

(No Model.)

2 Sheets—Sheet 1.

F. H. RICHARDS.
VALVE SEATING TOOL.

No. 500,215

Patented June 27, 1893.

Fig. 2

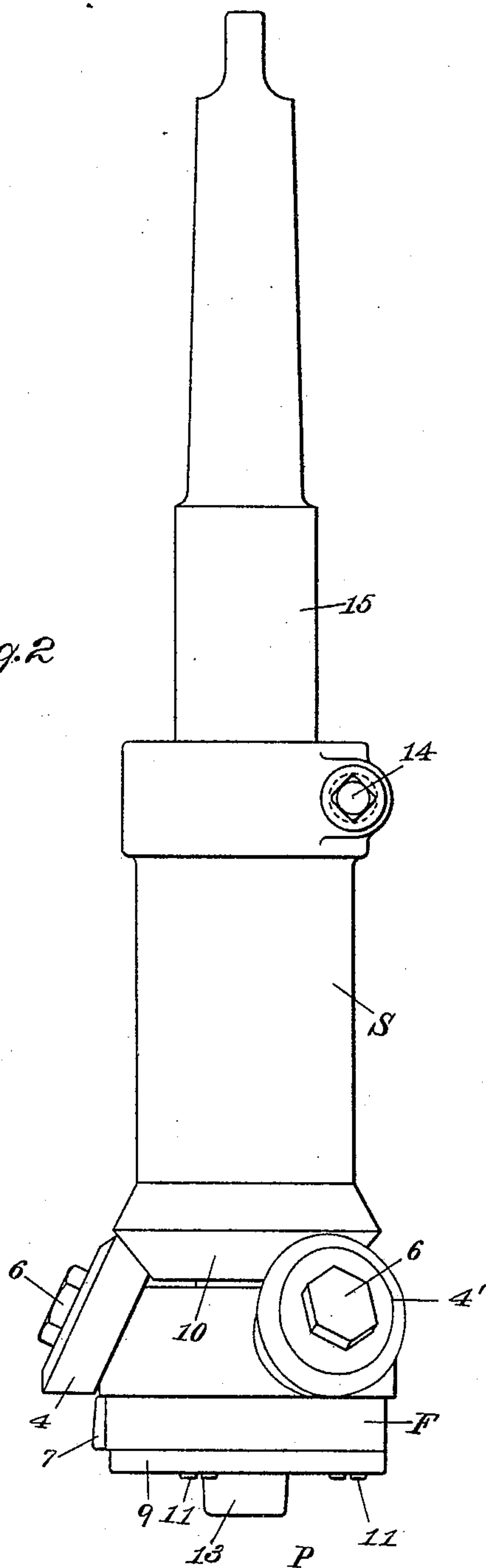
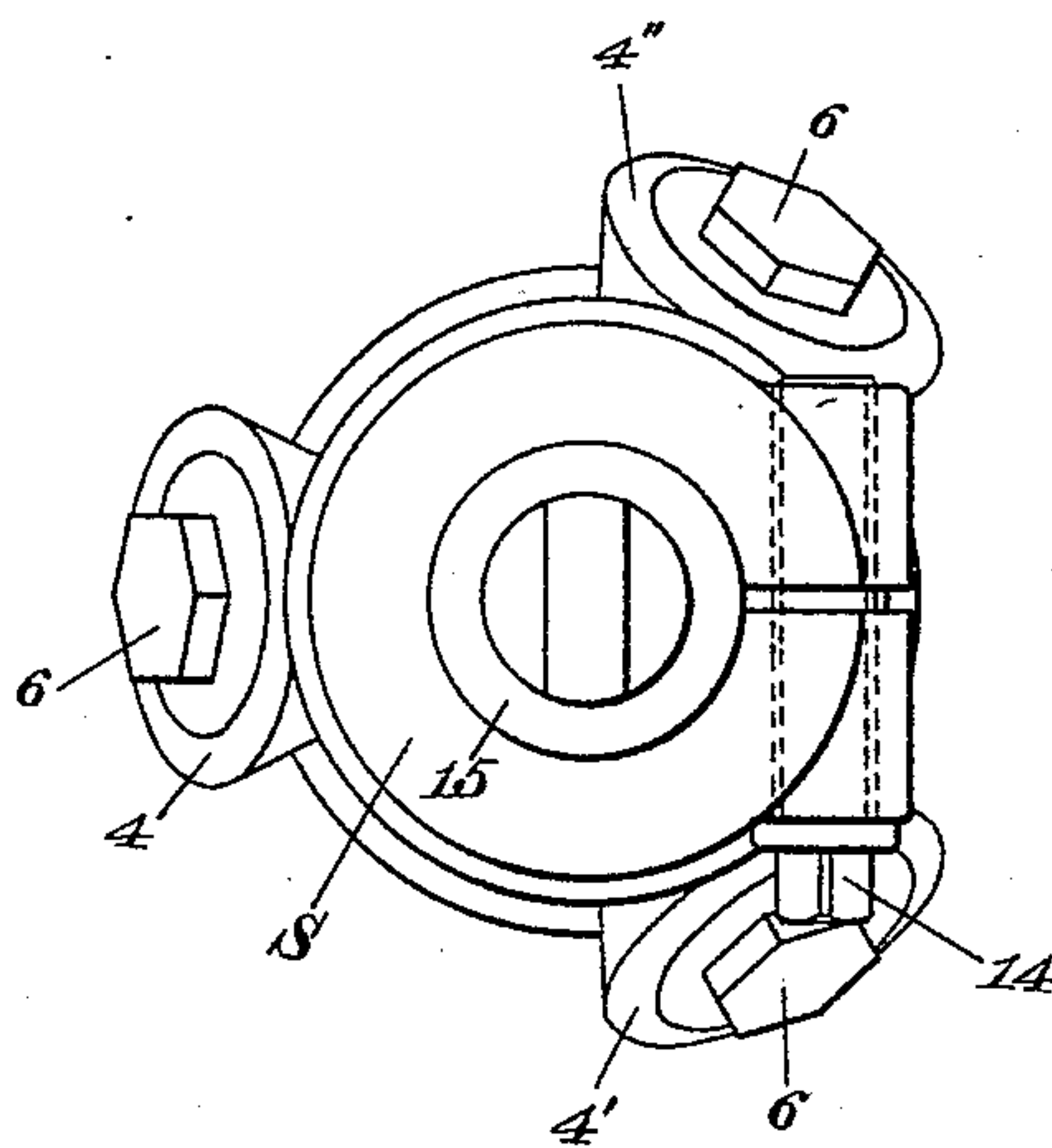


Fig. 1



Witnesses:
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H. Mallon.

Inventor:
F. H. Richards

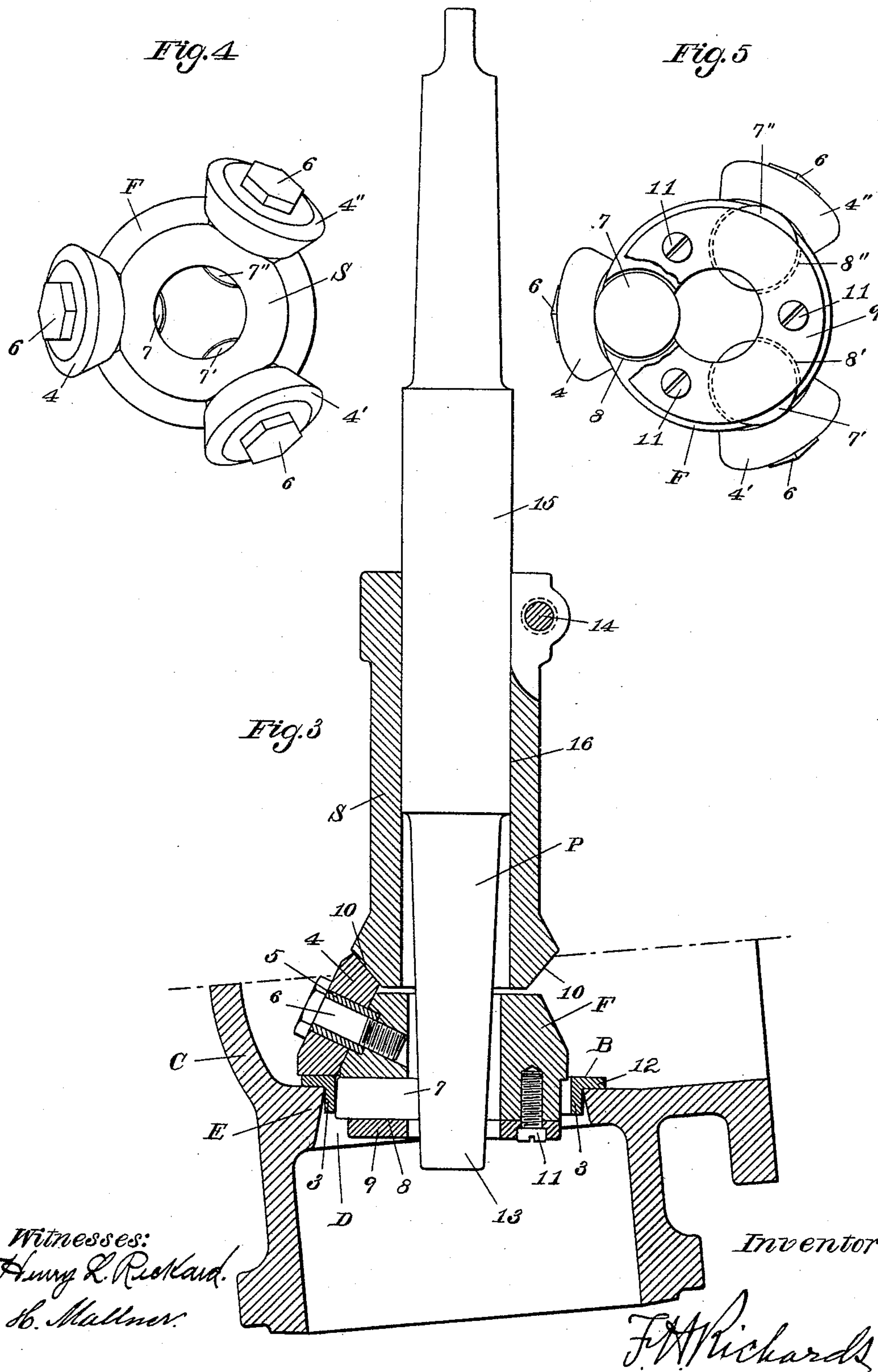
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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO WALTER WOOD, OF PHILADELPHIA, PENNSYLVANIA.

VALVE-SEATING TOOL.

SPECIFICATION forming part of Letters Patent No. 500,215, dated June 27, 1893.

Application filed July 11, 1892. Serial No. 439,691. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Valve-Seating Tools, of which the following is a specification.

This invention relates to tools for seating valves by the process of rolling-in the seat-rings into engagement with the valve-body; the object being to provide effective apparatus whereby that process may be carried out by simultaneously rolling the face and anchorage-flange of the valve-seat blank.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan view of a valve-seat tool embodying my present improvements. Fig. 2 is a side elevation of the same, as seen from below in Fig. 1. Fig. 3 is a sectional elevation of the tool, illustrative also of the manner of using the same. Fig. 4 is a plan view of the roller-head of the tool as seen from above in Figs. 2 and 3. Fig. 5 is a plan view of the roller-head as seen from below in Figs. 2 and 3.

Similar characters designate like parts in all the figures.

My improved valve-seating tool consists: first, in a roller-head furnished with rollers for acting upon the seat-blank disk and on the anchorage-flange thereof; and second, of devices for simultaneously driving said rollers. The roller-head consists of the body, or roll-carrier, F, constructed to receive the two sets of rolls, one set for rolling the face of the seat-blank and the other set for rolling the anchorage-flange of said blank. The face-rolls 4, 4' and 4'' (usually three in number, as shown) are each held in place on the carrier by some suitable means, as for instance, the tubular studs 5 and the bolts 6. The other set of rolls, designated as the "expander-rolls," 7, 7' and 7'', are set in pockets, or recesses, 8, 8' and 8'', formed in said carrier, the rolls being held in place in said recesses by a cap, 9, which may be formed integral with the roll-carrier; or, may be formed separately as herein shown, and secured to the carrier by means of screws, 11. For driving these rolls, a driving-sleeve, S, is provided, having at the end thereof a conical track, 10,

engaging upon and between the several rolls of the first set to drive these after the manner of frictional bevel gearing; this arrangement is primarily for the purpose of reducing to a minimum the friction of the face-rolls upon the face of the valve-seat disk 12 (Fig. 3); and secondly, to reduce the diameter of the track 10 to a size which will permit the withdrawal of this track through the opposite side of the valve,—it being understood that this seating-tool will generally be used for seating valves of the so-called "double-gate" glass. For the purpose of driving, and also for expanding, the expander-rolls, 7, 7' and 7'' during the seating operation, I provide the expander-pin, designated in a general way by P. This pin is formed tapering, as shown in Fig. 4, so that its point 13 will enter between the expander-rolls when these stand, as shown in Fig. 3, within the anchorage-flange 3 of the seat-blank B.

In practice, the two drivers S and P may be independently revolved and forced to their work, but one preferable arrangement is to extend the stem 15 of the expander-pin P through the bore 16 of the face-roll driver S, as best shown in Fig. 3, and to clamp said driver S, by means of the clamp-screw 14 or otherwise as may be preferred, with a moderate degree of force upon the cylinder stem 15 of said pin P. By means of this construction and combination, the expander-pin P, being revolved, also revolves the driver S; also, when the expander-pin P is forced downward between the expander-rolls during the seating operation, the friction of the driver S on the stem holds the driver down firmly against the face-rolls, and thus holds these rolls against the disk-portion 12 of the seat-blank B, in a manner which will be understood by comparison of the several figures of drawings.

When employing the construction and arrangement of roll-drivers here described, the diameter of the driver-track 10 relative to the diameter of the face-rolls 4 should be in the same proportion as the mean diameter of the expander-pin P relative to the diameter of the expander-rolls, so that the most effective work will be done with the least loss of power by enforced slipping of the rolling surfaces.

The mode herein shown of attaching the several face-rollers to the roll-carrier F is one of great strength and efficiency. The rollers should be made of steel of high resistance to crushing force and well tempered; the tube 5 should be driven firmly into the counter-bore made therefor in the roll-carrier, so that this tube will receive the shearing strain of the roll; the bolt should be screwed firmly in place 10 and have the head large enough to furnish wearing surface for holding the roll from outward movement.

In Fig. 3, the character "C" designates one-half of the body of an ordinary double-gate 15 valve, in whose inner wall E is formed the opening D for receiving the anchorage-flange 3 of the seat-blank B.

Having thus described my invention, I claim—

20 1. In a valve-seating tool, the combination with a unitary roll-carrier adapted for carrying two sets of rolls, of two sets of rolls, one arranged to bear upon the face of a seat-blank and the other to operate within said 25 blank, and roll-drivers acting upon each of said rolls simultaneously, substantially as described.

2. In a valve-seating tool, the combination with a unitary roll-carrier furnished with 30 rollers to bear upon the face of the seat-blank, of the expander-rolls carried in said carrier in position for operating on the inner side of the seat-blank, and the tapering expander-pin driving said expander-rolls, substantially as 35 described.

3. In a valve-seating tool, the combination with the roll-carrier substantially as described, of the expander-rolls carried in said carrier, the conical face-rolls supported on 40 said carrier, the expander-pin for driving the expander-rolls, and a conical track for driving the face-rolls, substantially as set forth.

4. In a valve-seating tool, the combination with a roller-head substantially as described 45 furnished with two sets of rolls, of the pin P for driving one set of rolls, and the driver S for driving the other set of rolls and constructed to be driven from said pin through a frictional clamp, substantially as described.

50 5. In a valve-seating tool, the combination with the roller-head F having the pockets 8, 8' and 8'', of the expander rolls in said pockets, the conical rolls 4, 4' and 4'', means substantially as described for supporting said 55 conical rolls on the carrier, and two co-acting roll-drivers for simultaneously actuating the two sets of rolls, substantially as described.

6. In a valve-seating tool, the combination with a unitary roller-head constructed for receiving flange-expanding rolls and for carrying 60 face-rolls, of the flange-rolls carried within said head, the conical face-rolls carried by the

head adjacent to the flange-rolls, said rollers being, respectively, in the same radial position on the roller head, and a friction roll- 65 driver for each said set of rolls, substantially as described.

7. A valve seating tool comprising a unitary roller-carrier furnished with one set of loose radially-arranged rollers, the axes of which 70 are parallel to the axis of the carrier, and one set of radially-arranged rollers whose axes are at an inclination to the axis of the carrier, and means to frictionally-drive each set of rollers independently or simultaneously, substantially as described. 75

8. A valve-seating tool comprising two independent members *i. e.*—the roller-carrier provided with one set of radially-arranged horizontally-rotating rollers and one set of 80 radially-arranged vertically-inclined rollers, and a sleeve having a track to frictionally-engage the faces of said inclined rollers and having a tapered pin to frictionally-engage the faces of the horizontal rollers, whereby 85 both sets of rollers may be simultaneously driven by the rotation of said sleeve, substantially as and for the purpose described.

9. In a valve-seating tool, the combination with the roller carrier, of radially-disposed 90 conical rollers mounted thereon with their axes at an inclination to the axis of the carrier, the horizontal rollers with their axes parallel to the axis of the carrier and arranged in the same radial plane as the axis of the inclined rollers, the driving sleeve having a 95 conically-faced track to coincide with the pitch of, and bear upon the faces of the conical rollers, and a conical driving-pin to engage the horizontal rollers, whereby both sets 100 of rollers may be driven simultaneously, substantially as described.

10. In a valve-seating tool, a unitary roller-carrier adapted for carrying one set of rollers having their axes substantially parallel with 105 the tool-axis and another set of rollers having their axes inclined to the tool-axis, combined with two sets of rollers having their axes arranged as set forth and of which the corresponding rollers, of each set respectively, are 110 maintained in the same planes radially of the tool-axis.

11. In a valve-seating tool, a unitary roller-carrier combined with two sets of rollers, of which the rollers in one set are located in the 115 same radial planes, respectively, with those of the other set, and means for simultaneously applying power to each set of rollers for turning them in the same direction.

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