

(No Model.)

2 Sheets—Sheet 1.

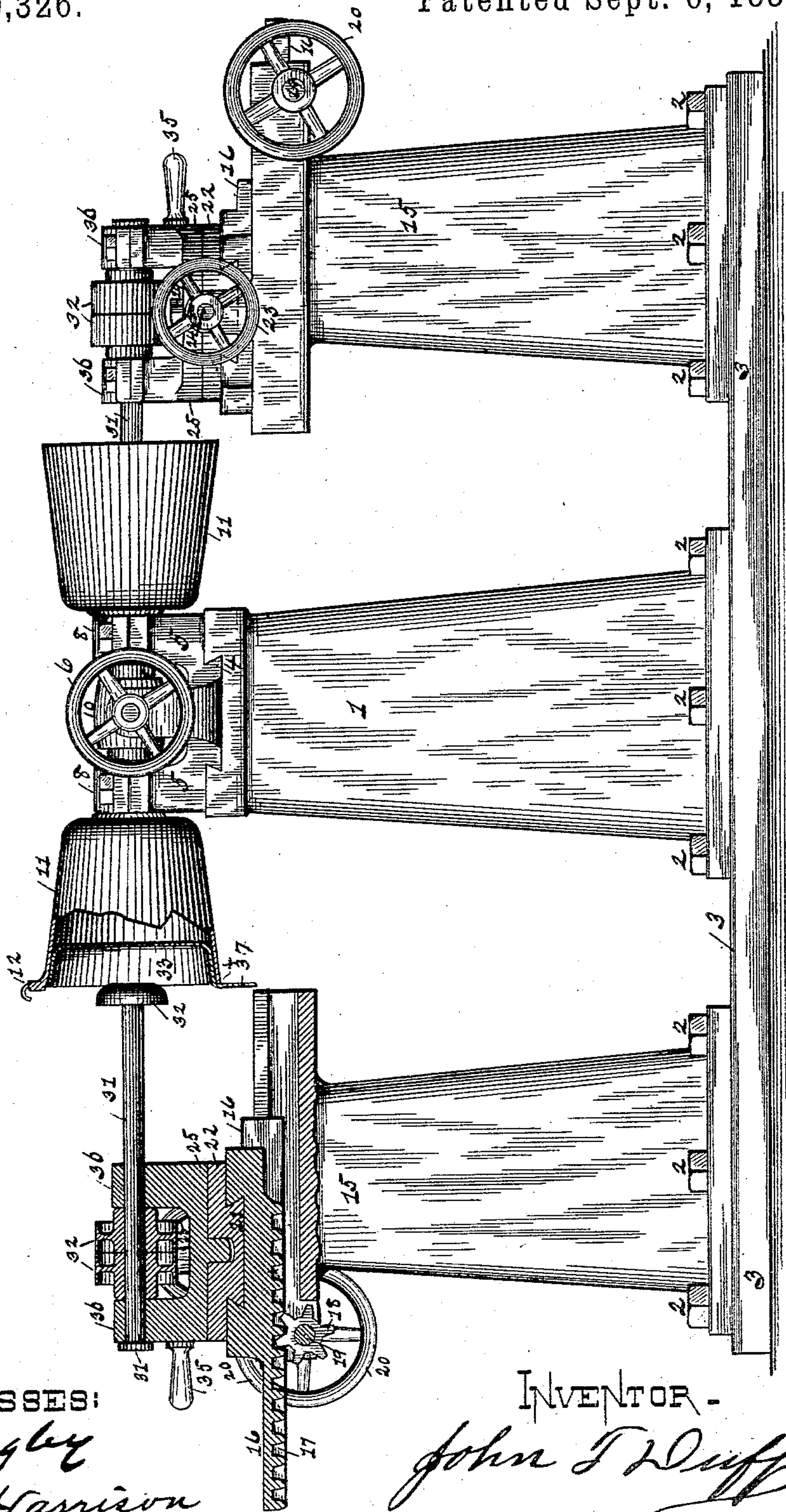
J. T. DUFF.

MACHINE FOR GRINDING AND POLISHING THE INTERIOR OF HOLLOW WARE.

No. 369,326.

Patented Sept. 6, 1887.

Fig. 1.



WITNESSES:

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(No Model.)

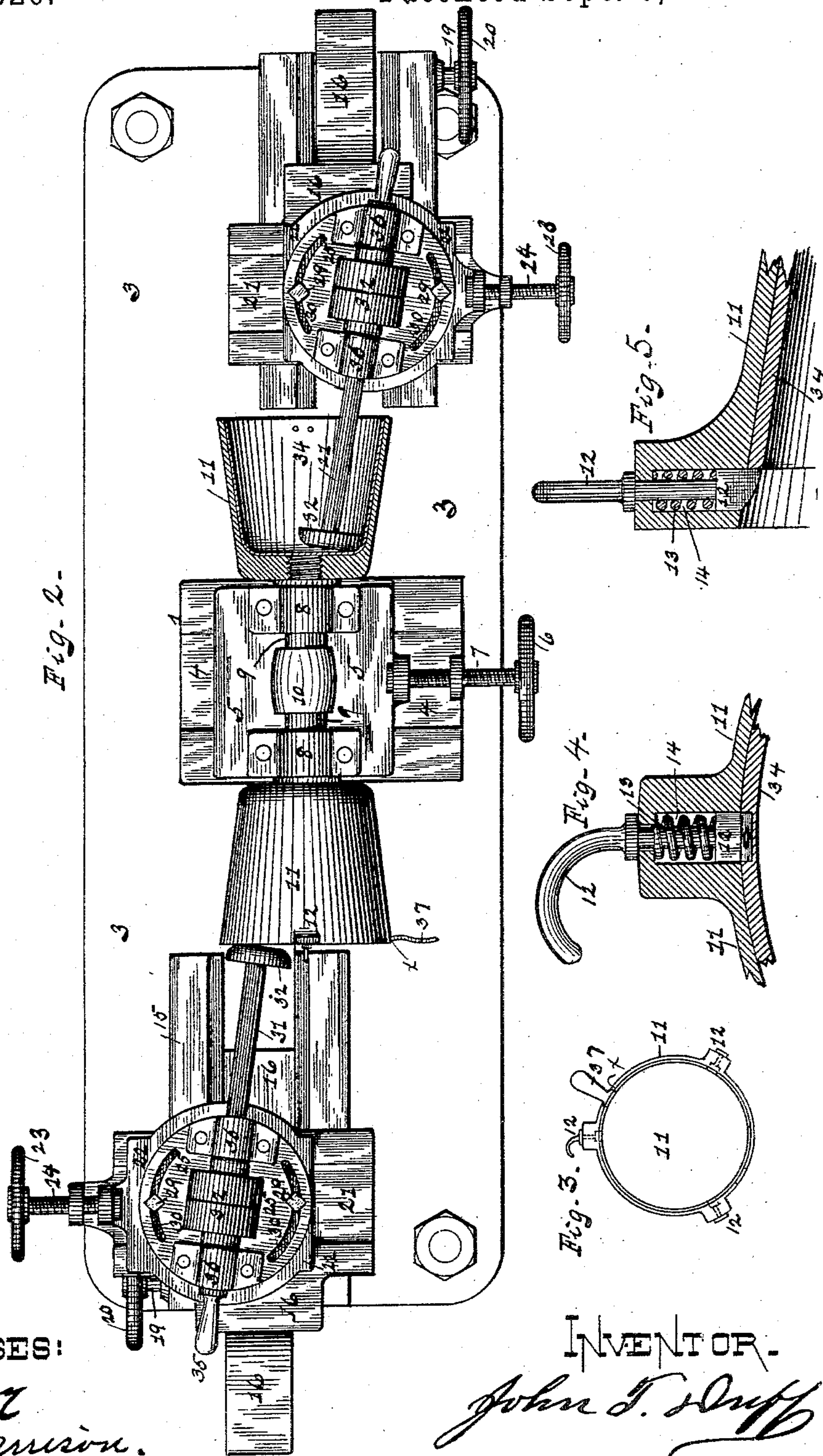
2 Sheets—Sheet 2.

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Patented Sept. 6, 1887.



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MACHINE FOR GRINDING AND POLISHING THE INTERIOR OF HOLLOW WARE.

SPECIFICATION forming part of Letters Patent No. 369,326, dated September 6, 1887.

Application filed November 11, 1886. Serial No. 218,643. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. DUFF, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Grinding and Polishing the Interior Surface of Hollow Ware; 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a machine for grinding and polishing the interior surface of hollow ware, the object being to provide a means whereby all sizes and shapes of hollow ware—such as pots, frying-pans, &c.—may be ground and polished on the inside surface in a simple manner and at small initial cost; and with such end in view my invention consists in a means for holding the article to be ground in position, an adjustable device for grinding or polishing the inner surface of the same, together with certain other details of construction and combination of parts, as will be fully described hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved inside grinding or polishing machine constructed in accordance with my invention, which I have partly shown in section the better to show its inner working parts. Fig. 2 is a plan view of the same, a portion of which is in section, showing the position of the grinding-wheel while operating on the bottom of a deep vessel. Fig. 3 is an end elevation of the holder, designed to show the position of the several catches or bolts constituting the locking device. Fig. 4 is an enlarged front sectional elevation of one of the bolts for securing the piece in the holder. Fig. 5 is a side sectional elevation of the same.

To construct a grinding and polishing machine in accordance with my invention I provide a standard or strong post, 1, and attach the same by bolts 2 to the center of an oblong base-plate, 3. Across the top of this standard 1, I form a dovetail slide, 4, in which a small

carriage or table, 5, is secured, capable of moving across the standard 1 transversely to the length of the machine, and actuated by a hand-wheel, 6, and threaded shaft 7, attached to the carriage 5 and passing through a threaded lug on the standard 1. Across this carriage 5, in the direction of the length of the apparatus, I secure in suitable bearings, 8, a stout shaft, 9, having attached thereto a small driving-pulley, 10. To each end of shaft 9, I secure, by means of a screw-thread, a hollow conical holder, 11, which in practice are made interchangeable to conform to the various sizes of the hollow ware to be ground. About the front perimeters of these holders 11, I arrange two or more spring-bolts, 12, consisting of a bolt, 12, actuated by a spiral spring, 13, placed in a cavity, 14, formed at suitable intervals about the perimeter of the holders 11. A recess is formed in the edge of the holder at x , into which the handle of the article is fitted, thereby serving to hold the article in place. To one side of this central standard, 1, I erect another, 15. A sliding carriage, 16, is moved in suitable guideways on the standard toward and from the holder 11 by means of a tooth-rack, 17, formed on the under side of the carriage, a small pinion, 18, mounted on a shaft, 19, and a hand-wheel, 20. Across the top of this carriage 16, and at right angles to the movement of the same, I form another slide, 21, in which I place a sliding table, 22, the position of which is regulated and controlled by a hand-wheel, 23, attached to a threaded shaft, 24, that is secured to the table 22, and works in a threaded lug on the carriage 16. On the top of this table 22, I pivot an annular plate, 25, and secure the same by set-screws 29, placed through circumferential slots 30, which allows the plate 25 a limited curvilinear movement. Across the top of this annular plate 25, I secure in suitable bearings, 36, a long shaft, 31, having secured to one end thereof a small emery or grinding wheel, 32. Between the bearings 36 of this shaft 31, I secure a tight and loose pulley, 32, which, in connection with an overhead pulley of a width equal to the length of the entire movement of the carriage 16, gives the shaft 31 a rapid rotary movement on its axis. This

grinding-wheel 32, I form with a portion of its perimeter beveled, which part grinds or polishes the bottom of the vessels 33 and 34.

At the other side of the central standard, 1, I construct an apparatus analogous in every part to that described, thus forming a double grinding and polishing machine.

With this machine deep or shallow vessels 33 34 may be ground or polished on their entire inner surface by the same wheel 32. At the right-hand side of the central post, 1, (see Fig. 2,) I have shown the holder 11 and deep vessel 34 in section, in which the grinding-wheel 32 is about to cross the bottom, while at Fig. 1, to the left of the central standard, I have shown a shallow vessel, 33, secured in position.

In operation a rapid rotary motion is given to the holders 11 and the grinding-wheel 32, the one rotating in an opposite direction to the other. The article to be ground or polished is forced into the holders 11, and secured in that position by the spring-bolts 12, together with the handles 37 of the vessels placed in recesses formed in the sides of the holders 11, which prevents the article from revolving inside the same. By means of the threaded shafts 24 and 7 and hand-wheels 23 and 6 the holders 11 and grinders 32 are adjusted to correspond to the size of the vessel to be polished. The grinding-wheel 32, occupying the position shown at the left of the central standard, 1, the operator places one hand on the wheel 20 and the other on the handle 35, projecting from the annular plate 25. By revolving the hand-wheel 20 the carriage 16 moves slowly toward the holder 11, carrying the

grinding-wheel 32 down the inner side of the vessel 33 34, which, being in rapid motion in a reverse direction to that of the grinding-wheel 32, scours or grinds the surface until the bottom of the vessel is reached, at which time the wheel 32 is inclined or at an angle with the bottom. By the use of the hand-wheel 23 and threaded shaft 24 the grinding-wheel 32 is moved toward the center of the vessel 33 34, thus completing the article, which is now taken out of the holder 11, and another put in place and the same operation repeated.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for grinding and polishing the interior of hollow ware, the combination of the supporting-frame, the rotatable holder, its carriage, the track or guideway transverse to the axis of the holder in which the carriage moves, the grinder, and the grinder-carriage adjustable toward and from the holder transversely thereto and at an angle therewith, substantially as set forth.

2. The herein-described holder for hollow ware, having an automatic spring catch or detent at its outer edge adapted to rest against the edge of the vessel when in position.

3. The herein-described holder for hollow ware, having a spring catch or detent at its outer edge and a recess for the handle of the vessel.

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Witnesses:

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