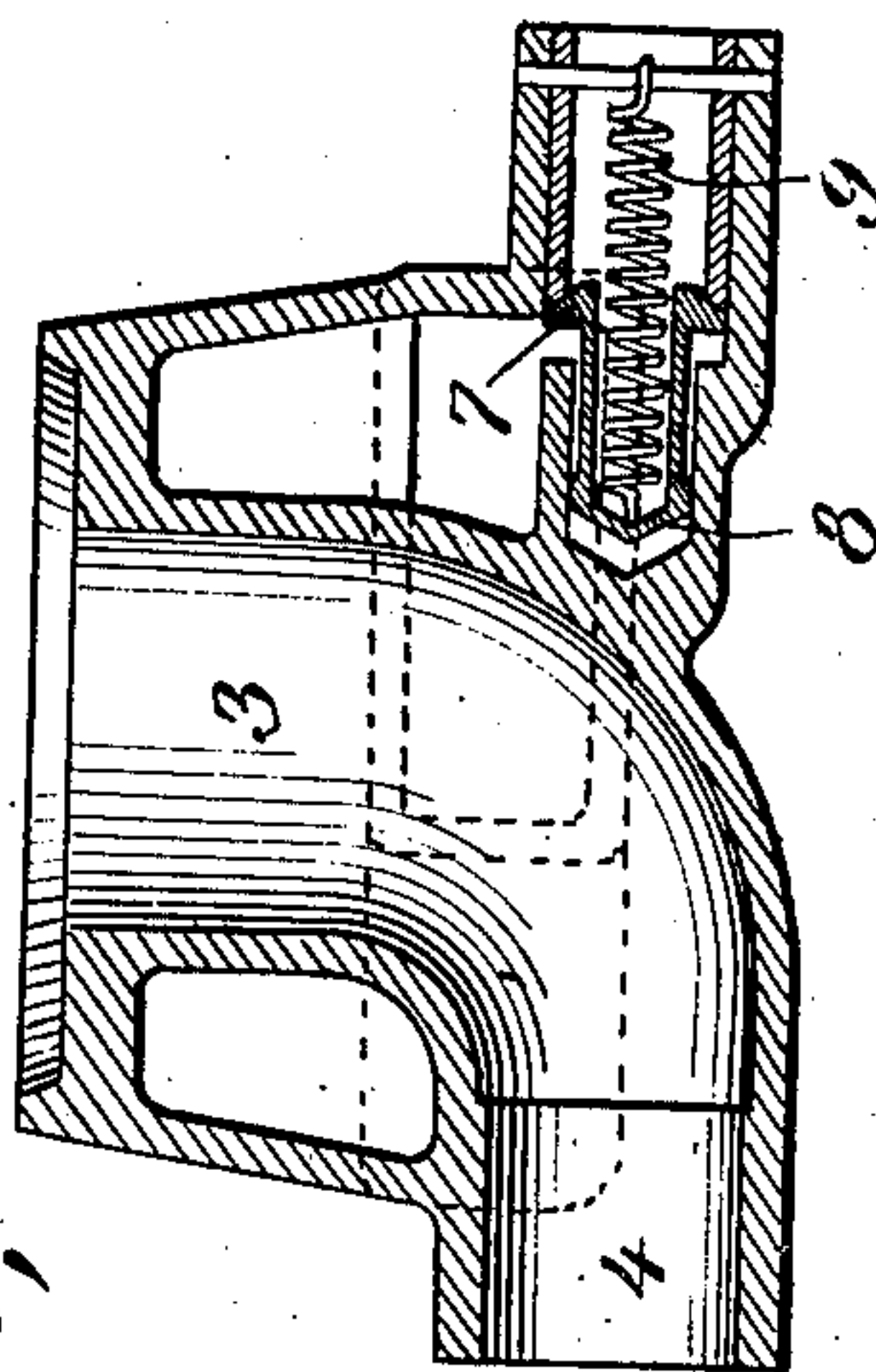
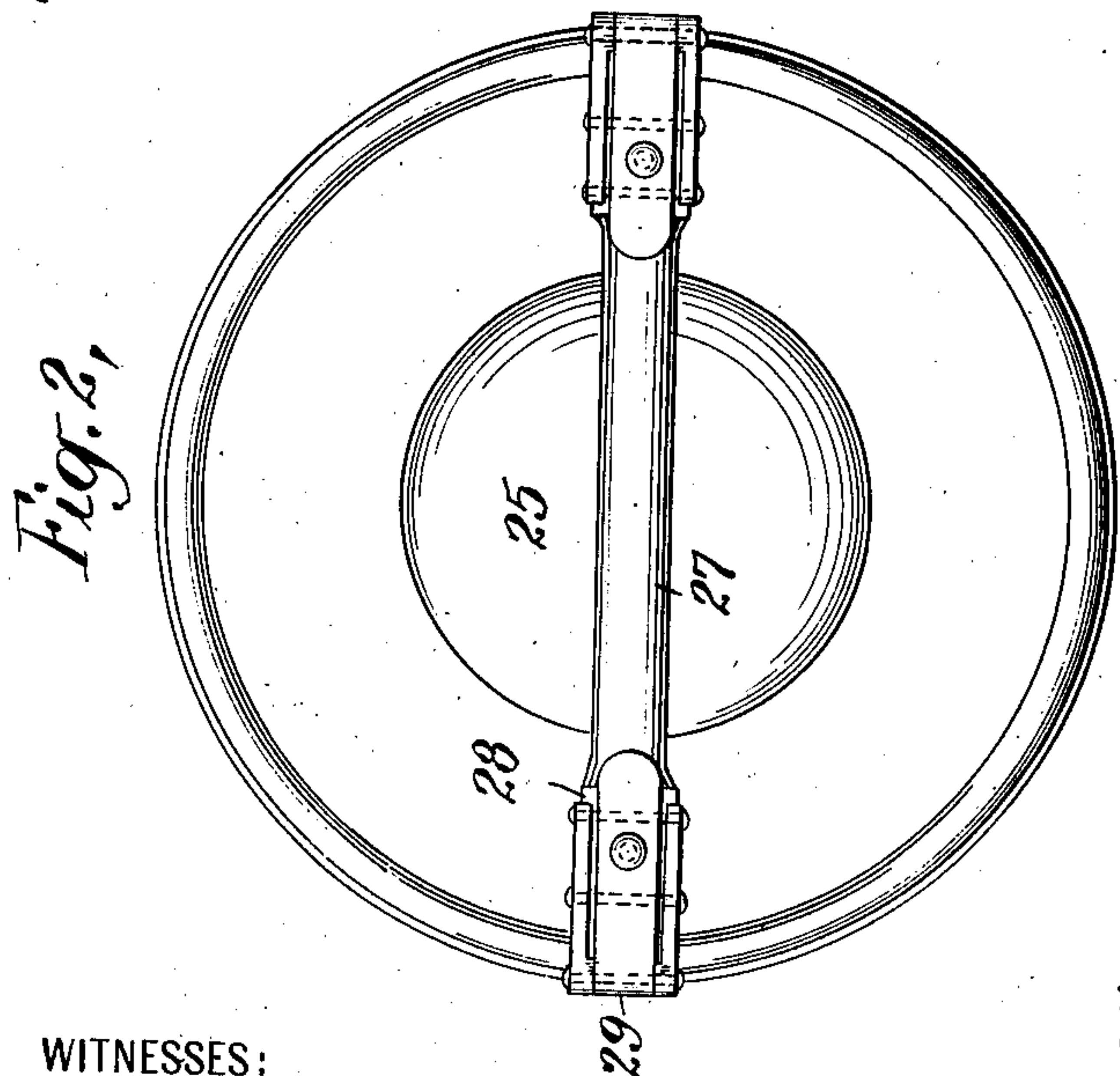
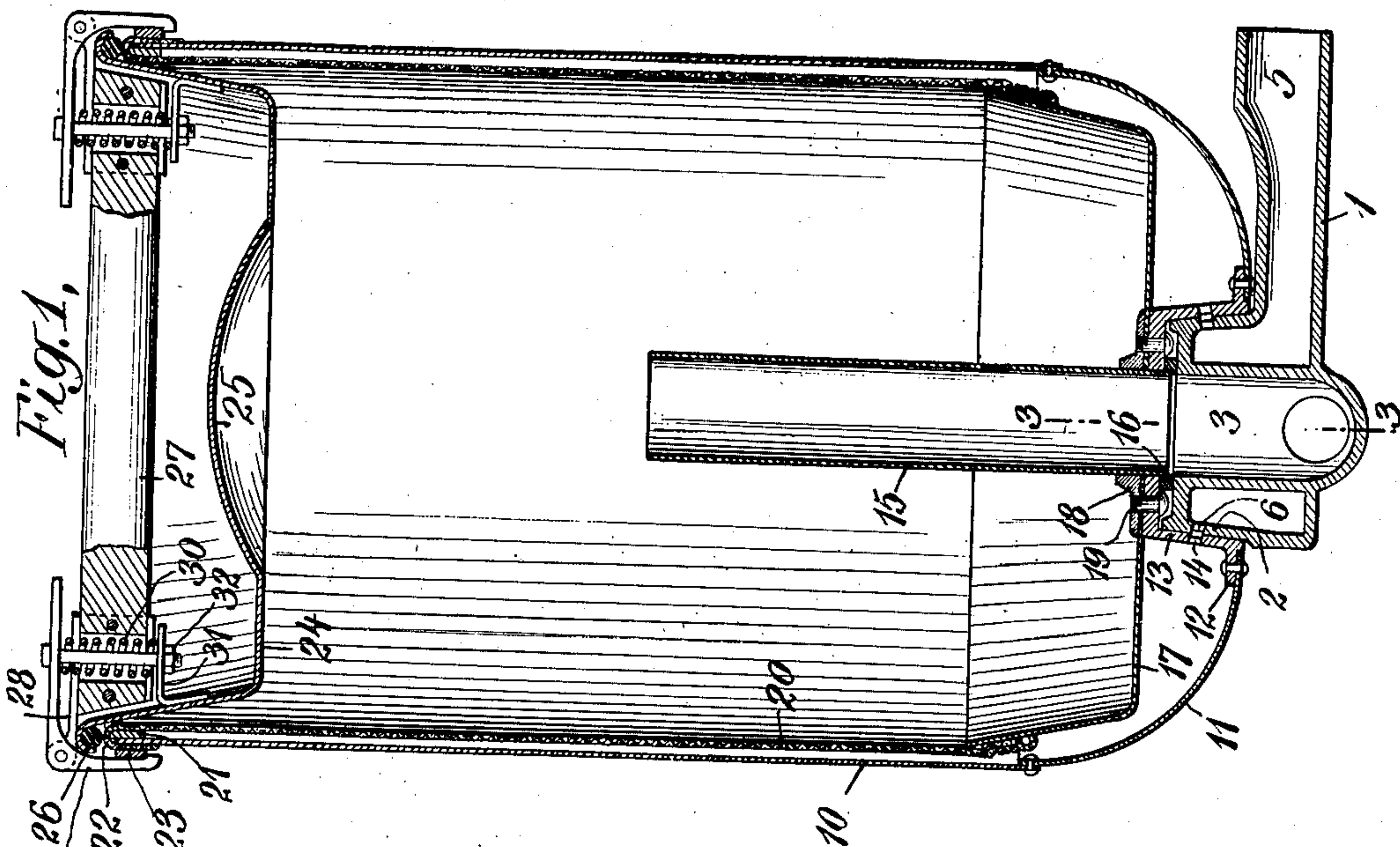


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CLEANING APPARATUS.
APPLICATION FILED APR. 14, 1910.

975,095.

Patented Nov. 8, 1910.



WITNESSES:

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CLEANING APPARATUS.

975,095.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed April 14, 1910. Serial No. 555,448.

To all whom it may concern:

Be it known that we, THOMAS J. WINANS and DANIEL M. WINANS, both citizens of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented certain new and useful Improvements in Cleaning Apparatus, of which the following is a specification.

This invention relates to apparatus for cleaning by the employment of an air-pump arranged to draw air and dust into a collector adapted to collect the dust and allow the air to escape.

The object of the invention is to provide an apparatus of this character of an improved construction, the improvements being directed particularly to making the apparatus very convenient to use, while at the same time being reliable, efficient and economical in operation.

Our invention is directed particularly to the provision of a dust-collector mounted upon a suitable support and removable therefrom, and means for making connection to the receptacle through this support, both for the incoming and the outgoing air. This construction makes it unnecessary to provide an opening in the wall of the receptacle for the connection of a hose or similar device, it eliminates the necessity of disconnecting a hose every time the dust-collector is to be emptied of dust, and it greatly facilitates the operation of emptying the collector, since for this purpose it is only necessary to raise the collector from its support by a conveniently-disposed handle. The collector may be carried thus to a suitable place for emptying it, its covering removed, and the dust dumped out, whereupon the collector may be replaced upon its support and the necessary connections thereto will be made merely by the act of placing it upon its support. These and other features of our invention will be more fully set forth in connection with the accompanying drawings, in which—

Figure 1 is a central vertical section of the cleaning apparatus, Fig. 2 is a top view, and Fig. 3 is a sectional detail view on line 3—3 of Fig. 1.

Referring to these drawings, 1 indicates a

casting forming the support for the dust-collector, this casting having two air passageways formed therein. The casting 1 is adapted to be secured to a suitable support or base, which may also support the motor and exhauster, forming with the collector the complete cleaning apparatus. At one end of the casting 1, is an upwardly-extending portion, the exterior surface of which is tapered, as shown at 2. A passageway 3 is formed within the casting 1, the upper end of this passageway being disposed centrally within the tapered portion 2 and the lower end of the passageway being deflected laterally, as shown at 4 in Fig. 3. Suitable connection is made from a vacuum-cleaning device to the port 4 and passageway 3, and this passageway forms the inlet to the dust-collector. The space around the passageway 3 is in communication with a tubular opening 5, forming the outlet for the air from the dust-collector, this passageway 5 being connected to the exhauster. In the tapered wall 2, are a plurality of openings 6. In the outlet passage 5, is a relief-valve 7 having an extension 8 adapted to slide within a cylindrical opening formed in the casting 1, this relief-valve being normally held in the closed position by a coil-spring 9, as shown in Fig. 3. If at any time, air does not enter the collector with sufficient freedom, the relief-valve 7 will be automatically opened by the suction of the exhauster acting through the passageway 5, so as to allow air to enter freely into the air-outlet 5. The upwardly-extending tapered portion of the casting 1 forms the support for the dust-collector. The latter consists of a receptacle having a cylindrical wall 10 of sheet-metal secured at its lower end to a dome-shaped sheet-metal end-piece 11, which is secured to a flange 12 formed upon a sleeve 13. The interior of this sleeve is tapered to correspond with the taper of the wall 2 of the outlet passageway, so that when the sleeve 13 is lowered upon the wall 2, a tight working fit is made which precludes the passage of air between these two parts. Holes 14 are provided in the sleeve 13, such that when the collector is mounted in position passageways are provided by these holes and

the holes 6 from the collector to the air-outlet passageway.

Secured to the sleeve 13 is a sheet-metal pan 17 having a reinforcement 18 made fast inside it through which a tube 15 extends, the tube being securely fastened to the part 18. The lower end of tube 15 extends below the part 18 and serves to center the pan 17 in sleeve 13 while the screws or bolts 19 draw the parts firmly together. On this downwardly-projecting end of the tube, is a gasket 16 of rubber or other suitable compressible material, which, when the collector is mounted upon the support 1, engages the upper face of the support 1 to prevent dust from entering between the top of base 1 and the under side of sleeve 13.

It will be noted, particularly by reference to Fig. 3, that the passageway for the incoming air through the base casting 1 is enlarged in cross-section in its passage through that casing so that its inner end where it connects with tube 15 is substantially larger than its outer end. By reason of this construction, the air passing through this passage is diffused and its velocity decreased so that the particles of dust carried by the air will not strike against the walls of the collecting device with too great force. We have found in practice that if the particles of dust enter the collector at too great velocity, they will be carried into contact with the walls of the collector with such force as to adhere thereto and build up thereon, with the result that emptying the collector of dust would be made more difficult and inconvenient. But by enlarging the passageway for the incoming air as shown, the velocity of the air is so decreased that this will not occur; instead the particles on issuing from tube 15 will drop into the pan 17 directly or will hit the walls of the collector with so much less force that they will not adhere but will then drop into the pan. The incoming air is strained of dust and dirt by a strainer 20, consisting of a closely woven fabric. The space within this strainer is of very large cross-sectional area as compared to the area of the passageway for the incoming dust-laden air, so that when this air issues from that passageway its velocity will be further and very materially decreased. It will be seen that the pan 17 approaches in diameter the diameter of the cylindrical wall 10 of the collector, and the straining material 20 lies close to the cylindrical wall 10. This strainer 20 is secured at its lower edge to the upper end of the pan 17 and extends upwardly therefrom to the top of the cylindrical wall 10, where its edge is secured to that wall. The upper edge of the wall 10 is strengthened in any suitable manner, as by turning it over upon itself; preferably a ring 21 is provided within the upper end of

the cylindrical wall 10, and the metal of that wall is turned over this ring as shown at 22, to provide a rounded and reinforced upper edge. The material of the strainer 20 is turned over the upper edge of the wall 10 and is secured thereto by means of a metallic ring 23.

The top of the collector consists of a sheet-metal member 24, the central portion of which is preferably curved upwardly, as shown, at 25, to form a deflector for the dust coming into the collector with the incoming air upwardly through the tube 15. At its outer edge, the metal of the cover 24 is turned over to form a housing for a compressible gasket 26 of such size as to coact with the upper edge 22 of the wall 20. Means are provided for securing the cover upon the upper end of the receptacle, this means being preferably carried by a bar which forms a handle for carrying the collector. A wooden handle is shown at 27, extending diametrically across the cover, and to the ends of this handle are secured metallic pieces 28, pivotally supporting latches 29, the lower ends of which are provided with projections adapted to take under the ring 23. The upper ends of these latches are extended laterally and are acted on by springs 30 to force the latches into the locking position. A bracket 31 is secured to the cover 24 and carries a bolt 32, which extends upwardly through an opening in the handle 27 and a similar opening in the laterally extending arm of the latch 29, this bolt serving to limit the movement of the latch. The spring 30 is coiled about the bolt 32 and is under compression between the bracket 31 and the latch 29.

In using the apparatus, the exhauster draws air in through the port 4, the passageway 3 and the tube 15. Upon issuing from the upper end of tube 15, the velocity of the air is greatly reduced because of the greatly increased area of the collector. Such dust as is carried upwardly into contact with the cover of the collector is deflected by the curved surface 25 and drops into the pan 17. The air moves radially outward from the tube 15 to the fabric 20, which, because of its close weave, strains the air of all of the dust carried thereby, and this dust falls into the pan 17. The air thus filtered passes down around the strainer, through the openings 14 and thus to the outlet passageway 5, and then to the exhauster. When a substantial quantity of dust has been collected, it is only necessary to grasp the handle 27 and remove the entire collector from its support upon the casting 1, and it will be seen that this can be done without disconnecting or in any way manipulating any of the parts of the apparatus; more particularly, it is unnecessary to dis-

connect the tube through which the dust-laden air is drawn into the receptacle. The collector may be carried thus to a place convenient for dumping the dust, and then by depressing the laterally-extending ends of the latches 29 the cover 24 may be removed, whereupon the dust may be dumped out of the collector. The cover may then be restored to its position upon the collector, and the latter mounted in position for further operation by simply bringing the tapered sleeve 13 down upon the tapered support 2.

If desired, two or more of the collectors may be provided for a single complete apparatus, so that when one is removed, full of dust, an empty one may be immediately thereafter inserted in position, in order to continue the cleaning operation without delay.

The strainer presents such a large straining area that it may be used for a very considerable period without clogging the interstices of the fabric to such extent as to render the cleaning operation inefficient. However, when it becomes necessary to substitute a new piece of straining fabric, this may be readily done by removing the ring 23, thus releasing the upper end of the fabric 20, and then detaching the fabric from the upper edge of the pan 17.

Having now described our invention, what we claim as new therein and desire to secure by Letters Patent is as follows:—

1. In a cleaning apparatus, the combination of a support having two passageways for air therethrough both of which are open at one end, a dust-collector mounted on said support, freely removable therefrom and having two openings for air through the wall thereof adapted, when the collector is mounted on the support, to register with the ends of the passageways through the support, and a strainer within the collector through which the air must pass in passing from one of said openings to the other, substantially as set forth.

2. In a cleaning apparatus, the combination of a support having two passageways therethrough and presenting a tapered surface, a dust-collector having a correspondingly tapered surface, said dust-collector being adapted to be removably mounted upon said support by bringing said tapered surfaces into coaction, and parts on said collector adapted to be connected with said passageways through the support when the collector is mounted upon the support, substantially as set forth.

3. In a cleaning apparatus, the combination of a support having two passageways for air therethrough both of which are open at one end, a dust-collector mounted on said support, freely removable therefrom and having two openings for air through the

wall thereof adapted, when the collector is mounted on the support, to register with the ends of the passageways through the support, one of said openings being located substantially centrally with respect to the collector and carrying the air flowing into the collector, and a strainer mounted within the collector adjacent to the side wall thereof through which the air passing from one of said openings to the other must pass, substantially as set forth.

4. In a cleaning apparatus, the combination of a support having two passageways for air therethrough both of which are open at one end, a dust-collector mounted on said support, freely removable therefrom and having two openings for air through the wall thereof adapted, when the collector is mounted on the support, to register with the ends of the passageways through the support, one of said openings being located substantially centrally with respect to the collector and carrying the air flowing into the collector, a tube mounted upon the collector and projecting inwardly thereof from said central opening, a strainer mounted within the collector adjacent to the side wall thereof and surrounding said tube, and a cover for the collector removably mounted opposite the end of said tube and shaped to form a deflector, substantially as set forth.

5. In a cleaning apparatus, the combination of a support having two passageways therethrough and presenting a tapered surface, a dust-collector having a correspondingly tapered surface, said dust-collector being adapted to be removably mounted upon said support by bringing said tapered surfaces into coaction, a connection on the collector adapted to connect one of said passageways to the central portion of the collector, and a connection from the collector to the other of said passageways, substantially as set forth.

6. In a cleaning apparatus, the combination of a support presenting a tapered surface and having a passageway for incoming air disposed centrally therein and a second passageway therein for outgoing air, a dust-collector having a correspondingly tapered surface and adapted to be removably mounted upon said support by bringing said tapered surfaces into coaction, a connection on said collector coacting with said centrally disposed passageway, a strainer of large area located adjacent to the side wall of the collector, and a connection on said collector coacting with said second passageway, substantially as set forth.

7. In a cleaning apparatus, the combination of a support presenting a tapered surface and having a passageway for incoming air disposed centrally therein and a second passageway therein for outgoing air, a dust-

collector having a correspondingly tapered surface and adapted to be removably mounted upon said support by bringing said tapered surfaces into coaction, a tube mounted centrally within the collector and adapted to coact with said central passageway, a cylindrical strainer surrounding said tube and of substantially greater diameter than the tube, and a connection from the collector exterior to the strainer to said second passageway, substantially as set forth.

8. In a cleaning apparatus, the combination of a support, a dust-collector mounted on said support and freely removable therefrom, two passageways through the support for incoming and outgoing air, two passageways through the collector adapted to coact with the passageways through the support when the collector is mounted on the support, a strainer within the collector through which passes the air flowing from one of said passageways through the collector to the other, said strainer being connected to the wall of the collector near the top thereof but spaced apart from said wall below said connection, and a removable cover for the top of the collector, substantially as set forth.

9. In a cleaning apparatus, the combination of a support having two passageways therethrough and presenting a tapered surface, a collector having a correspondingly tapered surface and adapted to be removably mounted upon said support by bringing said tapered surfaces into coaction, a connection to the central portion of the collector communicating with one of said passageways, a strainer in the collector connected near the top thereof to the side wall of the collector and spaced apart below the said connection, a removable top for the collector, and a connection from the exterior of the strainer to the other of said passageways, substantially as set forth.

10. In a cleaning apparatus, the combination of a support having two passageways therethrough, a collector removably mounted on said support, a passageway through the wall of the collector disposed centrally thereof and adapted to coact with one of said passageways through the support when the collector is mounted on the support, a tube mounted within the collector in continuation of the passageway therethrough, a strainer within the collector surrounding said tube and of substantially greater diameter than the tube, and a second passageway through the collector exterior to said strainer and adapted to coact with the other of said passageways through the support when the collector is mounted on the support, substantially as set forth.

11. In a cleaning apparatus, the combination of a collector, a passageway through the

bottom thereof at substantially the center of the collector, a tube mounted upon the bottom of the collector and continuing said passageway upwardly from the bottom, a metallic pan mounted within the collector and near the bottom thereof, a strainer of woven fabric having its lower edge secured to the edge of said pan and spaced apart from the wall of the collector and its upper edge secured to the wall of the collector, a removable cover for the top of the collector, and means for withdrawing air from the collector exterior to the strainer, substantially as set forth.

12. In a cleaning apparatus, the combination of an upwardly-extending support having two passageways for air therethrough open at one end, a removable dust-collector mounted on and supported by said support and having two openings for air through the bottom wall thereof adapted to register with the ends of the passageways through the support, a tube mounted on and extending inwardly of the collector, a pan mounted on said tube near the bottom thereof, a strainer of woven fabric having its lower edge secured to the outer edge of said pan and its upper edge to the collector, and a removable cover for the collector, substantially as set forth.

13. In a cleaning apparatus, the combination of a support having a tapered exterior surface and two passageways for air therethrough, a collector provided with a correspondingly tapered surface adapted to coact with that of said support to removably mount the collector on the support, said collector having two passageways therethrough adapted to coact with the passageways through the support when the collector is mounted on the support, a tubular member mounted within the collector extending upwardly from the bottom thereof in continuation of one of said passageways, and a removable cover for the top of the collector formed to provide a deflector overlying said tubular member, substantially as set forth.

14. In a cleaning apparatus, the combination of a support having two passageways for air therethrough both of which are open at one end, a dust-collector mounted on said support, freely removable therefrom and having two openings for air through the wall thereof adapted, when the collector is mounted on the support, to register with the ends of the passageways through the support, the passageway through said support for air flowing into the collector being enlarged in cross-section toward the collector, and a strainer mounted within the collector through which air passing from one of said openings to another must pass, substantially as set forth.

15. In a cleaning apparatus, the combina-

tion of a support having two passageways
therethrough and presenting a tapered sur-
face, a dust-collector having a correspond-
ingly tapered surface, said dust-collector be-
5 ing adapted to be removably mounted upon
said support by bringing said tapered sur-
faces into coaction, and a tube projecting
within the collector and communicating with
the passageway through said support for in-
10 coming air, said tube being of larger cross-

section than the inlet end of said passageway
for incoming air, substantially as set forth.

This specification signed and witnessed
this 11th day of April, 1910.

THOMAS J. WINANS.
DANIEL M. WINANS.

Witnesses:

GERTRUDE M. SMITH,
S. W. WHITEMAN.