

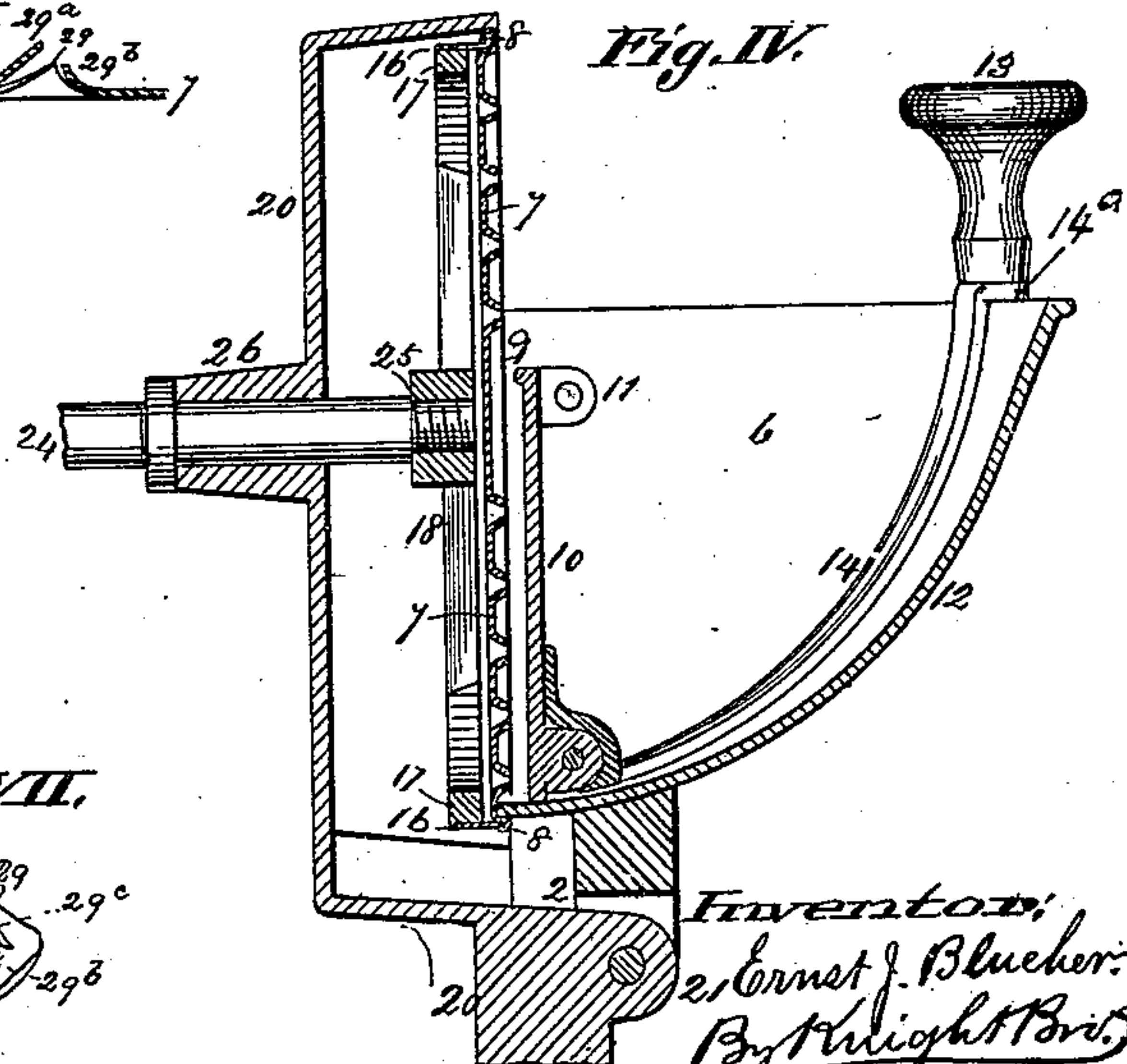
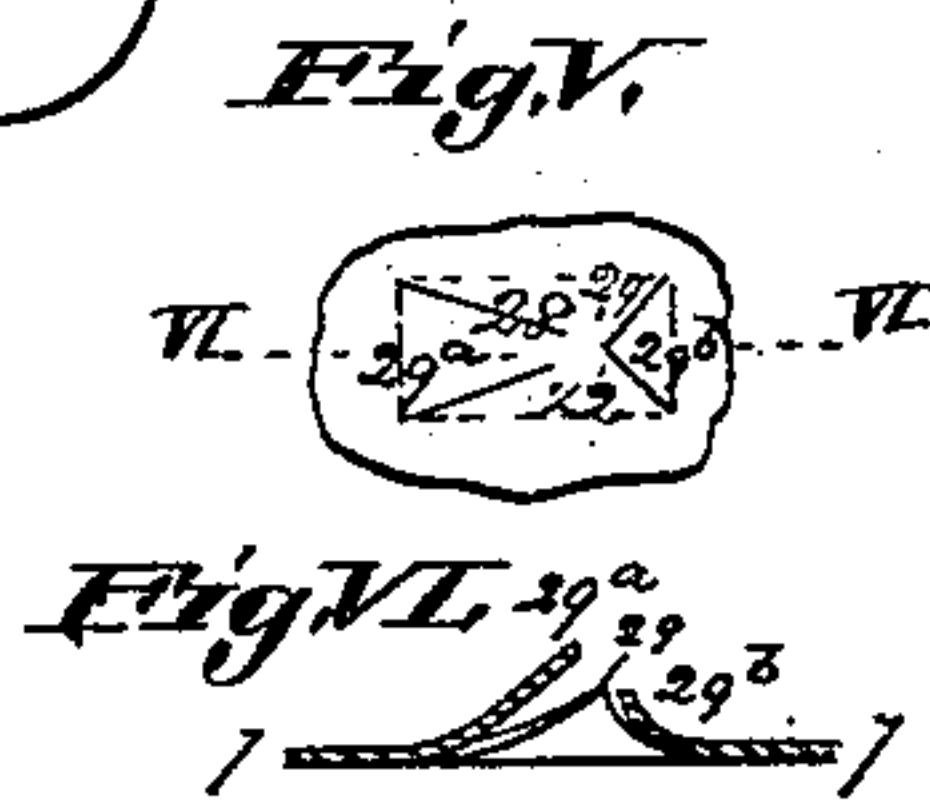
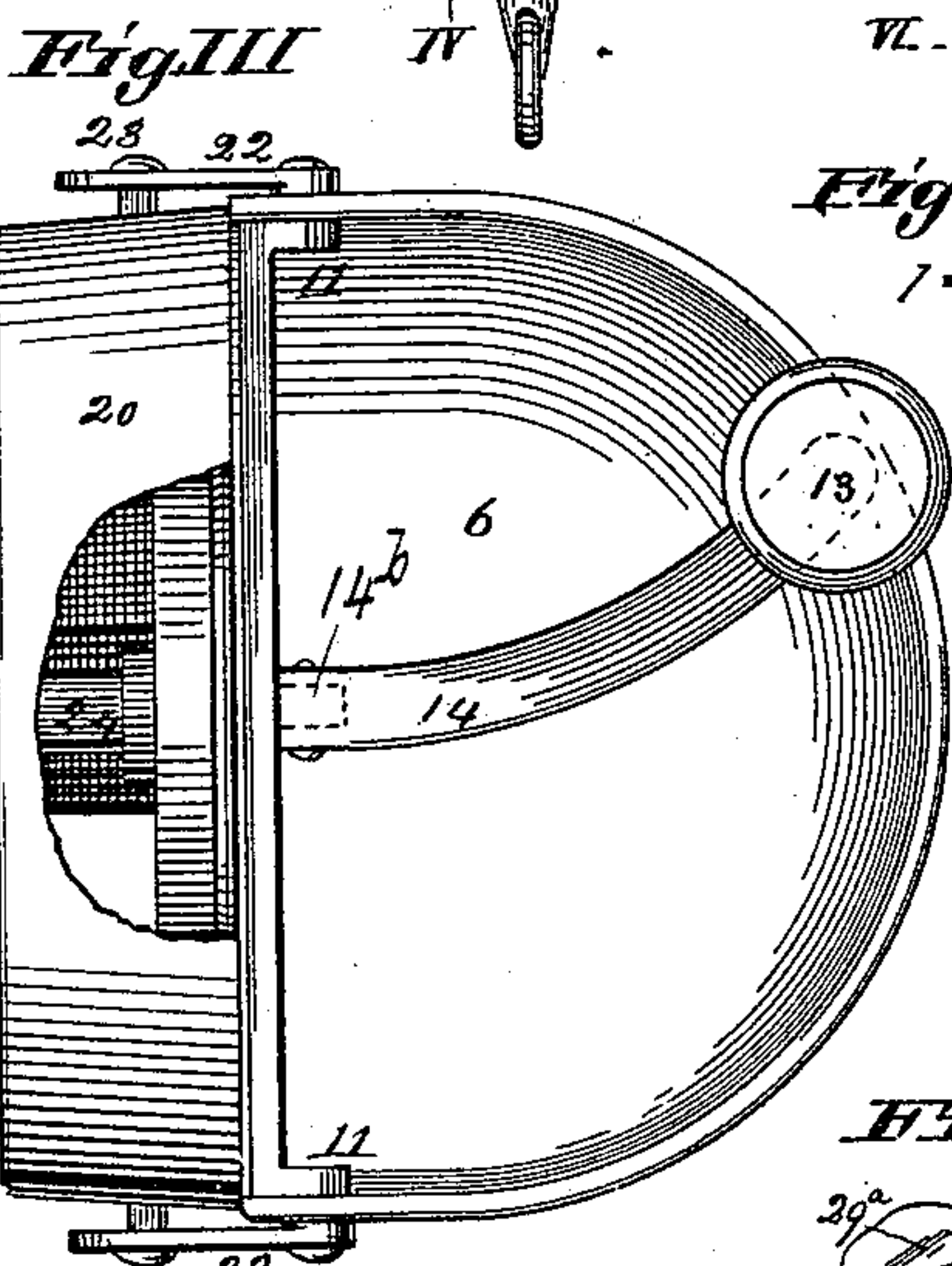
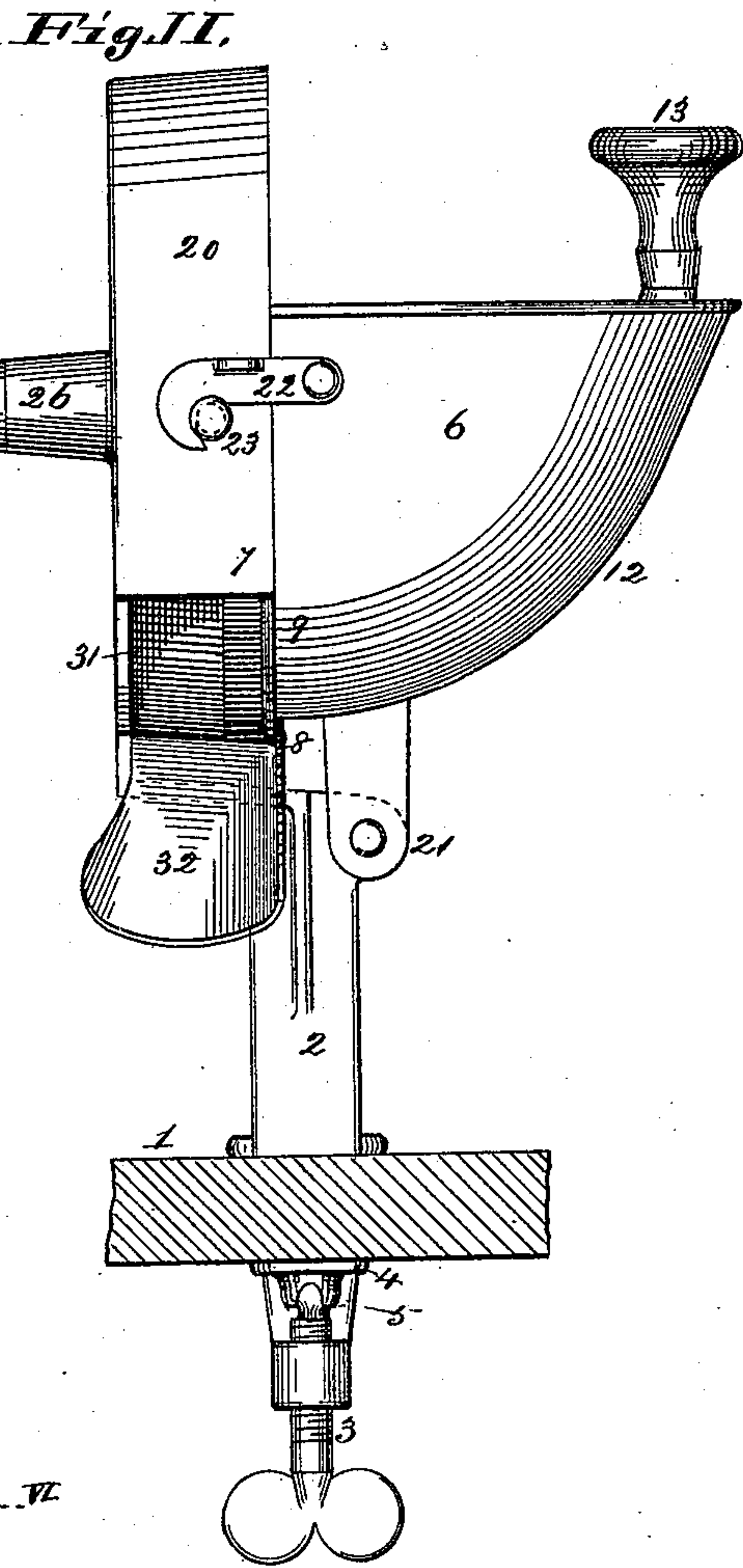
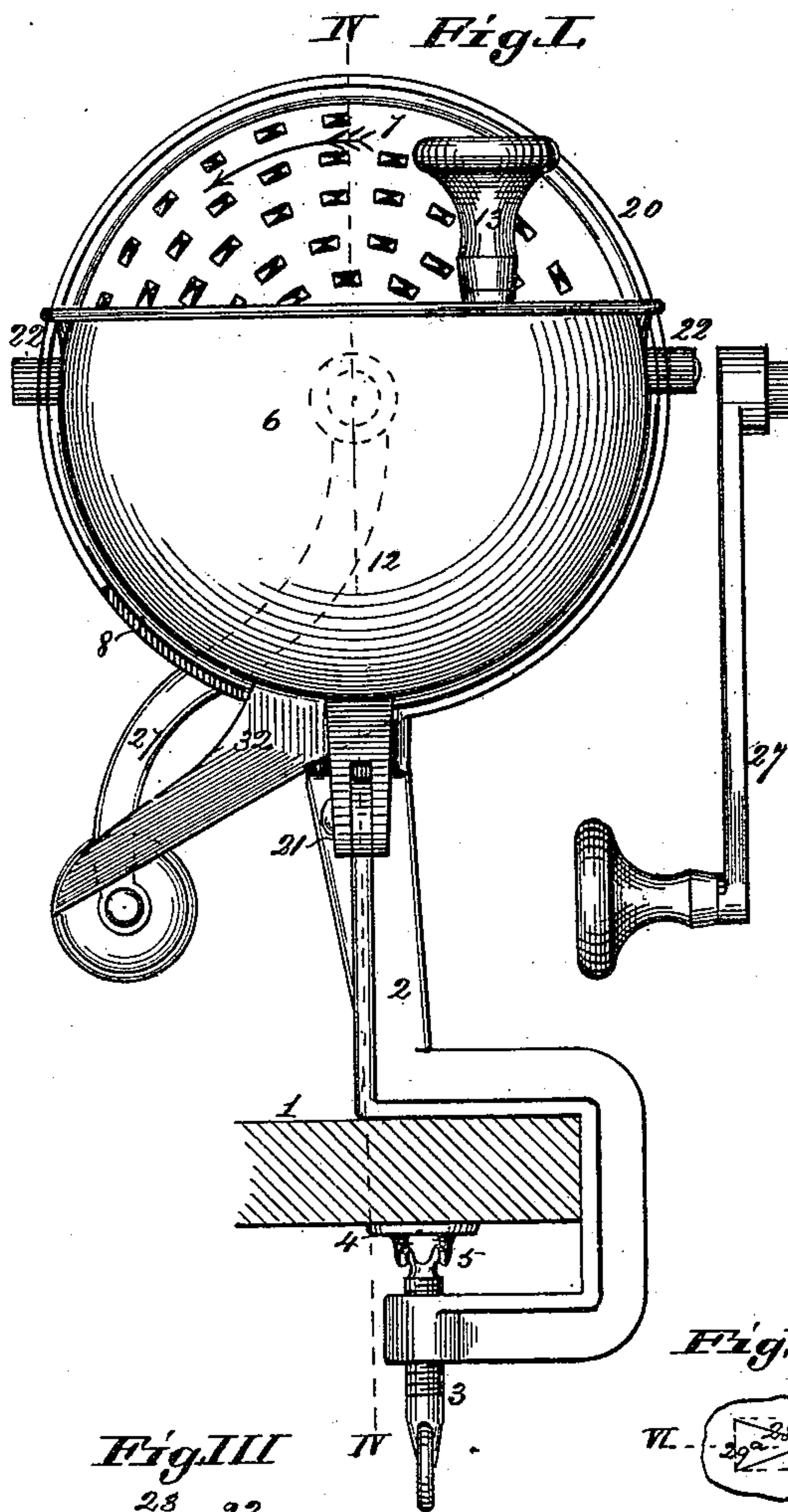
(No Model.)

2 Sheets—Sheet 1.

E. J. BLUEHER.  
GRATER.

No. 471,937.

Patented Mar. 29, 1892.



Attest:  
Harry S. Rohrer  
S. Cotton

Inventor:  
Ernest J. Blueher.  
By Wright & Bates  
Attys.



(No Model.)

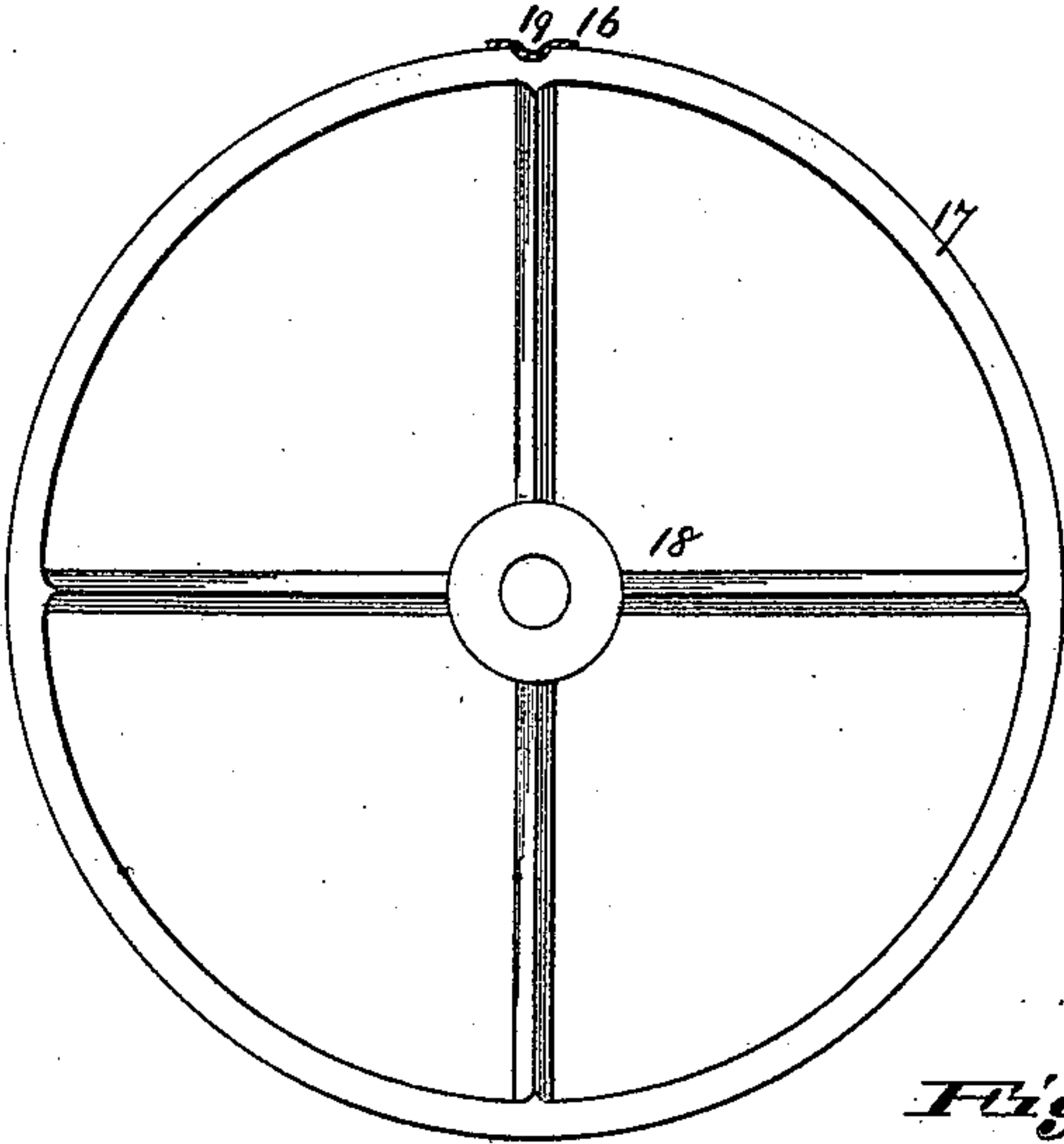
2 Sheets—Sheet 2.

E. J. BLUEHER.  
GRATER.

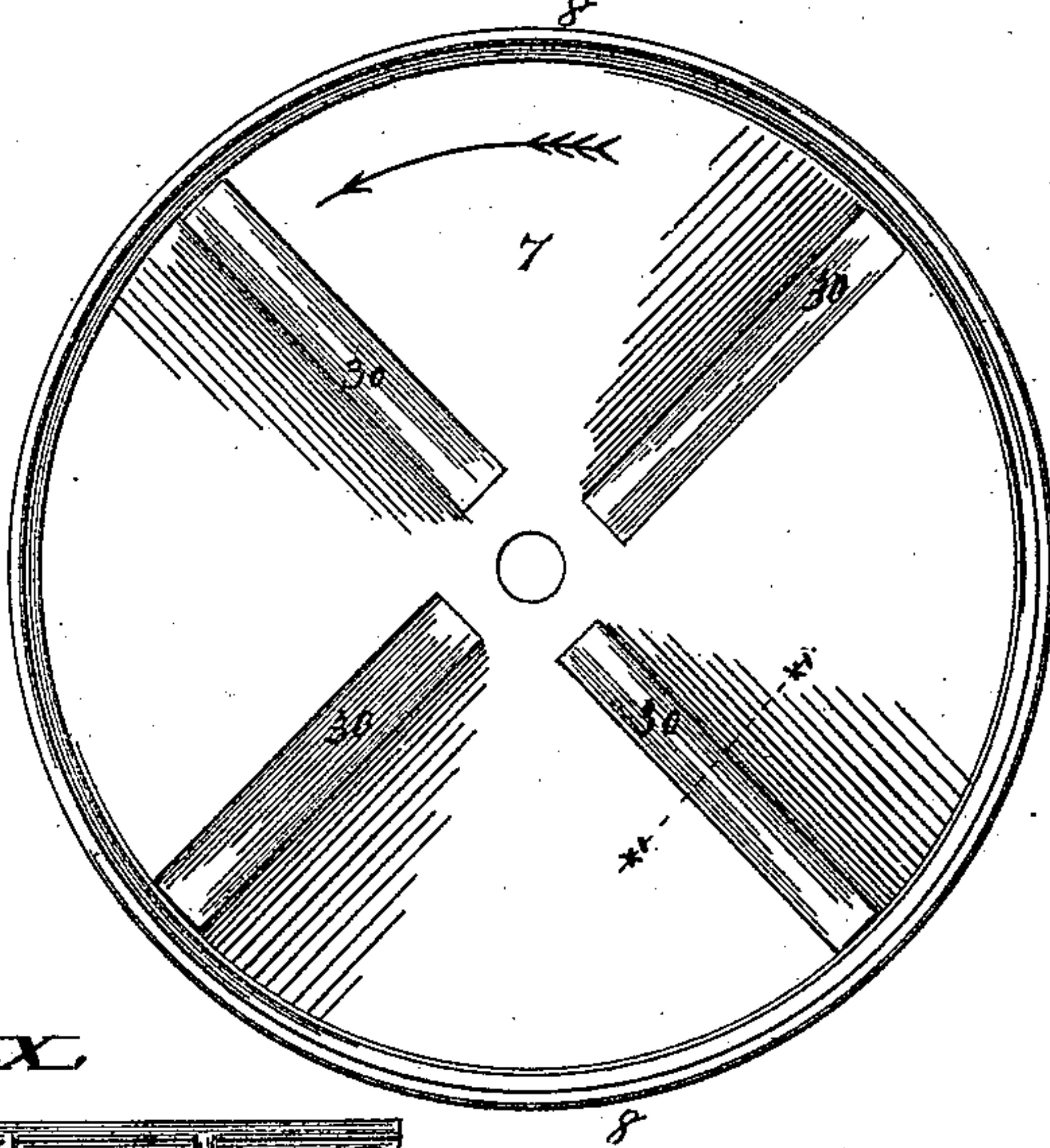
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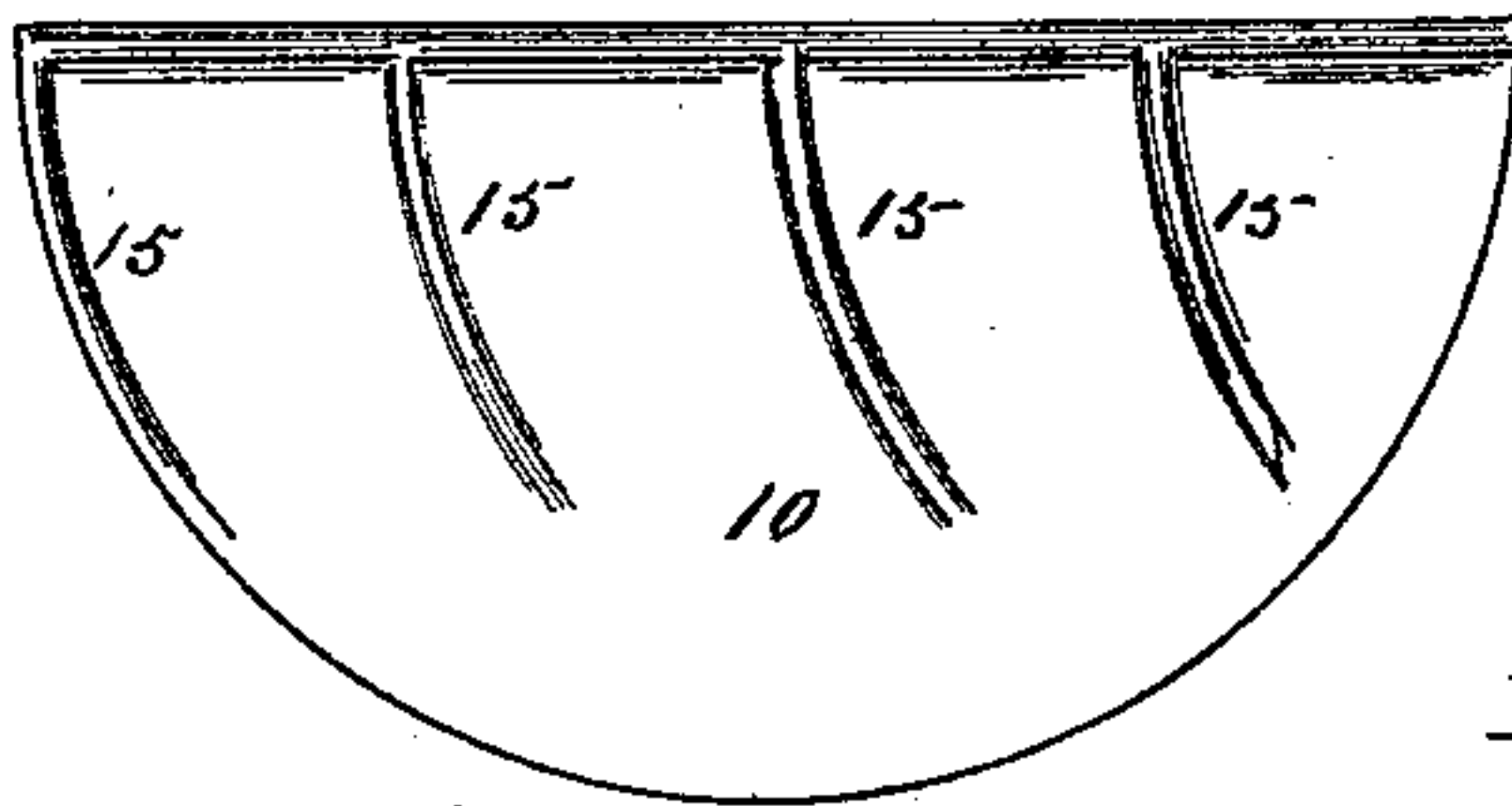
*Fig. VIII.*



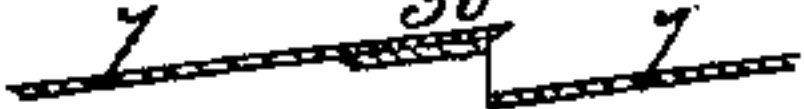
*Fig. IX.*



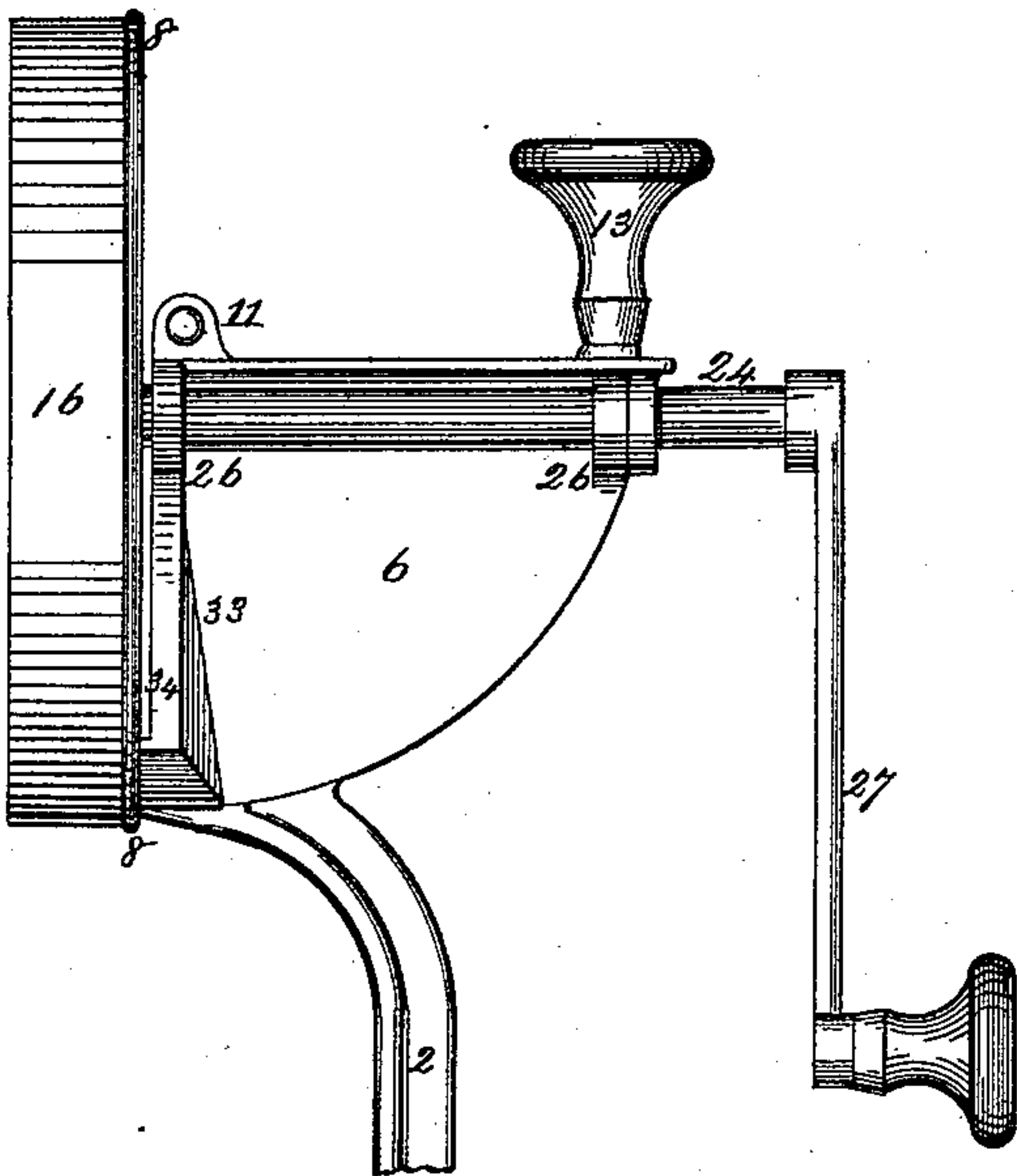
*Fig. X.*



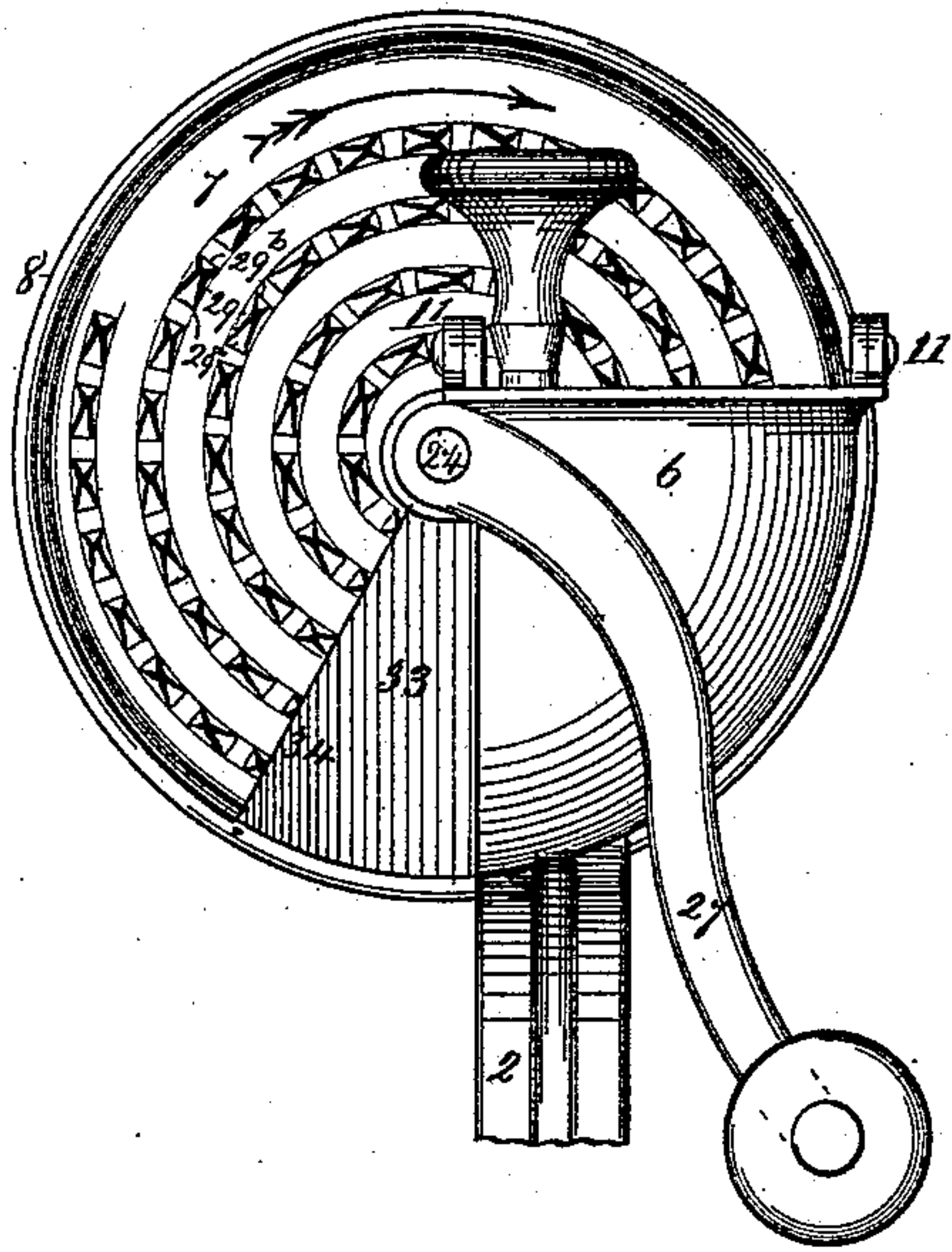
*Fig. XI.*



*Fig. XII.*



*Fig. XIII.*



*Attest;*  
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*Inventor;*  
*Ernest J. Blueher.*  
*By Knight Bros.*  
*Atty.*



# UNITED STATES PATENT OFFICE.

ERNST J. BLUEHER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO  
CHARLES E. NIXDORFF, OF SAME PLACE.

## GRATER.

SPECIFICATION forming part of Letters Patent No. 471,937, dated March 29, 1892.

Application filed March 28, 1891. Serial No. 386,732. (No model.)

*To all whom it may concern:*

Be it known that I, ERNST J. BLUEHER, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Graters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This is an improvement on the grater patented December 8, 1885, to A. Eperts and H. Perk, No. 331,874, the whole title in which patent is now vested in me. The position of the grater has been changed from horizontal to vertical, a follower has been added to press the material against the grater or cutter, the teeth of the grater have a peculiar and novel construction, and there are other novel details.

All novel features will be set forth in the claims.

Figure I is a front elevation of the device. Fig. II is a side elevation. Fig. III is a top view with part broken out. Fig. IV is a vertical section taken at IV IV, Fig. I. Fig. V is a diagram illustrating the manner of cutting the grater-plate in making the punctures. Fig. VI is a section through one of the grater-punctures, taken at VI VI, Fig. V. Fig. VII is a perspective view of the grater-teeth. Fig. VIII is a view of the spider or wheel upon which the grater-plate is supported. Fig. IX is a face view of the slicer-plate. Fig. X is a detail view showing the face of the follower. Fig. XI is a detail section taken at XI XI, Fig. IX. Fig. XII is a side elevation of a modification, and Fig. XIII is a rear elevation of the same.

1 is a table or bench, to which the grater is attached in a usual manner by means of a clamp-arm 2 and thumb-screw 3. The thumb-screw has a pressure-head 4, connected with the screw-shank by a ball-and-socket joint 5. The case or box 6 to contain the material being operated upon has the form of the quadrant of a sphere, the grater or cutter plate or disk 7 being at the vertical side of the box and closing such side. The disk 7 has a marginal bead 8, which overlaps the edge 9 of the box, while the face of the disk rests against

the said edge, thus giving sufficient bearing and holding the disk in place.

10 is a follower, which is connected to the sides of the box by hinges 11 at its upper corners, the hinges being at the center of the arc formed by the rounded part 12 of the box opposite to the disk, so that the rounded edge of the follower will fit the inside of the box in all positions. The follower is pressed down on the material to be operated on by a knob 13, connected with the follower by a shank 14. The face of the follower has ribs 15 to prevent the material slipping along it and thus escaping from the action of the grating teeth or knives. (See Fig. X.)

The grater has a flange 16, that embraces the rim 17 of the spider 18, and is prevented from turning on the spider by a dent 19 made in it, which occupies a recess in the rim of the spider. (See Fig. VIII.)

20 is a circular case receiving the grated or sliced material. The case is connected to the arm 2 by a hinge 21, and is held in working position by hooks 22, hinged to the box and engaging studs 23 on the case 20, or vice versa.

24 is the shaft by which the grater or cutter is turned, the shaft being secured centrally in the spider by screw connection 25. The shaft has journal-bearing in the case at 26 and carries a hand-crank 27, by which it is turned. The cutter or grater disk may be removed from the shaft by simply unscrewing the shaft from the spider.

The construction of the grater-teeth is novel, the punch being formed to make a crucial incision 28, forming four teeth 29<sup>a</sup> 29<sup>b</sup>, which are bent outward from the spider. (See Figs. IV, V, VI, and VII.) The teeth 29 are about straight with the line of movement as the disk revolves, and consequently score the materials with their front edges 29<sup>c</sup>. The point of the tooth 29<sup>a</sup> is in front as the disk revolves, so that the tooth 29<sup>a</sup> cuts at both of their edges 29<sup>d</sup>. The tooth 29<sup>b</sup> is adapted to simply scrape the material like the teeth of an ordinary grater. The teeth of the grater are so arranged that the tooth 29<sup>b</sup> is always in front, the tooth 29<sup>a</sup> following, and consequently if the grater is intended to re-



volve in an opposite direction the teeth are reversed. The same rule of course applies to the slicer-disk 7<sup>a</sup>, having knives 30 sunk in a depression of the disk and soldered or riveted in place. (See Figs. IX and XI.) The cutter-disk is fitted on a spider 18 in a similar way to the grater-disk. The arms of the spider are beveled on the side next the disk, as seen in Fig. VIII, so as not to interfere with the passage of the material from the grater or slicer.

The case 20 has at 31 a vent for the grated or sliced material, the vent being furnished with a spout 32 to carry the material away from the arm 2 and into a vessel.

In the modification shown in Figs. XII and XIII the box 6 is in the form of one-eighth of a sphere. In this modification the shaft has bearing in lugs 26 at the side of the box, and the case 20 may be dispensed with, as no bearing is required upon that side of the disk 7. The machine is thus in more compact form. It will be seen that if the hand-crank is turned forward, as in the other case, the disk 7 would be turned in an opposite direction, and consequently the arrangement of the grater-teeth and knives would have to be reversed, as before explained. 33 is a wing upon the box inclined so as to approach the disk 7 from its point of junction with the box to its outer edge 34, so as to crowd the material against the disk as the latter revolves. The direction of rotation of the disks is indicated by arrows.

The teeth of the grater have substantially the spiral arrangement described in Letters Patent No. 331,874 aforesaid, and no novelty is here claimed for this construction *per se*. It, however, is believed to form a novel and valuable combination with the ribs 15 of the follower, which prevent the material following the course of the spiral space between the teeth, and thus avoiding the teeth.

The shank 14 has a shoulder 14<sup>a</sup>, limiting

the approach of the follower to the disk 7. The shank 14 is connected to the follower by a joint 14<sup>b</sup>.

I claim as my invention—

1. The combination of a box or hopper, the case having its open side facing the box, the spider arranged within said case and carried by the shaft supported in a central bearing of said case, the grater or cutter disk carried by said spider and having a marginal bearing-bead overlapping a curved bearing-edge on said hopper, said bearing-edge resting transversely against the face of the disk, and means for feeding the contents of the hopper or box to said grater or cutter disk, substantially as set forth.

2. The grater-disk having the series of cutting-edged teeth, each series consisting of two teeth at the sides and two teeth at the ends of an opening in the disk, substantially as set forth.

3. The combination of a box or hopper, the case having its open side facing the box, the spider arranged within said case and carried by a handled shaft journaled in the case, the grater or cutter disk carried by said spider, and the follower hung at its upper edge within said box or hopper and having jointed to its lower edge a knobbed shank, substantially as set forth.

4. The combination of the box or hopper, the case having its open side facing the box, the spider arranged within said case and carried by a handled shaft journaled in the case, the grater or cutter disk carried by said spider, and the follower hung at its upper edge within said box or hopper and having jointed to its lower edge a knobbed shank, said follower having upon its acting side a series of holding-ribs, substantially as set forth.

ERNST J. BLUEHER.

In presence of—

SAML. KNIGHT,  
THOMAS KNIGHT.