

No. 819,538.

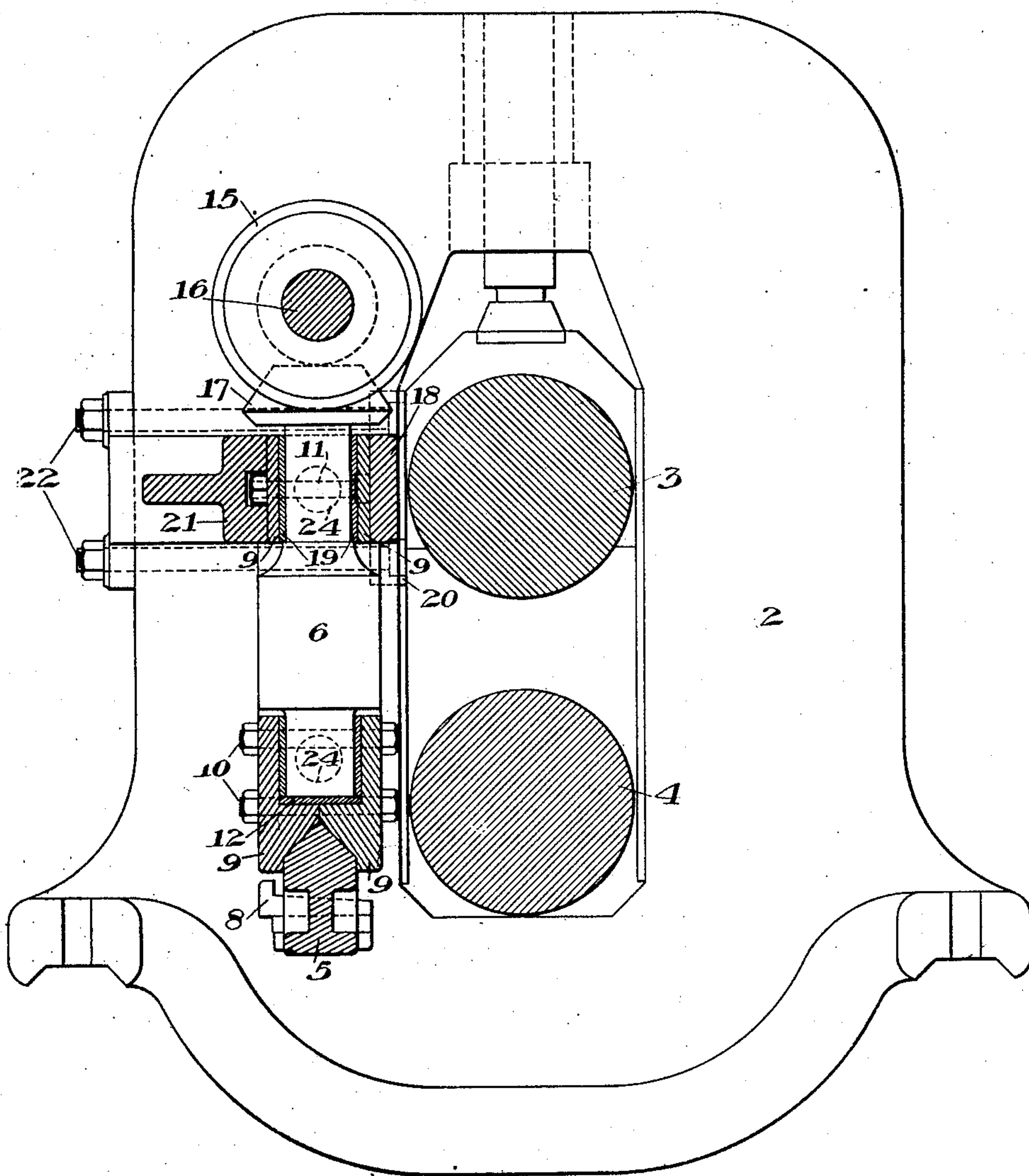
PATENTED MAY 1, 1906.

K. C. GARDNER.
UNIVERSAL MILL.

APPLICATION FILED FEB. 28, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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INVENTOR

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2 SHEETS—SHEET 2.

Fig. 3.

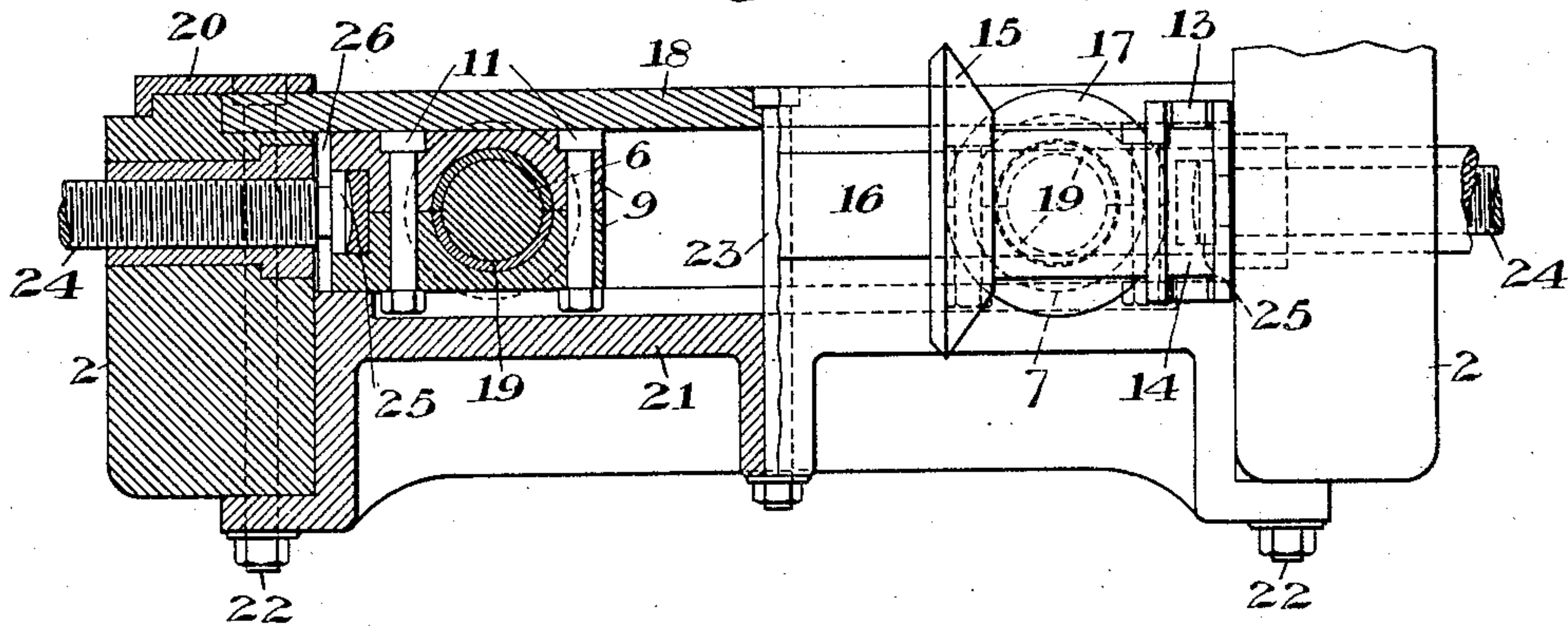
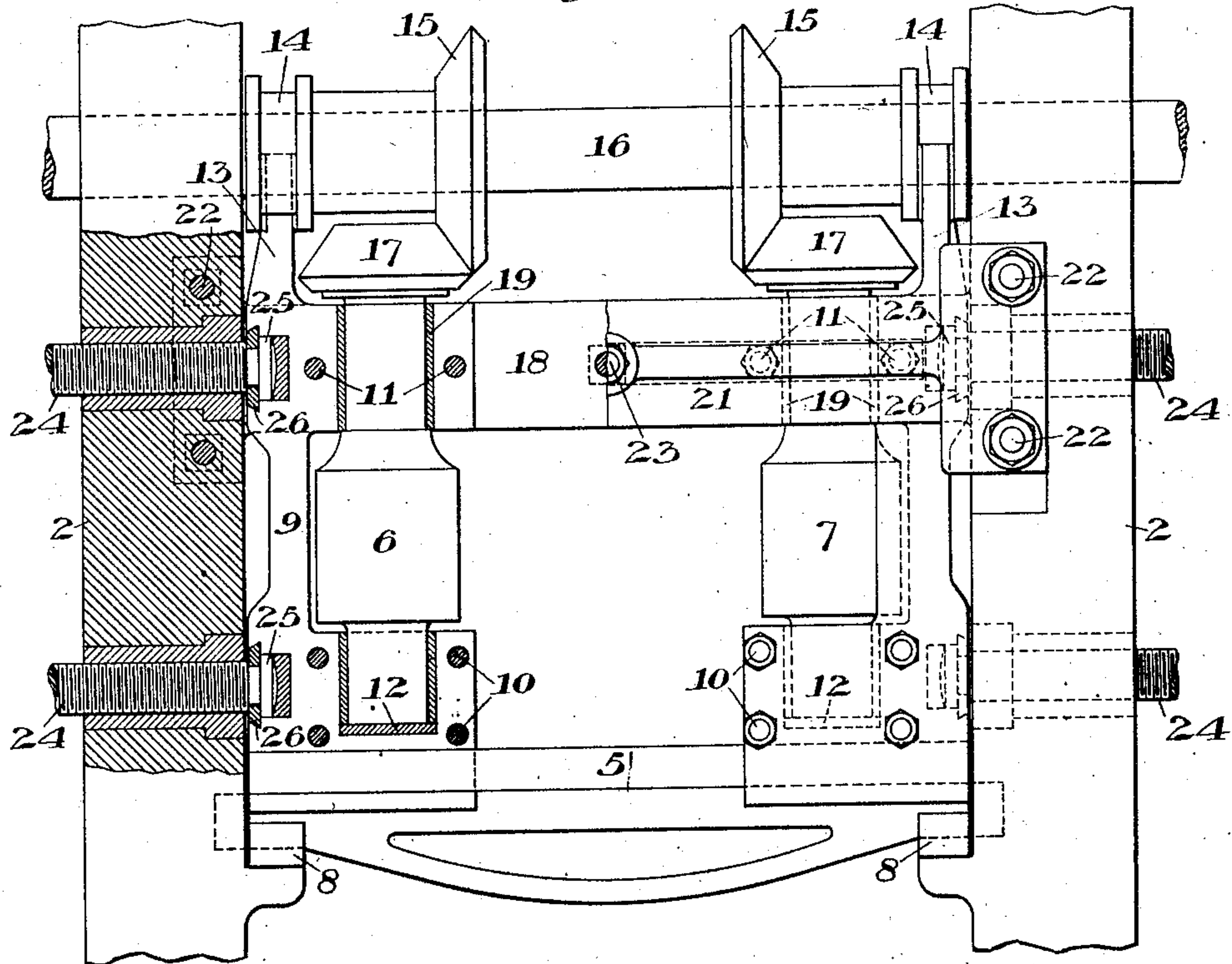


Fig. 2.



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

KIRTLAND C. GARDNER, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO
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UNIVERSAL MILL.

No. 819,538.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed February 28, 1905. Serial No. 247,705.

To all whom it may concern:

Be it known that I, KIRTLAND C. GARDNER, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Universal Mill, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation of my improved mill, partly in central vertical section. Fig. 2 is a partial front elevation with one-half broken away, and Fig. 3 is a partial top plan view of the one-half in horizontal section.

My invention relates to the class of universal mills, and is designed to provide a construction by which the vertical rolls may be brought nearer the horizontal rolls than formerly, and the vertical rolls may be removed without removing their driving-shaft and lifting them vertically.

In the drawings, 2 2 represent the end housings containing the horizontal rolls 3 and 4. At one side of these rolls is the lower rest-bar 5 for the vertical rolls 6 and 7, this rest-bar having a V-shaped or angular upper edge and being secured between the housings by keys 8. Each of the rolls 6 and 7 is supported in bearings in its individual frame 9. Each frame is made in two halves split in line with the axis of the vertical roll, the halves being secured together by the lower bolts 10 and the upper bolts 11. The lower portion of this split frame is recessed to fit upon the rest-bar and contains the step-bearing for the roll 6. This step-bearing is preferably provided with a removable bottom liner 12 to assist in removing the roll. The upper part of the frame 9 is provided with a fork portion 13 to engage the recessed sleeve 14 of the driving bevel-gear 15, which is splined on the driving-shaft 16. The wheel 15 engages the bevel-wheel 17, secured to the upper shaft of the vertical roll.

To hold the upper portions of the vertical-roll frames in proper position and allow them to be brought close to the horizontal rolls, I provide an inner bar 18, which extends back of the upper bearings 19 of the vertical rolls and is preferably set in recesses in the end windows of the housings inside the vertically-extending liners 20, and I provide an outer clamping-frame 21, which extends across the front of the upper bearings 19 and is remov-

ably secured by through-bolts 22. I have shown these through-bolts as extending through both the frame 21, the housings, and the bar 18, their heads being recessed within the vertical liners 20. The frame 21 is also preferably connected to the bar 18 by the intermediate bolt 23 between the vertical rolls. The vertical rolls are adjusted by screws 24, extending through the end housings and having heads 25, secured by dovetailed slides 26 in the frame 9.

In removing the vertical rolls the frame 21 is unbolted, the front halves of the vertical-roll frames are unbolted, the bottom liners 12 are pulled out to disengage the gears 15 and 17, and the roll may then be tipped forward and drawn out without removing the upper driving-shaft. During the adjusting of the vertical rolls the upper securing-bolts 11 for the roll-frames move within a recess in the front clamping-bar 21.

The advantages of my invention result from the simplicity of the device, the bringing of the vertical rolls close to the horizontal rolls, and the ease in removing and replacing the vertical rolls.

Many changes may be made in the form and arrangement of the parts without departing from my invention

I claim—

1. A universal mill having vertical rolls, a frame supporting at least one of said rolls, a rest-bar on which the frame is carried, and means for clamping the upper portion of the frame in position, said frame being divided on a vertical plane substantially parallel with the plane in which the vertical-roll axes lie; substantially as described.

2. A universal mill having a rest-bar, a vertical-roll frame carried on said rest-bar, and a removable transverse clamping device holding the vertical-roll frame in position, the frame being made in inner and outer parts on opposite sides of the rest-bar; substantially as described.

3. A universal mill having a rest-bar, a vertical-roll frame supported on the rest-bar, and made in halves secured together on opposite sides of the rest-bar, and means for clamping the upper portion of the frame in position; substantially as described.

4. A universal mill having a rest-bar, a frame carrying a vertical roll and supported

on the rest-bar, and removable transverse clamping-bars between which the upper part of the roll-frame is secured, said frame being divided substantially in line with the rest-bar; 5 substantially as described.

5. A universal mill having a rest-bar, a vertical-roll-carrying frame having a recessed sliding engagement with the rest-bar, and upper clamping-bars between which the upper 10 portions of the frame is slidably clamped, said frame being divided substantially in line with the rest-bar; substantially as described.

6. A universal mill having a vertical roll, a frame supporting said roll and provided with 15 a step-bearing carried on the frame, and a rest-bar on which the frame is carried, said frame being divided substantially in line with the rest-bar; substantially as described.

7. A universal mill having vertical rolls, a 20 driving-shaft therefor, gear connections between the rolls and the driving-shaft, a sectional frame supporting the vertical rolls, said frame being divided in a vertical plane passing through the axes of the vertical rolls, 25 and means whereby the vertical rolls may be lowered in said frame to disengage their connections with the driving-shaft; substantially as described.

8. A universal mill having vertical rolls, a

driving-shaft for said rolls, gear connections 30 between the rolls and the driving-shaft, a frame supporting said rolls, a rest-bar on which the frame is carried, means for securing the frame in position, said frame being divided in a vertical plane substantially in line 35 with the rest-bar, and means in the frame whereby the rolls may be lowered therein to disengage them from the driving-shaft; substantially as described.

9. A universal mill having vertical rolls, an 40 upper driving-shaft having gear connection therewith, a divided frame for the rolls arranged to allow their tipping outwardly on the rest-bar, and means for lowering the vertical roll to disengage its gear connections; 45 substantially as described.

10. A universal mill having a pair of vertical rolls, a separate two-part frame for each of said pair, upper clamping-bars arranged to hold the pair of frames in position, and a rest- 50 bar on which the two frames are carried; substantially as described.

In testimony whereof I have hereunto set my hand.

KIRTLAND C. GARDNER.

Witnesses:

GEO. B. BLEMING,

JOHN MILLER.