

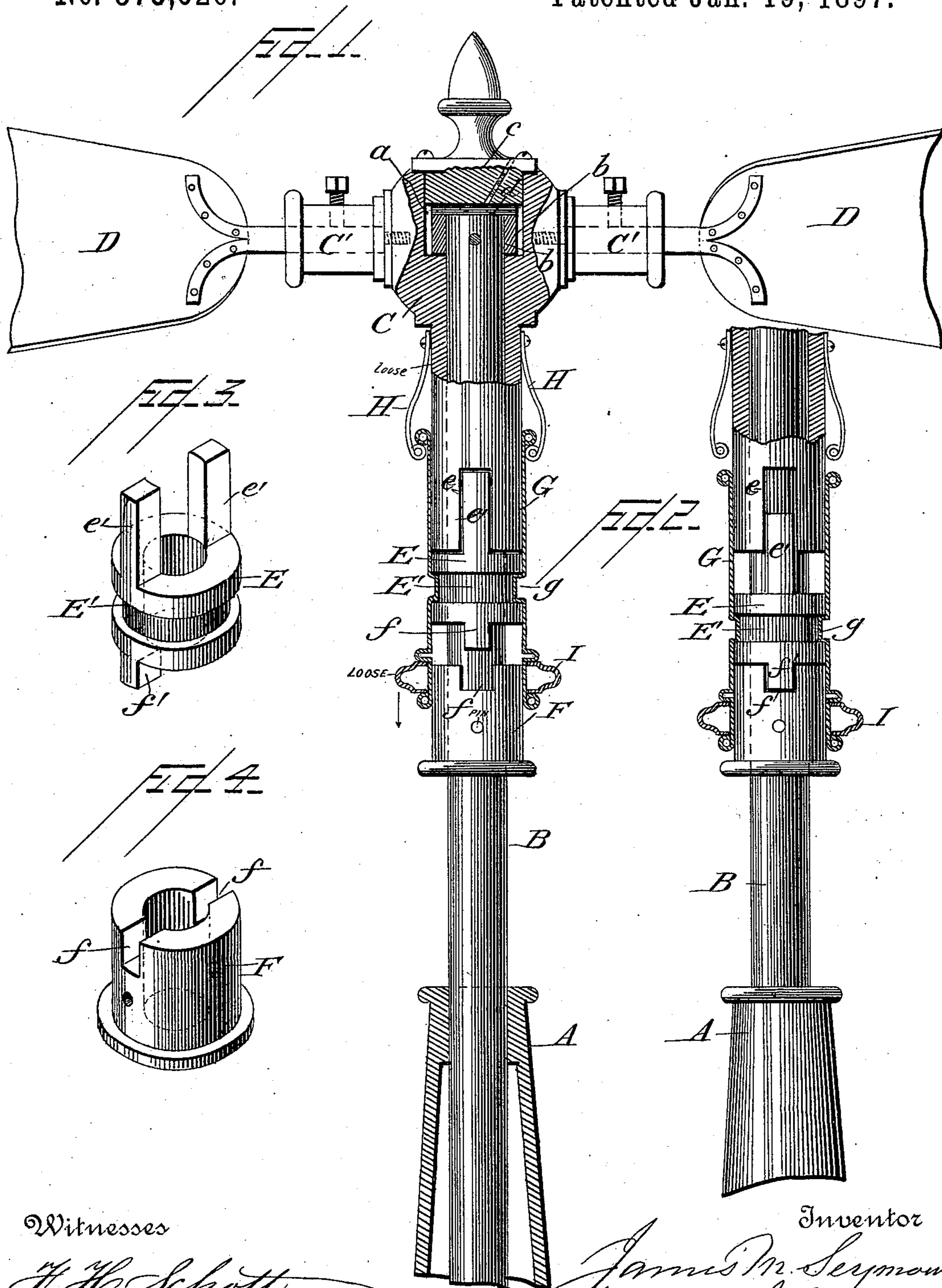
(No Model.)

3 Sheets—Sheet 1.

J. M. SEYMOUR.  
ROTARY FAN.

No. 575,620.

Patented Jan. 19, 1897.



Witnesses

*H. H. Schott*  
*Edw. E. Foster*

Inventor

*James M. Seymour*  
By *his Attorney John C. Foster*

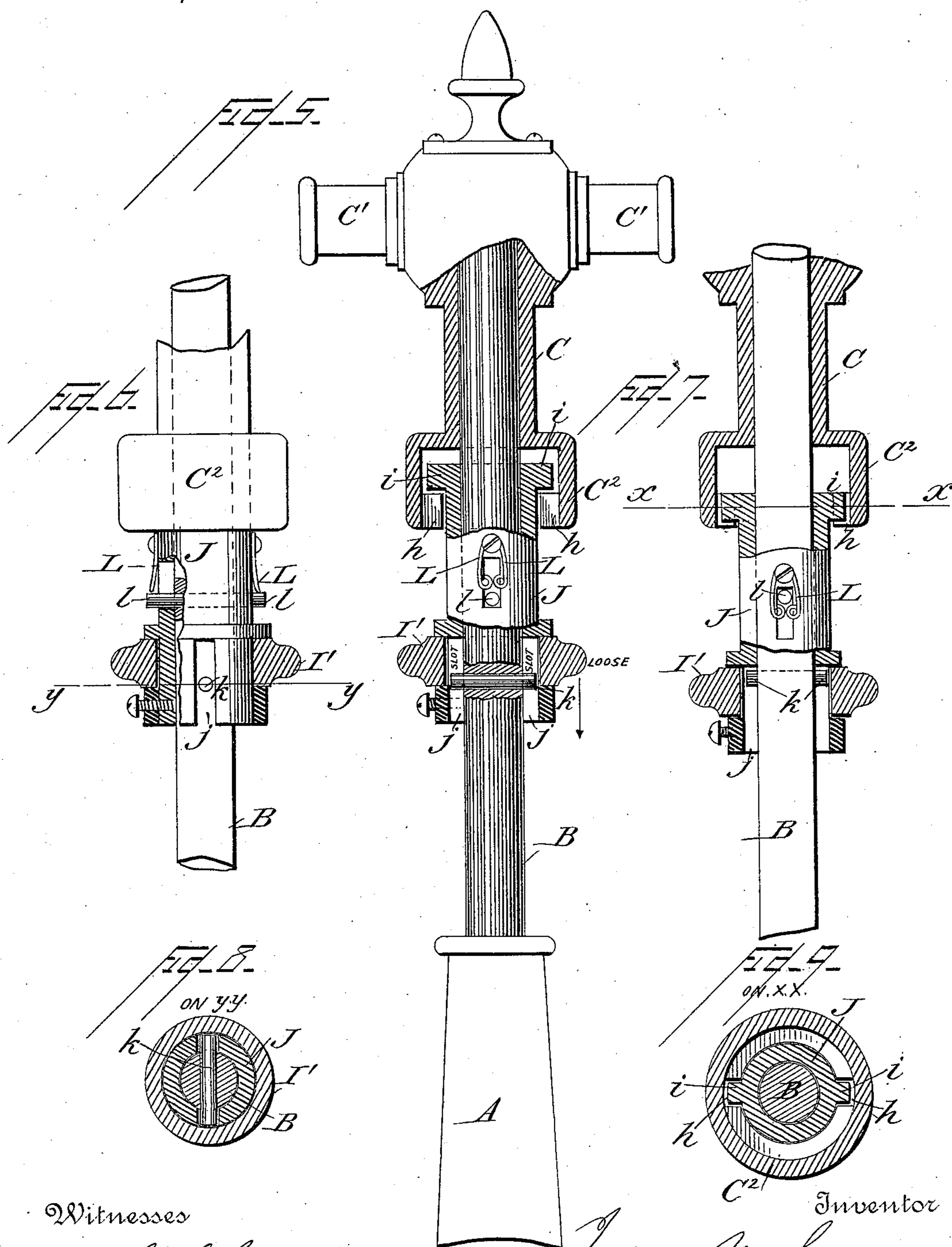
(No Model.)

3 Sheets—Sheet 2.

J. M. SEYMOUR.  
ROTARY FAN.

No. 575,620.

Patented Jan. 19, 1897.



Witnesses

H. H. Schott  
Fred E. Parker

Inventor

James M. Seymour  
By his Attorney John C. Tasker

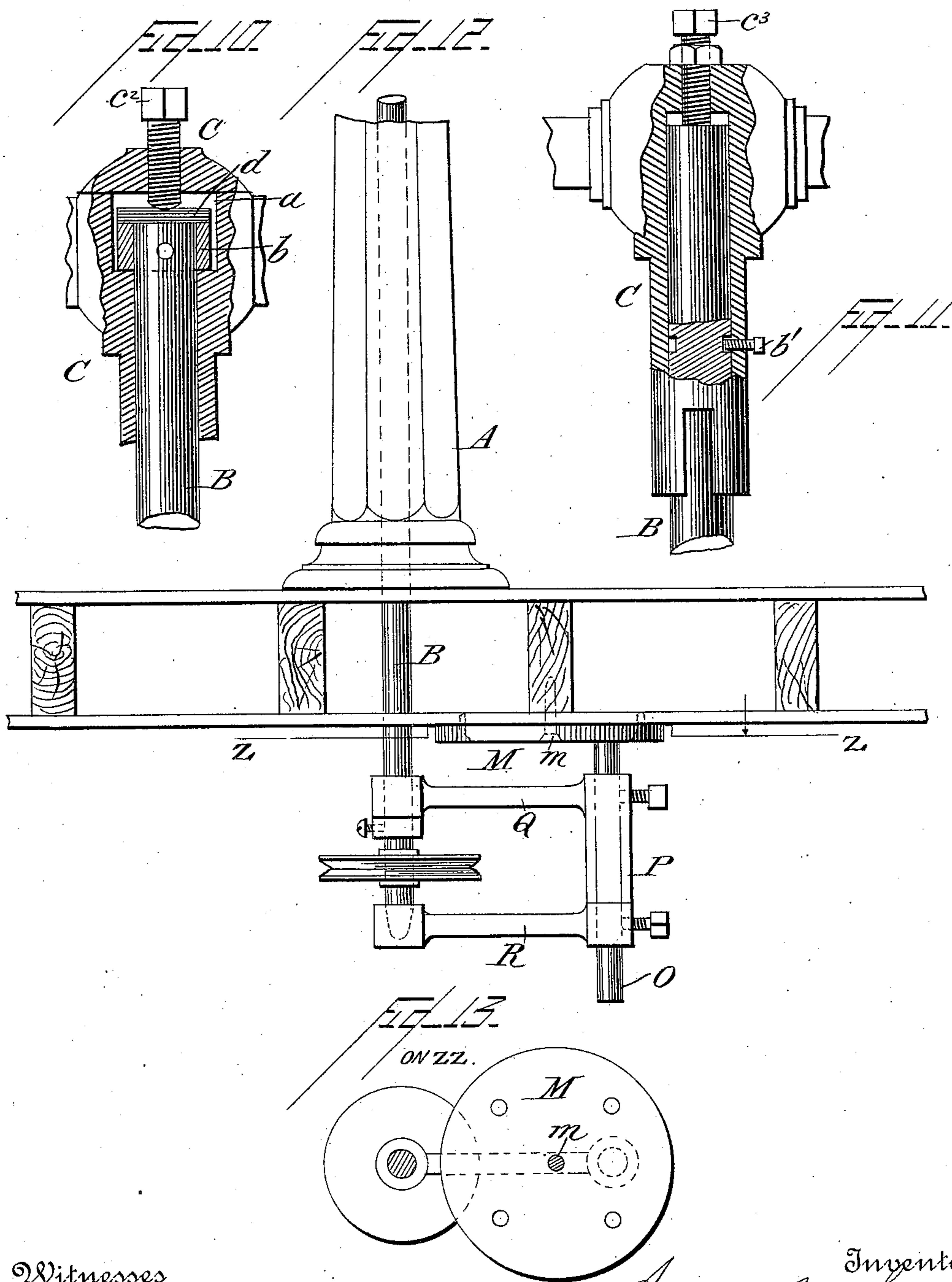
(No Model.)

3 Sheets—Sheet 3.

J. M. SEYMOUR.  
ROTARY FAN.

No. 575,620.

Patented Jan. 19, 1897.



Witnesses

*J. H. Schott*  
*Fred C. Parker*

Inventor

Inventor  
James W. Seymour  
By his Attorney John C. Parker

# UNITED STATES PATENT OFFICE.

JAMES M. SEYMOUR, OF NEWARK, NEW JERSEY.

## ROTARY FAN.

SPECIFICATION forming part of Letters Patent No. 575,620, dated January 19, 1897.

Application filed December 18, 1888. Serial No. 293,954. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES M. SEYMOUR, 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 Rotary 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.

My invention relates to an improvement in rotary fans for agitating the air in various kinds of apartments, such as offices, counting-rooms, factories, restaurants, &c.; and it consists, essentially, in a new construction of the fan-hub for a column-fan, whereby it is supported on the top of the driving-shaft in such a manner as to be securely held against any displacement from its normal position either up or down.

It also consists in clutching mechanism whereby the rotation of the fan may be easily and quickly started or stopped without interfering with the motion of the driving-shaft.

It further includes devices for supporting the lower end of the driving-shaft beneath the floor, which devices are accurately adjustable to determine the exact point for the location of the step that receives the end of the shaft; and it, moreover, embraces certain peculiarities in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of a column-fan provided with my present improvements, certain parts thereof being shown in section and the clutch mechanism being shown disengaged and the fan not in motion.

Fig. 2 is a similar view of a portion of the same, showing the clutch mechanism engaged so as to actuate the fan. Fig. 3 is a perspective view of the movable clutch-piece. Fig. 4 is a perspective view of the lower part of the clutch, which is rigid on the fan-shaft.

Fig. 5 is a side elevation of a column-fan similar to Fig. 1 and showing a modification in the construction of the clutch mechanism, which is disengaged. Fig. 6 is a partial sectional elevation of the fan shown in Fig. 5, the view being at right angles to that of Fig. 5. Fig. 7 is a partial sectional elevation similar to Fig. 5 and shows the clutching devices in engagement. Fig. 8 is a cross-section on line

*y y* of Fig. 6. Fig. 9 is a cross-section on line *xx* of Fig. 7. Fig. 10 is a vertical section of a fan-hub and shows a modification in its construction and attachment to the fan-shaft. Fig. 11 is another section of a fan-hub and shows still another modification in its construction and attachment to the fan-shaft. Fig. 12 is a sectional side elevation of the column, the floorings supporting it, the fan-shaft, and the mechanism beneath the floor for supporting the lower end of said shaft. Fig. 13 is a sectional plan view on the line *zz* of Fig. 12.

Similar letters of reference designate corresponding parts throughout all the different figures.

A denotes a pillar or column of any ordinary or suitable construction to rest upon the floor, as shown in Fig. 12, or be otherwise properly upheld, and through which the fan-shaft B extends upward, supporting on its upper end the fan-hub C, carrying the vanes or blades D, by the motion of which, when hub and shaft are properly clutched together, the air of the room or other apartment is agitated.

The hub C is applied to the shaft so as to turn loosely thereon. It has lateral bearings C' C', that receive the ends of the vanes, said ends being at their extremities preferably screw-threaded, as shown in Fig. 1, so as to form a strong attachment to the hub, and said bearings C' C' having set-screws to hold the vanes in proper position after their obliquity has been adjusted.

I have shown in the drawings several equivalent ways for applying the fan-hub loosely to the shaft, all of these ways being but examples of a common idea that I desire to cover broadly in this case, to wit, a fan-hub applied loosely to the shaft, but firmly held thereby, so that any displacement from its normal position, either up or down, may be prevented.

In Fig. 1 the hub C turns loosely on the shaft, but is immovable vertically. Said hub is provided near the top with a recess or chamber *a*, entered by the upper end of shaft B, which is therein provided with a collar *b*, pinned to the shaft. The chamber *a* is closed with any suitable cover, as, for instance, the cover *c*, having an ornamental head and fashioned to enter the chamber like a stopper. Between the cover and the end of the shaft I

place preferably a piece of rawhide, and then the cover is securely fastened in place by means of screws. In this way it will be seen that the hub is free to turn upon the shaft, but is securely held against any movement in a vertical direction. The pressure of the cover and rawhide beneath it upon the shaft end will be only enough to make a nice fit and not enough to bind the hub so tightly to the shaft that when the latter rotates the hub will revolve also, although of course when the shaft is revolving with great speed a very slight pressure upon the end of the shaft may cause the hub to revolve very slowly.

In Fig. 10 is shown a modification in the arrangement of the parts of the hub to secure the same result. The hub has a chamber *a*, as in Fig. 1, which is occupied by end of the shaft, collar *b* thereon, and rawhide *d* above the shaft end. The cover *c'*, however, differs from cover *c*. It rests upon the top of the hub, instead of partially entering chamber *a*, and through the center thereof passes a set-screw *c*<sup>2</sup>, which bears upon the rawhide on top of the shaft. By adjusting the set-screw *c*<sup>2</sup> the proper pressure may be brought to bear upon the shaft so as to keep the hub immovable vertically.

In Fig. 11 is shown another modification in the structure of the hub. The chamber *a* is dispensed with and the hub has simply the tubular opening which admits shaft *B*, said opening running to near the top of the hub. As there is no chamber there is also no cover. The upper part of the hub is intact, and through it passes a vertical set-screw *c*<sup>3</sup>, which comes in contact with the upper end of the shaft *B*, and by the proper adjustment of which the amount of pressure on the shaft can be regulated. The collar *b* on the shaft is omitted, and in lieu thereof a set-screw *b'* passes horizontally through the wall of the hub and enters an annular groove in the shaft. Thus it will be seen that the arrangement of the parts of the hub and its connection with the shaft may be greatly diversified.

The several ways herein illustrated and described are given as examples only. The essence of this part of the present invention resides in so applying the hub to the shaft that it will be loose thereon, but vertically immovable.

I will now proceed to describe the clutching mechanism for connecting the fan-hub and shaft, so that both may move in unison.

The hub *C* is provided with two slots *e e*, running vertically up for a certain distance from its lower edge and oppositely located with respect to each other.

*E* denotes the sliding clutch-piece, suitably bored to enable it to move freely on the shaft and having a diameter equal to that of the lower portion of the fan-hub. The clutch-piece *E* is provided with upward projections *e' e'*, oppositely located with respect to each other and of a size and shape adapting them to enter the slots *e e* in the fan-hub. The

clutch-piece *E* also has downward projections *f' f'*, located opposite each other and beneath the projections *e' e'* and of a size and shape adapting them to enter slots *f f* in the lower part *F* of the clutching mechanism, said part *F* being of equal diameter with the fan-hub and being affixed rigidly to the fan-shaft (which passes through it, as shown) at a point below the fan-hub. The clutch-piece *E* is movable up and down between the hub and the part *F*. When said clutch-piece is dropped into its lowest position, it engages both the hub and the part *F*, for the projections *e' e'* enter slots *e e* in the hub and the projections *f' f'* enter slots *f f* in the part *F*. This condition of the parts is shown in Fig. 2. The hub and fan-shaft are now connected, so that the rotary motion of the latter will be imparted to the former. When the clutch-piece occupies its uppermost position, as shown in Fig. 1, it engages only the fan-hub, the projections *e' e'* being in slots *e e*, but projections *f' f'* being removed from slots *f f*. Hence when clutch-piece *E* is lifted the hub and shaft will be disconnected and the rotary motion of the latter will not be transmitted to the hub. Thus it will be observed that while the projections *f' f'* on clutch *E* are only in the slots in part *F* when the fan is being driven, the projections *e' e'* maintain a constant engagement with the fan-hub. Inasmuch as by moving the clutch-piece up or down the fan may be started or stopped, it becomes necessary to provide some convenient means wherewith said clutch may be grasped to effect its change of position. For this purpose I have a tube or sleeve *G*, of thin strong metal, which surrounds a portion of the hub, all of the clutch-piece *E*, and a portion of part *F*. Said sleeve is made more or less ornamental to adorn the appearance of the fan structure, and a groove *g* is spun thereon to form a ridge to enter an annular groove *E'* in the clutch-piece *E*, so that the sleeve *G* and the clutch-piece may be connected together. By grasping the sleeve or tube *G* with the hand it can be moved up or down, carrying with it the clutch *E*. Flat retaining-springs *H H* are secured to the fan-hub, the ends of the springs being suitably ribbed, by infolding the metal thereof, so that they may be engaged by a similar rib on the end of the metal sleeve. In this manner the sleeve is retained in its upper position after being lifted. (See Fig. 1.) Also the sleeve is provided near the lower end with a loosely-encircling ring *I*, which enables the operator to more easily grasp the sleeve when it is in rapid motion.

In Figs. 5, 6, 7, 8, and 9 I have exhibited a modification of the clutching mechanism. The fan-hub is not slotted, as at *e e*, but the lower end thereof is enlarged to form a sort of box or open-ended chamber *C*<sup>2</sup>, having a pair of short interior grooves *h h*, extending from the lower edge of chamber *C*<sup>2</sup> upward for about half its length. Instead of the

clutch E this form of mechanism has a clutching device consisting of a tube or sleeve J upon shaft B, said tube having on its upper end horizontal projections *i i*, which are adapted to enter grooves *h h* (see Fig. 9) when the movement of the clutch brings them into a proper position to do this. In Fig. 5 the projections are out of engagement. In Fig. 7 they are indicated as being in the slots. The tube J is slotted near its lower portion at *j j*, said slots being vertical and receiving a horizontal pin *k*, passing through the shaft B and projecting on each side. (See Fig. 5.) By means of this pin entering the slots in the tube J said tube and the shaft B are so connected that they rotate in unison at all times. By grasping the tube, an act which is facilitated by a loose ring I' thereon, kept in place by a collar, as shown, said tube may be moved up into the position indicated in Fig. 5, where it will not connect with the fan-hub, thus allowing the fan to come to a standstill, or it may be depressed into the position shown in Fig. 7, where the projections *i i* enter slots *h h*. In this position the fan hub and shaft are connected so that the fan is actuated. When the tube J is in this position, it will be held up by resting on the pin *k* in the slots *j j*. When it has been lifted into position of Figs. 5 and 6, it is upheld by springs L L, secured to the outer face of the tube and resting on a pin *l*, passing through shaft B and slots in tube J. When the tube is depressed into the position shown in Fig. 7, the springs L open and surround the pin *l*, as shown.

Figs. 12 and 13 show the devices for supporting the lower end of the fan-shaft B beneath the floor and for accurately determining the exact point at which to locate the supporting-step for said shaft end. It has always been a matter of great difficulty to accurately locate the step-hanger for the end of the shaft. Slight variations from the correct point are productive of much trouble, and hence it becomes a matter of importance to devise means for overcoming the difficulty.

M denotes a circular disk which is secured beneath the floor in the vicinity of a point directly beneath the column A, which sustains the fan-shaft. The disk M is at first secured only by a central pin *m*, on which it may be made to turn. Secured rigidly to the disk, like a crank-handle, is a downwardly-projecting arm O, which carries a socket P, fastened thereto by set-screws and having horizontal arms Q and R, the arm Q having on its outer end a bearing for the shaft and the arm R having at its end a step. By revolving the disk the hanger may be so adjusted as to bring the shaft-bearings to any desired point directly beneath the column A, and thus they can be easily located so as to receive the shaft which is within said column. After the bearings have been properly located the disk M may be secured in place by means of screws and further rotation of the same prevented. In Fig. 12 I have shown a driving-pulley on

the fan-shaft immediately above the step which receives its lower end. This is a convenient location for the pulley.

I have thus described the leading points of my invention. Many changes in the structure, size, shape, relation, arrangement, and form of the several parts may doubtless be made without departing from the invention, and hence I do not desire to be confined to the precise description given in any one of these respects, but reserve the liberty of varying these matters within wide limits.

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

1. In a rotary fan, the combination of a fan-shaft having a collar or its equivalent near the upper end thereof, and a fan-hub having a chamber for receiving said collar, and closed by a cover, substantially as described.

2. In a rotary fan, the combination of the vertical shaft having a collar on the upper end, a fan-hub having a chamber to receive said collar, a cover for said chamber which partially enters the same, and an intermediate plate between the cover and shaft end, substantially as described.

3. In a column-fan, the combination of the vertical fan-shaft, the loose fan-hub thereon having slots, and the clutching mechanism for connecting the hub and shaft to move together, consisting of a movable tubular clutch-piece having upper and lower projections thereon, and a slotted part rigid on the shaft, said movable piece being adapted to have its projections enter the slots, substantially as described.

4. The combination of the fan-shaft, the loose hub C thereon having slots *e e*, the rigid part F on the fan-shaft having slots *f f*, and the movable clutch-piece E having upper projections *e' e'* adapted to enter slots *e e* and the lower projections *f' f'* adapted to enter slots *f f*, all substantially as described.

5. The combination of the fan-shaft, the loose hub thereon, having vertical slots, the clutching mechanism consisting of a slotted rigid part on the fan-shaft, and a movable tubular clutch-piece having projections that enter the slots in the hub and in the rigid part, and a covering-tube for the clutching mechanism, substantially as described.

6. The combination of the fan-shaft B, the loose hub C thereon, having slots *e e*, the rigid part F on the fan-shaft having slots *f f*, the movable clutch-piece E having projections adapted to enter slots *e e*, and other projections adapted to enter slots *f f*, and the covering-tube G having a ridge entering an annular groove E' in the piece E substantially as described.

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

JAMES M. SEYMOUR.

Witnesses:

S. HERBERT GIESY,  
FRED E. TASKER.