.

14. A draft-producing fan apparatus comprising a hollow casing mounted on a suitable stand, a helical spring and train of gearing driven thereby, contained in said casing, a rotary fan-wheel in front of the casing mounted on a horizontal driving-shaft driven by the said spring through the medium of said gearing, a hollow hub formed with a threaded socket, surrounding said driving-shaft and connected to the inner end of the spring, a winding device having a hollow, rearwardly-projecting hub, surrounding the fan-wheel

shaft and externally threaded to engage the internal thread of the spring-hub for winding the spring and a suitable pawl-and-ratchet device to prevent reverse rotation of the winding device.

15. A draft-producing fan apparatus comprising a hollow casing mounted on a suitable stand, a helical spring and train of gearing driven thereby, contained in said casing a rotary fan-wheel in front of the casing mounted on a horizontal driving-shaft driven by the said spring through the medium of said gearing and a winding device consisting of a frame surrounding the fan, handles projecting radially therefrom for turning it and a rearwardly-projecting hub engaging with the hub of the spring for winding the latter, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 22d day of January, 1904.

LOUIS MYERS.

Witnesses:
CHARLES H. PELL,
RUSSELL M. EVERETT.