

No. 670,523.

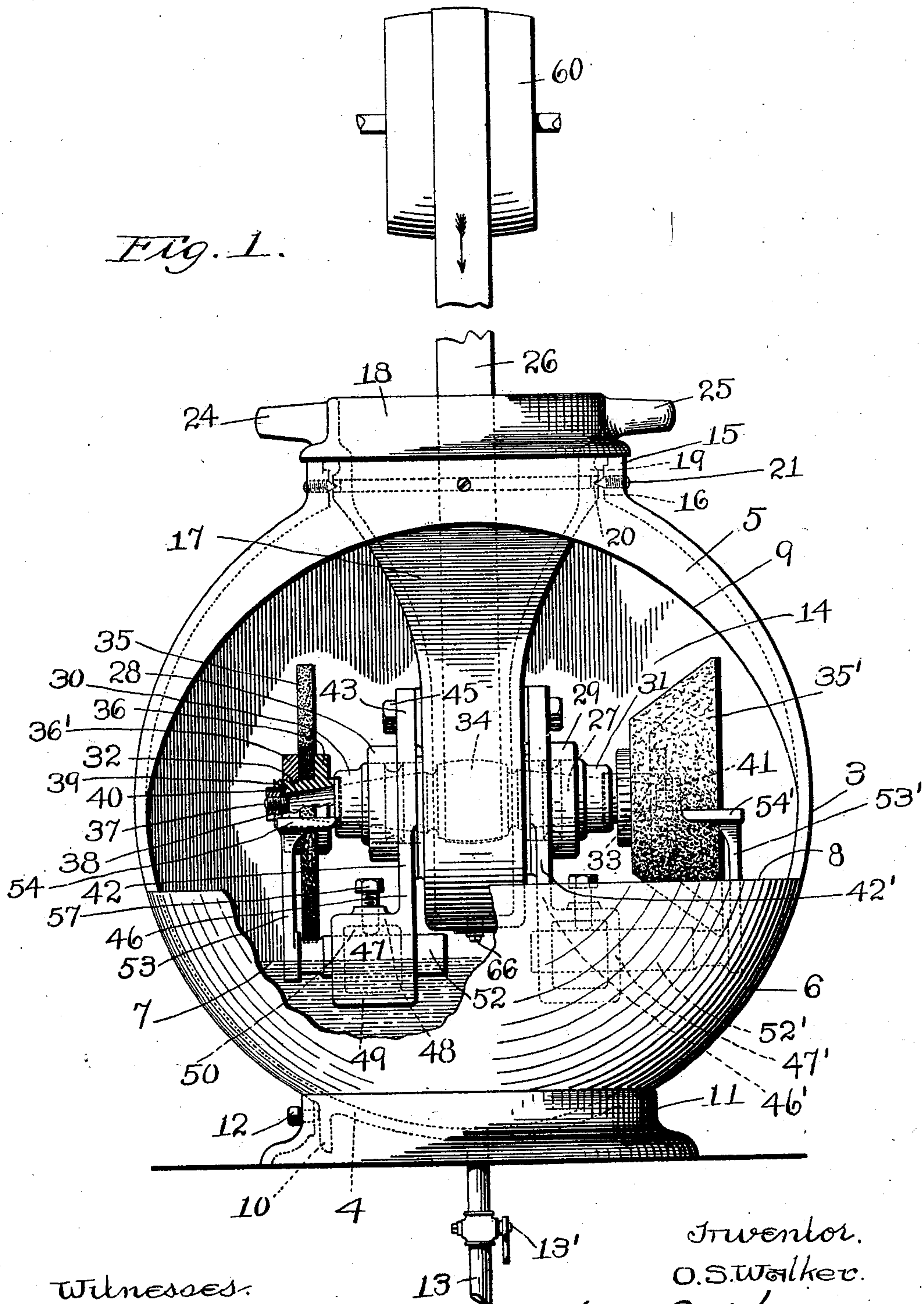
Patented Mar. 26, 1901.

O. S. WALKER.
GRINDING MACHINE.

(Application filed Aug. 30, 1900.)

2 Sheets—Sheet 1.

(No Model.)



Witnesses:

John S. Jones

13

Inventor.
O. S. Walker.

By *Adams C. Higgins*
attorney

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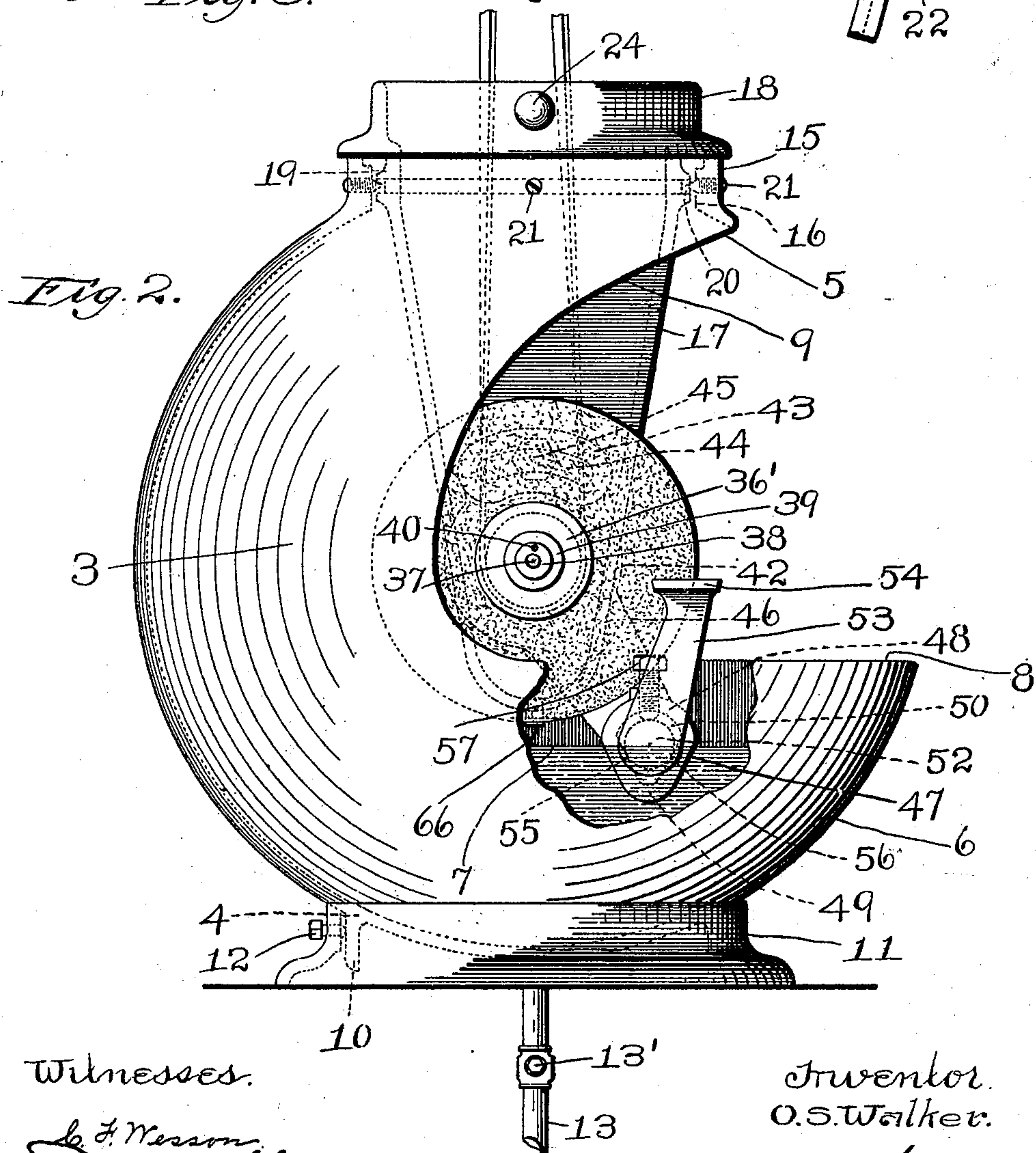
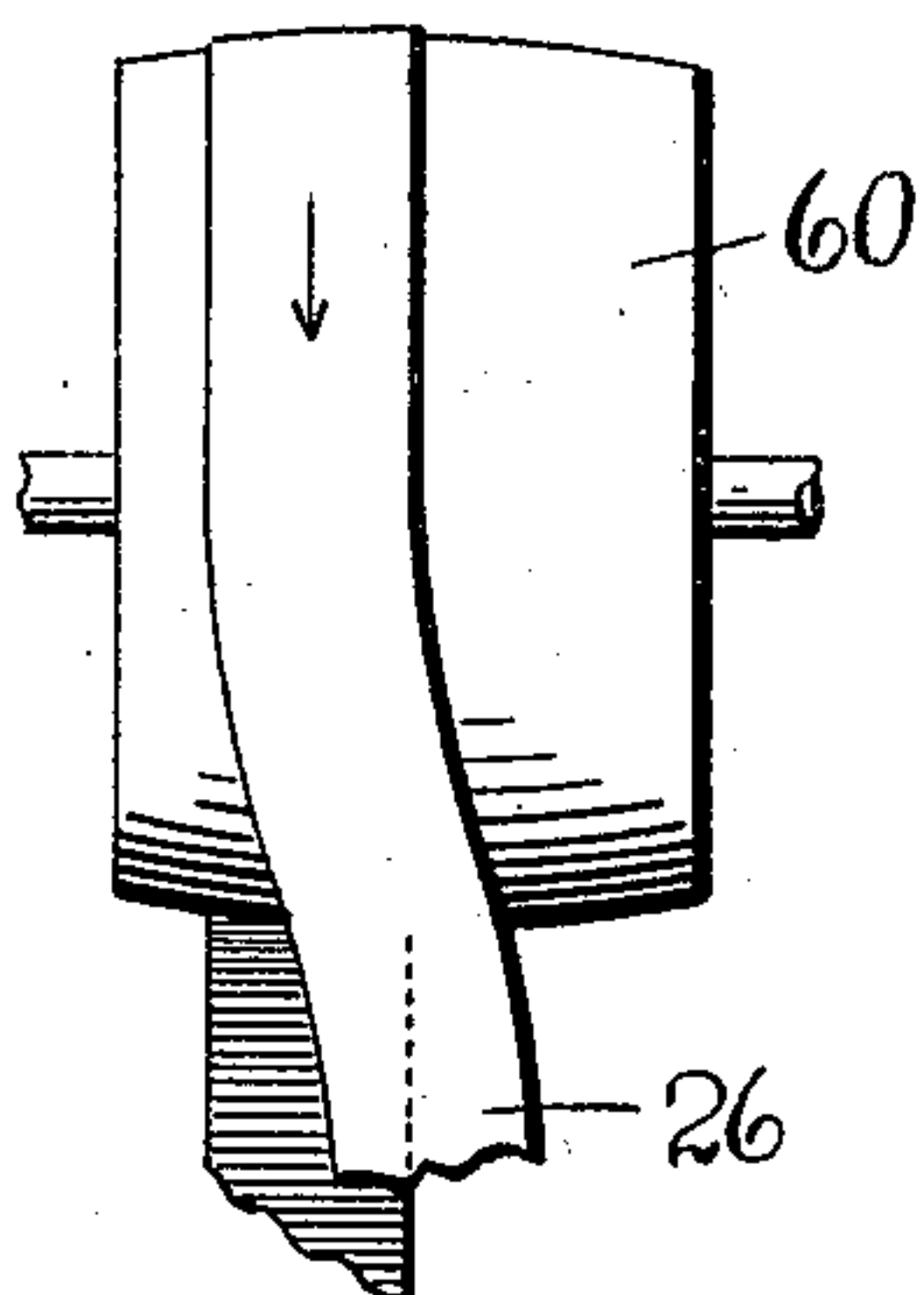
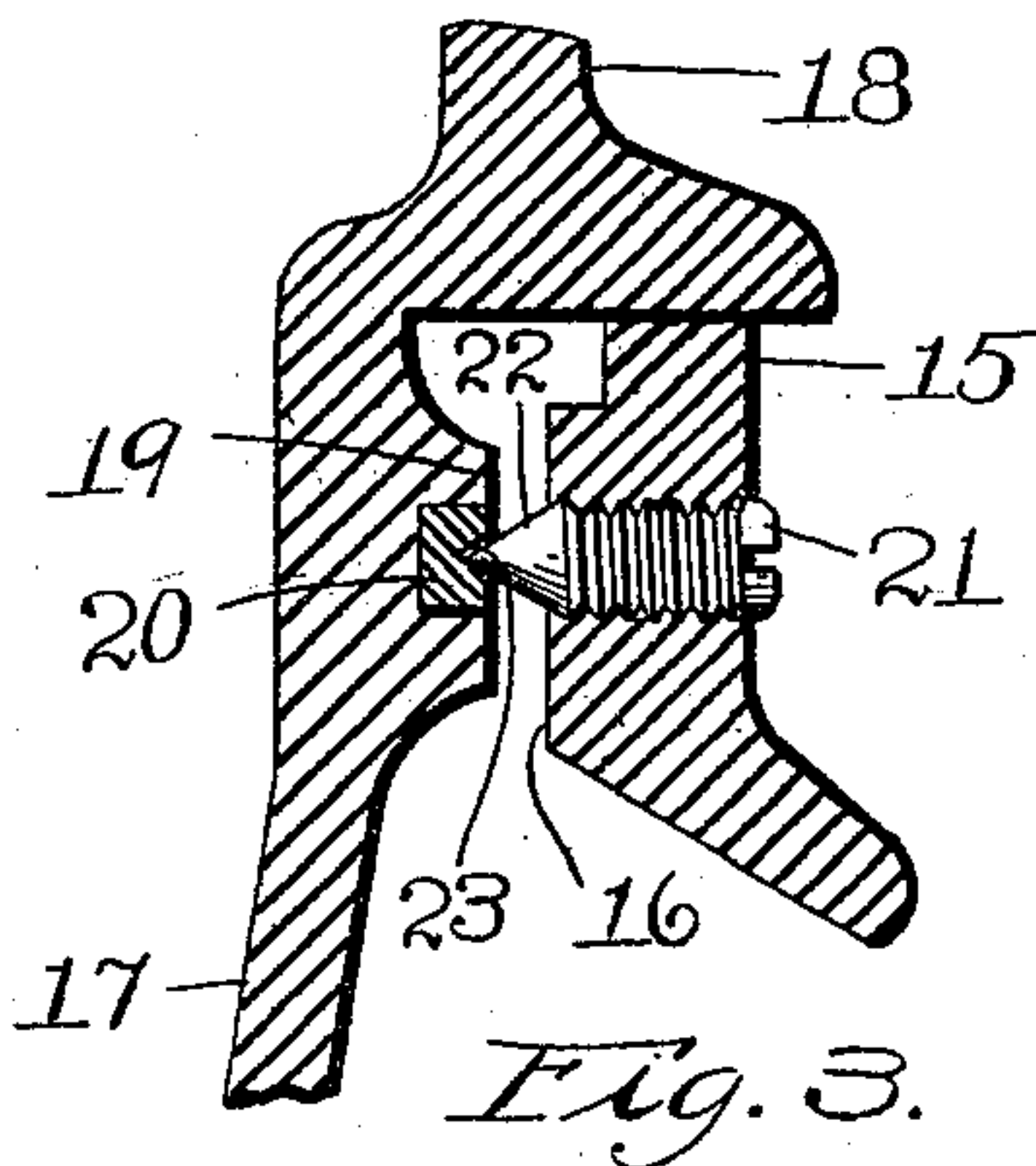
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2 Sheets—Sheet 2.



Witnesses.

L. F. Wesson
John S. Gove

Inventor.
O. S. Walker.

By Adair C. Higgins
Attorney.

UNITED STATES PATENT OFFICE.

OAKLEY S. WALKER, OF WORCESTER, MASSACHUSETTS.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 670,523, dated March 26, 1901.

Application filed August 30, 1900. Serial No. 28,513. (No model.)

To all whom it may concern:

Be it known that I, OAKLEY S. WALKER, a citizen of the United States of America, and a resident of the city of Worcester, county of Worcester, State of Massachusetts, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

My invention relates to grinding-machines, and particularly to a tool-grinding machine to take the place of the ordinary grinder for general machine-shop use.

It has for its main object to provide an improved grinding-machine of the class described and also the embodying of certain desirable features of construction in grinding machinery, which will be hereinafter described.

In order to secure certain desirable adjustments, proper relation of parts, and economy of construction, I mount the grinding-wheel in suitable bearings in a hanger which is suspended from and revoluble on a support resting on a base. This support also comprises a hood and water-pan, the hood or guard extending upward from the pan and preferably formed integral therewith. Said pan and hood are designed substantially in the form of a hollow sphere, having a sufficient portion cut out above the lower part, which is designed to hold the water, to provide access to the grinding-wheels. The hanger is suspended from the hood, which is provided with a suitable opening therefor, over the water-pan. The said hanger is made hollow and carries the journal-bearings of the grinding-wheel shaft or spindle, said spindle being provided within the hanger with a driving-pulley. The belt, which runs from the counter-shaft to the driving-pulley, runs within the hollow hanger and is thus protected from water.

The hanger is supported upon a flange surrounding the top opening in the hood by means of a collar, preferably integral with the hanger, resting on said flange. By this means the hanger may be revolved upon the hood, swinging the grinding wheel or wheels into any position in relation to the side opening in the hood that may be desired. The base of the hood and water-pan sets on a fixed base

and may be revolved thereon, turning on its vertical axis, thus providing for an adjustment toward the light or into any convenient position which the operator may desire.

The tool-rest and its support are mounted from the hanger and adapted for any desired adjustment. To permit of adjustment horizontally to and from the side of the wheel as well as its adjustment to and from the edge of the wheel, a round stem extends at right angles from a downward extension of the rest and fits loosely into a bearing in the rest-support. This bearing holds the said stem at three points, two of which are the sides of the bearing itself, formed at an angle to each other, the third being a set-screw in said support and bearing against the stem to hold it at the other two points.

The tool-rest support is mounted upon the hanger to revolve about and to be held in any desired adjustment around the bearing of the grinding-wheel spindle. This is held by suitable set-screws and provides for vertical adjustment of the tool-rest.

In order that my invention may be more fully understood, I have reference to the drawings filed herewith, in which—

Figure 1 represents a front elevation of my invention with the side opening therein turned full toward the point of view and the hanger and bearings adjusted in relation to the hood to show a full side elevation thereof. A portion of the pan is broken away to show more clearly the construction of the tool-rest and support. Fig. 2 is an elevation taken at right angles to Fig. 1, with a portion of the water-pan broken away to show the tool-rest and support. Figs. 3 and 4 are detail views showing the means for centering and holding the hanger in its bearing in the hood.

The standard 3, comprising the base portion 4, hood 5, and water-pan 6, is formed in substantially the shape of a hollow sphere. The thickness of the spherical shell is indicated by dotted lines. The lower part thereof forms the water-pan, and above the level 7 of the water a side opening 14 is cut in the sphere, the lower edge 8 of which is formed on a horizontal circle above the level of the water, the back and upper edge 9 being formed on a suitable curve allowing sufficient

opening to provide proper access to the wheel or wheels.

The entire hood and pan are mounted to be revolved on the vertical axis thereof on the base 11, fixed into which base 4 sets and which in this case is a simple ring-base adapted to be fastened to a bench or standard. A ring or flange 10, integral with the hood, fits loosely within said base-ring 11 and is centered therein by means of set-screws 12. A discharge-pipe 13, provided with the stop-cock 13', provides for the discharge of the water in the pan.

Above the opening 14 the supporting-flange 15 is formed about the horizontal circular opening 16 in the hood 5. The hollow hanger 17 extends through this opening and is supported on the flange 15 by means of the integral flange-collar 18. The thickness of the shell of the hanger is indicated by dotted lines. Below the flange-collar 18 a cylindrical portion 19 of the hanger is grooved around to receive the curved holding-blocks 20, which are adjusted by the adjusting and centering screws 21, threaded in the flange 15. These screws may be three or more in number, located around said flange, and are formed with conical ends 22, fitting into similar holes 23 in said blocks 20. The conical holes are drilled slightly above the point at which the conical ends would fit them when the flange-collar 18 rests upon the flange 15, so that while the conical ends enter said conical holes they engage the lower sides thereof and tend to draw the flange-collar 18 down onto the flange 15. The flange-collar is provided with the handles 24 25 to turn the hanger with relation to the hood.

Below the cylindrical portion 19 the hollow hanger is preferably made rectangular in cross-section and of such a size inside as to permit of the belt 26 running therein without interference with the sides thereof when the hanger is revolved to any desired position in the hood. The hanger is also provided at its lowest point with a plug 66, through which any accumulation of oil or dirt may be removed.

The spindle 27 is mounted in suitable journal-bearings in the lower end of the hanger. The hanger is formed with the bosses 28 29, in which are held suitable boxes 30 31, respectively. The spindle is tapered at each end 32 33, as shown by dotted lines, and said boxes fit the tapered portions and are provided with suitable lubricating means. (Not shown.) The driving-pulley 34 is mounted on and fastened to said spindle within the hanger. Suitable grinding-wheels 35 35' are mounted on the ends of the spindles. These may be of different grades and shapes adapted to tool or other grinding, according to the character of the work to be done. These wheels are mounted on the ends of said spindle, as shown in case of wheel 35. Said wheel is mounted on the collet 36 and held thereon by means of the threaded ring 36'. This col-

let is fitted onto the end of the taper spindle and held thereon by means of the threaded stem 37 of the spindle and the nut 38. The nut 38 is set into the collet against the shoulder 39 and held from revolving with relation thereto by the pin 40, fixed in the nut and slidably fitted in a hole in the collet. This nut is removable and adapted to fit other collets, on which are mounted wheels of different shape and grade. The nut on the other end, as 41, is also adapted to fit the collets, so that the wheel may be quickly placed on or removed from either end of the spindle.

The tool-rest support 42 is made with the collar portion 43 fitting around the boss 28. A set-screw slot 44 is provided in said collar, and the set-screw 45, threaded in the hanger, holds said collar, by which the tool-rest is supported and adjusted vertically in the desired position. Extending downward from said collar 43 is the arm 46. The lower end of said arm and the bearing 47, connected therewith by the ribs 48 49, comprise, with the set-screw 57, threaded in the rib 48, the holding means for, the tool-rest stem 52. Said bearing 47 and the lower end of the arm to which it is connected are each provided with the openings, as 50. These openings are made large enough to loosely receive the stem 52 of the tool-rest arm 53, carrying the rest proper, 54. The sides, as 55 56, of these openings, against which said stem is adapted to be clamped, are formed at a suitable angle to each other, so that the stem has a bearing upon two points only in circumference thereof. The set-screw 57, threaded in the rib 48, is adapted to be set down on the stem, forcing the latter against the said two bearing-points. Thus it will appear that the stem may be firmly held between three points in its circumference and between three points in its length. By this construction it is not necessary to finish the casting of the stem, and the action of the water can in no way injure the holding means. The set-screw being located above the water-level is not affected by the water and may be easily reached for adjustment. The tool-rest support 42' is similar to the support 42 and is mounted around the boss 29. The tool-rest 54', having the arm 53' and stem 52', is held in the arm 46' and bearing 47' of the support 42'. The tool-rests and the means for mounting the same at each end of the spindle are in all respects similar to each other.

The vertical axis of the spherical hood and support is in the center of the hanger and runs through the axis of the spindle at right angles thereto. The hanger may be revolved about this vertical axis on the supporting-hood to locate the grinding-wheel in a convenient position for the work in hand. In order that the belt will run properly in any desired position to which the hanger may be adjusted, the machine should be located so that the belt shall feed onto the spindle-pulley 34 from the counter-shaft pulley 60 practically at right angles to the axis of the spin-

dle-pulley and also that the belt 26 shall feed onto the counter-shaft pulley from the spindle-pulley at practically right angles to the axis of the counter-shaft pulley. The machine is therefore located with its vertical axis plumb and so that said axis when extended intersects the middle of the face of the counter-shaft pulley tangent thereto on the side from which the belt runs to the spindle-pulley. The size of the spindle-pulley makes it impossible for the belt to feed onto both counter-shaft and spindle pulleys at exactly right angles in all positions of the hanger. To overcome this error, the counter-shaft pulley is made of a width sufficient to allow some travel from side to side. It may also be made somewhat more crowning than is usual, so that the tendency of the belt will be to run near the middle. If desirable to reduce the size of the hanger, an idler-pulley can be journaled therein, which holds the belt nearer to the axis of the hanger when the latter is swung around.

By means of the construction described the pan and hood may be turned independently of the hanger on its base—as, for example, from position of Fig. 1 to that of Fig. 2—to allow the light to fall on the work or for any other reason. The hanger may also be turned independently of the hood to put the grinding-wheel into any convenient position. The tool-rest may be adjusted vertically and horizontally by means of the adjustments described. The wheel runs over a pan of water, into which the article ground may be dipped to cool the same, and the hood prevents the water from being thrown around and reduces the danger from the breaking of the emery-wheel. These and other features, which will be evident to those skilled in the art, I accomplish by my invention. I do not, however, limit myself to the exact construction shown nor to any particular shape or form of parts or relation thereof, as I am aware that many changes may be made without departing from the spirit of my invention, which I desire to protect by Letters Patent of the United States.

I claim—

1. The combination with a water-pan, of a hanger suitably suspended above and revolvably mounted over said water-pan, and a shaft journaled in said hanger and having a grinding-wheel mounted thereon, substantially as described.

2. The combination with a water-pan, of a hanger-support integral therewith, a hanger suspended from and having a revoluble bearing on said hanger-support over said water-pan and a shaft journaled in said hanger and having a grinding-wheel mounted thereon, substantially as described.

3. The combination with a hood suitably mounted on a standard, of a hanger suspended from and having a revoluble bearing on said hood, and a shaft journaled in said hanger and having a grinding-wheel mounted there-

on below said bearing, substantially as described.

4. The combination with an integral hood and pan, of a hanger suspended from said hood over said pan, and a shaft journaled in said hanger and having a grinding-wheel mounted thereon, substantially as described.

5. The combination with the integral hood and pan, of a hanger suspended from and having a revoluble bearing on said hood, and a shaft journaled in said hanger and having a grinding-wheel mounted thereon, below said bearing, substantially as described.

6. The combination with the integral hood and pan, revolvably mounted on a suitable base, of a hanger suspended from and having a revoluble bearing on said hood, and a shaft journaled in said hanger and having a grinding-wheel mounted thereon, below said bearing, substantially as described.

7. The combination with the integral hood and pan, said hood being provided with an opening through which the hanger is suspended over said pan, a hanger suspended from said hood and having a revoluble bearing thereon, and a shaft journaled in said hanger and having a grinding-wheel mounted thereon, substantially as described.

8. The combination with the integral hood and pan substantially in the form of a hollow standard having a side opening to provide access to the grinding-wheel and the top opening through which the hanger is suspended, a hanger suspended from said hood and having a revoluble bearing thereon and a shaft journaled in said hanger and having a grinding-wheel mounted thereon, substantially as described.

9. The combination with the integral hood and pan, of a hollow hanger suspended from and having a revoluble bearing on said hood, a shaft journaled in said hanger and having a grinding-wheel mounted thereon and a driving-pulley mounted on said shaft within said hanger, substantially as described.

10. The combination of the integral hood and pan substantially in the form of a hollow sphere having a side opening to provide access to the grinding-wheel and a top opening through which the hanger is suspended, a hanger suspended from said hood and having a revoluble bearing thereon and a shaft journaled in said hanger and having a grinding-wheel mounted thereon, substantially as described.

11. The combination of the integral hood and pan substantially in the form of a hollow sphere revolvably mounted on a suitable base, and having a side opening to provide access to the grinding-wheel and a top opening through which the hanger is suspended, a hollow hanger suspended from said hood and having a revoluble bearing thereon, a shaft journaled in said hanger and having a grinding-wheel mounted thereon and a driving-pulley mounted on said shaft within said hanger, substantially as described.

12. The combination with the hanger, of the shaft journaled therein, a grinding-wheel mounted on said shaft, and a tool-rest support mounted on said hanger around said shaft, and a tool-rest held in said tool-rest support, substantially as described.

13. The combination with a grinding-wheel, of a grinding-wheel shaft, a journal-bearing for said shaft, a tool-rest support having a ring mounted on and adjustable around said bearing and a tool-rest in said support, substantially as described.

14. The combination with a grinding-wheel, of a tool-rest support suitably mounted and having a three-point bearing therein for the tool-rest stem, and a tool-rest having a cylin-

drical stem adapted to be inserted and held in said bearing, substantially as described.

15. The combination with a grinding-wheel of a tool-rest support suitably mounted and having an angular bearing therein for the tool-rest stem, a tool-rest having a stem adapted to be inserted in said bearing, and a set-screw for holding said stem, substantially as described.

Signed by me at Worcester, Massachusetts, this 28th day of August, 1900.

OAKLEY S. WALKER.

Witnesses:

JOHN S. GOULD,
ALDUS C. HIGGINS.