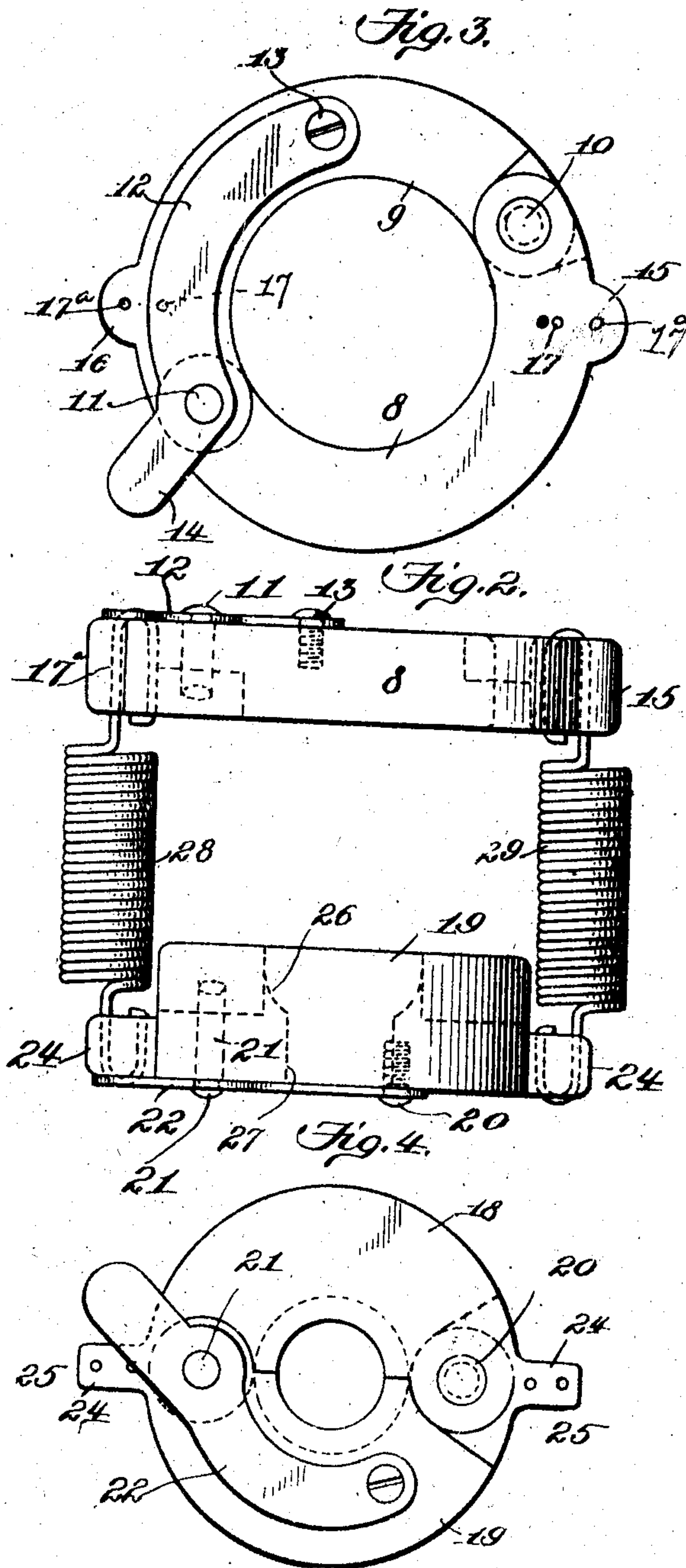
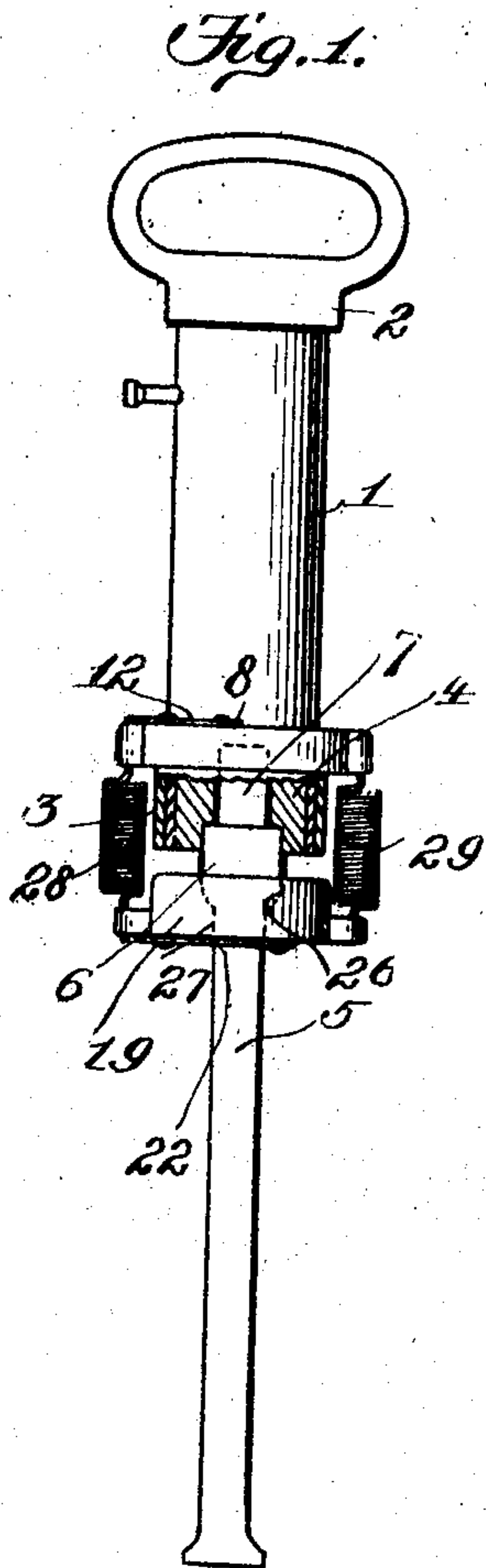


No. 834,153.

PATENTED OCT. 23, 1906.

J. MURPHY.
DRILL.

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Witnesses:
C. D. Kesler
J. B. Kesler

Inventor
Jeremiah Murphy
By *James L. Vorrig*
Atty

UNITED STATES PATENT OFFICE.

JEREMIAH MURPHY, OF DENVER, COLORADO, ASSIGNOR TO CHARLES T. CARNAHAN, OF DENVER, COLORADO.

DRILL.

No. 834,153.

Specification of Letters Patent.

Patented Oct. 23, 1906.

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To all whom it may concern:

Be it known that I, JEREMIAH MURPHY, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented new and useful Improvements in Drills, of which the following is a specification.

This invention relates to percussive drills generally employed for drilling and boring when mining, and aims to provide a drill of such class with means hereinafter more specifically referred to for moving or loosening the tool from the wall of the bore in case the tool should become fast or stick, and, furthermore, said means is adapted during the operation of the drill to always position the shank of the tool in one end of the cylinder or body portion of the drill, so that the hammer of the drill will always strike the end of the shank of the tool, thereby preventing the hammer striking against the tool-holder or bushing, so that under such conditions when the drill is operated the tool-holder or bushing will not become loosened or worn out.

The invention further aims to provide a percussive drill with means for the purpose set forth which shall be simple in its construction, strong, durable, automatic in its action when positioning the tool, comparatively inexpensive to manufacture, and conveniently set up in position.

With the foregoing and other objects in view the invention consists in the novel construction, combination, and arrangement of parts hereinafter more specifically described, illustrated in the accompanying drawings, which form a part of this specification, and wherein is shown the preferred embodiment of the invention; but it is to be understood that changes, variations, and modifications may be resorted to which come within the scope of the claims hereunto appended.

In the drawings, wherein like reference characters denote corresponding parts throughout the several views, Figure 1 is a side elevation of a percussive drill, partly in section and showing, by way of example, the means for removing or loosening the tool and for positioning the shank of the tool for the purpose set forth. Fig. 2 is a side elevation of the means for withdrawing or loosening the tool and for positioning the shank thereof. Fig. 3 a top plan, and Fig. 4 is a bottom plan, of said means.

Referring to the drawings by reference characters, 1 denotes the cylinder of the drill; 2, the cap for one end thereof; 3, the cap for the other end thereof; 4, the tool-holder or bushing; 5, the tool; 6, the shoulder formed on the tool, and 7 the shank of the tool, which is adapted to receive the blows of the hammer of the drill and which is of such length as to normally extend above the tool-holder or bushing 4.

The means for withdrawing the tool from the bore or for loosening the tool within the bore and also for positioning the shank of the tool so that said shank will always receive the blows of the hammer of a drill comprises what may be termed a "cylinder-receiving" member and a "tool-receiving" member, connected by a plurality of distensible and contractible springs, to be hereinafter referred to. The cylinder-receiving member consists of a collar formed of two sections 8 9, having their ends overlapped, and the said sections 8 9 are pivoted together, as at 10, and are also connected together through the medium of the removable pin 11, engaging in suitable alining openings formed in the sections 8 9, and the said pin 11 is carried by a shiftable spring-arm 12, which is swiveled, as at 13, to the section 9. The pin 11 is carried by the arm 12 at a point removed from its free end, and said arm 12 is so constructed as to form a handle portion 14. The sections 8 9 are formed with diametrically opposite apertured ears 15 16, and each of said sections is further provided with an opening 17, arranged in alinement with the opening in its respective ear. The cylinder-receiving member is adapted to clamp around the cylinder 1 in close proximity to the top edge of the cap 3, and the opening in the said member is of such diameter that when the member clamps the cylinder it will be in an unusually snug manner. The sections 8 9 of said member, as before stated, are connected together through the medium of the pin 11, and by shifting the arm 12 the pin 11 will be elevated so as to pass out of the section 8, and the sections can then be swung open and removed from the cylinder 1. The tool-receiving member consists of a collar formed of two sections 18 19, which have their ends overlapped and are pivotally connected together, as at 20. The said sections 18 19 are also detachably connected through the medium of

a removable pin 21, which extends in aligning openings formed in the said sections, and the said pin 21 is carried by a shiftable spring-arm 22, which is swivelly connected 5 with the section 19, as at 21. The sections 18 19 are provided with a pair of laterally-extending ears 24, which are arranged diametrically opposite with respect to each other, and each of the said ears 24 is provided with a pair of openings 25. The inner 10 face of each of the sections 18 19 is cut away so as to form an opening 26 to receive the shoulder 6 and to also provide an opening 27, through which extends the tool 5, said opening 27 being of less diameter than the opening 26. The tool-receiving member is so constructed that when it surrounds the tool it will tightly clamp the same. The distensible 15 and contractible springs are indicated by the reference characters 28 29, and said springs are closely coiled, and each of said springs at one end extends up and through the openings 17^a, formed in the ears of the cylinder-receiving member, and down and through the 25 openings 17 and then bent at an angle to engage the inner face of the cylinder-receiving member, so as to fixedly connect the upper ends of the springs thereto. By this arrangement the springs 28 29 are fixedly connected to the cylinder-receiving member. 30 The other end of each of the springs extends in and through the outer opening of the pair of openings 25 of the ears 24 and then up and through the inner opening of the pair of openings 25 and then bent to engage the inner face 35 of the apertured ears, so as to fixedly connect the lower ends of the springs thereto. By such an arrangement the springs 28 29 are fixedly connected to the tool-receiving member. 40 The function of the springs 28 29 is to withdraw or loosen the tool in case the same should become fast or stick in the bore, and said springs 28 29 also act as a means for withdrawing the tool so as to retain the 45 shank thereof above the tool-holder or bushing 4, so that the shank of the tool will receive the blows of the hammer.

The manner in which the means operates in case the tool becomes fast or sticks in the 50 bore is as follows: The motive fluid is turned on partly, so as to allow the hammer to hit a light blow and at the same time the operator can pull back with the cylinder. The light blows of the hammer will tend to loosen the 55 tool, the springs will assist to withdraw the tool, and owing to the action of pulling back of the cylinder by the operator the tool will be withdrawn. During the operation of the drill the hammer as it strikes the tool will 60 force the tool forward. At the same time, owing to the position of the shoulder 6, when the bore moves forward the tool-receiving member will be carried with the tool, thereby distending the springs 28 29. When the

hammer moves in an opposite direction, the 65 springs 28 29 will come into play, or, in other words, contract, and this action will cause the tool-receiving member to move toward the cylinder and carry the tool therewith and at the same time move the shank of the tool 70 in the path of the hammer.

It will be evident when the drill becomes stuck and loosened in a manner as hereinbefore set forth it can be readily and quickly 75 caused to resume its operative position, and also, owing to the manner in which the tool is connected with the cylinder, the entire drill can be conveniently laid aside without possibility of the tool separating from the drill, 80 overcoming the necessity of holding the tool when removing the drill and replacing the tool in the drill-body when it is desired to use the drill.

Having thus fully described the invention, what I claim as new, and desire to secure by 85 Letters Patent, is—

1. Means for withdrawing a tool from a bore, consisting of a stationary and a movable clamping element, each consisting of a pair of sections hinged together at one end 90 and a spring member carrying means detachably engaging with the sections for connecting the other ends together, combined with a plurality of spring elements having their upper ends fixed to the stationary element and 95 their lower ends fixed to the movable element.

2. Means for withdrawing a tool from a bore, consisting of a stationary and a movable clamping element, said stationary element having an opening and said movable 100 element having an opening, the opening through the movable element having one portion of greater diameter than the other portion, combined with a plurality of spring 105 elements having the upper ends thereof extending through and fixed to the stationary element and their lower ends extending through and fixed to the movable element.

3. Means for withdrawing a tool from a 110 bore, consisting of a stationary and a movable clamping element, each of said elements consisting of two sections, each pair of sections hinged together at one end and having 115 their other ends overlapping each other, and a spring clamping member carrying means for detachably connecting the overlapping ends of each pair of sections, combined with a plurality of spring elements having upper 120 and lower projecting ends, the upper projecting ends of said spring elements fixedly secured to said stationary member and the lower projecting ends to said spring elements fixedly secured to said movable element.

4. Means for withdrawing a tool from a 125 bore, consisting of a stationary and a movable clamping element, said stationary element provided with a pair of diametrically

opposite apertured ears and further provided with openings in alinement with the openings through the ears, and said movable element provided with a pair of ears each having a pair of openings, combined with a plurality of spring elements having upper and lower projecting ends, said upper projecting ends of said spring elements extending up through the apertures in the ears of the stationary element and down through the openings in said stationary element and then bent at right angles to abut against the stationary element, thereby fixedly connecting the upper projecting ends of said spring elements to the stationary element, said lower projecting ends of said spring elements extending down through one of the apertures of the ears of said movable element and then up through the other apertures of the ears of said movable element and then bent at right angles to abut against the ears of the movable element, thereby fixedly connecting the lower project-

ing ends of the spring elements to the movable element.

5: Means for withdrawing a tool from a bore, consisting of a stationary and a movable clamping element, each provided with an opening, the opening through the movable element having one portion of greater diameter than the other portion, each of said elements provided with a pair of apertured ears, combined with a plurality of spring elements having the ends thereof extending through the ears of said stationary and movable element and fixedly connected to said stationary and movable element.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JEREMIAH MURPHY.

Witnesses:

C. T. CARNAHAN,
ANNA ROSENBAUM.