(No Model.)

2 Sheets—Sheet 1.

A. BALL.

DRILL CLAMP FOR STONE CHANNELING MACHINES.

No. 549,624. Patented Nov. 12, 1895.

Fig. 1.

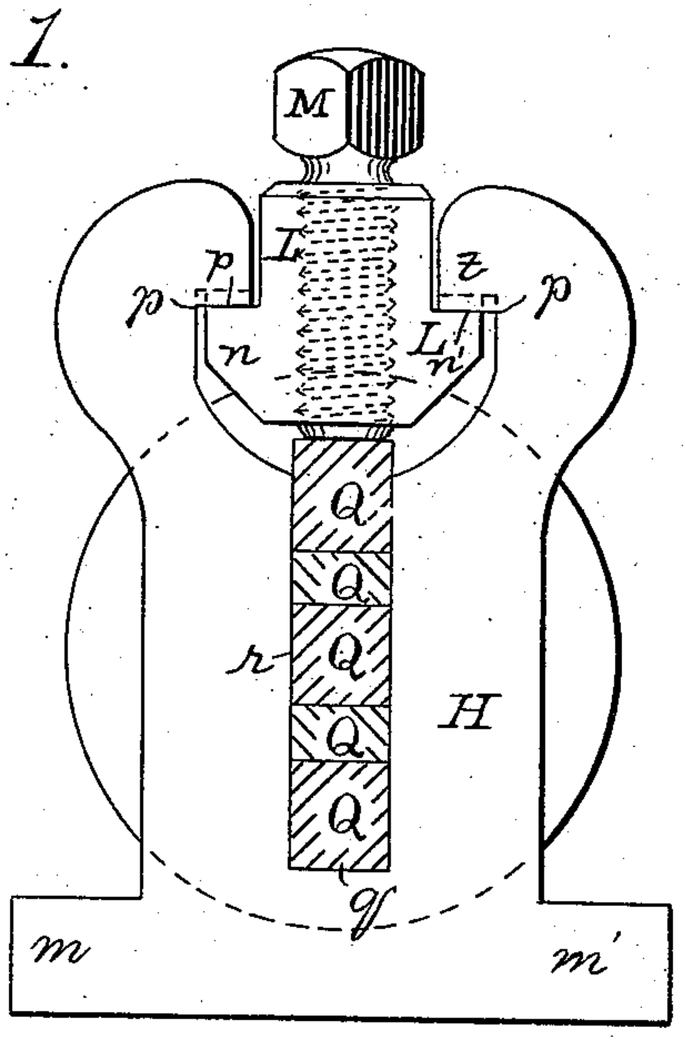


Fig. 2.

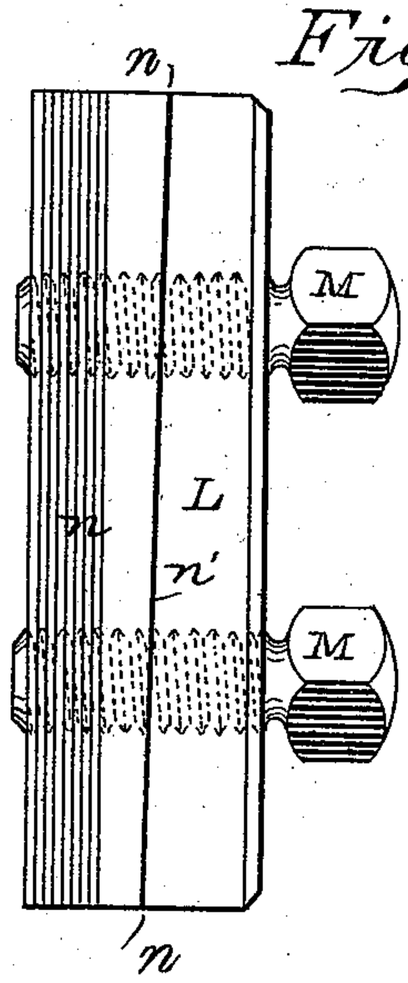
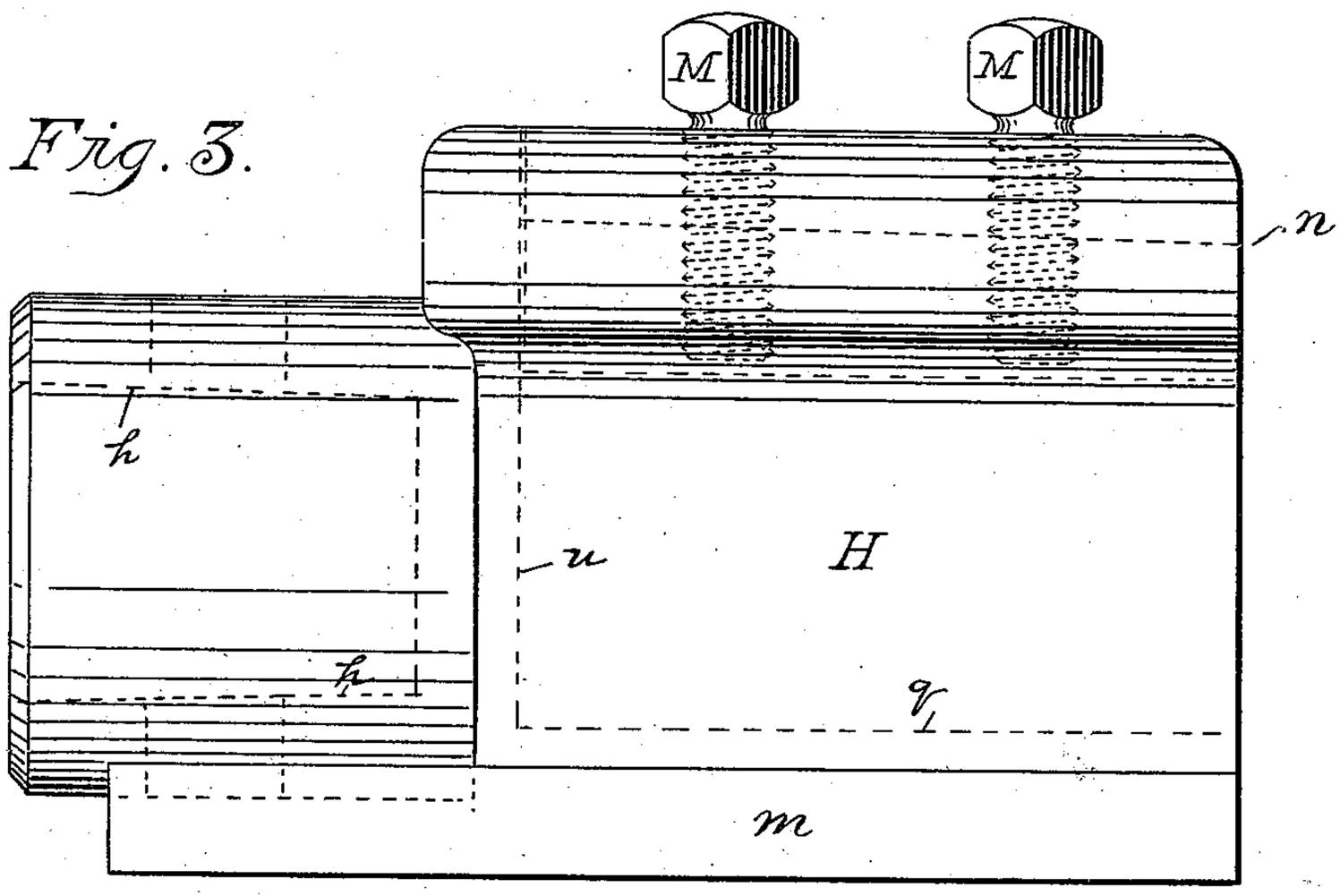


Fig. 3.



Witnesses:
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(No Model.)

2 Sheets—Sheet 2.

A. BALL.

DRILL CLAMP FOR STONE CHANNELING MACHINES.

No. 549,624. Patented Nov. 12, 1895.

Fig. 4.

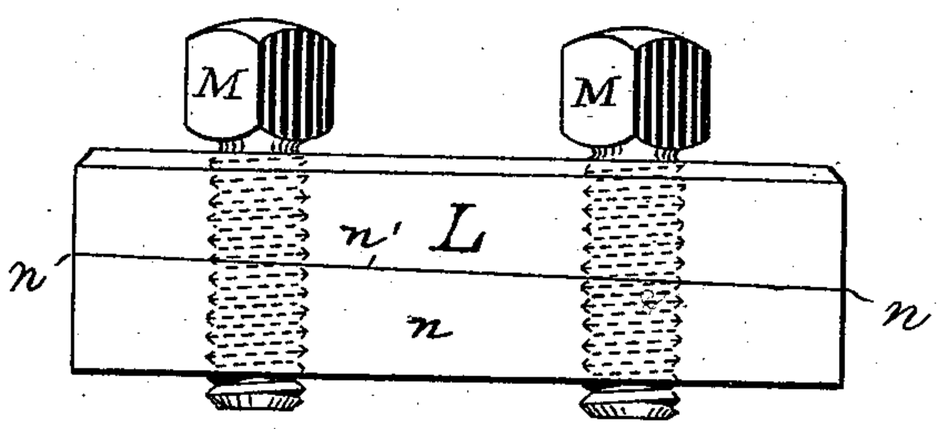


Fig. 5.

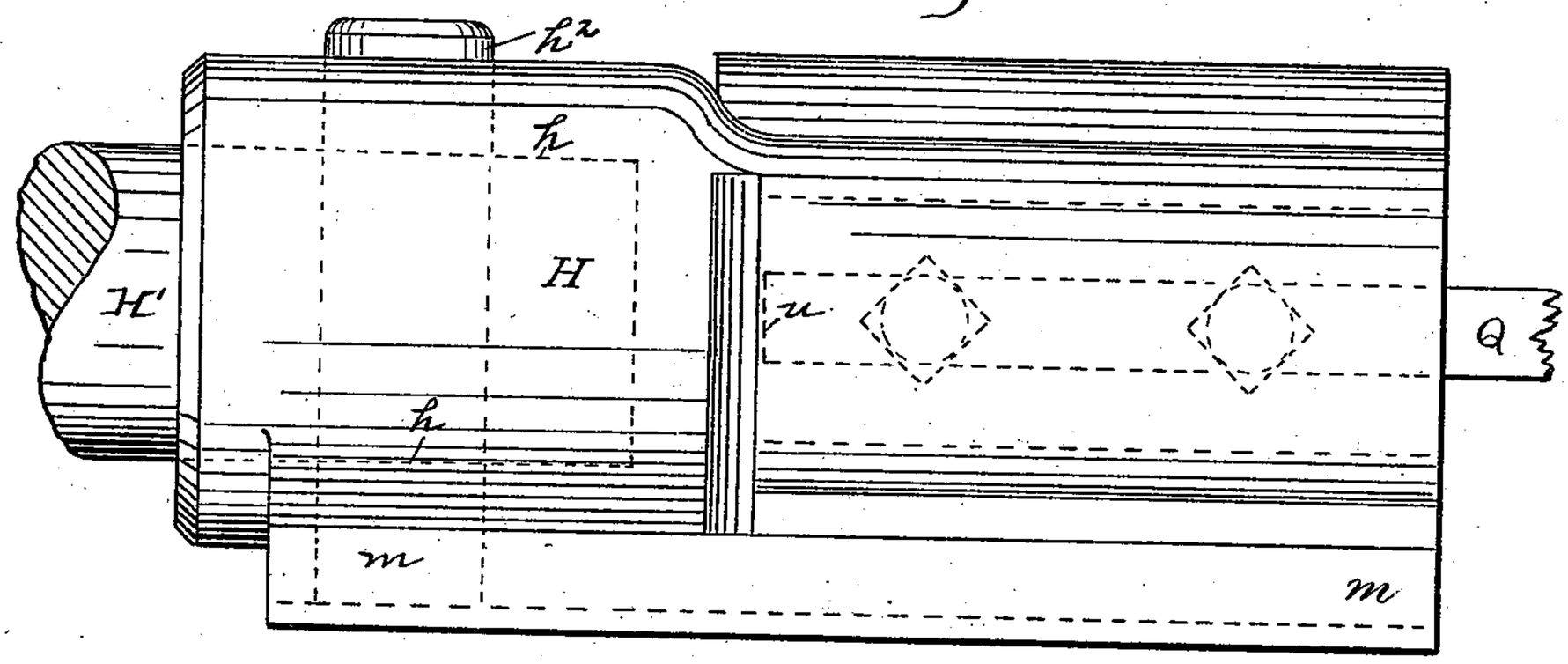
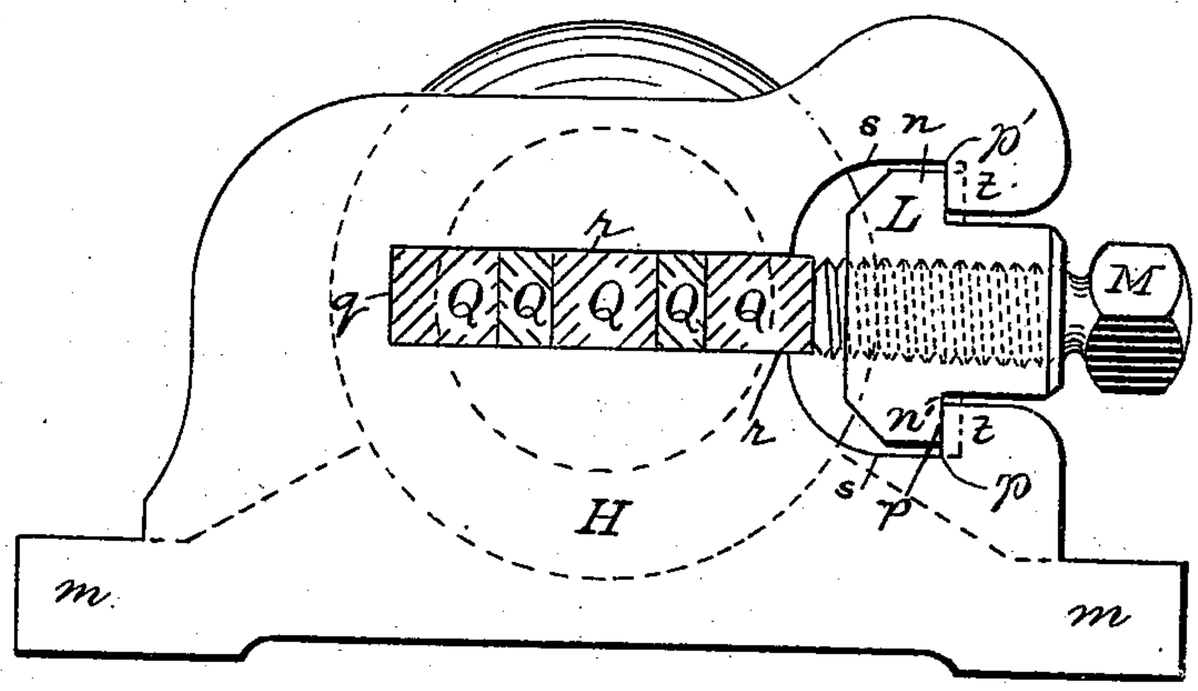


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALBERT BALL, OF CLAREMONT, NEW HAMPSHIRE, ASSIGNOR TO THE SULLIVAN MACHINERY COMPANY, OF SAME PLACE AND CHICAGO, ILLINOIS.

DRILL-CLAMP FOR STONE-CHANNELING MACHINES.

SPECIFICATION forming part of Letters Patent No. 549,624, dated November 12, 1895.

Application filed December 14, 1892. Serial No. 455,190. (No model.)

To all whom it may concern:

Be it known that I, ALBERT BALL, a resident of Claremont, in the county of Sullivan and State of New Hampshire, have invented a new and useful Improvement in Drill-Clamps for Stone-Channeling Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to drill-clamps—that is, clamps for holding drilling-tools—and has special reference to that class of drill-clamps in which a gang or number of drilling-tools in line with each other is held in the drill-clamp—such, for example, as in channeling-machines. The ordinary drill-clamps for holding a gang of drills as heretofore employed acted to hold the drills upon their side edges by means of a clamping-block which itself bore against all of the drills in the gang, and in which several parts were required in order to grasp and hold the gang of drills, and these parts were liable to breakage, as so strong a clamp as desired could not be formed with so many separate parts, while at the same time, as the bodies of the drills could not well be formed accurately to the same thickness, the clamping-block would only bear upon the higher bars or drill-faces, and the ones which were not so thick were not held firmly to place or required additional means for holding them.

In the present invention I employ a clamp-body having formed therein a deep seat corresponding in width to the drills and of a depth sufficient to receive a number or a gang of drills, and a clamp-block engaging with the clamp-body and having set-screws or like devices adapted to bear on the outer drill of the gang and clamp the gang of drills against the base of the seat, the clamping action being thus in the direction of the gang or series of drills and the clamping pressure being exerted from the outer drills of the gang upon those between them, instead of upon the face or wide side of the gang of drills; and on account of the simplicity of construction of the clamp a very heavy and strong clamping device is provided, which occupies but comparatively little space.

The particular points of invention desired to be covered will be hereinafter decribed and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is an end view of a drill-clamp embodying the invention, in which the drills are held in a plane at right angles to the guides in which the cross-head travels. Fig. 2 is a side view of the clamp employed with the same, and Fig. 3 is a side view of the cross-head and drill-clamp when so employed. Figs. 4, 5, and 6 are views showing the combined clamp and cross-head where the drills are held in a plane parallel to the cross-head guides.

Like letters of reference indicate like parts in each view.

I have illustrated my improved clamp in connection with a cross-head of the channeling or drilling machines, as it is preferred to form the cross-head and clamp in a single piece for the purpose of strength and rigidity, the combined cross-head and clamp H having the seat *h* to receive the piston-rod H′, which is connected to the cross-head by the key h^2. The clamp proper is provided with the seat *r* to receive the gang of drills Q, this seat corresponding in depth to the width of the gang of drills to be inserted therein, the base *q* of the seat receiving one outer drill of the gang and forming the abutment against which the pressure is exerted by the clamping-block L. This seat *r* corresponds substantially in width to the width of the bodies of the drills, being of sufficient width to receive the same, the drills fitting neatly within, as shown, the drill-seat being made of sufficient width to accommodate the slight irregularity in the width of the drill-bodies. In the drawings five of these drills are shown in line, fitting within the seat *r*. The clamp-body H is provided above the seat with the enlarged recess *s* to receive the clamp-block L, and above the said recess has the inwardly-extending flanges *t*, under which the lips or flanges *n* of the clamp-block L extend. The ends of the drills fit against the end *u* of the seat *r*, (shown in dotted lines,) and as the socket H′, to which the

piston-rod is connected, extends somewhat above the recess *s*, the clamp-block L is inserted from the front of the clamp, the lips or flanges *n* catching under the lips *t* of the clamp-block. The combined cross-head and clamp-block is provided with the guides *m*, which are adapted to fit within suitable guideways for the movement of the cross-head, which are not shown. The clamp-block L is clearly shown in the several figures, and it will be noticed in the side views, Figs. 2 and 4, that the faces *n'* of the flanges *n* are formed at a slight incline to the body of the clamp, while the faces *p* of the flanges *t* of the clamp-body are correspondingly inclined, so that as the clamp is secured in place and the set-screws M are brought to bear on the drills it will be difficult to jar the clamp-block forward on account of the wedge connection between the clamp and its block, the clamp-block being held within the clamp in this way, and any such jarring action tending to hold the block more firmly in place. I have shown two set-screws M passing through the clamp-block in line with the seat *r* in the clamp, though any suitable number of set-screws may be employed, according to the size of the clamp and the length of the seat *r*. While I prefer to employ these set-screws bearing upon the drills, any other suitable clamping mechanism exerted from the clamp-block L or forcing the block itself against the gang of drills may, of course, be employed.

The two forms of clamping-blocks shown in the drawings differ from each other only in the position of the seat for the drills, whether on a plane at right angles to the guide for the cross-head or parallel therewith, the clamp of Figs. 1, 2, and 3 being generally employed for channeling at an angle to the travel of the machine, while the clamp of Figs. 4 and 6 is employed for channeling in a line parallel with the travel of the machine.

When the clamp is in use the number of drills forming the gang are inserted within the seat *r*, the faces of the gang being confined by said faces of the seat, and the end or edge face of one of the outer drills of the gang bearing against the base *q* of the seat. The clamp-block L is then inserted in place, its lips *n* fitting under the flanges *t* of the clamp-body, and the set-screws are then turned so as to bear against the outer edge of the other outer drill in the gang, the gang of drills being thus clamped between the screws M and the base *q* of the seat *r*, and the pressure being thus exerted through the entire gang of drills, so that they are firmly bound together and a sufficiently strong clamping action obtained, no matter what the relative thickness of the several drills in the gang may be. It is found by actual use that in this form of clamp the entire gang of drills is held firmly to place, while, as but few parts are employed, all these parts may be made so heavy and strong that they can withstand all strain brought upon them, liability of breakage being reduced to a minimun. The clamp can also be made at lower cost than the old forms of clamps, because it contains but few parts and does not require so much finishing or dressing as where many parts required to fit accurately together are employed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In drill clamps for gang drills, the combination of an integral clamp body having formed therein a depression or seat corresponding to the width of the drills and of depth sufficient to receive a number or gang of drills, and having an open mouth, and a removable clamp engaging with the clamp body and closing the open mouth or end of the seat, and a means to confine the drills within the same by edge pressure between the clamp and the base of the seat, substantially as set forth.

2. In drill clamps for gang drills, the combination of an integral clamp body having formed therein a depression or seat corresponding to the width of the drills at a depth sufficient to receive a number or gang of drills and having an open mouth or end, and a clamp block engaging with the clamp body and closing the open end of the seat and having set screws adpted to bear on the outer drill of the gang and clamp the gang against the base of the seat, substantially as set forth.

3. In drill clamps for gang drills, the combination of a clamp body having formed therein a seat corresponding to the width of the drills and of depth sufficient to receive a number or gang of drills, and having inwardly extending flanges above said seat and a clamp block provided with lips adapted to extend under said inwardly extending flanges, and having set screws in line with the seat of the clamp, substantially as set forth.

4. In drill clamps for gang drills, the combination of a clamp body having formed therein a seat corresponding in width to the drills, and of depth sufficient to receive a number or gang of drills, and having above the seat inwardly extending flanges provided with tapering or wedge-shaped faces, and a clamp block having lips extending under said flanges, said lips having tapering or wedge-shaped faces, substantially as set forth.

5. A combined cross-head and drill clamp, having formed in one piece the cross head and clamp body, said clamp body having a seat therein corresponding in width to the drill and of depth sufficient to receive a number or gang of drills, and a clamp engaging with the clamp body and having means to confine the drills by edge pressure within the seat in the clamp body, substantially as set forth.

In testimony whereof I, the said ALBERT BALL, have hereunto set my hand.

ALBERT BALL.

Witnesses:
GEO. O. BALL,
GEO. E. WOLCOTT.