

No. 720,791.

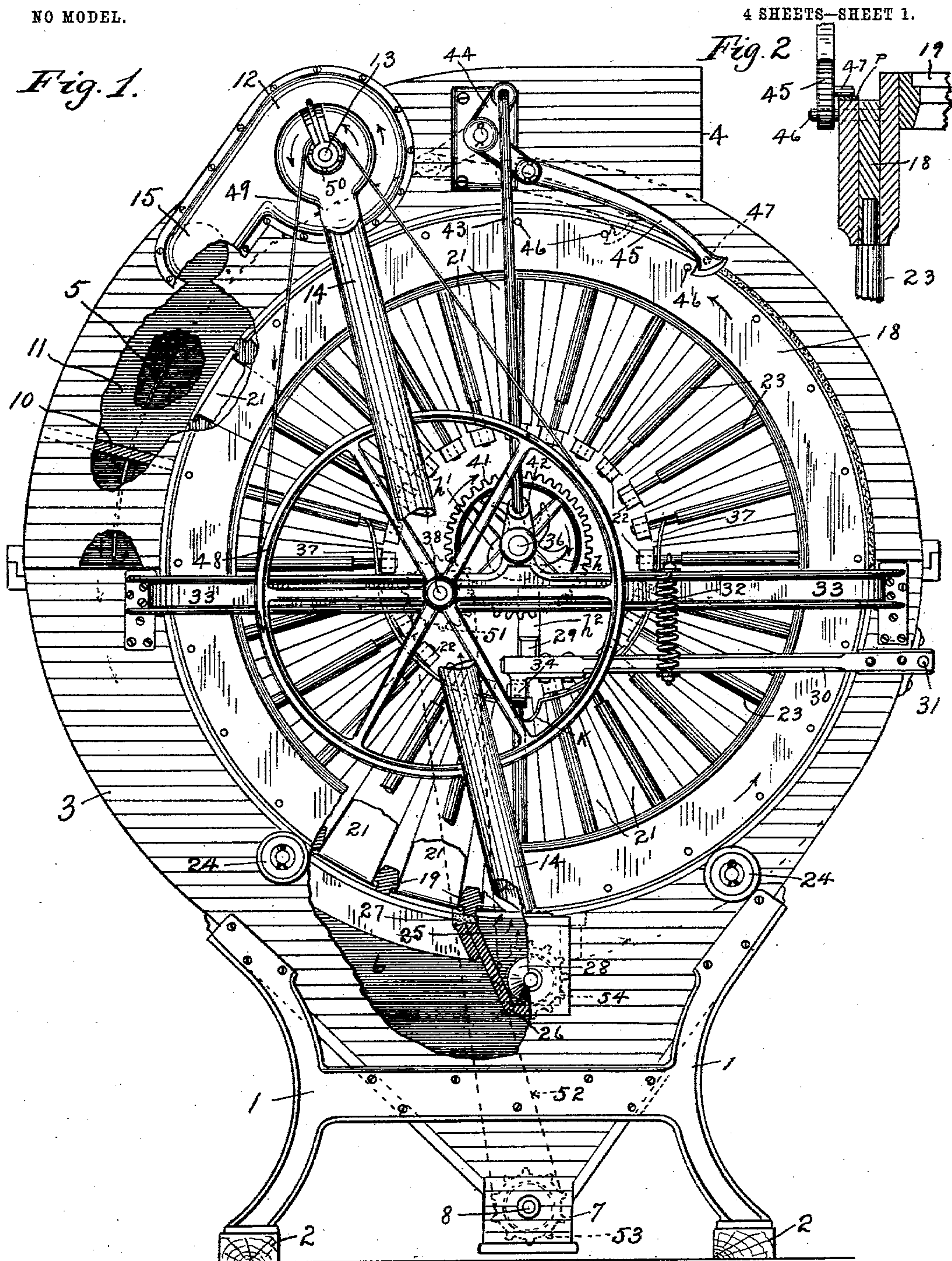
PATENTED FEB. 17, 1903.

E. R. DRAVER.
DUST COLLECTOR.

APPLICATION FILED MAR. 27, 1900.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses.
C. F. Kilgore.
Robert Otto.

Inventor.
Emil R. Draver.
By his Attorneys,
Williamson & Merchants.

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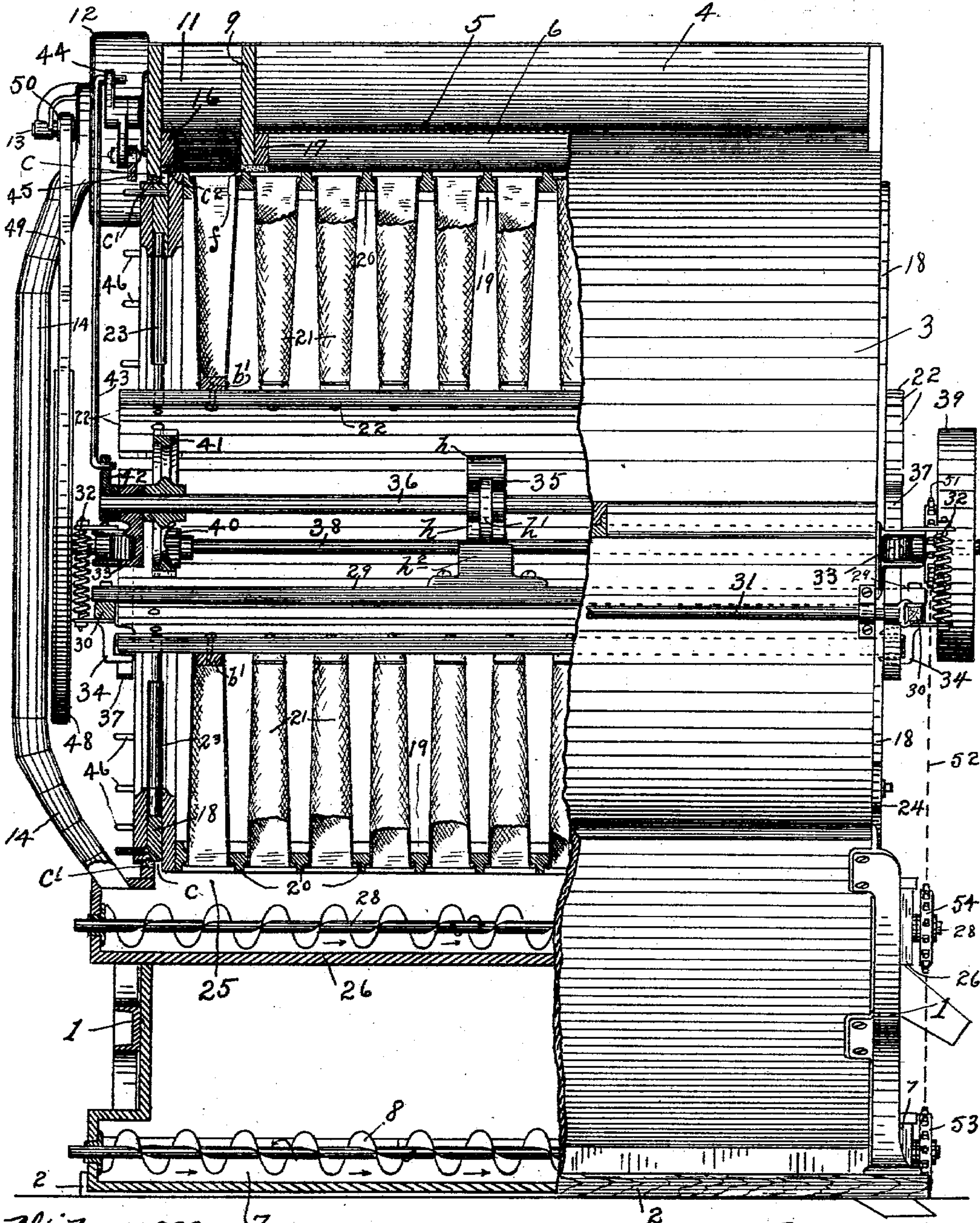
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4 SHEETS—SHEET 2.

Fig 3.



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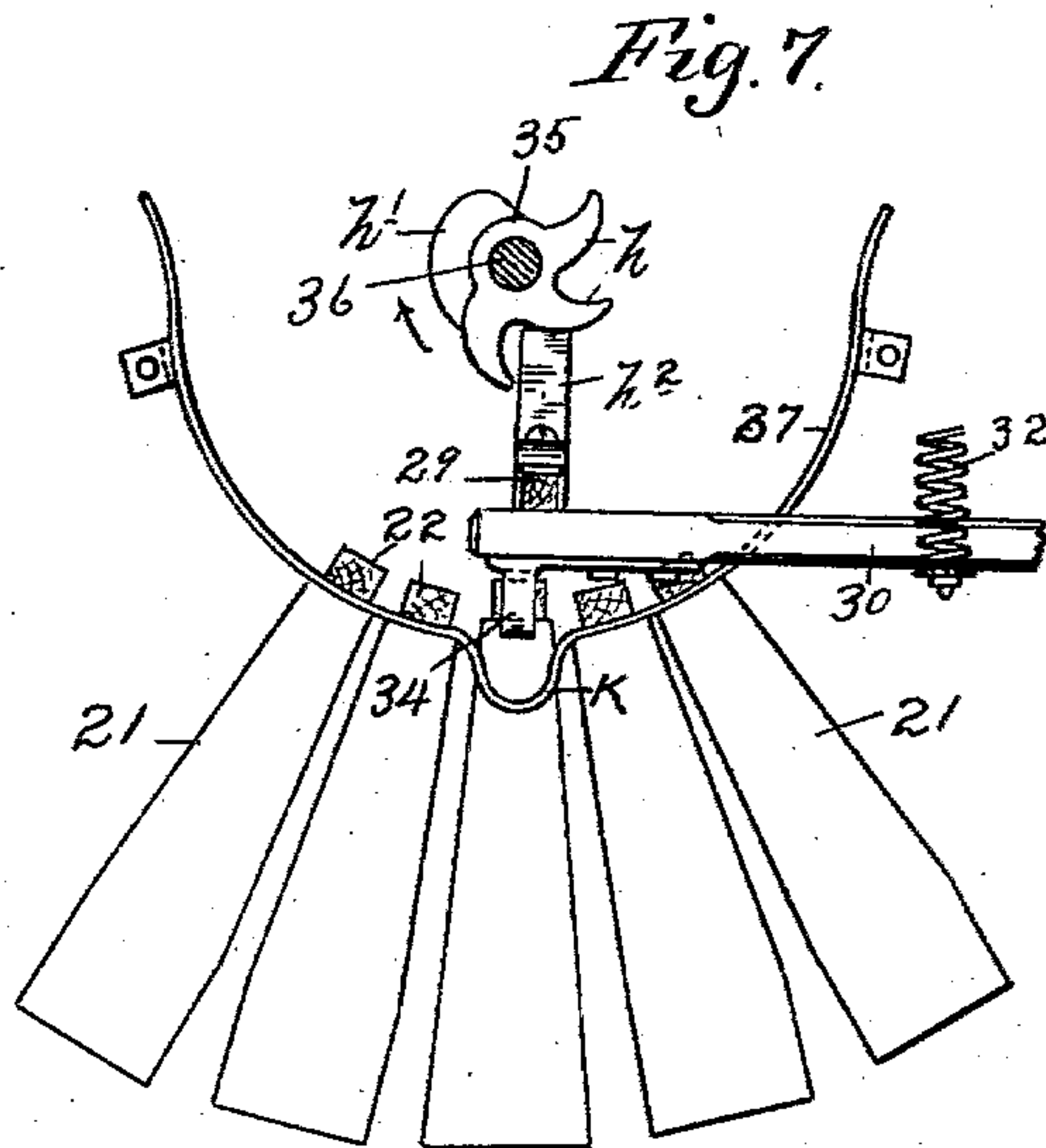
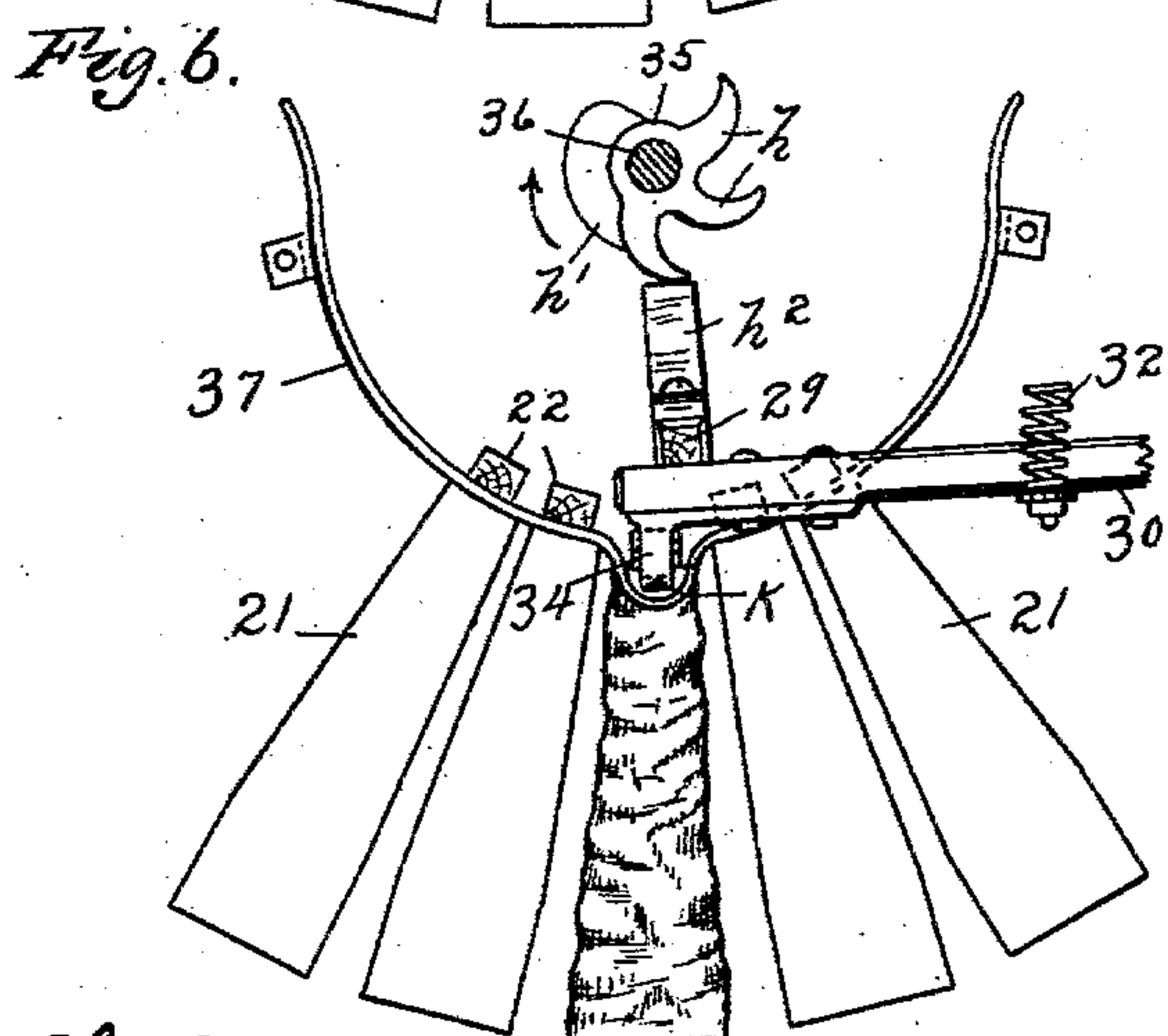
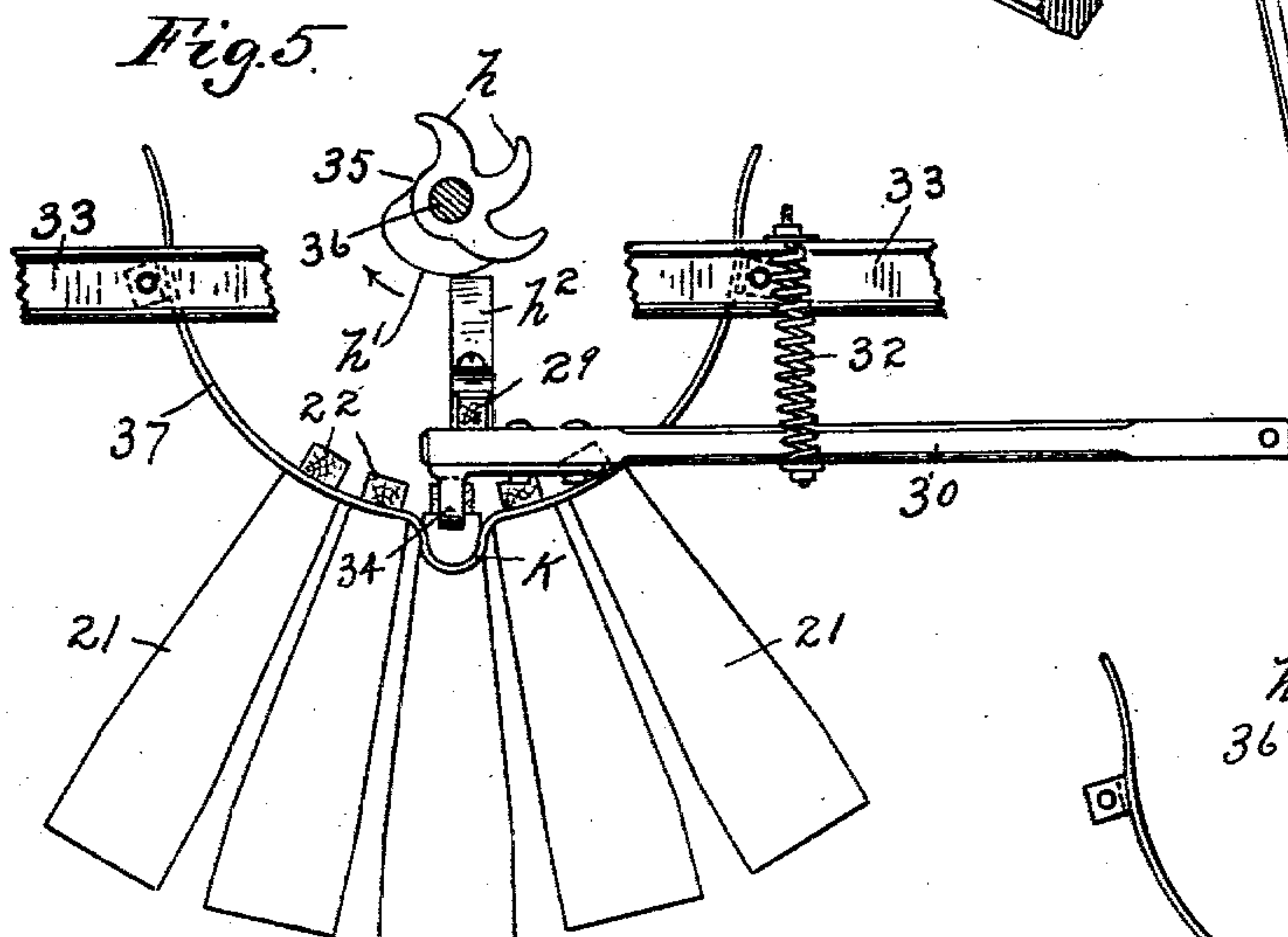
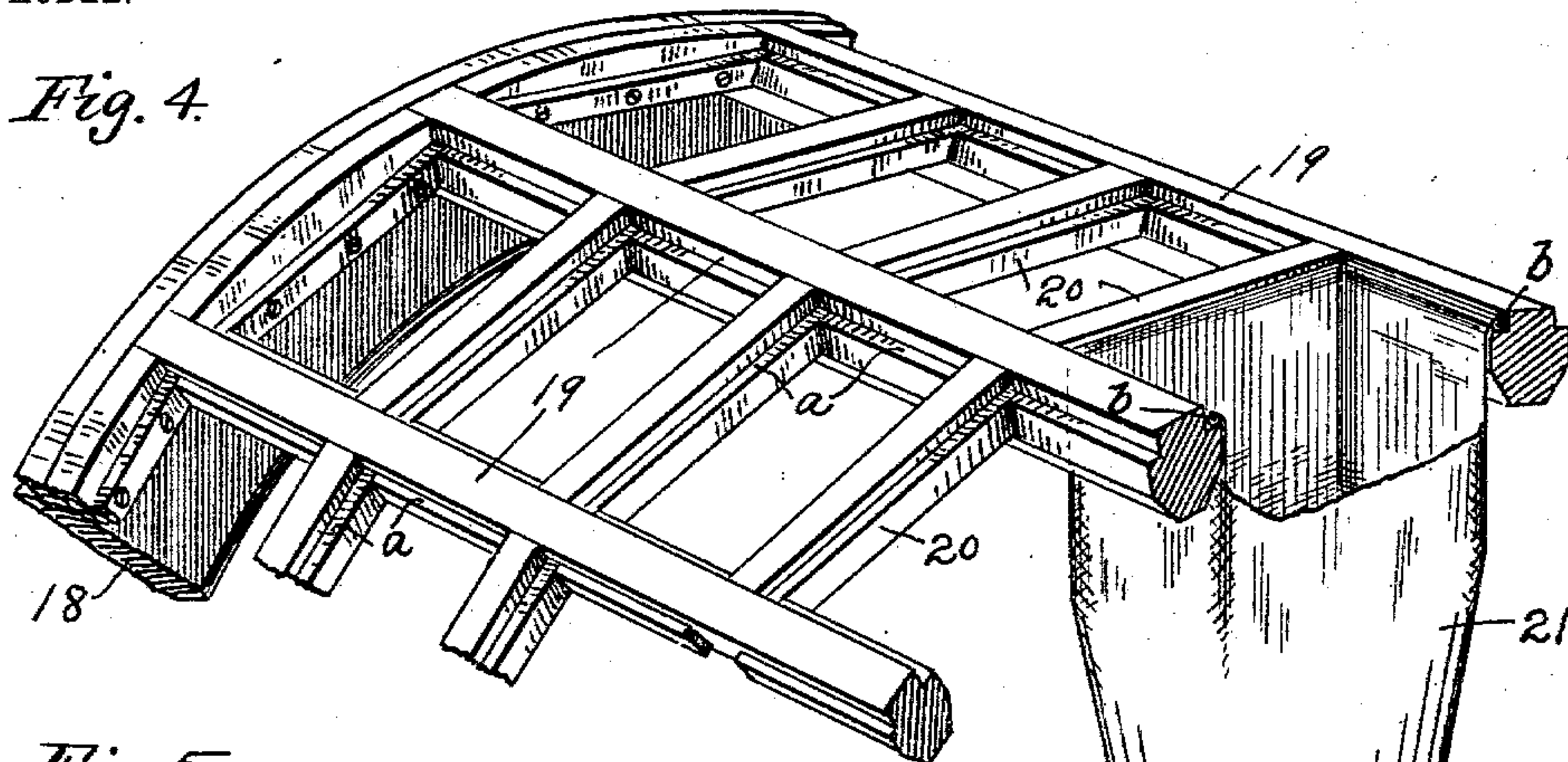
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 8.

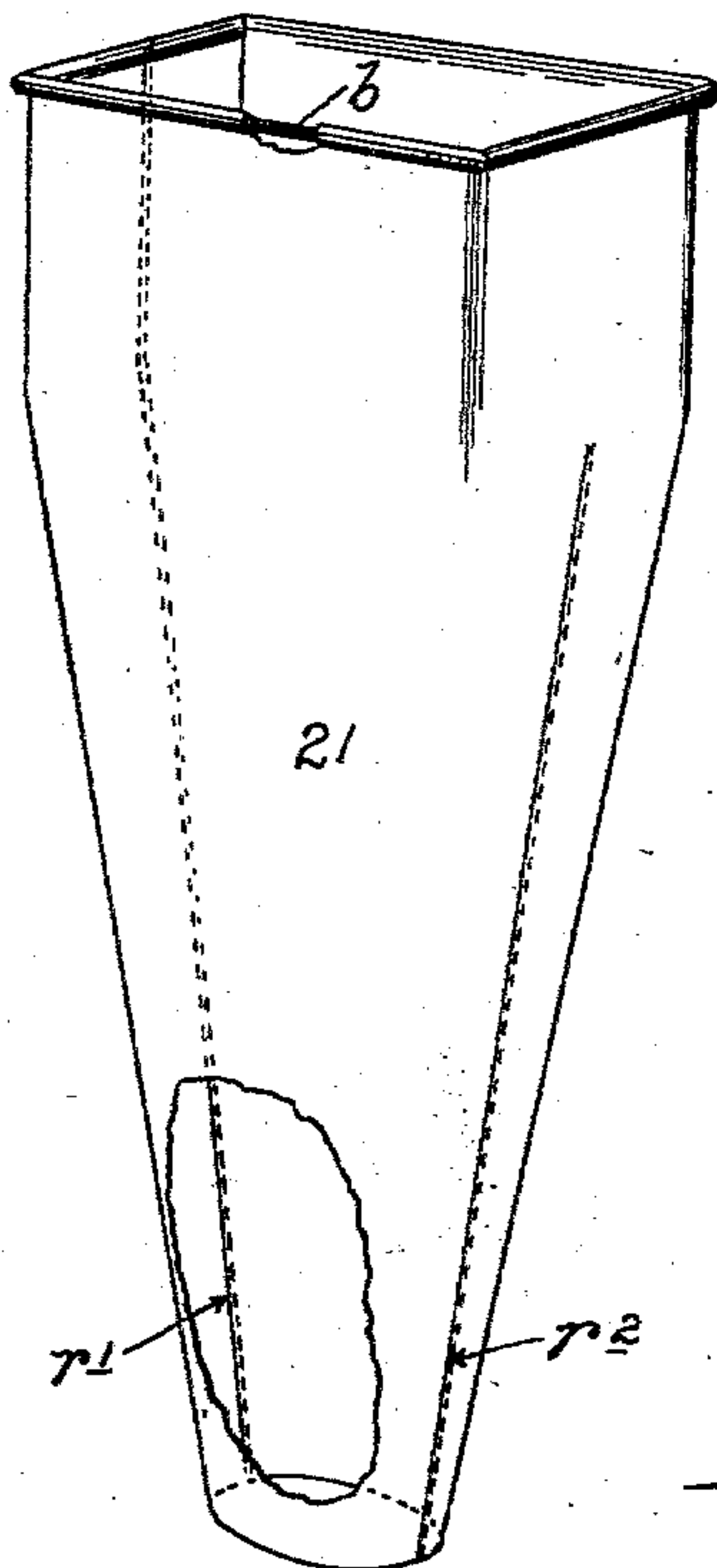


Fig. 9

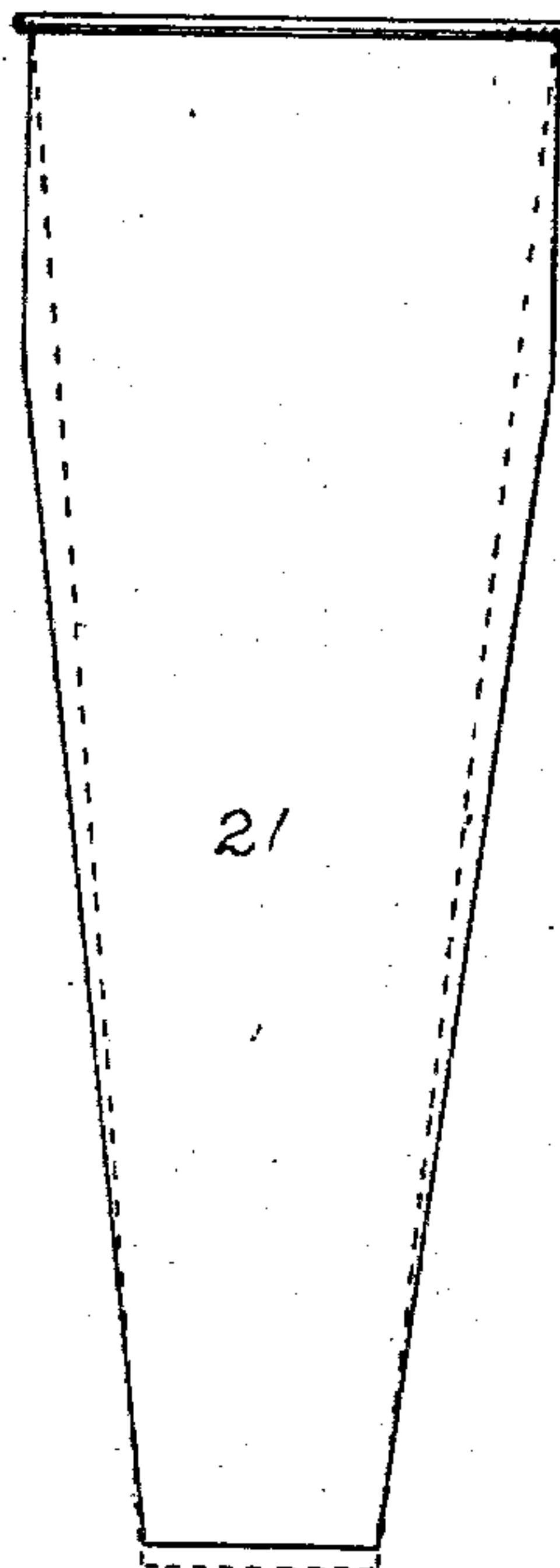
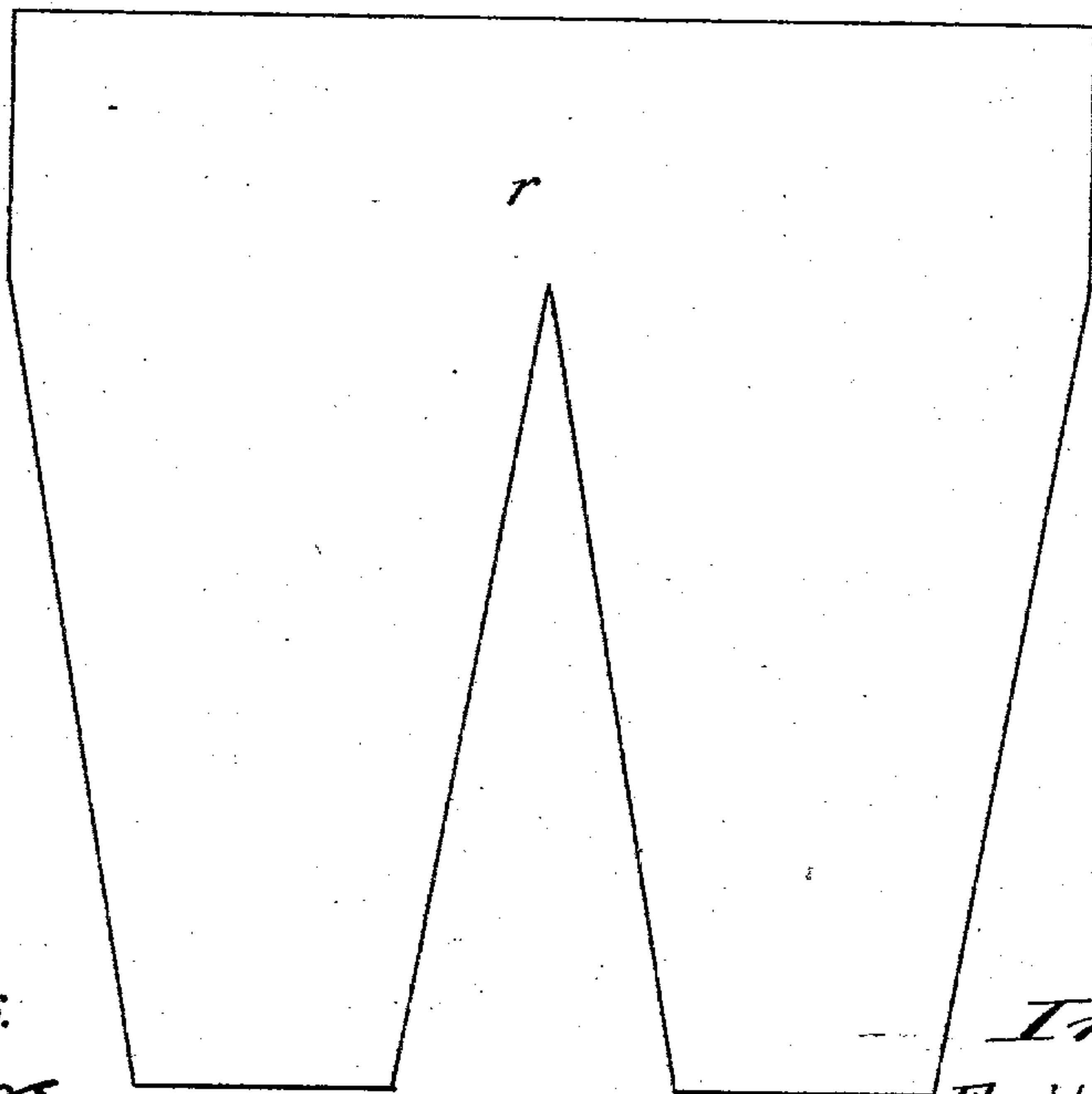


Fig. 10



Witnesses.

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UNITED STATES PATENT OFFICE.

EMIL R. DRAVER, OF WINCHESTER, INDIANA.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 720,791, dated February 17, 1903.

Application filed March 27, 1900. Serial No. 10,316. (No model.)

To all whom it may concern:

Be it known that I, EMIL R. DRAVER, a citizen of the United States, residing at Winchester, in the county of Randolph and State of Indiana, have invented certain new and useful Improvements in Dust-Collectors; 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 dust-collectors of the balloon type, and has for its object to provide certain improvements in this class of machines with a view of securing greater efficiency.

To this end my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings. Therein like notations refer to like parts throughout the several views.

Figure 1 is an end view of the machine chiefly in elevation, but partly in section and with some portions broken away. Fig. 2 is a detail, chiefly in section, showing a portion of the devices for intermittently rotating the reel or balloon frame. Fig. 3 is a view showing the entire machine chiefly in central vertical section, taken longitudinally of the machine, but partly in elevation and with some portions broken away. Fig. 4 is a detail in perspective, showing a portion of the annular reel or balloon frame with one of the collecting-pockets as suspended therefrom. Fig. 5 is a detail or skeleton view showing the devices which jar the tubes. Figs. 6 and 7 are similar views showing the same devices in different positions. Fig. 8 is a perspective view with some portions broken away, showing one of the collecting-pockets detached. Fig. 9 is a view showing one of the pockets in elevation, the full lines showing the pocket as it appears during the collecting action and the dotted lines showing the position taken by the walls of the pocket when the same has been jarred; and Fig. 10 is a plan view showing the blank from which the pockets illustrated in Figs. 8 and 9 are made.

The numeral 1 represents suitable castings or supports, to which is secured the casing 3. The supports 1 are shown as resting upon

sleepers 2. The casing 3 is substantially of involute form and is of the proper construction to encompass the rotary balloon and afford a trunk for receiving and delivering the dust-laden air to the collecting-tubes of the balloon. The construction of the casing is such as to afford an intake or receiving section 4 and a main trunk-section 6, divided off from the intake-section 4 by a transverse partition-plate 5, extending around about a little more than one-third of the casing, as best shown in Fig. 1. The casing 3 is also of the proper form to afford a hopper-like bottom, which, as shown, terminates in a receiving-trough 7, equipped with a conveyer 8, as best shown in Fig. 3, for catching the heavy dust and delivering the same to any point desired outside the machine. The casing 3 is also provided with a vertical partition 9 directly above the horizontal partition-plate 5 and extending for about two-thirds of the length of said horizontal partition 5, as best shown in Fig. 1. A cross-partition 10 connects the lower end of the vertical partition 9 to the adjacent end wall of the casing, as shown in Fig. 1. The partitions 5, 9, and 10 therefore cooperate to afford a chamber 11, to the end wall of which is applied a fan-house 12, equipped with a suitable fan 13, having a draft-tube 14 and a delivery-pipe 15, which taps the chamber 11 for purposes which will later appear. The casing 3 is also provided with suitable joint-plates 16 and 17 for cooperation with the reel or balloon-frame, as will later appear. The balloon-frame is in the form of an annular reel, having annular heads 18, made up of a set of triple plates constructed and applied in such a manner as to lap joints with each other, as best shown in Figs. 3 and 4. The annular heads 18 are connected by tie-timbers 19, and the tie-timbers 19 are connected by pieces 20, extending on chords of the arcs in the circumference of the reel terminated by the cross-ties 19. The cross-ties 19 and the short pieces 20 are rabbeted to afford shoulders *a*, which serve as seats from which the radial dust-collecting pockets are suspended from the periphery of the reel, as best shown in Fig. 4. These pockets 21 are composed of suitable fabric and are so formed as to be of square or rectangular shape in cross-section at their upper ends for a certain section of their length and then

to be of conical shape, tapering downward toward the center of the drum for the remainder of their length. Their outer ends are open and provided with a marginal wire *b*, which rests on the shoulders *a*, formed by the rabbeted surfaces of the timbers 19 and 20, thereby suspending the pockets 21 from the said shoulders, as shown in Fig. 4. If desired, the wires *b* may be stapled, tacked, or otherwise secured to the walls of their seats. The inner ends of the pockets 21 are closed by suitable caps *b'*, which are adapted to be made fast by wood-screws or otherwise to suitable distending-bars 22. The distending-bars 22 are mounted to work over the inner and reduced ends of suitable radial guides 23, projecting inward from the annular heads 18 of the rotary reel. The balloon, made up of the annular drum with its radial pockets, as described, is rotatively mounted in the casing 3. For this purpose it is shown as resting on antifriction-rollers 24, suitably journaled on the casing, one pair at each end thereof.

From the construction described it is obvious that the radially-disposed collecting-pockets 21 are arranged in rows lengthwise of the reel and that the periphery of the reel is of circular form at its heads 18 and of polygonal form between the heads 18. It is further obvious that the periphery of the reel is closed, except for the openings afforded by the open outer ends or mouths of the collecting-pockets 21. These open outer ends of the collecting-pockets 21 communicate directly with the main air-trunk 6, formed in the casing 3 and extending entirely around the balloon or annular reel when the latter is in working position.

Provision is made for securing a sufficiently tight joint between the annular reel and the surrounding casing wherever necessary or desirable. Such a joint is necessary between the reel-heads 18 and the end walls of the casing. For this purpose the inner plate of the annular reel-heads 18 extends outward beyond the other two plates of said reel-heads, and the joint-plates 16 of the casing are offset toward the periphery of the casing in respect to the end walls of the casing 3 at the openings provided for the reel. A packing-strip *c'*, of suitable material, is interposed between the end wall of the casing and the outer reel-head surface afforded by the two outer members of the three lapped plates of each reel-head, as best shown in Fig. 3. Another packing-strip *c''* is interposed between the outer surface of the innermost member of the three reel-head plates and the joint-plate 16 of the casing. This construction affords a lap-joint between the reel-heads and the casing, which is packed at two points, or on two peripheral lines offset from each other, and the joints thus packed are so related as to leave a clearance-space or joint-chamber *c* between the packed surfaces, which joint-space *c* extends entirely around the reel-heads and opens into the cut-off chamber 25, which will

presently be more fully noted. Another packing-strip *f* is interposed between the reel and the casing-surfaces formed by the vertical partition 9 and the joint-plate 17, as shown in Fig. 3. This strip *f* extends, of course, only to the length of the plates 9 and 17. The joints at both ends of the reel are of course packed in the same way.

The cut-off chamber 25 is afforded by a dust-receiving trough 26, the walls of which are provided with packing-flanges 27, which make a close joint with the periphery of the reel. The side walls of the trough are spaced corresponding exactly with the spacing of the longitudinal or tie timbers 19 of the reel. This dust-receiving trough 26 is located in the casing 3 at a point directly underneath the axis of the reel or with its center in a vertical line through the axis of the drum. This dust-receiving cut-off trough 26 is shown as provided with suitable conveyer 28 for directing away the dust collected thereby to any point outside the casing which may be desired. Under the rotary motion of the reel each row of tubes or collecting-pockets 21 will be brought in succession into a vertical line directly over the mouth of the trough 26, with the open ends of the tubes in position to deliver directly into the trough, and at this time the packing-flanges 27 will lap the tie-timbers 19 for that row of pockets and completely cut off the movement of the dust-laden air through the pockets. It has already been noted that the small fan 13 at the upper left-hand portion of the casing is provided with a draft-tube 14. This draft-tube 14 taps the cut-off chamber 25, or, in other words, its lower end opens into the dust-receiving box 26, as clearly shown in Figs. 1 and 3. It has been further noted that the clearance-space or joint-chamber *c* between the packed joints of the reel-heads and the casing-walls opens into the cut-off chamber 25. Hence at the same time that the collecting-pockets 21 are cut off from the dust-laden air they will be subject to a draft from the fan 13, thereby drawing backward through the pockets a body of clean air for cleaning the tubes.

The collecting-pockets 21 are of less length than the radius of the reel or balloon-frame, thereby affording a central opening around the axis of the drum. Through this central opening extends a knocker-bar 29, the outer ends of which are fixed to the inner ends of carrying-arms 30, which are pivoted by a rod 31 or otherwise to the casing 3 and are subject to strong springs 32, shown as connecting the said arms 30 to the crosstrees 33, made fast to the casing at its opposite ends in position to span the central opening at the ends of the reel. The distending-bars 22 are of greater length than the reel. The spring-held arms 30 carry at their inner ends lateral lugs or jaws 34, which are adapted to receive the ends of the distending-bars 22 at the proper times for the cleaning action. Otherwise stated, as each row of tubes comes to the lowest point

of its travel or in position to cause the open lower ends of the tubes or pockets 21 to register with the dust-collecting trough 26, the distending-bar 22 for that particular row of tubes will pass at its ends onto the jaws or lugs 34 of the knocking device. Each of said arms 30 is shown as provided with a pair of said lateral lugs or jaws 34; but it is of course obvious that a single jaw—to wit, the lower one—would answer the purpose, for the reason that when the distending-bars 22 come over the drop k in the upholding-track 37 the particular bar over the drop, together with the tubes normally distended thereby, will fall by gravity into the drop as fast as permitted by the spring-held arms 30 and the underlying members of the lateral lugs or jaws 34. The upper members of said jaws 34 may therefore be dispensed with, and this may be desirable in order to avoid the necessity for any accurate registration between the distending-bars and the jaws. The knocker-bar 29 is subject to a cam 35 on a constantly-running shaft 36, which extends through the central opening of the reel and is suitably journaled in the crosstrees 33, as best shown in Figs. 1 and 3. This cam 35 has three knocker-arms or surfaces h and a back-stop surface h' . The knocker-bar 29 is provided with a block or anvil h^2 in proper position for coöperation with the surfaces h and h' , of the cam 35. As shown, the cam 35 is located on the shaft 36 at about the center of the reel, and the anvil-block h^2 on the knocker-bar 29 is similarly located. Normally the springs 32 hold the knocker-bar 29 in its uppermost position with its anvil-block h against the back-stop surface h' of the cam. When thus held, the jaws 34 at the ends of the knocker-bar 29 are in position to receive the ends of the distending-bars 22, as best shown in Figs. 3 and 5. In order to make sure that the distending-bars 22 will enter the jaws 34 of the knocking device and for the further purpose of holding the bars 22 in distending position while the collecting-pockets 21 are traveling under the center of the reel, suitable guides or upholding-tracks 37 are provided, which, as shown, are supported from the crosstrees 33. These guide-tracks 37 are of the proper shape and extend for the proper length about the central opening of the reel to receive the ends of the distending-bars 22 whenever the latter begin to travel below a position wherein gravity would hold the bars in their distending position, as is obvious from an inspection of Fig. 1. The guides 37 are properly shaped to direct the distending-bars 22 into registration with the jaws 34 of the knocking device. At their lowermost point, or at a point in a vertical line through the axis of the reel, the guides 37 are provided with a suitable drop k , which will permit the distending-bars 22 to be thrown downward, as required, for the knocking action. When the row of collecting pockets or tubes 21 comes into cleaning position, the distending-bar for that particular row

will be engaged by the jaws of the knocker device, as shown in Figs. 1 and 5. The reel will then stand stationary until the knocking or jarring action has been completed. The draft of dust-laden air is cut off from the tubes by the packing-flanges 27 of the dust-receiving box 26 while the tubes are in cleaning position, as hitherto described. The cam-arms h of the cam 35 on the shaft 36 will then come into action in succession on the anvil-block h^2 of the knocker, and thereby force the distending-bar 22 downward into the drop k of the track 37 and carry therewith the arms 30 against the tension of the retracting springs 32. After the action of each cam-arm h the springs 32 will throw the knocker and the distending-bar 22 of that particular row of tubes back upward to the limit, thereby imparting a quick sharp shake to the collecting-pockets 21. The diagram views, Figs. 5, 6, and 7, illustrate the positions taken by the respective parts at the successive stages in one of these shaking actions. At the same time that this shaking occurs the tubes are subject to the back draft from the fan 13, as hitherto described, thereby pulling back through the cloth a body of fresh air and thoroughly cleaning the collecting-tubes.

A shaft 38 extends through the central opening of the reel and is suitably journaled in the crosstrees 33. At its right end this shaft 38 is provided with a pulley 39 for receiving motion from any suitable source. Near its left end the shaft 38 has a small gear 40, which engages a larger gear 41 on the cam-shaft 36, as best shown in Fig. 3. At its left end the cam-shaft 36 is provided with a crank-arm 42, which is connected, by a pitman-rod 43, with the short arm of a bell-crank lever 44, which is pivoted at its elbow to the casing 3, as best shown in Fig. 1. The other arm of the bell-crank 44 has pivoted thereto a long pawl 45, the free or outer end of which is of the proper shape to serve as a hook for engagement with coöperating pins 46, projecting from the adjacent head 18 of the reel. The pawl 45 is provided with a laterally-projecting stud 47, which rides on the projecting flange of the drum-head 18, thereby preventing the pawl from dropping out of proper working position. The head of the pawl 45 is of the proper shape to ride easily over the pins 46 when moving into engaging position therewith. The reel-head flange may have a metallic chafing-band p for pawl-stud 47, as shown in Fig. 2. With these connections 42, 43, 44, and 45 from the constantly-running cam-shaft 36 the reel or balloon will receive an intermittent or step-by-step motion, as required for bringing the rows of collecting-tubes 21 successively into cleaning position.

The main shaft 38 is shown as provided at its left end with a large pulley 48, connected by a belt 49 with a small pulley 50 on the fan 13. This imparts proper motion to the said fan 13.

The main shaft 38 is provided with a sprocket 51, which is engaged by a chain 52. The chain 52 embraces a sprocket 53 on the lower conveyer 8 and doubles back over a sprocket 54 on the conveyer 28. These connections impart the proper motion to the two conveyers.

Having regard to the form of the dust-collecting pockets 21, as hitherto described and as best shown in Figs. 8 and 9, this form is secured by first cutting a blank r , of cloth, into the shape or form shown in Fig. 10. This is then brought together at its upper end about the rectangular marginal wire b , and the meeting edges are sewed together, as shown by the seams r' and r'' . When thus formed, the upper end portion of the pocket will be rectangular in cross-section for a portion of its length, extending downward to the top of the seam r'' . From that point downward the pocket will be conical or of circular form in cross-section, tapering downward to the inner end of the tube or the end which is closed when the pocket is in working position. In virtue of this form of the pockets 21 the walls of the pocket will normally appear as shown in full lines in Fig. 8. Otherwise stated, this will be the form and appearance of the pocket when in dust-collecting position. When the pockets are brought to cleaning position and the return or spring motion from the knocking device takes effect on the pocket, the walls will assume the position shown in dotted lines in Fig. 9. This renders the shake extremely effective for cleaning the cloth.

All of the parts of the machine have now been specified, and the action of the same is probably clear from the detail description. A brief statement as to the general action of the machine as an entirety may, however, be of service.

The dust-laden air enters under pressure into the intake or receiving section 4 of the air-trunk in the casing. Thence it is conducted into the main air-trunk 6 of the casing, entering the same at the largest part of said main trunk, when the current will divide and a large part of the same will return around the lower end of the horizontal partition-plate 5 and move upward between said partition-plate and the periphery of the balloon or through the smaller part of the main trunk 6. The main trunk 6 entirely surrounds the balloon, as hitherto described, and hence the dust-laden air can freely enter the open outer ends of the collecting-pockets 21 at all points in the travel of the same through the trunk 6, with the exception of the row of pockets which may be cut off therefrom by the dust-collecting cloths 26. The casing 3, in virtue of the construction described, serves as a preliminary separator for eliminating a large part of the dust from the air. All the heavier particles will have been eliminated before the air enters the dust-collecting pockets. The dust so removed in the preliminary separa-

tor or casing 3 drops downward into the hopper-like bottom of the casing and is directed off by the conveyer 8. The dust-laden air which enters the open mouths of the collecting-pockets 21 must pass therethrough to the atmosphere, and under the action of the collecting fabric all the dust will be collected on the inside surfaces of the pockets. At the proper intervals the rotary reel or balloon is moved forward step by step, thereby bringing the rows of pockets successively into their cut-off or cleaning position with their mouths in registration with the dust-collecting trough 26. The knocking or jarring action then takes place, as described, thereby effectually shaking out the dust from the pockets, and while the dust-laden draft is thus cut off the back draft from the fan 13 is in action on the tubes, then in cleaning position, thereby drawing backward through the fabric a body of clean air and thoroughly cleaning the same. Notwithstanding the packings between the reel-heads and the casing more or less dust may enter into the clearance or joint space c ; but as this joint-space c opens into the cut-off chamber 25 it will also be subject to the suction from the back-draft fan 13, thereby keeping this joint-space c free from accumulations of dust and effectually avoiding any escape of dust into the surrounding atmosphere of the room. The cleaning action is therefore extremely effective.

From the detail description of the parts it is also obvious that the machine is comparatively simple and cheap to make.

It will of course be understood that the details of the construction might be changed in many ways without departing from the spirit of the invention. The independent fan, however, for securing the back draft or suction for cleaning purposes is of itself an important improvement in this class of machines. Equally good results cannot be secured if the back-draft tube taps the eye of the main fan, which supplies the dust-laden air under pressure to the dust-collector. This is true, for the reason that the main or blast fan proper for supplying the dust-laden air under pressure has heavy work, requiring comparatively high pressure, while the work of securing the back draft is comparatively light and requires much less pressure. The suction for the back draft should not be the same as the blast-pressure, for the reason that if the back draft be of equal pressure with the blast the dust will be pulled up from the cut-off chamber by the back-draft suction. By providing the small independent back-draft fan, as herein disclosed, the back-draft suction may be made as strong or as weak as may be required for the best work. Otherwise stated, the small fan can be run at any speed desired, according to the size of the collector and the suction force needed, regardless of the speed of the main or blast fan. Experience demonstrates that this constitutes an important improvement in the art.

Having regard to the back-draft device, as shown, it is of course obvious that whatever dust may be pulled up from the cut-off chamber 25 by the back-draft fan will be delivered 5 into the chamber 11 of the casing, from whence the same can reënter the left-hand circumferential row of the collecting-pockets 21 and be subjected to a recleaning action. The chamber 11 may therefore be termed a 10 "recleaning-chamber," which receives the portion of dust-laden air drawn up by the back-draft fan and delivers the same to the particular collecting-pockets devoted to that purpose, and this recleaning-chamber 11 is 15 cut off from the main blast of dust-laden air. This is highly important, as otherwise the back-draft fan would have to produce a stronger pressure than the pressure from the main-blast fan that supplies the primary blast 20 of dust-laden air. It is of course obvious that instead of a circumferential row of the collecting-tubes 21 being appropriated to the said recleaning purpose the recleaning cut-off chamber might extend lengthwise of the reel 25 or balloon frame and a longitudinal row of the tubes be appropriated to the recleaning purpose.

It is of course obvious that the casing herein shown and described may be regarded as 30 a stationary drum, which coöperates with the rotary reel or balloon frame. It is equally obvious that the back-draft fan is located on or within the said casing or stationary drum.

The machine herein disclosed is in some of 35 its features substantially identical with the machine disclosed in my pending application, Serial No. 729,452, filed September 5, 1899. The features of improvement over the said machine so far as patentable are defined in 40 the claims.

It should be noted that some of the novel features herein disclosed and claimed—such, for example, as the back-draft device or feature—do not depend on the particular form 45 of the collecting-pockets herein disclosed.

It will of course be understood that the term "tubes" or "pockets" as herein used are interchangeable terms. A tube can have any desired cross-section or, otherwise stated, 50 may be of such cross-section as to extend the entire length of the drum, and in that case would be more properly called a "pocket." Otherwise stated, instead of a row or series of small tubes disposed lengthwise of the 55 drum a single pocket might be employed extending through the entire length of the drum.

What I claim, and desire to secure by Letters Patent of the United States, is as follows: 60

1. The combination with the casing, of an annular reel or balloon frame rotatively mounted therein, rows of radially-disposed collecting-pockets suspended inward from the 65 periphery of said reel, distending-bars for the inner or closed ends of said pockets, radial guides, for said distending-bars, and uphold-

ing runways or tracks by which said distending-bars are upheld in distending position when traveling below the axis of the reel, substantially as described. 70

2. The combination with the casing, of the annular reel or balloon frame rotatively mounted therein, rows of radially-disposed collecting-pockets suspended inward from 75 the periphery of said reel, distending-bars carried by the inner or closed ends of said pockets, upholding runways or tracks for said bars, which tracks are provided with a drop at their lowermost point, for permitting the 80 bars to be thrown downward into said drops, under the jarring action, and knocking devices for action on said distending-bars when over said drops, substantially as described.

3. The combination with the casing, of the 85 annular reel or balloon frame, rotatively mounted therein, the rows of radially-disposed collecting-pockets suspended inward from the periphery of the reel, the distending-bars carried by the inner or closed ends of 90 said rows of pockets, the radial guides for said distending-bars, the upholding tracks for said distending-bars having the drop at their lowermost points, a cut-off chamber with which the open ends of said pockets register, 95 when in cleaning position, spring-held lugs adapted to receive said distending-bars as directed thereto by said tracks when said bars come over the drop in said tracks, and knocking devices operating on said spring-held 100 lugs, substantially as and for the purposes set forth.

4. The combination with the casing, of the annular reel or balloon frame rotatively 105 mounted therein, the rows of radially-disposed collecting-pockets suspended inward from the periphery of the reel, the distending-bars carried by the inner or closed ends of said pockets, radial guides for said distending-bars, the upholding tracks for said distend- 110 ing-bars with central drops as described, spring-held arms pivoted to the casing and having lugs at their inner ends which receive the ends of said distending-bars as they come over said drops in said tracks, a knocker-bar 115 connecting the inner ends of said pivoted arms and a constantly-running shaft having a cam with back-stop and knocker surfaces for action on said knocker-bar, substantially as described. 120

5. The combination with the casing and the annular reel or balloon frame, of packed joints between the reel-heads and the casing, constructed and arranged to afford a clearance-space or joint-chamber *c* between the 125 packed joints and a draft device applied to said joint-chamber for keeping the same clear from accumulations of dust, substantially as described.

6. In a dust-collector of the balloon type, 130 the combination with the casing constructed to afford the air-trunk for supplying the dust-laden air to the balloon, of the annular reel or balloon frame rotatively mounted in said

casing, the rows of radially-disposed collecting-pockets suspended inward from the periphery of said reel, with their outer ends in communication with said air-trunk of the casing and their inner ends closed, a cut-off chamber with which the open ends of said pockets register, when in cleaning position, packed joints between the reel-heads and the casing constructed to afford a clearance or joint chamber *c* which opens into the cut-off chamber, and a back-draft device applied to said cut-off chamber, substantially as and for the purposes set forth.

7. The combination with the casing constructed as described, of the rotary annular reel mounted in said casing, the rows of collecting-pockets radially suspended inward from the periphery of said reel, the distending-bars carried by the inner or closed ends of said pockets, the upholding-tracks for said distending-bars having the central drop as described, the dust-receiving cut-off chamber below the reel, with which the open ends of said pockets register when in cleaning position, the spring-held arms pivoted to the casing and having the jaws at their inner ends for receiving the distending-bars, the knocker-bar connecting said pivoted arms, the knocker-cam with back-stop and knocker surfaces for action on said knocker-bar as described, the packed joints between the reel-heads and the casing constructed to afford the joint-chamber *c* opening into the cut-off chamber as described, and a back-draft device applied to said cut-off chamber, all for cooperation substantially as described.

8. The combination with the casing, of the annular reel or balloon frame rotatively mounted therein, rows of radially-disposed collecting-pockets suspended inward from the periphery of said reel, distending-bars carried

by the inner or closed ends of said pockets, upholding runways or tracks for said bars, when traveling below the axis of the reel, which tracks are provided with a drop at their lowermost point, for permitting the bars to pass downward into said drops, and knocking devices for action on said distending-bars at said drops, substantially as described.

9. In a dust-collector of the balloon type, the combination with the rotary reel containing the filtering-pockets into which the dust-laden air is forced, under pressure, of a cut-off chamber with which the open ends of the tubes or pockets register when in cleaning position, and a back-draft fan tapping said cut-off chamber and operative on the pockets from which the dust-laden blast is cut off, and which back-draft fan is independent of the means for producing the dust-laden blast, substantially as described.

10. In a dust-collector of the balloon type, the combination with a rotary reel containing the filtering-pockets into which the dust-laden air is forced under pressure, of a cut-off device operative to cut off the dust-laden blast from the pockets in cleaning position, a back-draft fan operative on said pockets from which the dust-laden blast is cut off, which back-draft fan is independent of the means for producing the dust-laden blast, and a recleaning cut-off chamber receiving from said back-draft fan and delivering to collecting-pockets carried by the drum or reel, substantially as described.

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

EMIL R. DRAVER.

Witnesses:

MARTHA DUNHAM,
H. C. DRAVER.