

(No Model.)

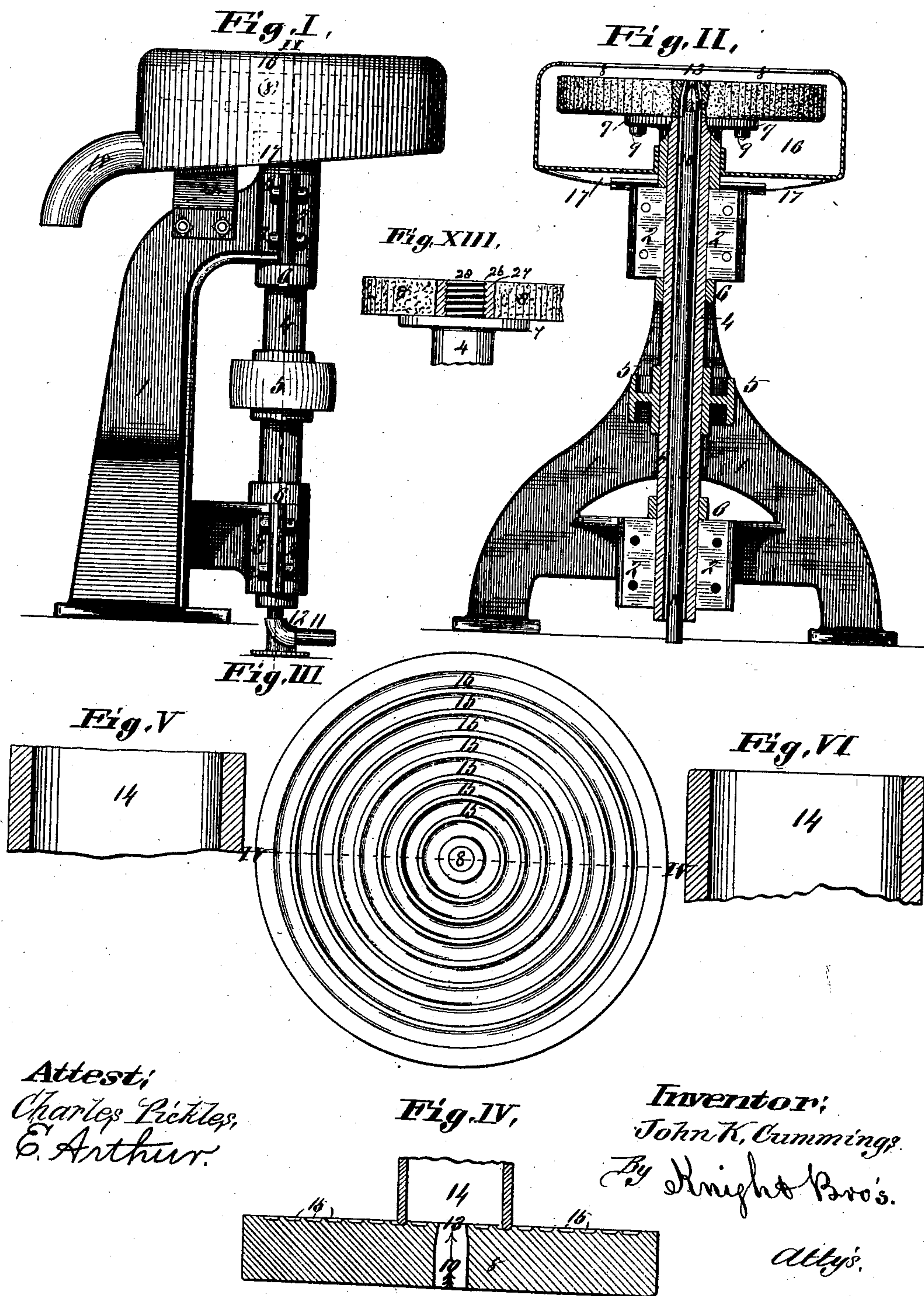
2 Sheets—Sheet 1.

J. K. CUMMINGS.

MACHINE FOR GRINDING THE MOUTHS OF GLASS BOTTLES, JARS, &c.

No. 387,555.

Patented Aug. 7, 1888.



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Fig. VII

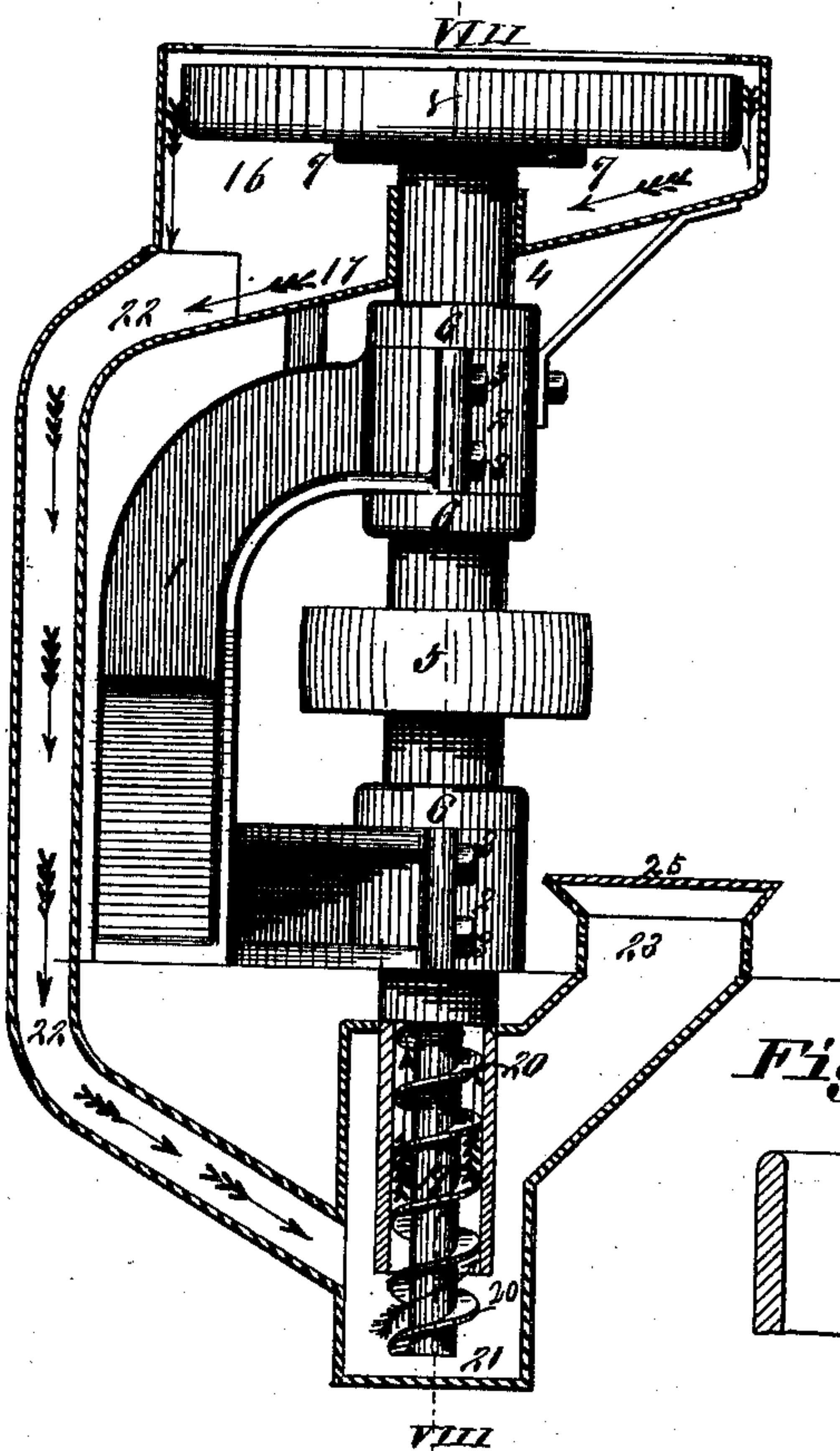


Fig. VIII

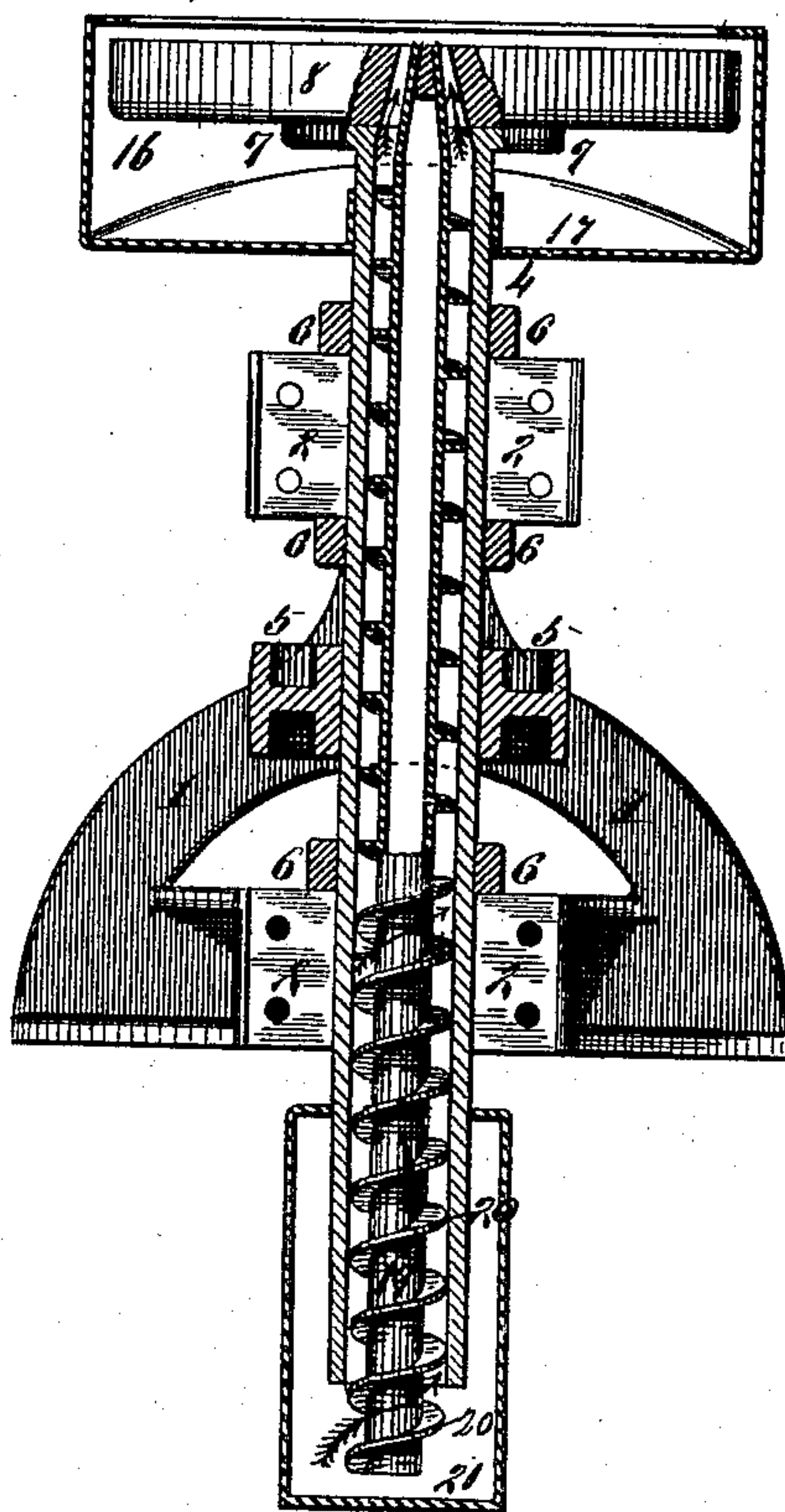


Fig. XI

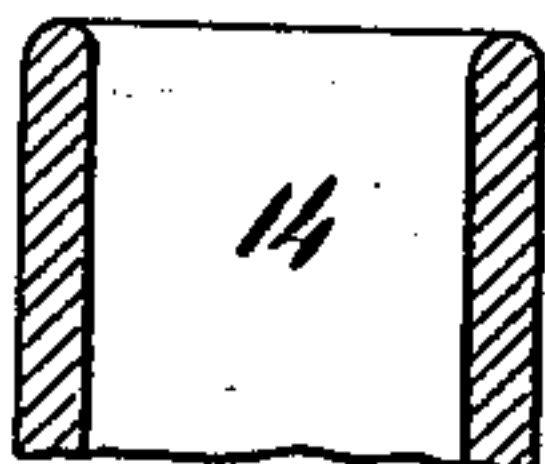


Fig. IX

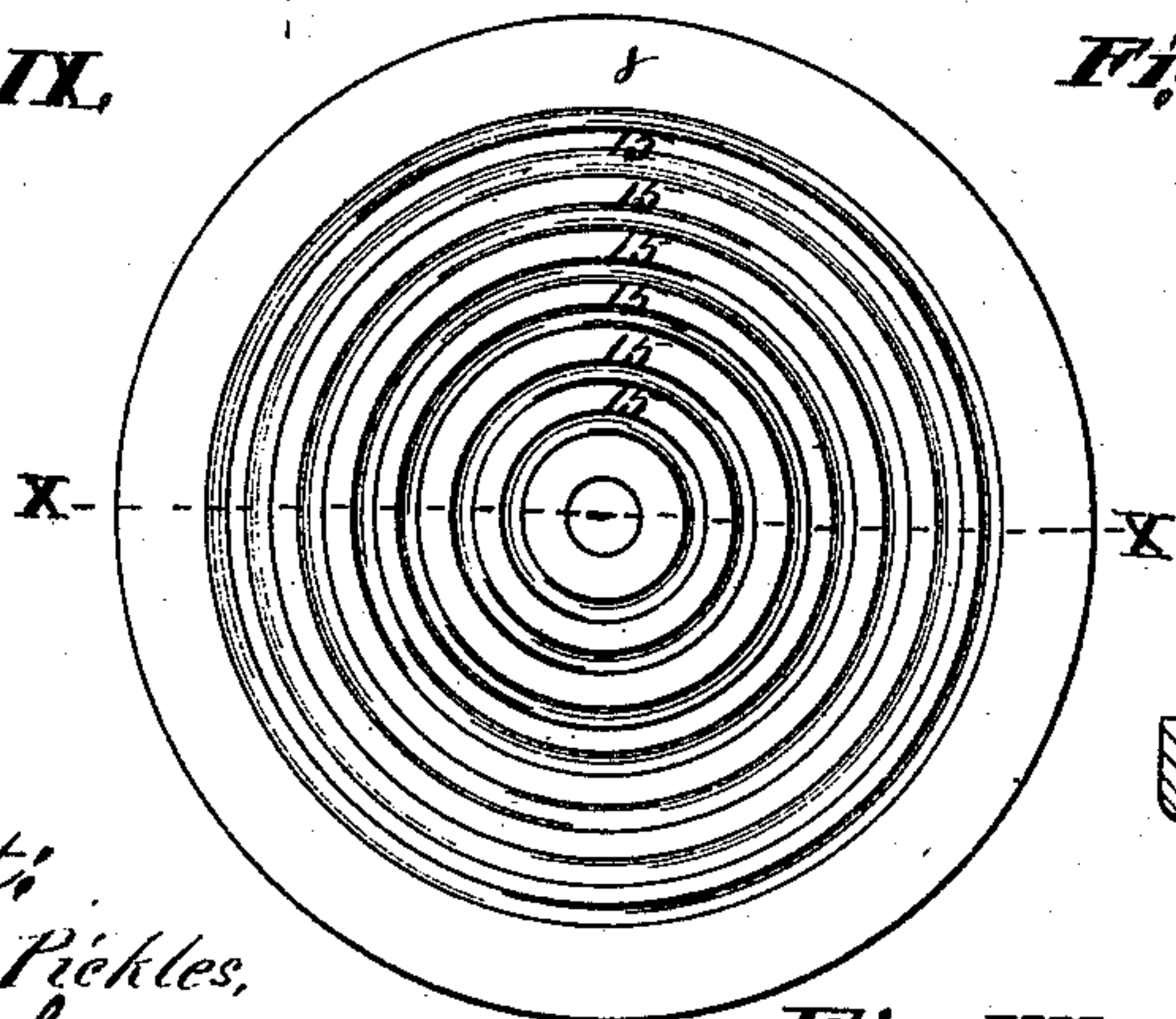
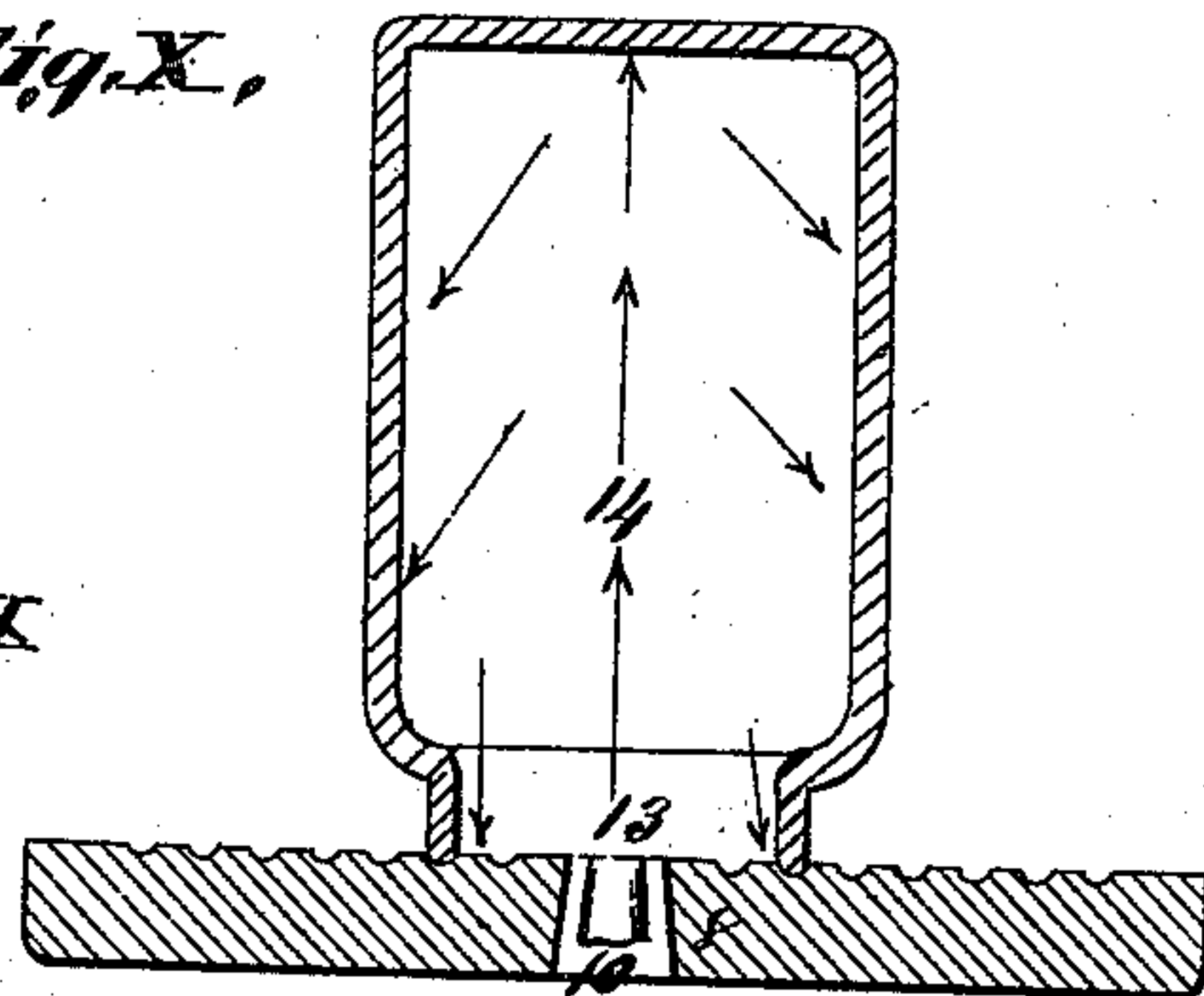


Fig. X



Attest:
Charles Pickles,
E. Arthur.

Inventor:
John K. Cummings
By *Knight Bros.*

Fig. XII



Atty's

UNITED STATES PATENT OFFICE.

JOHN K. CUMMINGS, OF ST. LOUIS, MISSOURI.

MACHINE FOR GRINDING THE MOUTHS OF GLASS BOTTLES, JARS, &c.

SPECIFICATION forming part of Letters Patent No. 387,555, dated August 7, 1888.

Application filed February 20, 1888. Serial No. 264,545. (No model.)

To all whom it may concern:

Be it known that I, JOHN K. CUMMINGS, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Machines for Grinding the Mouths of Glass Bottles, Jars, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure I is an elevation of the machine, showing the hydrant-pipe ascending through the rotary vertical shaft and the emery or other grinding wheel in dotted lines within the bath or drip tank. Fig. II is a vertical section taken on line II II, Fig. I, showing the rotary vertical shaft, the hydrant-pipe within it, and the emery or grinding wheel tightly fixed to said rotary shaft or screwed thereon. Fig. III is an enlarged top view of the rotary emery or grinding wheel, and shows the surface grooves within which the mouths of the glass vessels are ground. Fig. IV is an enlarged vertical section taken on line IV IV, Fig. III, showing the rotary emery-wheel with the mouth of a glass vessel in course of grinding within the face grooves of the wheel. Fig. V is an enlarged vertical section showing the mouth of the glass bottle or jar previous to grinding. Fig. VI is a like view of the mouth of the glass bottle or jar after grinding. Fig. VII is an elevation of a modification, showing a combined sand and water tank with a vertical rotary shaft, within which ascends a screw-elevator shaft that is rigidly secured thereto. It also shows the rotary grinding-wheel, which may be of emery, metal, or any suitable material, and the sluiceway for the return of sand and water to the well of the tank. Fig. VIII is a vertical section taken on line VIII VIII, Fig. VII, showing the rotary vertical shaft and the screw-elevator that ascends from the well of the tank and said shaft surmounted by the rotary grinding-wheel. Fig. IX is an enlarged top view of the rotary grinding-wheel, showing the grooves within which the necks of the glass vessels are ground and formed. Fig. X is an enlarged vertical section of the rotary grinding-wheel, taken on line X X, Fig. IX, and also shows a vertical section of a glass jar

with its mouth within a groove of the grinding-wheel in the operation of grinding and forming, and the course of the injected water, &c., within the vessel. Fig. XI is an enlarged vertical section showing the mouth of a glass vessel after grinding. Fig. XII is an enlarged vertical section showing a modification in which a smooth-faced grinding-wheel is used; and Fig. XIII is a horizontal detail of a modification, showing a direct screw attachment of the grinding-wheel to the screw-head of the rotary tubular shaft.

The invention relates to devices for grinding and forming the mouths of glass bottles, jars, &c.; and the invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, in which similar figures of reference indicate like parts in all the views, 1 represents the vertical stand, that is preferably of cast-iron. To near the top and bottom of said stand are attached journal-boxes 2, the sectional parts of which are secured together by screw-bolts 3. Within said journal-boxes a vertical rotary tubular shaft, 4, has its bearings, and has secured to it a band drive-wheel, 5, which connects by an endless band with a drive-pulley operated by any suitable power. The said rotary shaft is provided with shoulder-collars 6, integral therewith, which work in bearing contact with the journal-boxes 2, and so hold the shaft from longitudinal displacement. The shaft is surmounted by a circumferential flange or bed-table, 7, to which is secured the grinding-wheel 8, which may be of emery, metal, stone, or any other suitable material. The grinding-wheel is secured to its flanged bed 7 by screw-bolts 9.

10 represents a vertical stationary fountain-pipe which ascends disconnectedly within the rotary tubular shaft 4. The said fountain-pipe is connected to the hydrant-pipe 11 by the elbow-joint 12, and discharges the water under hydrant-pressure through the jet 13 into the glass vessel 14 that is being ground.

The water is discharged by hydrant-pressure, so that it shoots up inside the vessel under treatment, strikes against the bottom thereof, flows down its sides, and comes into

intimate contact with the grinding-surface at the mouth of the vessel, and thereby keeps it from heating and aids by its passing current the grinding process on the wheel.

5 15 represents circumferential grooves on the face of the grinding-wheel, whose bevel sides serve as a former to shape the bevel edges on the mouth of the vessel and remove all tendency to produce sharp square cutting-edges, 10 which are a frequent annoyance and injury to parties handling the vessels.

The aforesaid semicircular grooves on the face of the grinding-wheel are preferably made sufficiently wide, as shown in Figs. III and IV, 15 to allow of a slight lateral movement of the mouth of the vessel on the grinding-wheel, sometimes bringing said mouth on one side of said bevel-grooves and sometimes the other. This also allows free movement for the water 20 and any grit that may be used—such as sand—to aid the cutting of the glass.

While the above is my preferred form for the face of the wheel, I do not confine myself thereto, for the grooves may be made narrower, as shown in Figs. IX and X, and the 25 mouth of the vessel is then held stationary therein and the shape of the groove constitutes a complete former for said mouth of the vessel, as shown; but, as stated, in most 30 classes of manufacture I prefer the use of my open grooveway (shown in Figs. III and IV) as allowing just sufficient freedom for the passage of the water and grit in grinding, and also freedom for a slight lateral 35 movement, which slight lateral movement, not predominating over the rotary movement, is not objectionable, as it is in the present usual practice of grinding the mouths of glass 40 vessels on ungrooved wheels, in which the lateral movement predominates over the rotary movement and sweeps across the mouth of the bottle or jar or edge of the tumbler, &c., and leaves as the product of said action the 45 objectionable fractions square edge, that is apt to wound the hands or mouth of the user, and makes an unreliable edge over which to pour or drop the ingredient contained in the vessel; also, the smooth bevel-edged mouth of the vessel provided by this invention, as it avoids the irregular, splintered, and fractious mouth or edge, 50 such as of tumblers, &c., also avoids the danger now experienced of small sharp fragments of glass, already almost detached, passing with the liquid, (let it be poured or dropped 55 for cooking or medicine,) and from that passing into and lacerating the mouth of the individual, or, worse yet, be swallowed by him.

In Fig. V is shown the mouth of a glass vessel previous to grinding in my grooved wheel, 60 and in Figs. IV, VI, X, and XI are shown the finished appearance of the bevel-edged mouth or edge after it has been both ground and formed by the operation of my grooved-faced wheel.

65 The amount of water provided may be adjusted by the usual stop-cock in the hydrant-

pipe. The rotary grinding-wheel works within a bath-tank or drip-chamber, 16, that has an inclined bottom or floor, 17, from the lower 70 inclined side of which the waste-pipe 18 carries off the waste products from the wheel.

In Figs. VII and VIII is shown a modification intended especially for use where hydrant water and pressure are not attainable, 75 or where it is desired to use grit—such as sand or emery—in connection with the water. In such case the vertical hydrant-pipe within the rotary shaft 4 is replaced by a cylinder, 19, around which coils an elevator-screw, 20, 80 which fits tight within said rotary shaft, and consequently is carried round with it. The foot of the cylinder 19 and the screw-elevator 20 that it carries work within the well 21 of the bath-tank or drip-chamber 16, with which 85 they connect by the tube 22, that drains from the lower incline, 17, of said chamber into the said well.

The well is provided with a feed-chute, 23, for the supply of the bath of sand or other 90 frictional grit and water to the well of the tank, the mouth of which chute, with its cover 25, that is intended to be closed when the chute is not used, may be, as shown, elevated above 95 the floor; or, when it is desired to facilitate the approach of the operator around the wheel, the spout need not rise above the floor, and in that case the trap-door or cover would shut 100 down level with the floor, so as to be convenient for the operator to walk over it; or said chute may be dispensed with altogether, and the water and grit in that case would be supplied 105 via the tank or drip-chamber. As the shaft 4 rotates when driven by the band-wheel 5, (the well 21 having received its supply,) the elevator screw within the rotary shaft lifts the sand and water and projects it upward 110 through the rotary grinding-wheel into the vessel being ground, against the bottom of which the jet of water and frictional grit strikes, and, spreading around, descends down its sides and delivers within the groove 15 of 115 the wheel, from which, after performing its functions, it descends through the drip-chamber and drainage-tube and is reconveyed to the well for future service.

In this form of the device, especially, metal and other grinding-wheels that possess but little free grit in themselves may very appropriately be used, as sand and other frictional 120 grit can thus very easily be employed and pass around again and again, utilizing also the grindings from the glass vessels until the grit has itself become too finely pulverized for further use, when the well is emptied and again 125 replenished.

I have shown and described the grinding-wheel as secured to a bed-plate that surmounts the rotary shaft; but I do not confine myself to that means of attachment, for the wheel 130 may be provided with an inner central screw, 26, in its metallic core 27, as shown in Fig. XIII, which screws down on the screw-head

28 of the rotary shaft 4. By this means the wheel is easily attached and detached and made interchangeable with other wheels.

A flanged bed-plate, 24, rises from the shoulder of the stand and supports the lower inclined side of the drip-chamber to which the pendent drainage-pipe is attached. The said drainage-pipe, when not connected to and emptying into the tank-well 21, may be connected with and empty into any convenient drain or sewer.

In Fig. XII is shown a flat grinding-wheel, which may replace the grooved wheel on the rotary shaft when plate glass or other flat objects are to be ground.

I claim as my invention—

1. In a glass-grinding device, the vertical tubular rotary shaft, the band-wheel that drives it, suitable means for supplying water within said shaft, the rotary grinding-wheel carried by said shaft, and the circular ridges on the face of said wheel, arranged to provide grooves between them in which to grind and bevel the mouths of glass vessels, &c., circumferentially, to avoid a lateral grind and production of sharp cutting-edges, substantially as and for the purpose set forth.

2. In a glass-grinding device, the combination of the supporting-stand, the journal-boxes 2, the rotary tubular shaft that has bearings in said boxes, the band-wheel that drives it, the flanged bed-plate that surmounts said shaft, the grinding-wheel secured on said bed-plate and to the screw-head of the tubular shaft, and the circular ridges on the face of said wheel, that provide circumferential grooves between them to guide, grind, and form smooth bevel edges to the mouths of glass vessels, substantially as and for the purpose set forth.

3. In a glass-grinding device, the combination of the stand, the rotary tubular shaft and band-wheel that drives it, the hydrant-pipe that ascends through said shaft, the bed-plate that surmounts it, the grinding-wheel secured on said bed-plate and to the screw-head of the tubular shaft, the circular ridges on the face of said wheel, that provide between them circumferential grooves to guide, grind, and bevel the mouths of glass vessels, &c., and the drip-chamber 16 and drainage-pipe 18, to receive and carry off the waste products from the wheel, substantially as and for the purpose set forth.

4. In a glass grinding device, the combination of the stand, the rotary tubular shaft and the band-wheel that drives it, the water and sand conveyer within said rotary shaft, the grinding-wheel 8 and bed-plate 7, that surmount said shaft, and a drainage-tube, substantially as and for the purpose set forth.

5. In a glass-grinding device, the combination of the stand, the vertical tubular rotary shaft, the band-wheel that drives it, the hydrant-pipe within said shaft, the flat rotary grinding-wheel secured to the screw-head of the rotary shaft, the said hydrant-pipe arranged to throw a jet of water through and onto the grinding-wheel, and the drip-chamber 16 and its drainage-pipe that collect and discharge the overflow from the wheel, substantially as and for the purpose set forth.

JOHN K. CUMMINGS.

In presence of—

BENJN. A. KNIGHT,
SAML. KNIGHT.