

(No Model.)

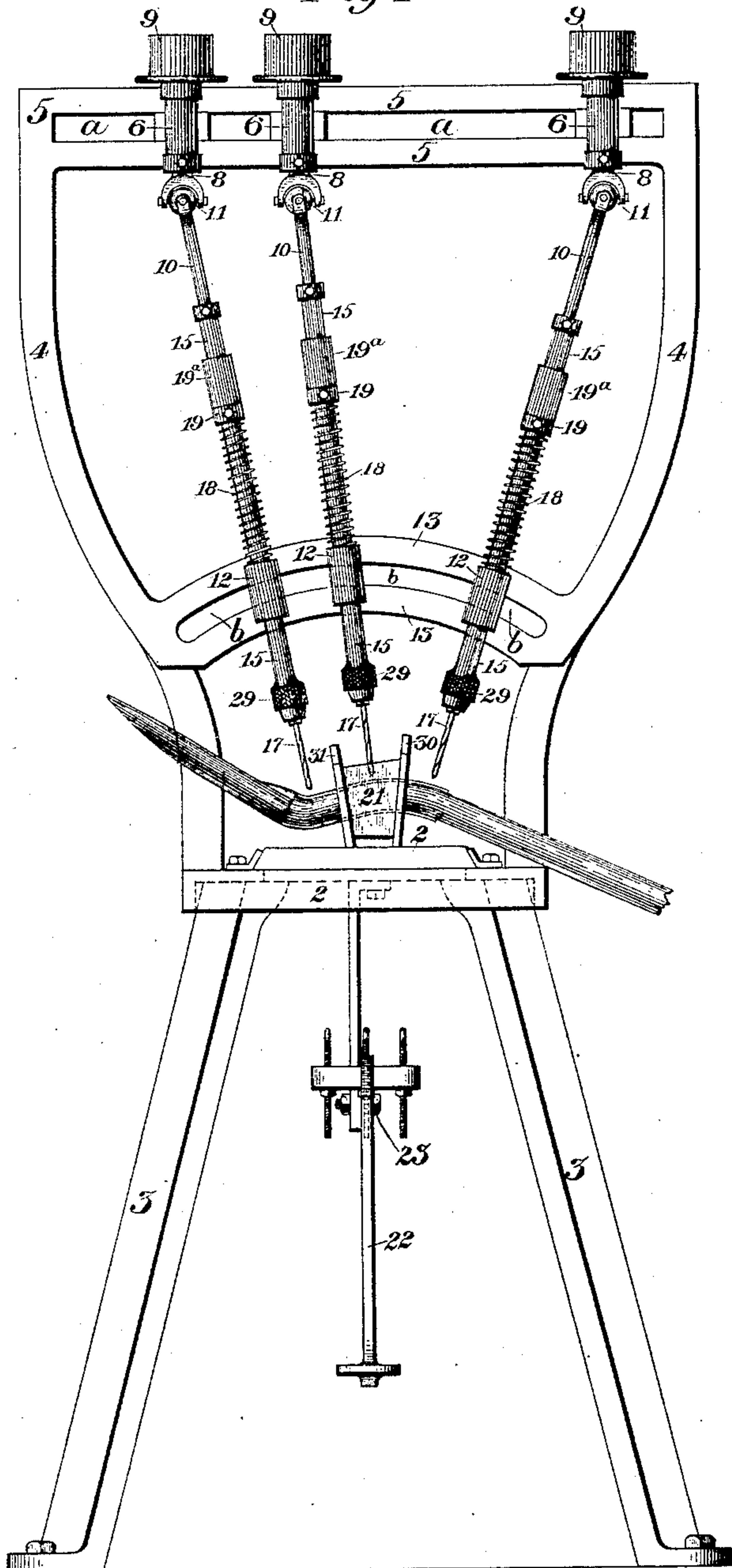
3 Sheets—Sheet 1.

W. R. DICKSON.  
DRILLING MACHINE.

No. 353,124.

Patented Nov. 23, 1886.

*Fig. 1.*



Witnesses.

*Harry L. Gill*  
*W. D. Corwin*

Inventor.

*William R. Dickson*  
*by Baxwell Kern*  
*his Attorneys*

(No Model.)

3 Sheets—Sheet 2.

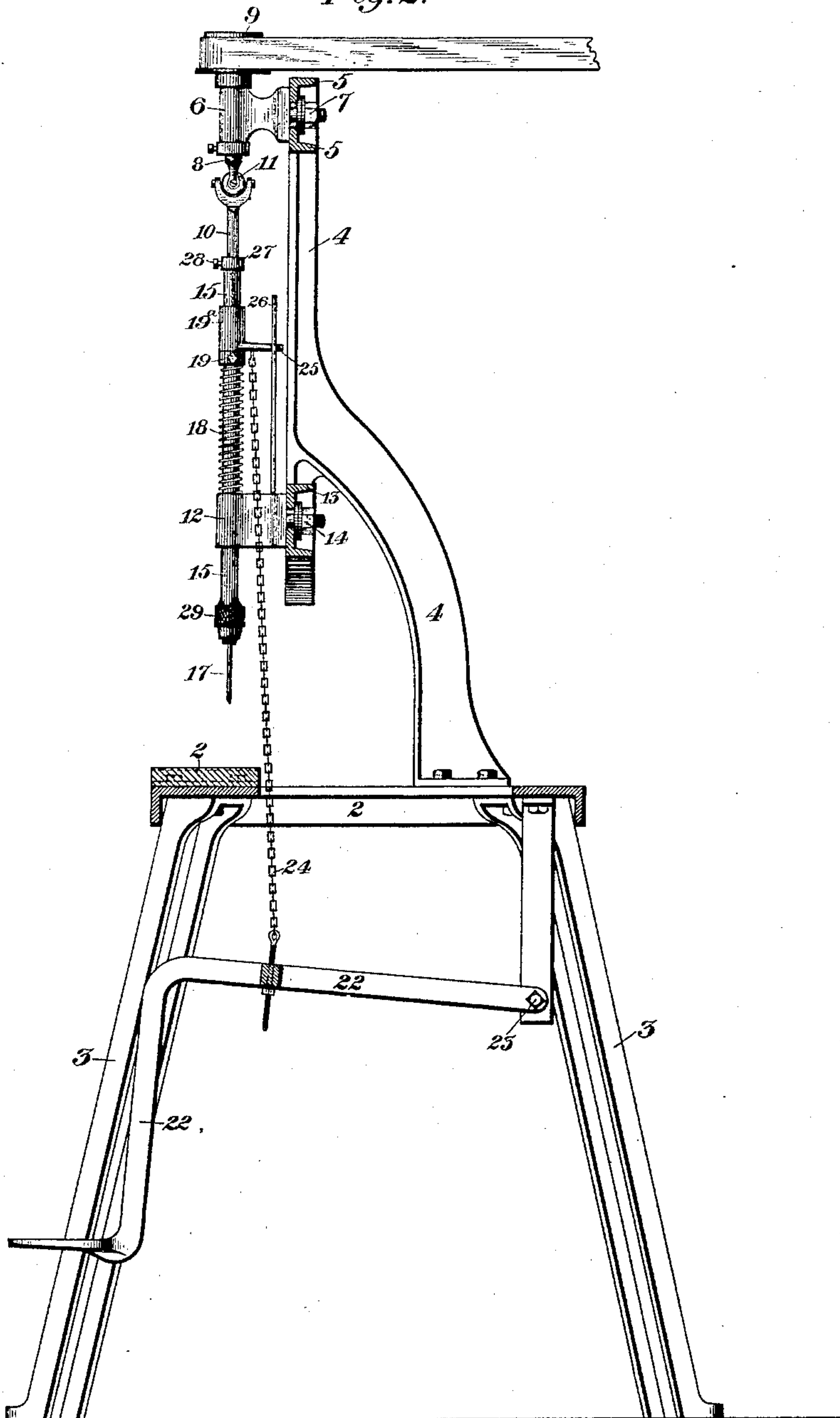
W. R. DICKSON.

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*Fig. 2.*



*Witnesses.*

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(No Model.)

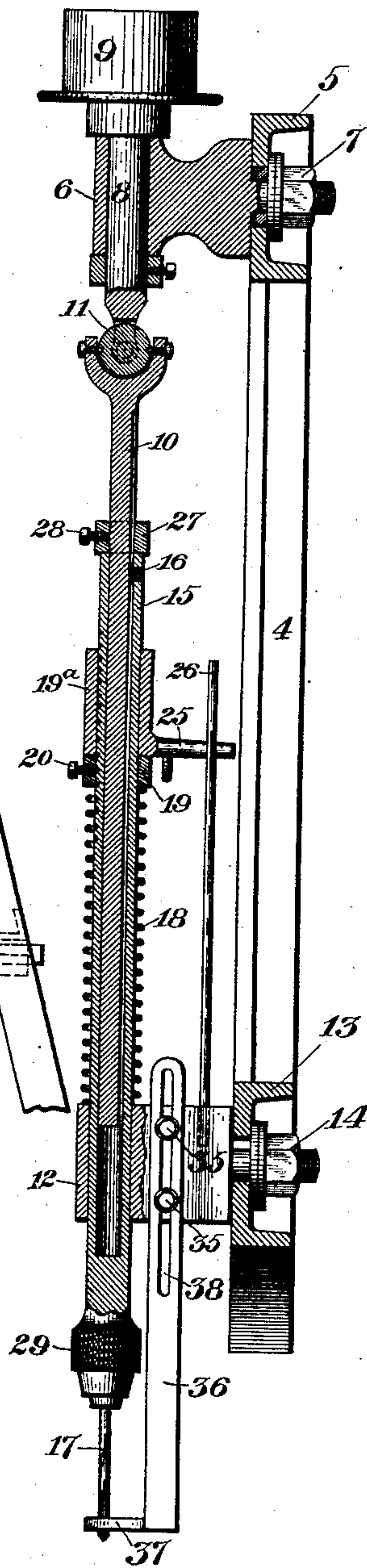
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W. R. DICKSON.  
DRILLING MACHINE.

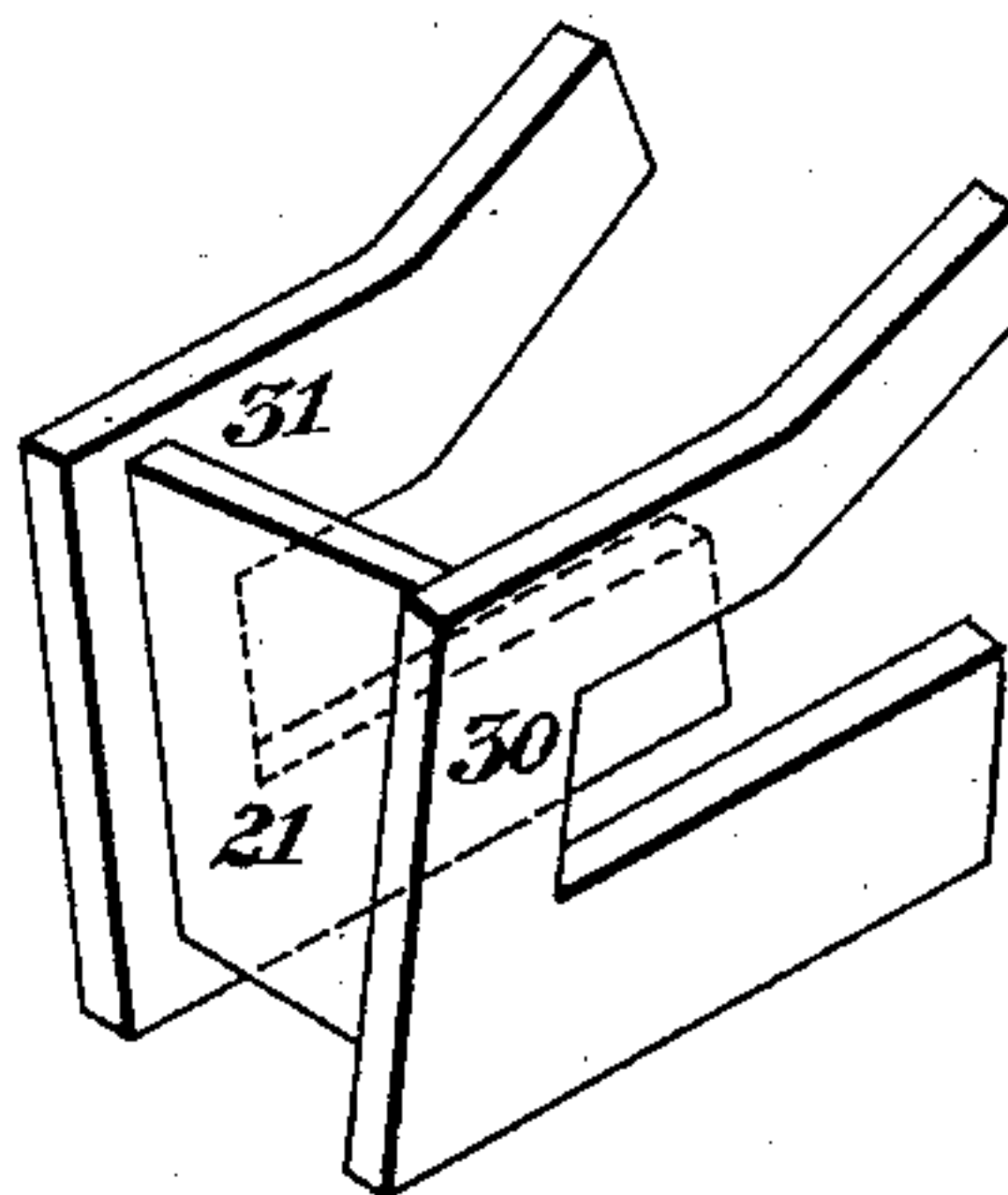
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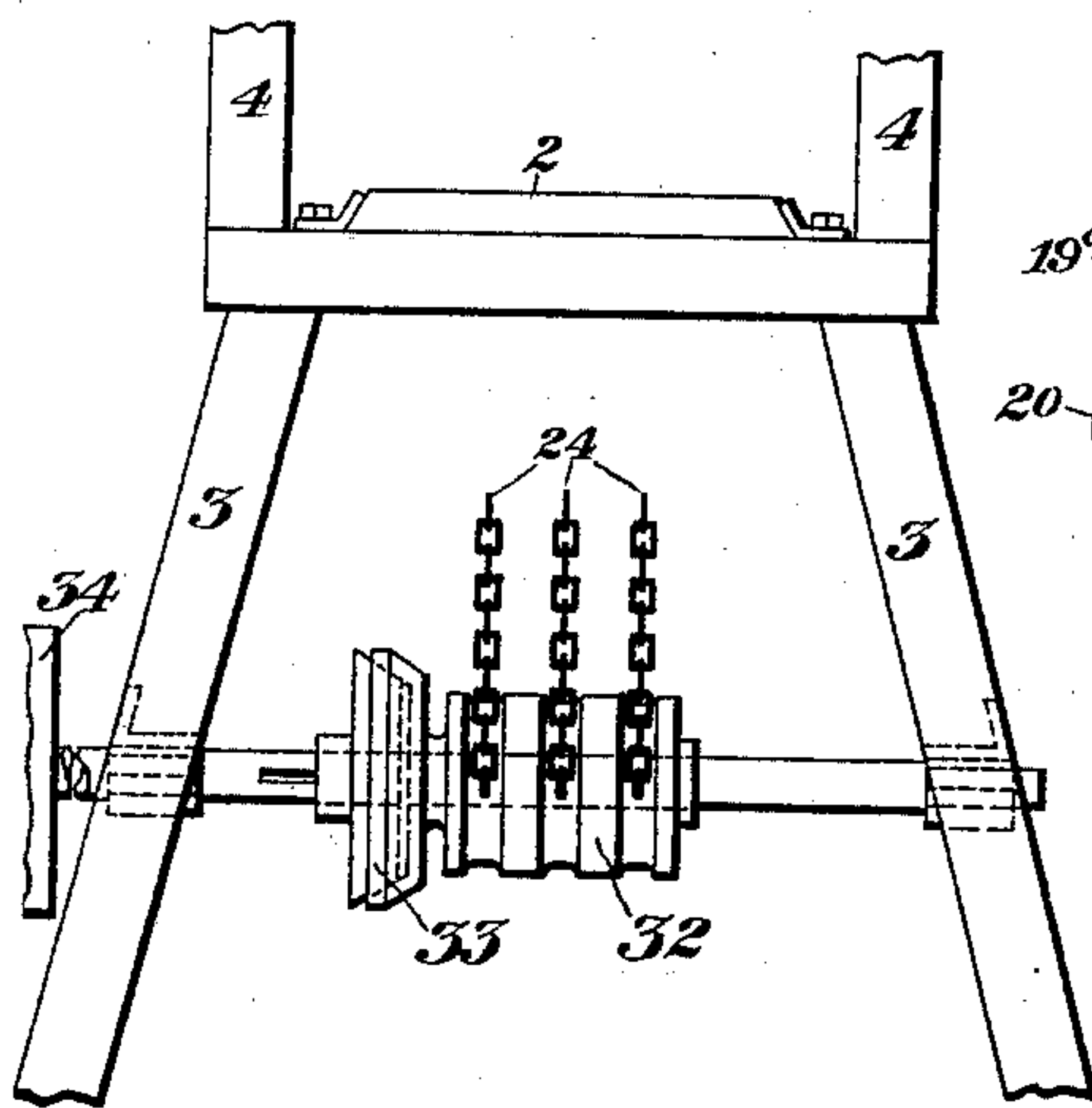
*Fig. 3.*



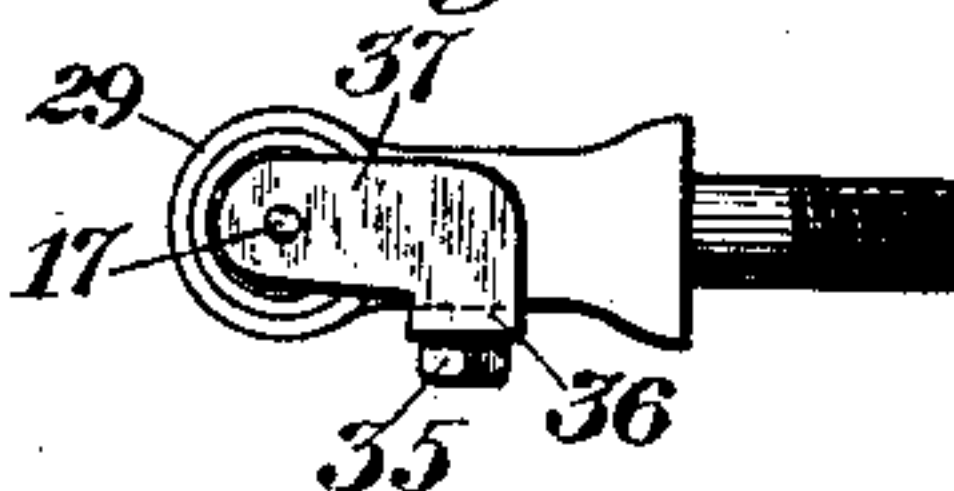
*Fig. 5.*



*Fig. 6.*



*Fig. 4.*



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*his Attorneys*



# UNITED STATES PATENT OFFICE.

WILLIAM R. DICKSON, OF PITTSBURG, PA., ASSIGNOR OF TWO-THIRDS TO  
JOHN E. HALL AND LEONARD A. BRADLEY, BOTH OF SAME PLACE.

## DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 353,124, dated November 23, 1886.

Application filed September 13, 1886. Serial No. 213,364. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. DICKSON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Drilling-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

Heretofore in the process of attaching the blades of shovels and similar agricultural implements to their handles it has been customary to first punch rivet-holes in the straps and then, after inserting the handle between the straps, to continue the holes through the handle by means of a hand-drill. The time lost by these several steps is considerable, and I have discovered that by drilling holes through the straps and through the handle at one operation after the insertion of the handle, time is saved and better work is accomplished. I have also discovered that the preferable manner of doing this is to employ a drilling-machine whose drills are set so that they shall be directed toward the shovel-handle in lines at right angles to the tangents of the curves of the strap and handle at the points where the holes are to be drilled. In this way the strain on the drills is less than if they be directed obliquely to the tangents of the curve, a straighter hole is drilled, and the drills are saved from danger of being broken.

My improvement consists in the particulars of invention above noted, and also in certain details of construction hereinafter to be indicated.

In the accompanying drawings, Figure 1 is a front view of the drilling-machine. Fig. 2 is a side view thereof. Fig. 3 is a side view of one of the drills, showing its stock in axial longitudinal section. Fig. 4 is a bottom plan view of Fig. 3. Fig. 5 is a perspective view of the clamp for holding the shovel on the bed-plate. Fig. 6 is a front view of a modification.

Like symbols of reference indicate like parts in each.

2 indicates the bed-plate or table of the machine, which is supported by suitable legs, 3. A frame, 4, which extends upward from the table 2, supports the bearings for the drill-shafts. At the top of the frame 4 is a hori-

zontal bar, 5, provided with a longitudinal slot, *a*, in which are set the shanks of journal-blocks 6.

At the rear side of the bar 5, the shanks of the journal-blocks 6 are fitted with lock-nuts 7, which are adapted to be screwed up against the bar 5 and to lock the blocks 6 in position. The blocks 6 are movable from place to place in the slot *a*, and when adjusted in the desired positions are there locked by means of the nuts 7.

At the forward ends of the blocks 6 are vertical holes which form the journal-bearings of short rotary shafts 8. The shafts 8 are rotated by belt-pulley wheels 9, keyed to the ends of the shafts and driven by suitable belts.

10 are the drill-shafts, which are connected with the shafts 8 by universal joints 11. (Shown in Figs. 1, 2, and 3.) The bearings or journal-blocks 12 of the drill-shafts are set in a curved slot, *b*, made in a cross-bar, 13, of the frame 4. The journal-blocks 12 are adjustably secured in the slot *b* by means of nuts 14, arranged similarly to the nuts 7, before described. Each drill-shaft consists of two parts, 10 and 15, the part 10 being arranged telescopically within the outer part or sleeve, 15, and the part 15 provided with a tongue or key, 16, which fits within a vertical keyway on the surface of the part 10, and is thus allowed to move longitudinally, but is prevented from rotating independently of the inner part, 10. By this means the drill-shaft between the slots *a* and *b* is automatically elongated or contracted, as may be necessary in changing the inclination of the whole drill-shaft. The drill 17 is arranged at the end of the sleeve 15. A spring, 18, is interposed between a collar, 19, which is adjustably fitted on the outside of the sleeve 15, and the top of the journal-block 12. This collar is vertically movable on the sleeve 15, and is adjustable in any desired position thereon by means of a set-bolt, 20, which passes through the collar 19 and engages notches in the sleeve 15.

Above the collar 19, on the sleeve 15, is a second collar, 19<sup>a</sup>, which is loosely mounted on the sleeve, so that the latter may turn freely within the collar. The shovel and its handle are arranged on a supporting-clamp, 21, on



the bed-plate 2, and the drill-shafts are then adjusted by moving the journal-blocks 12 in the slot *b*, and the journal-blocks 6 in the slot *a*, so that the drills shall all be directed toward the strap of the shovel at substantially right angles to the tangents of the curve of the shovel-strap. The drills are caused to enter the shovel-strap by means of a pedal-lever, 22, fulcrumed at a point, 23, and provided with chains 24, which are attached to projecting arms 25 of the several collars, 19<sup>a</sup>. When the pedal 22 is depressed by the foot of the operator, it draws down the collars 19, and their attached tubular sleeve 15, against the force of the spring 18, causing the drills 17 to engage the shovel-straps at right angles to the tangents of the curve at the several points of contact. By continuing the pressure of the foot on the pedal 22 the drills are held firmly against the straps, and the rotation of the drills, which is caused by the rotary shafts 8, acting on the drill-shafts through the universal joints 11, causes the drills to penetrate the shovel-straps and the handle. When the holes have been drilled, the pedal is released, so as to permit the springs 18 to retract the sleeves 15, and to withdraw the drills from their several holes.

By means of the slots *a* and *b* the drills may be adjusted for shovel straps and handles of any desired curvature, and the universal joints 11 permit the easy rotation of the drill-shafts, no matter at what angle they may be inclined. Instead of universal joints 11, equivalent devices—such as a flexible connection between the shafts 8 and 10—may be substituted. After the holes have been drilled, the straps are riveted to the handle in the usual way.

There are certain important details of construction which I shall now describe.

26 is a guide-rod which extends upward from the journal-block 12, and bears against the arm 25 of the collar 19<sup>a</sup>.

27 is a collar fixed by a screw, 28, to the shaft 10 above the sleeve 15, so as to limit the upward motion thereof by the spring 18. Secured to the collars 12 by bolts 35 are vertically-depending rods 36, at the lower ends of which are horizontal arms 37, in which are holes through which the drills pass. These arms serve to guide the drills and to prevent them from snapping in case they strike obliquely against the straps to be drilled. These guide-rods are made adjustable by vertical slots 38, through which the bolts 35 pass. The drills 17 are of ordinary form, and are secured to the ends of the drill-shaft sleeves 15 by means of chucks 29. I have shown three drills, 17, adapted to drill three holes in the shovel strap and handle simultaneously. I do not, however, limit myself thereto, since any number (one or more) may be used.

The clamp-support 21 and the mode of clamping the shovel-straps to the handle before drilling are important features of my invention. In Fig. 1 the clamp is shown in position on the table 2, and it is further shown in de-

tail in Fig. 5. It consists of a frame having rising legs 30 and 31, the legs 30 diverging from the legs 31, so as to afford a tapering or wedge-shaped intermediate space. Before the drilling process the straps of the shovel are bent against the interposed handle by compression, and then the handle and straps are placed in the clamp 21, the legs of which confine the straps on the handle and prevent them from spreading while the holes are being drilled.

In Fig. 6 I show mechanism equivalent to the lever 22 for elongating the drill-shafts and bringing the drills down upon the work. It consists of a drum, 32, journaled adjacently to a rotary friction-clutch disk, 33, which is rotated by a belt-connection, 34, leading from a primary driving-shaft. The chains 24 are attached to the drum, and when the latter is connected with the rotary clutch 33 by means of a clutch-lever the drum will be rotated, and the winding of the chains 24 on the drum will depress the drills, as before described.

I claim as my invention—

1. An improvement in the art of attaching the blades of shovels, &c., to their handles, which consists in first placing the shovel-handle between the straps and then drilling a hole through the straps and handle, substantially as and for the purposes described.

2. In a machine for drilling curved articles, the combination of a support for the article to be drilled, a drill, a drill-shaft capable of vertical elongation or contraction, and a journal-block for such drill-shaft movable horizontally, whereby the drill can be adjusted, substantially as and for the purposes described.

3. In a machine for drilling curved articles, the combination of a support for the article to be drilled and several drills directed there-toward at right angles to the tangents of the curve, substantially as and for the purposes described.

4. In a drilling-machine, the combination of a drill and its shaft and a journal-block for the drill, said journal-block being movable and adjustable to vary the angle of inclination of the drill-shaft, substantially as and for the purposes described.

5. In a drilling-machine, the combination of a drill and its shaft, a journal-block for the drill, said journal-block being movable and adjustable to vary the angle of inclination of the drill-shaft, and a driving-shaft, 8, connected with the drill-shaft by a flexible joint, substantially as and for the purposes described.

6. In a drilling-machine, the combination of a drill and its shaft, a journal-block for the drill, said journal-block being movable and adjustable to vary the angle of inclination of the drill-shaft, and an adjustable driving-shaft, 8, connected with the drill-shaft by a flexible joint, substantially as and for the purposes described.

7. In a drilling-machine, a rotary drill-shaft



made in sections, arranged to be elongated or contracted, substantially as and for the purposes described.

5 8. In a drilling-machine, a rotary drill-shaft made in sections, arranged to be elongated or contracted, and mechanism, substantially as described, for elongating the drill-shaft, as and for the purposes specified.

10 9. In a drilling-machine, a rotary drill-shaft made in sections, arranged to be elongated or contracted, mechanism, substantially as described, for elongating the drill-shaft, and a spring for contracting it, substantially as and for the purposes described.

15 10. The combination, with a drill for drilling a shovel-handle and its straps, of a clamp,

21, for confining the straps to the handle during the drilling, substantially as and for the purposes described.

11. The combination, in a drilling-machine, 20 of a rotary drill and a guide depending from and secured to the journal-block holding the drill-shaft in position, through which guide the drill passes, substantially as and for the purposes described.

25 In testimony whereof I have hereunto set my hand this 16th day of August, A. D. 1886.

WILLIAM R. DICKSON.

Witnesses:

W. B. CORWIN,

THOMAS W. BAKEWELL.