

No. 750,342.

PATENTED JAN. 26, 1904.

A. C. BRANTINGHAM.

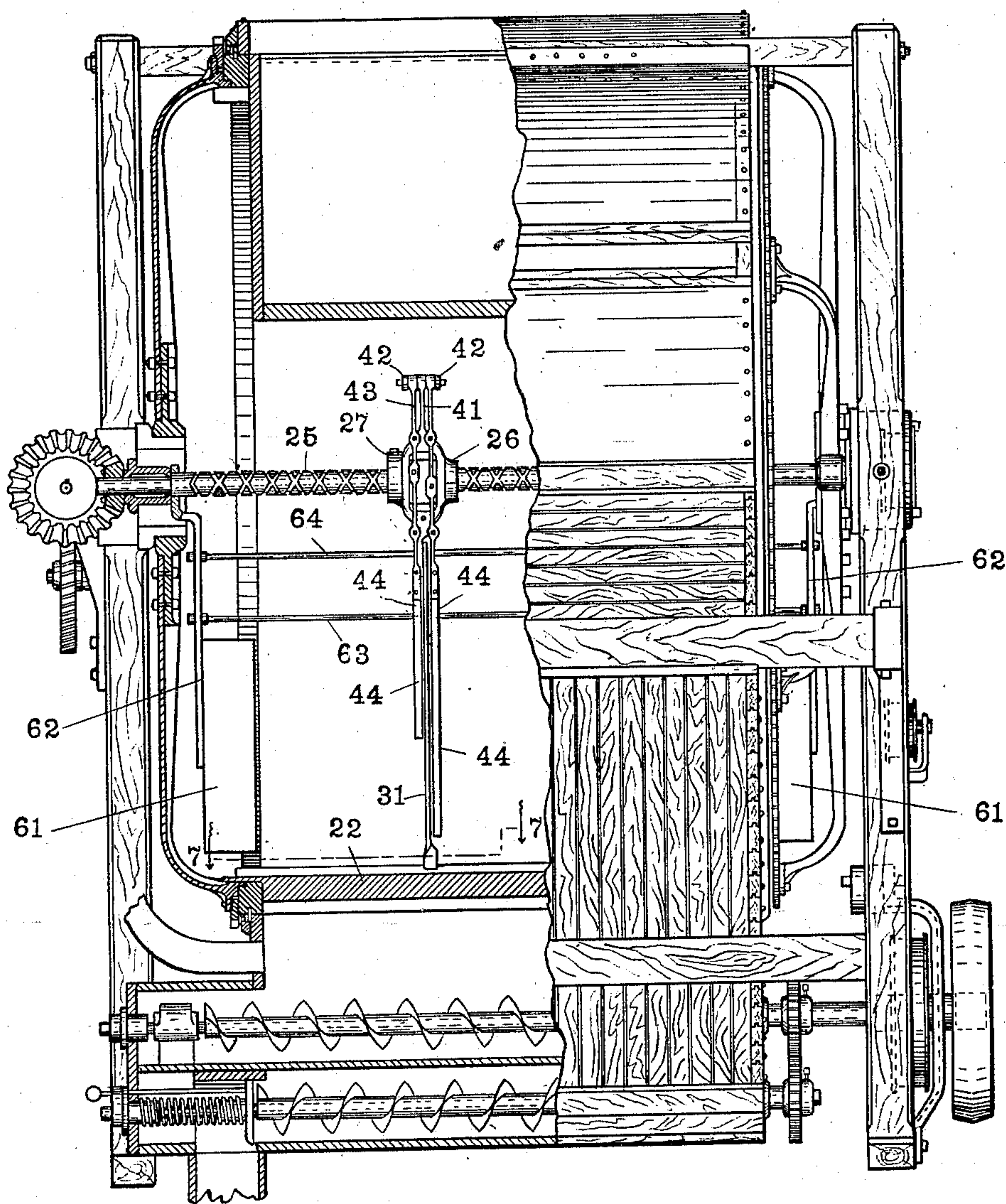
DUST COLLECTOR.

APPLICATION FILED APR. 8, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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3 SHEETS—SHEET 2.

Fig. 2.

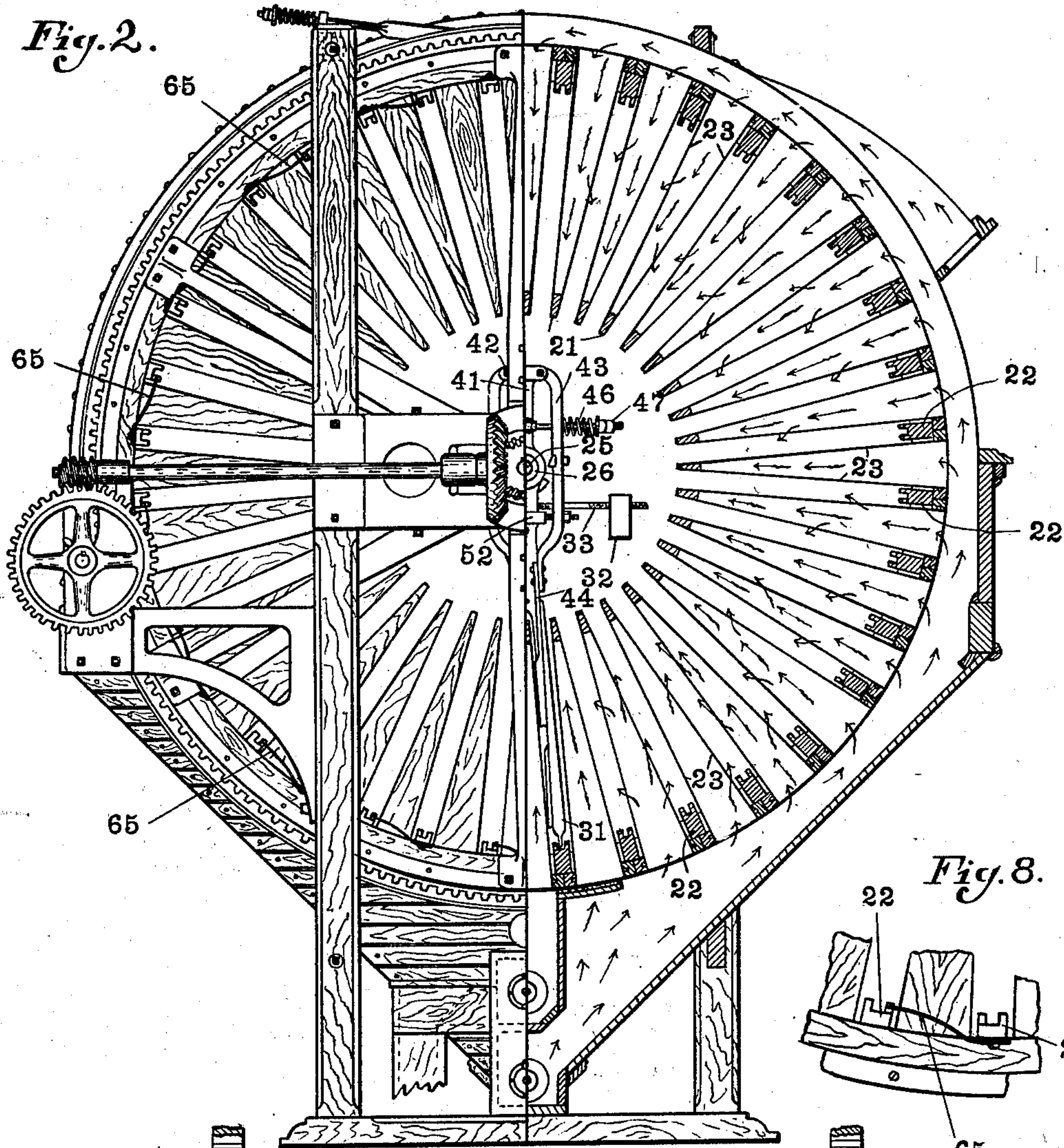


Fig. 8.

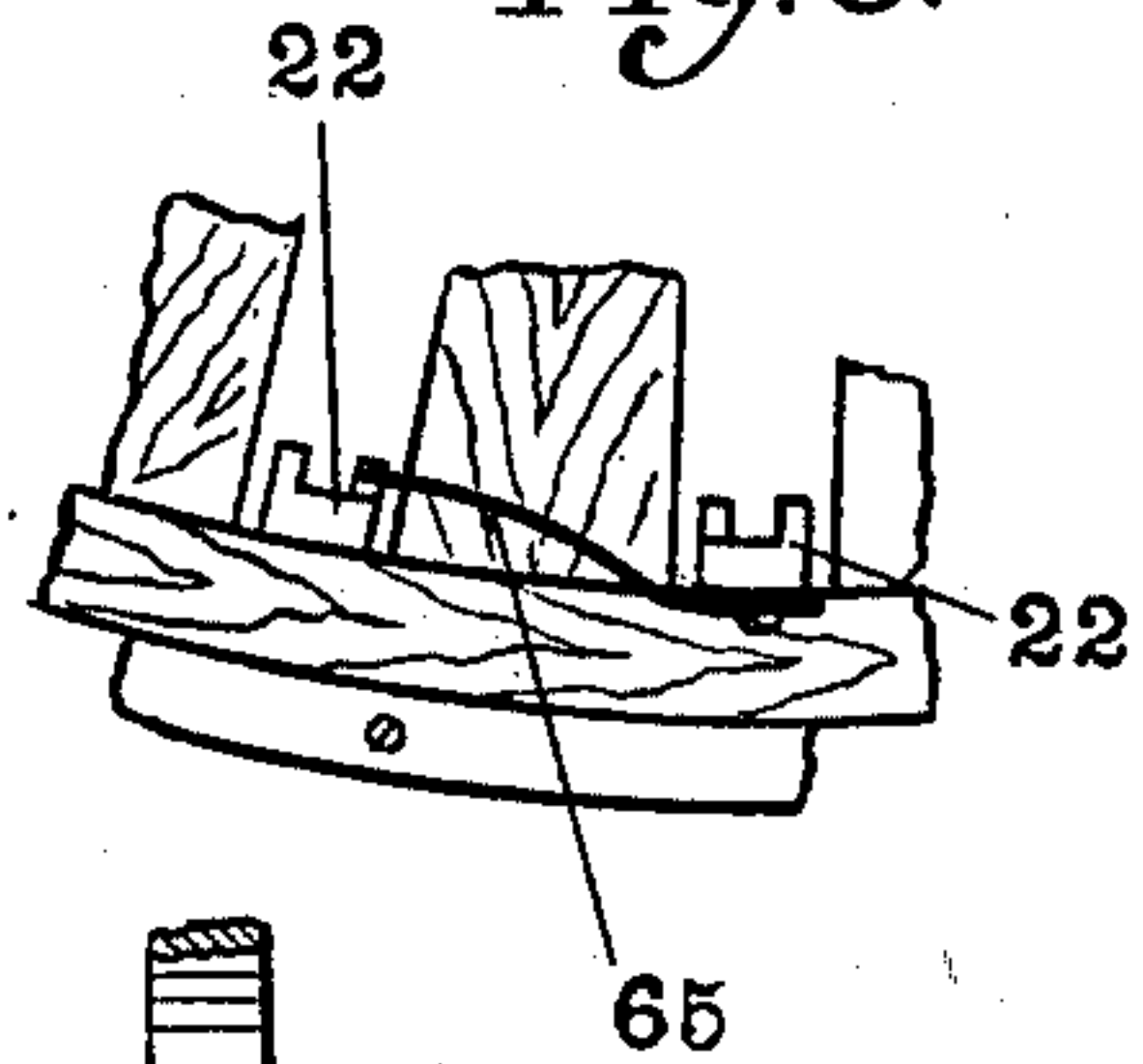
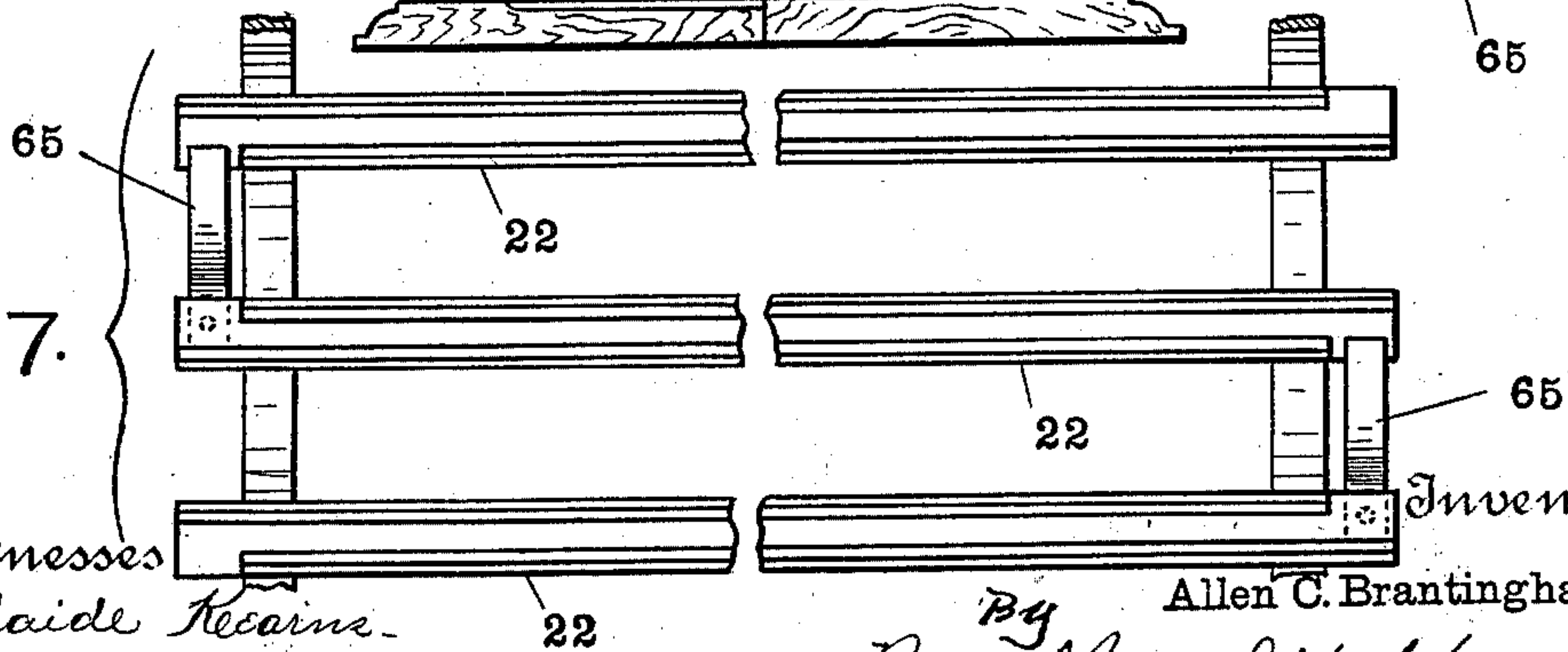


Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 3.

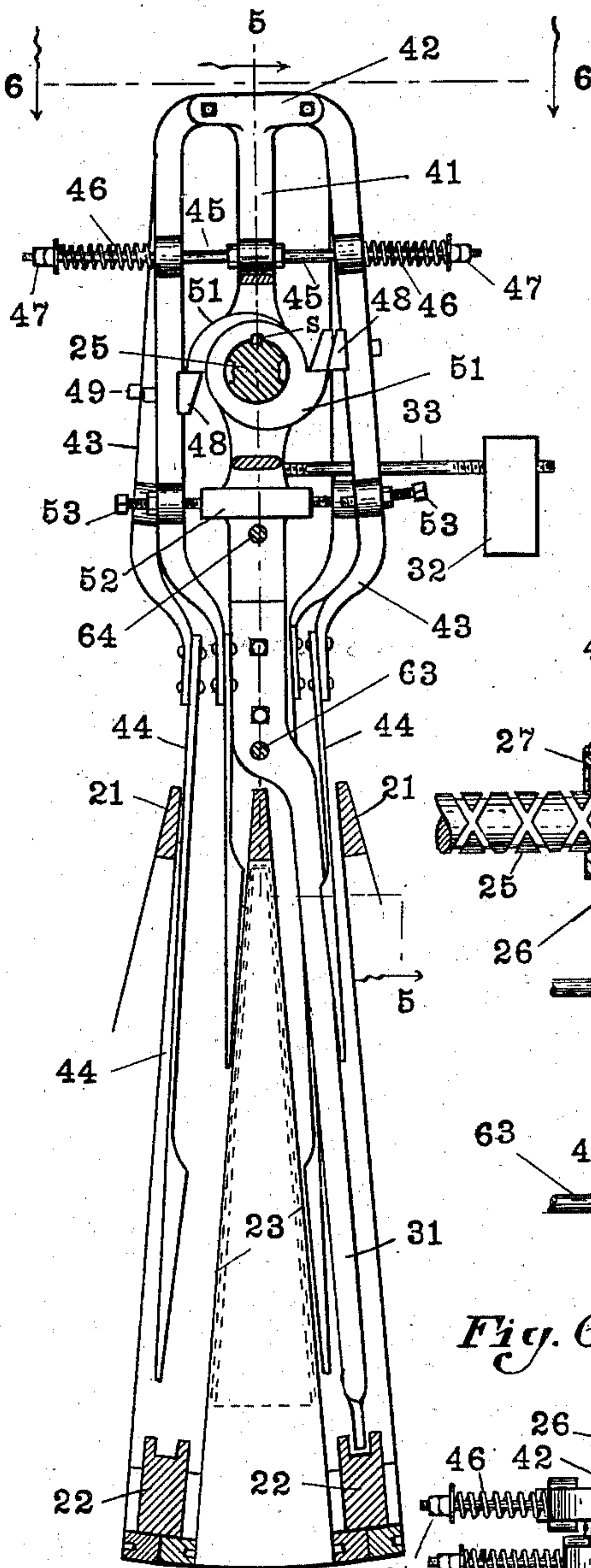


Fig. 4.

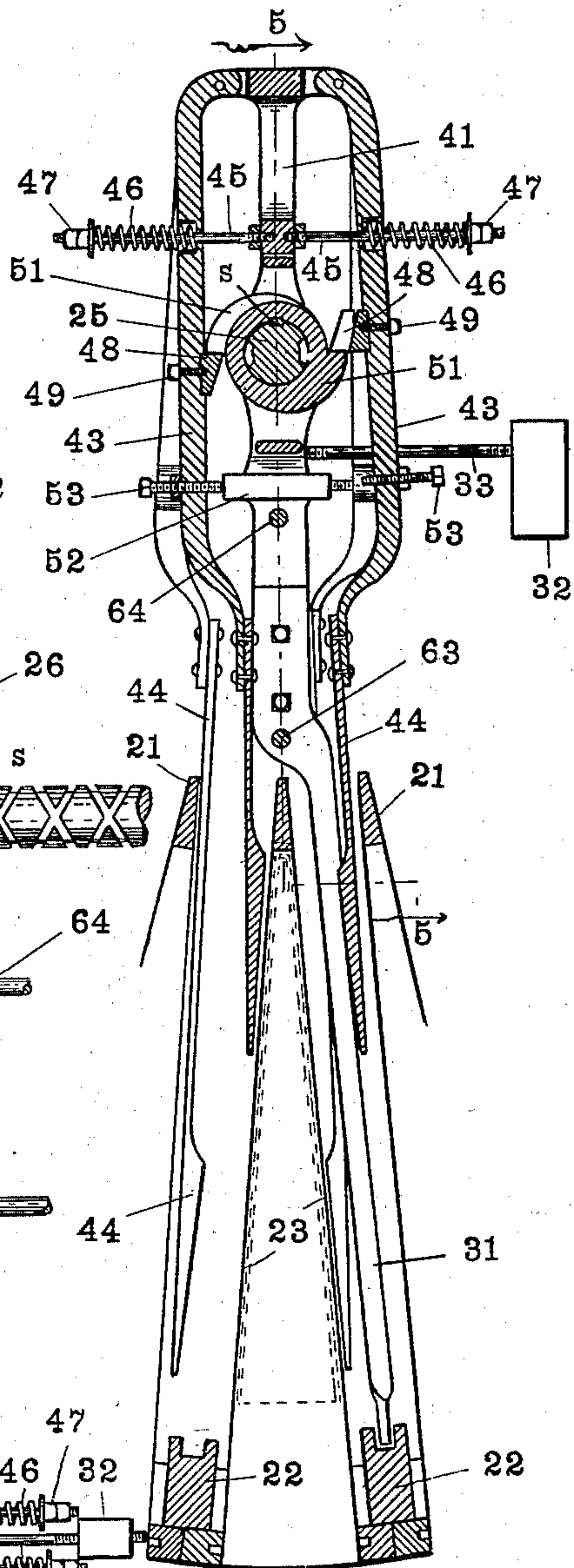


Fig. 5.

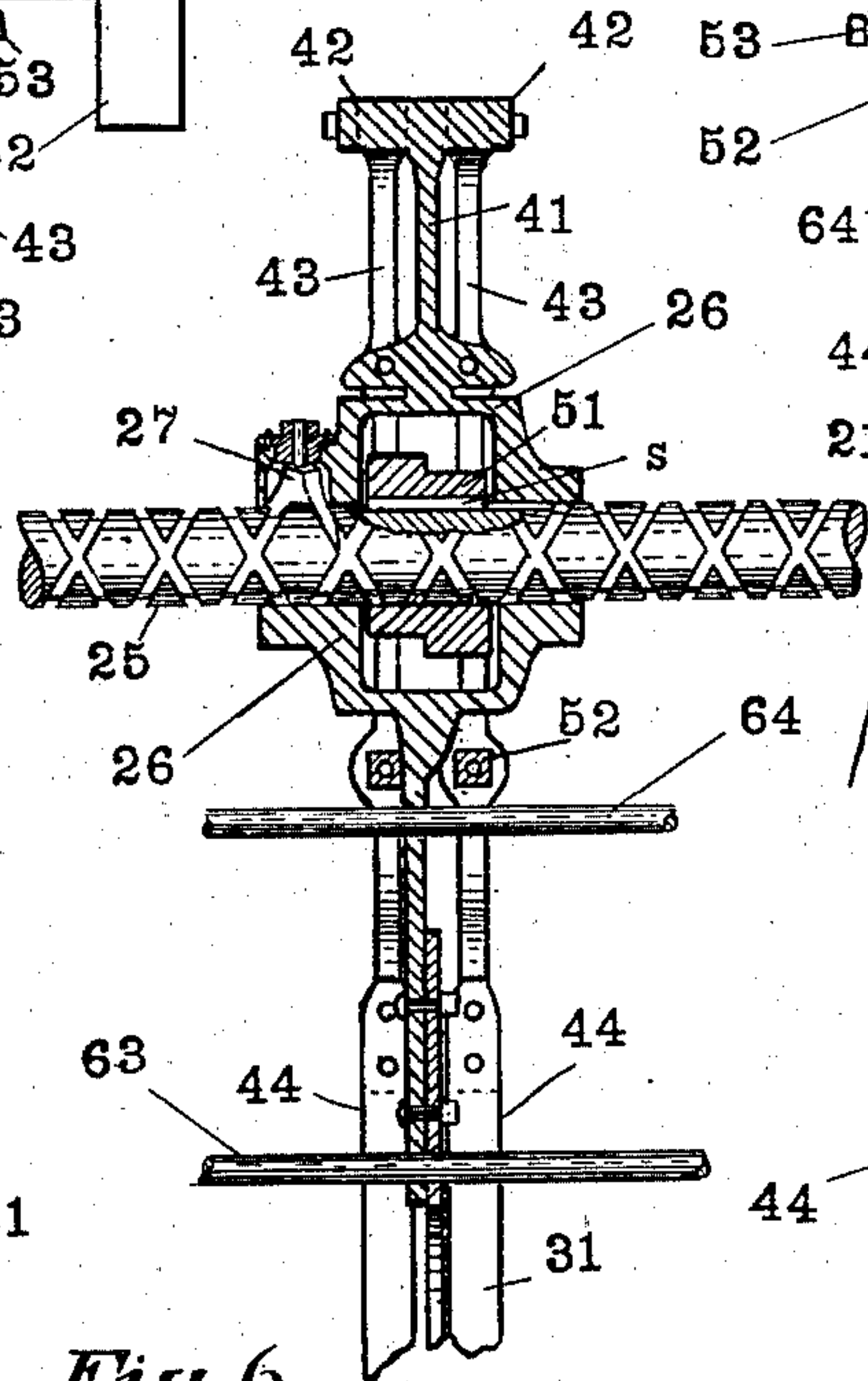
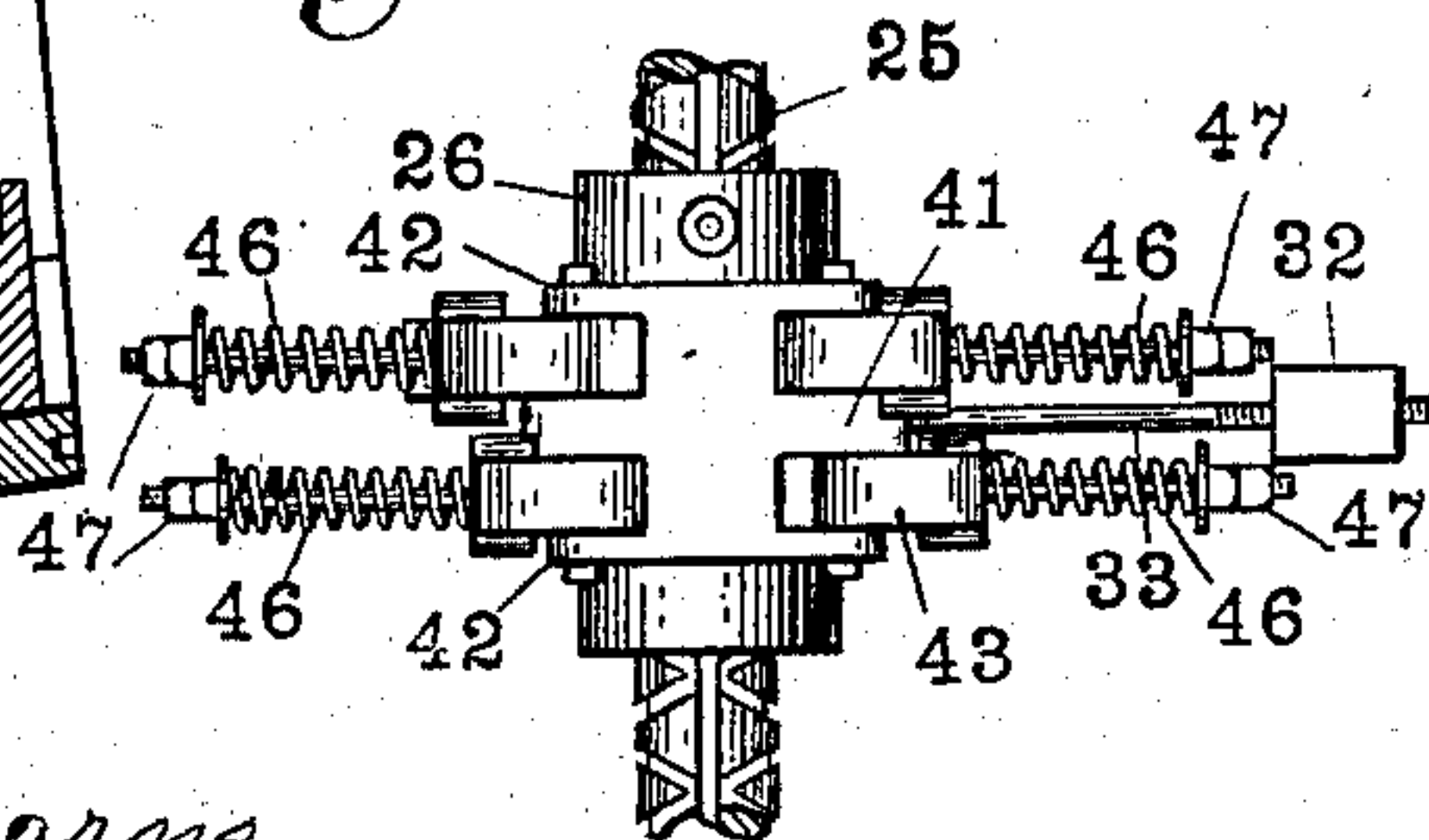


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALLEN C. BRANTINGHAM, OF TOLEDO, OHIO.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 750,342, dated January 26, 1904.

Application filed April 8, 1903. Serial No. 151,599. (No model.)

To all whom it may concern:

Be it known that I, ALLEN C. BRANTINGHAM, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Dust-Collectors, of which the following is a specification.

The object of my present invention is to provide an effective means for dislodging the accumulated dust on the sieves of rotary dust-collectors which shall be automatic and continuous in operation. Its leading features, generally speaking, consist of a continuously reciprocally traveling head carried upon the shaft of the rotary dust-collector, intermittently-operated whipping-fingers carried by said head, and means for automatically advancing the structure from section to section of the dust-collector as the latter revolves.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a view, partly in front elevation and partly in central longitudinal vertical section, of a dust-collector embodying my said invention; Fig. 2, a view, partly in end elevation and partly in transverse vertical central section, of the same; Fig. 3, an elevation of the dust-dislodging mechanism and immediately adjacent parts separately, on an enlarged scale; Fig. 4, a similar view, except that one set of the dislodging devices and immediately adjacent parts are shown in section; Fig. 5, a central vertical sectional view as seen from dotted line 5 5 in Figs. 3 and 4; Fig. 6, a top or plan view as seen when looking downwardly from the dotted line 6 6 above Fig. 3; Fig. 7, a detail view as seen when looking downwardly from the dotted line 7 7 in Fig. 1, and Fig. 8 a detail end elevation illustrating the spring-catch more plainly.

The dust-collector in question is of the type which embodies a suitable framework and casing, within which is revolving structure embodying suitable frames over which filtering or screen cloth is secured, thus forming a series of pockets or chambers into which the dust-laden air is drawn, the dust being intercepted by the cloth, while the air passes through and is discharged beyond it. As the

present invention does not relate to any particular construction of dust-collector, such construction will not be further described herein, except incidentally in describing the invention. Suffice it to say (for the present) that the dust-collector should be rotatably mounted and have a horizontal shaft and that the dust-collecting pockets or chambers are generally and most conveniently substantially triangular in cross-section, the sides thereof being most conveniently bound by approximately radial lines laid from the axis to the circumference of the revolving structure. At the inner ends of these pockets are commonly and preferably frame-bars 21, and at the periphery of the said structure are the frame-bars 22, and the walls of the pockets or chambers are formed by screen-cloth, as 23, extending from one side of a frame part 22, around one of the frame-bars 21, and back to the nearest side of the adjacent frame-bar 22, as clearly indicated in the drawings. The course of the air-currents which pass through the machine is indicated by numerous small arrows on Fig. 2 of the drawings.

A shaft 25, arranged centrally within the dust-collector, serves to support the dust-dislodging structure. Said shaft in the construction shown is a double screw, and the body 26 of the traveling head embodies a reversing-nut and is adapted to travel back and forth continuously along it. Extending out radially from said traveling head toward the periphery of the revolving dust-collector is an arm 31, the point of which enters and in operation is guided by ways (shown as grooves) in the inner faces of the frame-bars 22. As will be seen upon an inspection of Figs. 1 and 7, the arrangement is such that the traveling head 26 will carry the arm 31 to just beyond the end of the pocket or dust chamber (or as is sometimes called "section") upon which it is operating at each end of its travel, and, as is especially shown in Fig. 7, the adjacent faces of the walls of the ways in the frame-bars 22 are cut away at the extreme ends, so that as the structure reaches its extreme position the arm 31 is able to escape from the way in which it has traveled during the passage from end to end of the dust-col-

lector which it is just concluding and (being also beyond the end of the chamber or section) to swing over into and engage with the corresponding way in the next frame-bar 22, the nearest wall whereof is correspondingly cut away to receive it, as just stated. This shifting from one frame-bar to another occurs after the cleaner is clear of the pocket, at about the time the reversing device of the double-nut in the traveling head is operated, and when this has happened the dust-dislodging structure is immediately started on a journey (alongside the next chamber or section) back toward the opposite end, and when this is completed the operation just described is again repeated and the dust-discharging mechanism shifted along to the next section of the dust-collector, and so on continuously as long as the machine is in operation. The dust-collector body as a whole is given a continuous slow rotary motion by a suitable driving mechanism, and this mechanism and the mechanism by which the traveling head is operated are so geared together that the dust-collector will advance just the distance allotted to one of its chambers or sections while the traveling head is making a single journey from one end to the other of the machine. As a result the dust-dislodging devices are carried somewhat to one side of a perpendicular position during each passage across the machine, and therefore the natural tendency of the arm 31 (by reason of its gravity) is to swing to the next dust-collector section each time it reaches the end of a journey, as described, and this is aided by the friction of the revolving shaft. In order, however, to make this movement more certain, I provide an auxiliary weight 32, which is carried by a horizontal arm 33, extending out from the traveling head, (or from a point below it on the arm 31,) the tendency of which is to force said arm 31 in the direction indicated. The weight 32 is adjustable on the arm 33, so that the force can be nicely adjusted as required. I have shown as the means of effecting this adjustment a screw-threaded engagement between the arm and the weight.

Extending up from the head 26 is a standard 41, terminating in a head 42. To this head one or more whippers (I have shown and prefer to use four) are secured. These whippers in detail, as I prefer to construct them, consist of rigid arms 43, having or terminating in flexible whipping-fingers 44, which extend down close to but not in contact with the screen or sieve cloth 23, forming the walls of the dust-collecting pockets or chambers. These whipping or dust-dislodging fingers should be duplicated, so as to operate upon both sides or walls of the chambers or sections of the dust-collector, and I prefer to make them of wood having considerable resiliency, such as hickory or ash. That part of each of these fingers which is meant to form the spring or yielding

portion is quite thin, while the extreme outer portion, which is meant (as it flies in) to come in contact with the cloth, is thicker and has a face arranged or formed to lie parallel to the cloth walls, and thus equal contact throughout the entire length of the striking-surface is provided for. As above stated, the whipping-fingers are not in contact with the chamber-walls—that is, they will not normally bear against said walls when at rest. The flexibility of said whippers, however, enables them as they fly inwardly (under the force of their springs) to strike the chamber-walls sudden sharp blows, which serve to dislodge the dust; but they immediately recede from contact therewith, so that there is no wearing-friction as the dust-dislodging device as a whole travels through the machine. These whipping-fingers are rigidly attached to the arms 43, which arms are preferably formed of metal and are secured by pivots to the head 42, as before stated. They are held inwardly toward the standard 41 by means of rods 45, which are secured to said standard and pass out through openings in said arms and carry springs 46 on their ends. These springs may be adjusted to a greater or less tension, as desired, by means of the adjusting-nuts 47. To the inner faces of these arms 43 at points opposite the shaft 25 I secure suitable contact-plates 48. These might be formed integrally with the arms; but as they are the parts which receive the greatest amount of wear I prefer to make them separate and removable (as shown) and secure them in place by suitable means, as cap-screws 49. A suitable cam or cams 51 (according to the number of arms and whippers employed) are secured to the shaft 25 and revolve therewith. These cams coming in contact with the plates 45 operate to force the arms outwardly and when the cams have passed the springs 46 force them inwardly, thus causing the whippers to deliver the blows. Buffers 52 limit the inward movement, and this limit is rendered adjustable by the adjusting-screws 53.

At each end of the structure, just outside the dust-collector chambers or pockets, are blocks 61 of substantially the shape and size of the ends of said chambers or pockets and which are suspended, by means of hangers 62, preferably from the shaft 25. Rods 63 and 64 extend from one of these hangers to the other and pass through suitable orifices formed for the purpose in the downwardly-extending portion of the traveling head 26. The hangers 62 are mounted loosely on their bearings, and therefore the blocks, except for their connection to the head 26, might sway at will in the spaces occupied thereby. The parts are so arranged, however, that when the traveling head 26 approaches the end of the machine it will, through the rods 63 and 64, guide the block which it is approaching into exact registry with the end of the chamber or pocket being operated upon, so that as the

traveling head carries the whipping-fingers past the end of said chamber or pocket they will have something to strike against and hold them in position till they start back (over the
 5 next pocket or chamber) on their return journey. Without some provision of this character the whipping-fingers might, as the dust-dislodging structure passes from that section of the dust-collector on which it has
 10 been operating into registry with the next section or pocket, strike or swing down past said end and would be apt to catch behind the ends of said pockets or sections, and this, if permitted, would obviously result in damage
 15 either to the sections or to the fingers.

In order to prevent the arm 31 from rebounding as it swings into the way or groove alongside the dust-collector section or pocket with which it is to next operate, I provide suitable
 20 spring-catches 65, the free ends of which project up into the path of said arm 31, but which are sufficiently flexible and yielding so that said arm 31 will force them down and pass over and be secured thereby, as will be
 25 readily understood. This prevents the blocks 61 from swinging back out of registry and insures the accuracy of the operation just described.

While it is necessary for the cams to revolve with the shaft, it is also necessary for them to travel alongside said shaft with the
 30 head 26. A longitudinal groove is therefore cut in the shaft, and a spline *s* is fixed in the cam and slides therein, which accomplishes
 35 this result, as is clearly indicated in Fig. 5. The body 26 of the traveling head is in the form of a yoke or housing inclosing the cam or cams and of course does not revolve with the shaft, but travels thereon. It contains a
 40 shifting internal projection 27, which engages with the threads of the screw-shaft, as is common in reversing-nuts adapted to travel on such double screw-shafts as are used in this machine.

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

1. The combination, with a dust-collector embodying a multiplicity of chambers for receiving the dust-laden air, of a central shaft,
 50 dust-dislodging devices carried by said shaft and adapted to travel back and forth (between the chambers,) frame members arranged in the outer portion of the dust-collector and
 55 having guiding-ways with which an arm on the traveling dust-dislodging structure will engage, the adjacent walls of said ways being cut away at the ends, thus permitting said arm to swing from one to the other at the
 60 end of the journey, whereby the dust-dislodging devices are enabled to act upon the several chambers in succession.

2. The combination, with a dust-collector embodying a multiplicity of chambers for re-

ceiving the dust-laden air arranged radially
 65 about a central shaft, of a dust-dislodging device mounted upon and adapted to travel longitudinally of said shaft, means whereby said dust-dislodging device is shifted from one section to another at the ends of its respective
 70 journeys to and fro, and means whereby the dust-collector is caused to revolve a distance substantially equal to the distance allotted to each chamber synchronously with the time of each journey of the dust-dislodging devices. 75

3. The combination, with a dust-collector, of a dust-dislodging device composed of a double-threaded screw-shaft, a traveling head mounted thereon and adapted to travel back
 80 and forth from end to end thereof, a cam also mounted on said shaft to revolve therewith and also adapted to travel longitudinally thereof, and whippers mounted on said traveling head and adapted to be actuated by said cam to strike the chamber-walls of the dust-collector. 85

4. The combination, with a dust-collector, of a dust-dislodging device comprising a shaft, a traveling head mounted on said shaft and adapted to be moved thereon past the chambers of the dust-collector, a cam carried and
 90 adapted to be revolved by said shaft and also adapted to travel longitudinally thereof with said traveling head, and whippers carried by said traveling head and operated by said cam to strike the chamber-walls of the dust-collector. 95

5. The combination, with a dust-collector, of a dust-dislodging device comprising a shaft, a housing-shaped traveling head mounted on said shaft, means for causing said head to
 100 travel longitudinally of said shaft, a cam contained within the housing of the traveling head and carried longitudinally of the shaft thereby, a spline whereby said cam is engaged by and caused to revolve with said shaft, and
 105 whippers mounted on said traveling head and operated by said cam to strike the chamber-walls of the dust-collector.

6. The combination, with a dust-collector, of dust-dislodging device comprising a shaft,
 110 a traveling head mounted on said shaft, means for propelling said head longitudinally of the shaft, a cam mounted upon and revolved by the shaft and moved longitudinally thereof by the traveling head, whippers mounted on said
 115 traveling head and operated in one direction by the cam, and springs also carried by said traveling head and operating on said whippers in the reverse direction.

7. The combination, with a dust-collector,
 120 of dust-dislodging device comprising a shaft, a traveling head mounted on said shaft, means for propelling said head longitudinally of the shaft, a cam mounted upon and revolved by the shaft and moved longitudinally thereof by
 125 the traveling head, whippers mounted on said traveling head and operated in one direction by the cam, springs also carried by said trav-

eling head and operating on said whippers in the reverse direction, and buffers for limiting the inward movement of the whippers.

8. The combination, with a dust-collector, 5 of dust-dislodging device comprising a shaft, a traveling head mounted on said shaft, means for propelling said head longitudinally of the shaft, a cam mounted upon and revolved by the shaft and moved longitudinally thereof by 10 the traveling head, whippers mounted on said traveling head and operated in one direction by the cam, springs also carried by said traveling head and operating on said whippers in the reverse direction, and adjustable buffers 15 for limiting the inward movement of the whippers.

9. The combination, with a dust-collector embodying a multiplicity of chambers for receiving the dust-laden air arranged radially to 20 a shaft, of a dust-dislodging device mounted on the same axis as the said dust-collector and comprising a traveling head, means for propelling said traveling head longitudinally of its shaft back and forth, whippers secured on 25 both sides of said traveling head and extending down on both sides of the individual chamber being operated upon, and means for operating said whippers and thus dislodging the dust from both walls of the chamber at the 30 same operation.

10. The combination, in a dust-collector, with the chambers thereof, of a shaft, a traveling head thereon, and intermittingly-operated whipping-fingers carried by said head and 35 adapted to operate upon the walls of the chambers.

11. The combination, in a continuously-rotating dust-collector, of the chambers thereof, dust-dislodging devices adapted to advance 40 with the chamber structure during operation and to operate upon the walls of said chambers, and means for automatically shifting the dust-dislodging structure from section to section of the dust-collector during operation.

45 12. The combination, in a dust-collector, of the chambers thereof, a traveling dust-dis-

lodging device adapted to operate upon the walls of said chambers and to pass successively from one chamber to another at the ends thereof, guiding-ways for guiding the path of said 50 dust-dislodging device alongside each of said pockets or chambers, and blocks arranged at the ends of the said chambers or sections of substantially the same form in cross-section and adapted to receive said dust-dislodging de- 55 vice as the same passes therefrom, and guides operated by the dust-dislodging device for holding said blocks into registry with the section with which it is at the time operating.

13. The combination, in a dust-collector, of 60 a central shaft, a traveling head mounted thereon and adapted to travel from end to end of the machine, a dust-dislodging device mounted on said traveling head, blocks arranged at the ends of the chambers or sections 65 of the dust-collector and suspended from said shaft, and means controlled by the traveling head whereby said blocks are guided into registry with said chambers or sections at the time the dust-dislodging device approaches 70 them.

14. The combination in a dust-collector, of a rotary structure containing chambers, a central shaft therein about which said sections or chambers are radially disposed, a dust-dis- 75 lodging device carried upon said central shaft, a guide-arm extending out therefrom, a guideway arranged alongside each dust-collector section, the adjacent faces of the guideway-walls being cut away at the ends thus enabling 80 said arm to swing from one to the other, and spring-catches for holding said guide-arm from rebounding when it has completed its swinging movement.

In witness whereof I have hereunto set my 85 hand and seal, at Toledo, Ohio, this 1st day of April, A. D. 1903.

ALLEN C. BRANTINGHAM. [L. s.]

Witnesses:

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EUGENE KANE.