

(No Model.)

2 Sheets—Sheet 1.

W. L. SHEPARD.
POTTERY MACHINE.

No. 417,099.

Patented Dec. 10, 1889.

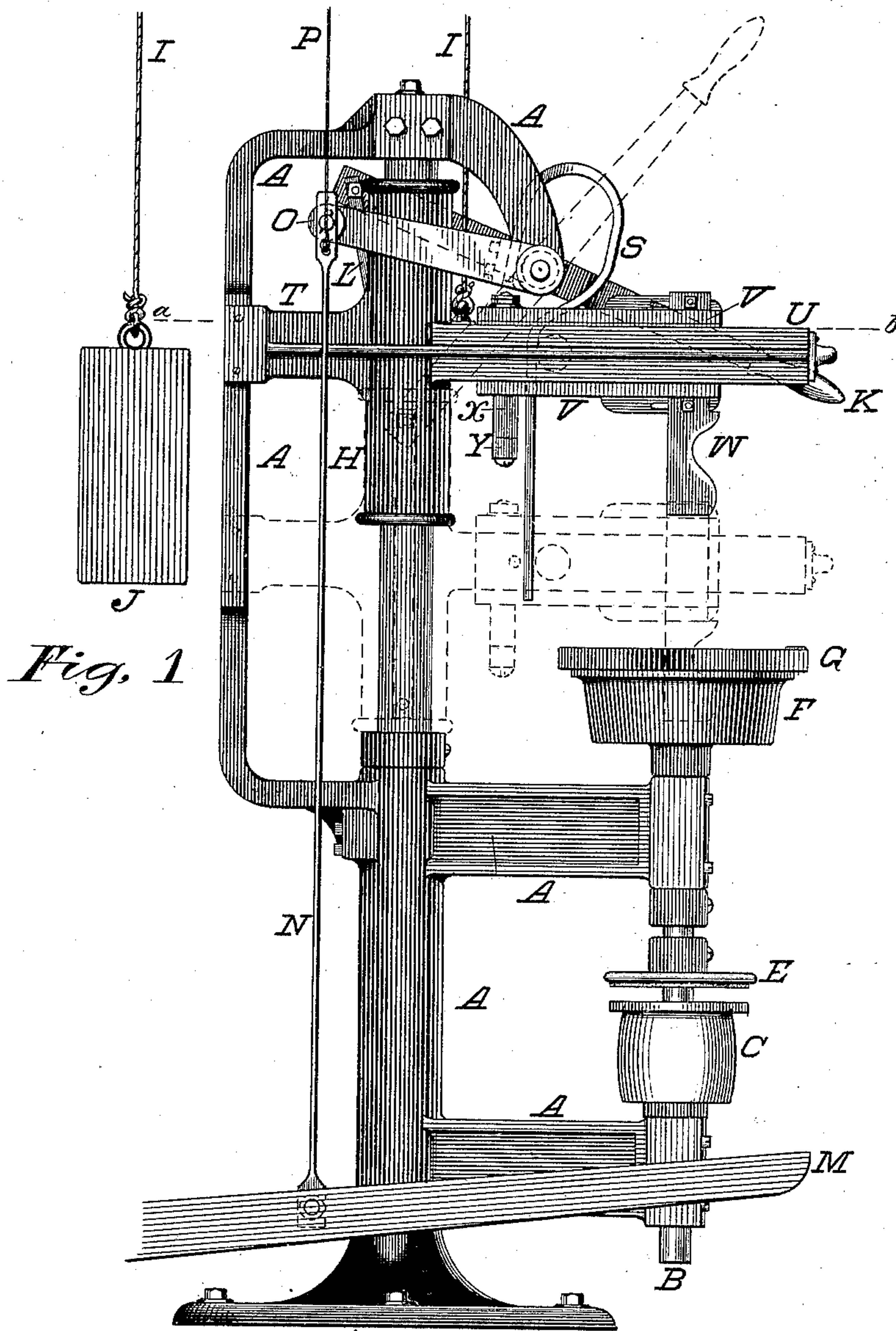


Fig. 1

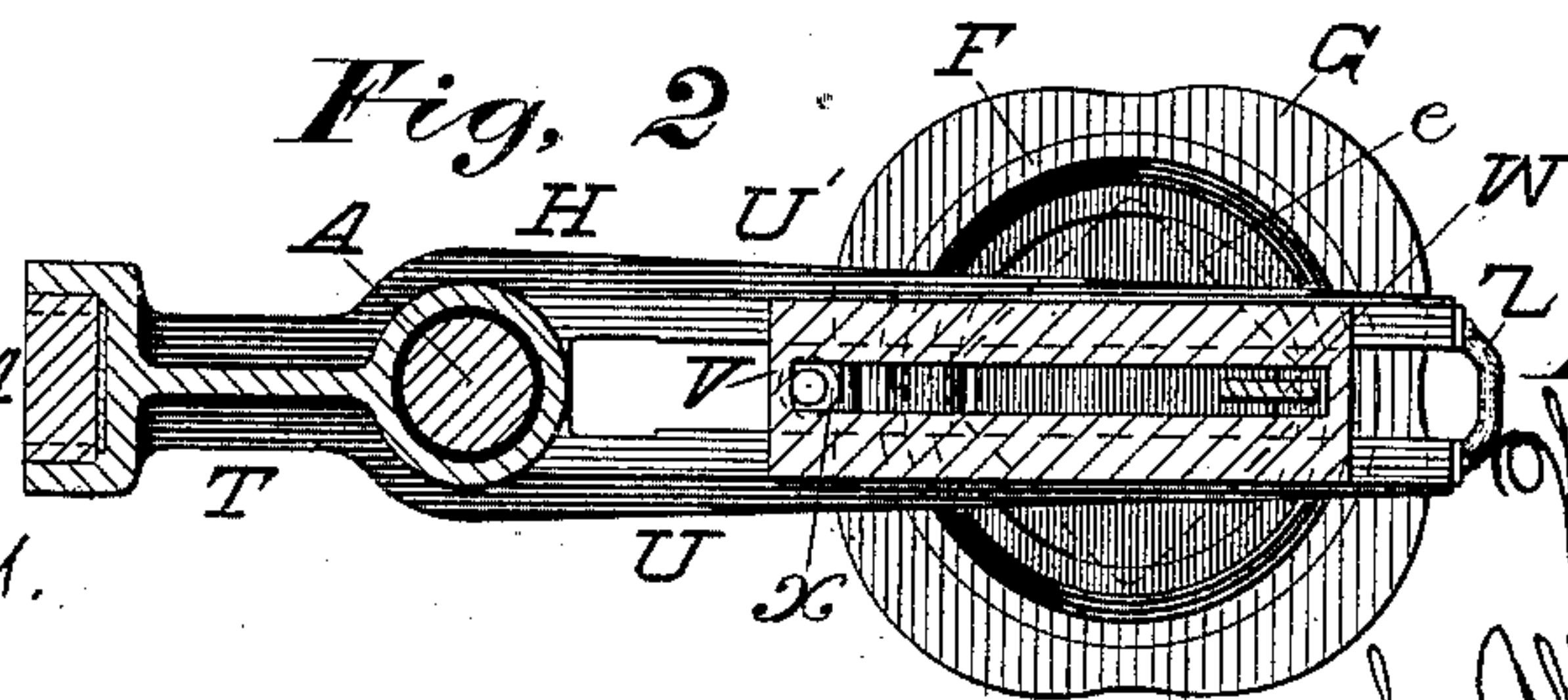


Fig. 2

Witnesses;

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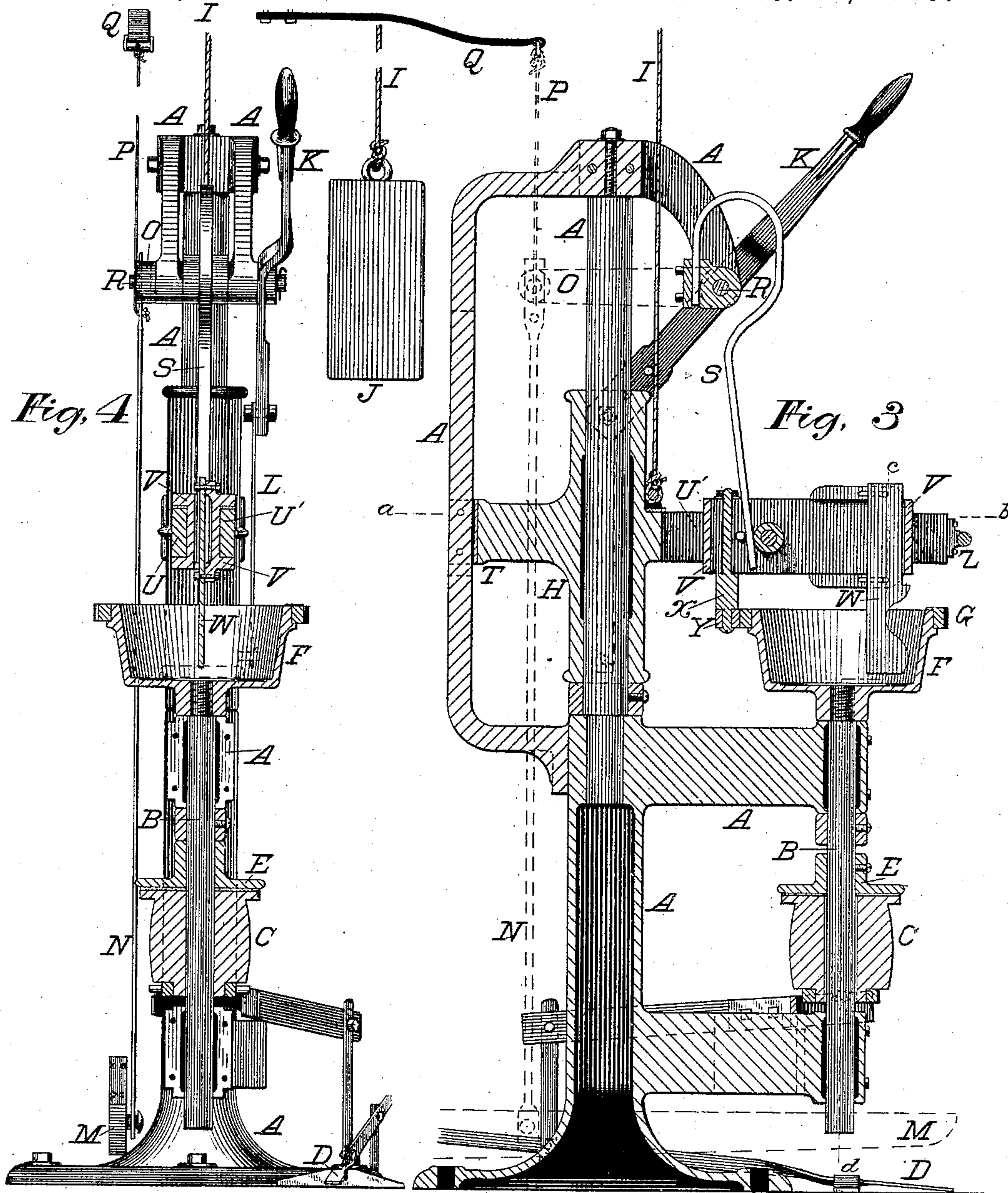
Inventor;

W. L. Shepard,
by Albert H. Walker
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UNITED STATES PATENT OFFICE.

WILBUR L. SHEPARD, OF WEST HARTFORD, ASSIGNOR OF ONE-HALF TO H. BURDETT GOODWIN, WILBUR E. GOODWIN, AND NEWELL E. GOODWIN, OF ELMWOOD, CONNECTICUT.

POTTERY-MACHINE.

SPECIFICATION forming part of Letters Patent No. 417,099, dated December 10, 1889.

Application filed September 10, 1889. Serial No. 323,503. (No model.)

To all whom it may concern:

Be it known that I, WILBUR L. SHEPARD, of West Hartford, Connecticut, have invented a new and useful Pottery-Machine, of which the following description and claims constitute the specification, and which is illustrated by the accompany two sheets of drawings.

This invention is particularly applicable to turning non-circular interiors in articles of pottery; but it may also be applied to turning non-circular forms in or on articles composed of other material.

Figure 1 of the drawings is a side elevation of the machine. Fig. 2 is a horizontal section looking downward from the broken line *a b* of Figs. 1 and 3. Fig. 3 is a central vertical section of the machine on a plane parallel with the view of Fig. 1, but showing sundry of the parts in a different position from what is indicated by the full lines of Fig. 1, though in the same position as is indicated by broken lines in that figure. Fig. 4 is a vertical section looking to the left from the broken line *c d* of Fig. 3. Fig. 5 is a diagram hereinafter explained.

The letter A indicates the stationary parts of the frame of the machine.

The letter B indicates a vertical shaft revolved by the pulley C when that pulley is elevated by the treadle D and the intermediate mechanism shown in the drawings, so as to make a solid frictional contact with the disk E, which is itself fixed to the shaft B, though the pulley C, when out of contact with the disk E, revolves loosely on that shaft. The upper end of the shaft carries the mold F. The guide G rests upon a flange which encircles the mold some distance below its annular edge. The sleeve H reciprocates vertically on the frame of the machine, being pulled upward by the rope I and the weight J and being forced downward by the lever K and the pitman L. The treadle M works the rod N and the arm O in one direction, and that arm is pulled in the other direction by the rope P and the spring Q. The arm O is keyed to the shaft R, and the spring S is also fastened to that shaft, so as to rock with the arm O. The sleeve H is provided with the rearward extension T, the end

of which reciprocates vertically on the rearward part of the frame A. The sleeve H is also provided with the parallel forward extensions U and U', between which the slide V reciprocates when caused to do so by the oscillation of the spring S working in the central vertical longitudinal opening thereof. The upper end of the scraper W is adjustably fixed in the forward end of that longitudinal opening, and the stud X is likewise fixed in the rearward end thereof, and its lower end is provided with the anti-friction roller Y. The forward ends of the extensions U and U' are united by the bracket Z.

The mode of operation is as follows: The mold F is provided with clay on its bottom and the inner sides of its annular wall in sufficient quantity to furnish material for the article of pottery to be made. The lever K is then raised from the position shown in Fig. 1 in full lines to that shown in dotted lines in that figure and in full lines in Figs. 3 and 4, and the sleeve H is thus lowered against the resistance of the weight J', and its forward extensions U and U' and their appurtenances are also lowered from their positions shown in full lines in Fig. 1 to the positions shown in dotted lines in that figure. That operation carries the scraper W down to the center of the mold. Then the treadle M is depressed, and the spring S is thus rocked forward with the shaft R. That motion carries the slide V forward until the roller Y reaches a contact with the outside of the guide G; but that forward motion is resisted by the outer edge of the scraper W sooner reaching contact with the inside of the mass of clay which is upon the inside of the walls of the mold F. Then the treadle D is depressed, so as to bring the loose pulley C into solid frictional contact with the disk E, and to thus cause that disk, the shaft B, the mold F, and the guide G to participate in the revolution of the pulley. As that revolution continues, the forward edge of the scraper W turns the inside of the upright annular wall of the clay in the mold into a contour corresponding with the compound curvature of the front edge of the scraper in a vertical direction and having a circular form of con-

tinually-varying diameter horizontally; but as soon as that turning has continued so far as to enable the spring S to carry the roller Y into contact with the outside of the guide G that guide causes the stud X, the slide V, and the scraper W to reciprocate against and under the action of the spring S four times during each revolution of the mold F and the guide G. That reciprocation of the scraper W depends upon the contour of the outside of the guide G in point of frequency and also in point of the varying speed of the various parts of each of the backward and forward motions which constitute that reciprocation. Where the outside of the guide G has the contour shown in Fig. 2, the reciprocation of the scraper W, combined with the revolution of the mold F, results in turning the inside of the upright part of the clay in that mold with a vertical contour corresponding to the compound curve of the forward edge of the scraper W and into a horizontal contour, which, instead of being circular, as it was before the roller Y reached contact with the outside of the guide G, is square with slightly-rounded corners, as indicated by the area which in Fig. 2 is bounded by the broken line *e*. After the interior of the wall of the article of pottery has been turned into the form desired the treadle M is released, and the spring Q is thus allowed to raise the arm O, and thus to cause the spring S to oscillate backward and carry the scraper W to the center of the mold. The lever K is then brought down to the lower position shown in Fig. 1, and the sleeve H, with its appurtenances, including the scraper W, is raised to the position shown in full lines in Fig. 1, so that the finished article of pottery may be withdrawn from the mold.

Other forms than that resulting from the use of the guide G may be turned on the insides of articles of pottery by substituting for that guide other guides having different exterior contours.

The rule for making drawings for the manufacture of a guide to produce any desired contour on the inside of articles of pottery will be understood from the following description of the method of making the drawing for the guide G when that description is studied in connection with the diagram of Fig. 5, which illustrates that method.

In the diagram of Fig. 5, the numeral 1 indicates a center which is coincident with the axis of revolution of the mold F, and the numeral 2 denotes an endless line which represents the horizontal contour of the inside of the annular wall of the article of pottery, the inside of which is turned to that contour by the scraper W when that scraper is governed in its motions by the guide G, and the numeral 3 denotes a circle which represents the inner side of the annular wall of the mold, and the numeral 4 denotes a circle which represents the outer side of that annular wall and the inner side of the guide G, and the numeral 5 denotes an endless line which rep-

resents the contour of the outer side of the guide G. The radial lines in the diagram of Fig. 5 do not represent any tangible things, but are placed on the diagram ten degrees apart after the diagram is otherwise completed, except as to the line 5, in order to facilitate the work of the draftsman in laying out the line 5 from the line 2.

The line 5 is laid out from the line 2 in the following manner: A pair of dividers is set with its points such a distance apart as to exactly reach from the point *x* in line 2 to a point exactly on the opposite side of the central point 1 and a short distance beyond the circle 4. The point thus reached is marked by the divider and becomes the point *x* in the line 5. Then one point of the dividers is placed upon the point *y* of the line 2, and the other point of the dividers is placed exactly on the opposite side of the central point 1, and the point thus reached becomes the point *y* in the line 5. Then one point of the dividers is placed upon the point *z* of line 2, and the other point of the dividers is placed exactly on the opposite side of the central point 1, and the point thus reached becomes the point *z* in the line 5. In the same manner all the thirty-six points in the line 5, which are indicated by the junctions of the radial lines with that line, are established by measuring with the dividers from all the thirty-six points in the line 2, which are respectively on the opposite side of the central point 1 relatively to the said thirty-six points in the line 5. Then the line 5 is completed by uniting all the thirty-six points which have thus been established, so as to constitute the symmetrically-curved endless line which is designated by that numeral in Fig. 5. Thus it appears that the rule for laying out the contour of the outside of a guide for producing any contour on the inside of an article of pottery may be stated in the following terms: Establish all parts of the endless line which is to be made to represent the contour of the outside of the guide equally distant from the opposite parts of the endless line which represents the contour desired for the inside of the article of pottery and have that central point of the diagram which represents the center of revolution of the article of pottery exactly on a line between each pair of opposite parts of the two endless lines.

I claim as my invention—

1. In a machine for turning non-circular forms, the combination of a guide having a non-circular contour and revolving concentrically with the revolution of the article being turned, a cutter or scraper adapted to work on one side of that center of revolution, and a reciprocating slide working across that center of revolution and adapted to govern the cutter or scraper in accordance with reciprocating motion received by it from the guide on the opposite side of that center of revolution.

2. The combination of the treadle M, the

rod N, the arm O, the spring Q, the shaft R, and the spring S, all substantially as described.

3. The combination of the sleeve H, the lever K, the slide V, and the scraper W, all substantially as described.

4. The combination of the sleeve H, provided with the extensions U and U', and the slide V, reciprocating between those extensions, all substantially as described.

5. In a machine for turning non-circular forms, the combination of a guide having a non-circular contour, a revolving holder for the article to be turned, a cutter or scraper

adapted to work on one side of the center of revolution of the article being turned, and a reciprocating slide working across that center of revolution and adapted to govern the cutter or scraper in accordance with reciprocating motion received by it from the guide on the opposite side of that center of revolution, all substantially as described.

Hartford, Connecticut, September 7, 1889.

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Witnesses:

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