C. W. SKINNER.

DRILL.

APPLICATION FILED NOV. 11, 1913.

1,247,341.

Patented Nov. 20, 1917.

2 SHEETS—SHEET 1.

FIG. 1.

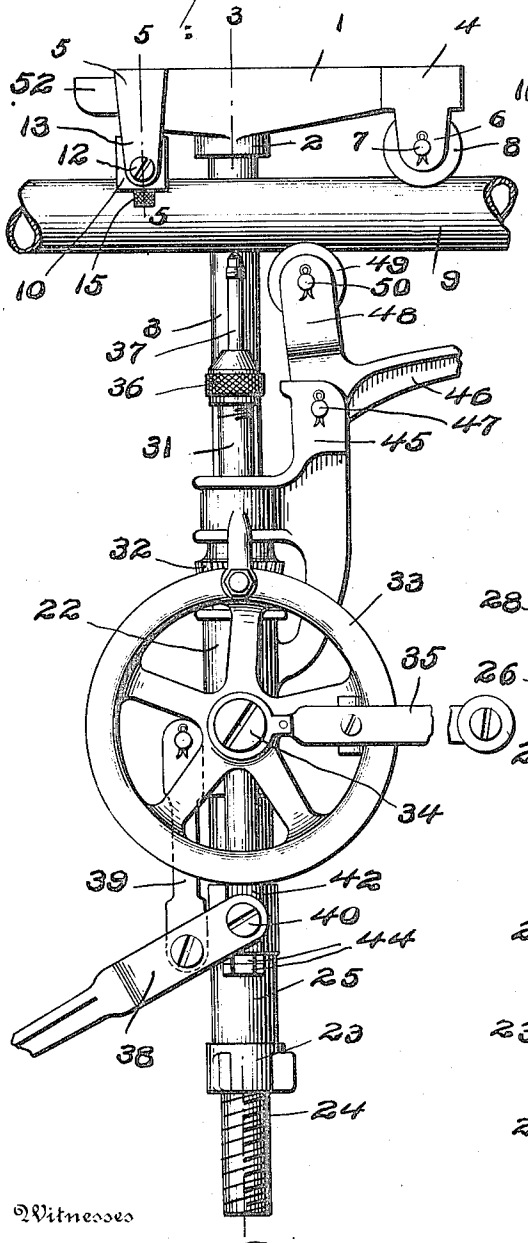
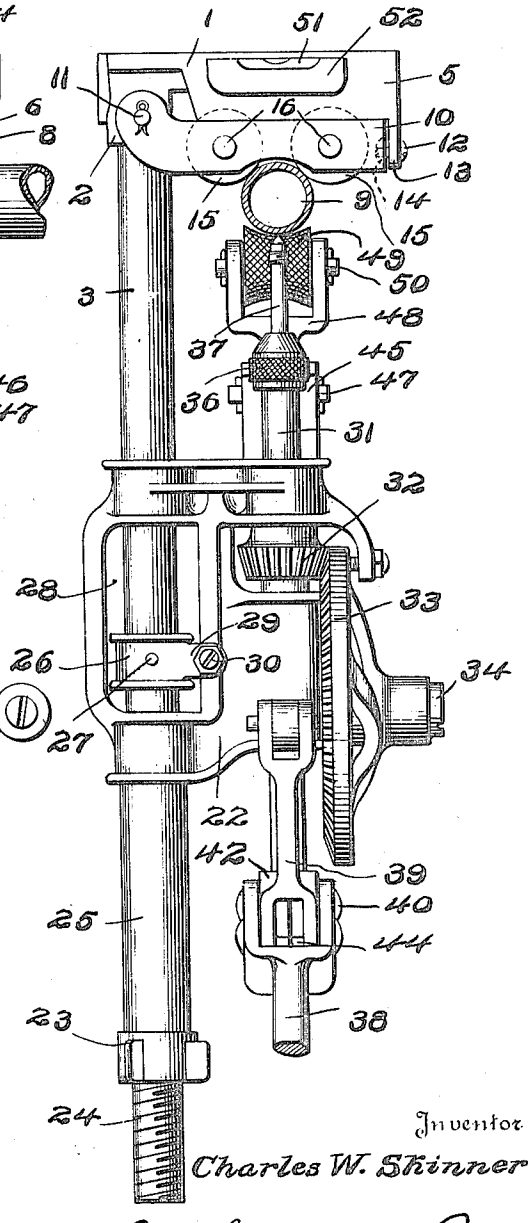


FIG. 2.



Witnesses

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2 SHEETS—SHEET 2.

FIG. 3.

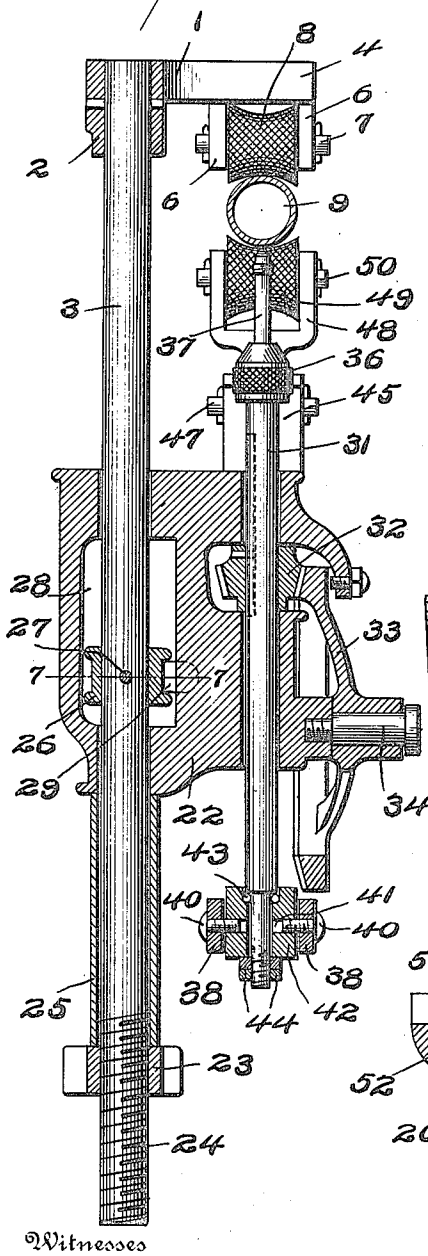


FIG. 4.

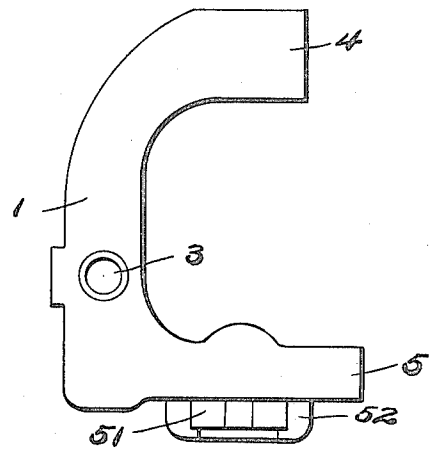


FIG. 5.

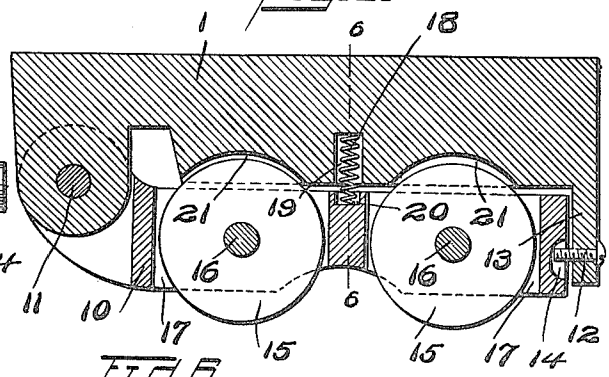


FIG. 6.

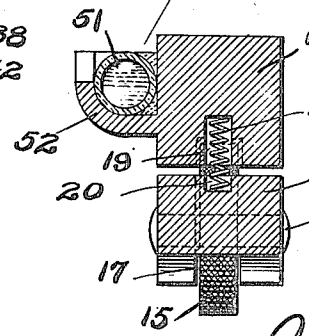
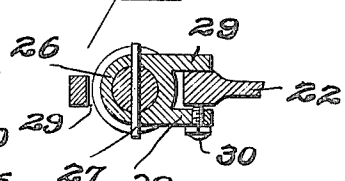


FIG. 7.



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DRILL.

1,247,341. Specification of Letters Patent. Patented Nov. 20, 1917.

Application filed November 11, 1913. Serial No. 800,256.

To all whom it may concern:

Be it known that I, CHARLES W. SKINNER, a citizen of the United States, residing at Newfield, in the county of Gloucester and State of New Jersey, have invented certain new and useful Improvements in Drills, of which the following is a specification.

My invention relates to improvements in drills and more particularly to an improved drill designed for drilling nozzle receiving openings in horizontally positioned irrigating pipes, the object of the invention being to provide an improved drill which will insure a uniform positioning of the holes and facilitate the drilling operation.

A further object is to provide improved means for clamping the drill on the pipe to be drilled.

A further object is to provide an improved construction of drill with improved means for adjusting the same to drill various sizes of pipe.

With these and other objects in view, the invention consists in certain novel features of construction and combinations and arrangements of parts as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings:

Figure 1 is a view in side elevation illustrating my improvements.

Fig. 2 is a view in elevation at right angles to Fig. 1.

Fig. 3 is a view in longitudinal section on the line 3—3 of Fig. 1.

Fig. 4 is a plan view of the drill supporting frame.

Fig. 5 is a view in section on an enlarged scale on the line 5—5 of Fig. 1.

Fig. 6 is a view in section on the line 6—6 of Fig. 5.

Fig. 7 is a view in section on the line 7—7 of Fig. 3.

1 represents a supporting frame which comprises a casting of somewhat U-shape in plan having an integral collar 2 intermediate its ends, in which a depending rod 3 is rigidly secured.

The frame 1, by reason of its shape, provides two substantially parallel arms 4 and 5, the former having perforated depending ears 6 in which the journal 7 of a roll 8 is mounted. The roll 8 is concaved and has a milled surface to rest upon the horizontal irrigating pipe 9 and assist in supporting the drill as will be more fully hereinafter described.

To the frame 1, below stationary arm 5, a movable arm 10 is pivotally connected at one end as shown at 11. This pivoted arm 10 is limited in its vertical movement by a screw 12 extending through a depending tongue 13 on the free end of arm 5 and into a recess 14 in the free end of pivoted arm 10.

Alined disks 15 are supported on journals 16 and are located in slots 17 in the pivoted arm 10. These disks 15 project above and below the arm 10, and their lower edges are adapted to engage the pipe 9 as shown clearly in Fig. 2.

A coiled spring 18 located in registering sockets 19 and 20, in stationary arm 5, and pivoted arm 10 respectively, exerts a downward pressure on the pivoted arm to hold the disks out of engagement with the curved inner walls of recesses 21 in stationary arm 5, but when pressure is applied, so that the disks bear firmly upon the pipe 9, the upper edges of said disks will be forced into contact with the walls of recesses 21, and prevent possibility of rotary movement of the disks and cause them to firmly grip the pipe.

On the rod 3, a bracket 22 is mounted to slide. This bracket 22 is adjusted vertically by means of a wing nut 23 screwed onto the threaded lower end 24 of the rod 3 and bearing against the lower end of a spacing sleeve 25. The upper end of said spacing sleeve bears against the bracket 22 as clearly shown in Fig. 3, so that when the nut 23 is turned, the bracket 22 will be adjusted on the rod to accommodate the drill to various sizes of pipe.

To prevent the bracket from turning on the rod, a sleeve 26 is pinned to the rod as shown at 27, and the bracket 22 is cut out as shown at 28 to accommodate the sleeve 26. Parallel lugs 29 are made integral with the sleeve 26 and are positioned at opposite sides of bracket 22. A set screw 30 located in one of said lugs 29 bears against the bracket 22 and may be adjusted if the parts wear to insure a proper engagement, preventing turning movement of the bracket and allowing the latter to be adjusted vertically.

The bracket 22 supports a vertically movable rotary drill spindle 31 to which a bev-

eled pinion 32 is keyed and is in mesh with a relatively large beveled driving gear 33 supported on a journal screw 34 and having a crank arm 35 secured thereto to turn the same. The upper end of the spindle 31 is provided with a chuck 36 to connect the drill tool 37 to the spindle. The drill tool illustrated is a combined drill and tap, so that when the opening is formed in pipe 9, it will be screw-threaded by the same operation and ready for the reception of the ordinary sprinkler nozzle.

The spindle 31 is moved vertically by a lever 38 which is pivotally connected near one end to a link 39 depending from and pivotally connected to the bracket 22. The extreme end of the lever 38 which is bifurcated is provided with inwardly projecting screws 40 engaging in a transverse opening 41 in a block 42, the latter having ball bearing connection with the spindle 31 as shown at 43, and secured on the spindle by nuts 44.

The bracket 22 is formed with an upwardly projecting support 45 to which an angle lever 46 is pivotally connected by means of a pin 47. The longer member of this angle lever constitutes a handle to manipulate the same, while the shorter member is bifurcated as shown at 48 to accommodate a concaved gripping roll 49 which is located upon a journal pin 50 as clearly shown.

A spirit level 51 is supported in a housing 52 integral with fixed arm 5, so that a glance at the spirit level will show whether or not the frame is in the horizontal position.

The operation is as follows:

The frame 1 is positioned on the pipe 9 to be drilled with the roll 6 and disks 15 supporting the entire weight of the drill. The drill may be moved laterally on the pipe 9 until the spirit level 51 indicates that the parts are in proper position when lever 46 is moved upwardly to press the roll 49 against the lower face of pipe 9, and the continued upward movement of this roll firmly grips the pipe between the roll 8, disks 15, and roll 49, and this gripping action is maintained when the roll 49 is moved slightly past the line of pivot 47.

When the roll 49 first moves upwardly, it will cause the disks 15 to move upwardly against the action of spring 19 until the upper surfaces of the disks engage the walls of recesses 21, when such upward movement is stopped, and the further movement of the roll 49 serves only to bind the disks 15 against rotary movement. Prior to this gripping action, the frame may be freely swung on the pipe 9, disks 15 revolving to permit this movement until the spirit level 51 shows a proper position when the operation of the lever 46 as above set forth firmly clamps the drill in position on the pipe.

The lever 38 is then operated to move the spindle 31 upwardly and move the drill tool 37 into engagement with the pipe 9. At the same time, driving gear 36 is revolved and motion transmitted to pinion 32 and to the spindle to turn the latter and drill an opening in the pipe 9, and at the same time screw thread the opening. The drill will then be moved along the pipe 9 the desired distance and another hole drilled, and all of the openings will be in perfect alinement.

By reference particularly to Fig. 2, it will be noted that the levers 38 and 46 are in alinement with the pipe 9, so that these levers exert a pressure in direct line with the pipe and do not tend to swing the rod 3 when they are operated as would be the case if they were not in line with the pipe. In other words, they exert a straight pressure and not a torsion one, and hence the operation is superior.

Various slight changes might be made in the general form and arrangement of parts described without departing from my invention, and hence I do not limit myself to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A device of the character described, comprising a frame, a rod rigidly secured to and depending from the frame, a drill mounted on the rod, a plurality of rotary devices on the frame spaced apart and adapted to be positioned on the pipe, and a movable member supported on the rod and adapted to be moved into engagement with the lower portion of the pipe and clamp the pipe between it and said rotary devices, said member being movable in a plane extending midway between said first rotary devices substantially as described.

2. A device of the character described, comprising a frame, a rod rigidly secured to and depending from the frame, a drill mounted on the rod, a plurality of rotary devices on the frame spaced apart and adapted to be positioned on a pipe, a movable member supported on the rod and adapted to be moved into engagement with the lower portion of the pipe and clamp the pipe between it and said rotary devices, said member being movable in a plane extending between said rotary devices, said rotary devices being movable relatively to the frame when forced upwardly by engagement with the pipe, substantially as described.

3. A device of the character described comprising a frame, a rod rigidly secured to and depending from the frame, a bracket mounted to move on the rod and comprising a drill support, a member movably connected

to the frame, disks supported by the member and adapted to engage the upper surface of a pipe, a movable device on the bracket adapted to engage the lower surface of a pipe and clamp the pipe between the same and said disks, and said disks when the movable device is operated to clamp, held against rotary movement, substantially as described.

4. A device of the character described, comprising a frame, a rod depending from the frame, a bracket movable on the rod, a drill spindle supported by the bracket, an arm pivotally connected to the frame, two disks having rotary mounting on the arm and adapted to engage the upper surface of a pipe to be clamped, a device on the bracket adapted to engage the pipe, and thus to move said disks into contact with the frame to lock them against rotary movement, substantially as described.

5. A device of the character described, comprising a frame, a rod depending from the frame, a bracket movable on the rod, a drill spindle supported by the bracket, an arm pivotally connected to the frame, two disks having rotary mounting on the arm and adapted to engage the upper surface of a pipe to be clamped, a device on the bracket adapted to engage the pipe, and thus to move said disks into contact with the frame to lock them against rotary movement, means for limiting the pivotal movement of the arm, and a spring exerting downward pressure on the arm, substantially as described.

6. A device of the character described, comprising a frame, a rod depending from the frame, a bracket movable on the rod, a drill spindle supported by the bracket, an arm pivotally connected to the frame, two disks having rotary mounting on the arm and adapted to engage the upper surface of a pipe to be clamped, a device on the bracket adapted to engage the pipe, and thus to move said disks into contact with the frame to lock them against rotary movement, and means for limiting the pivotal movement of the arm, substantially as described.

7. A device of the character described comprising a frame having parallel arms, a roller connected to one arm, and a pair of disks connected to the other arm, said roller and disks adapted to be positioned upon a pipe, a rod depending from the frame, a bracket on the rod, a vertically movable drill spindle supported by the bracket, a clamping lever supported by the bracket and having a roller adapted to engage the under side of a pipe upon which the first-mentioned roller and disks are supported to draw said roller and disks into clamping engagement with the pipe, and a lever in line with the clamping lever and adapted to move the spindle vertically, substantially as described.

8. A device of the character described comprising a frame having parallel arms, a roller connected to one arm, and a pair of disks connected to the other arm, said roller and disks adapted to be positioned upon a pipe, a rod depending from the frame, a bracket on the rod, a vertically movable drill spindle supported by the bracket, a clamping lever supported by the bracket and having a roller adapted to engage the under side of a pipe upon which the first-mentioned roller and disks are supported, to draw said roller and disks into clamping engagement with the pipe, and means for adjusting the bracket vertically on the rod, substantially as described.

9. A device of the character described comprising a frame having parallel arms, a roller connected to one arm, and a pair of disks connected to the other arm, said roller and disks adapted to be positioned upon a pipe, a rod depending from the frame, a bracket on the rod, a vertically movable drill spindle supported by the bracket, a clamping lever supported by the bracket and having a roller adapted to engage the under side of a pipe upon which the first-mentioned roller and disks are supported, to draw said roller and disks into clamping engagement with the pipe, a spirit level supported on one of said arms, said rod having a screw-threaded lower end, an adjusting nut in said screw-threaded lower end and a spacing sleeve around the rod between the bracket and the nut, means for moving the spindle longitudinally, and means on the bracket for imparting a rotary movement to the spindle, substantially as described.

10. A device of the character described, comprising a frame adapted to be positioned over a pipe to be drilled, a rod depending from the frame, a bracket on the rod, a sleeve fixed to the rod and having lugs at opposite sides of the bracket, and a set screw in one of said lugs bearing against the bracket, a drill spindle supported by the bracket, means on the bracket for imparting a rotary movement to the spindle, means for moving the spindle longitudinally, and means for clamping a pipe between the frame and the bracket, substantially as described.

11. A device of the character described, comprising a frame adapted to be positioned over a pipe to be drilled, a rod depending from the frame, a bracket on the rod, a sleeve fixed to the rod and having lugs at opposite sides of the bracket, a set screw in one of said lugs bearing against the bracket, a drill spindle supported by the bracket, means on the bracket for imparting a rotary movement to the spindle, means for moving the spindle longitudinally, means for clamping a pipe between the frame and the bracket, and means for adjusting the bracket

longitudinally on the rod, substantially as described.

12. The combination with a rod, a bracket adjustable vertically on the rod, a drill spindle supported in the bracket, a link pivotally connected to the bracket and depending therefrom, a lever pivotally connected near one end to said link and at one end to the spindle, whereby the movement of the lever causes the spindle to move longitudinally in the bracket, and means supported on the bracket for imparting a rotary movement to the spindle, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES W. SKINNER.

Witnesses:

S. W. FOSTER,

C. R. ZIEGLER.