

A. BALL.
DRILL COLUMN.

No. 568,470.

Patented Sept. 29, 1896.

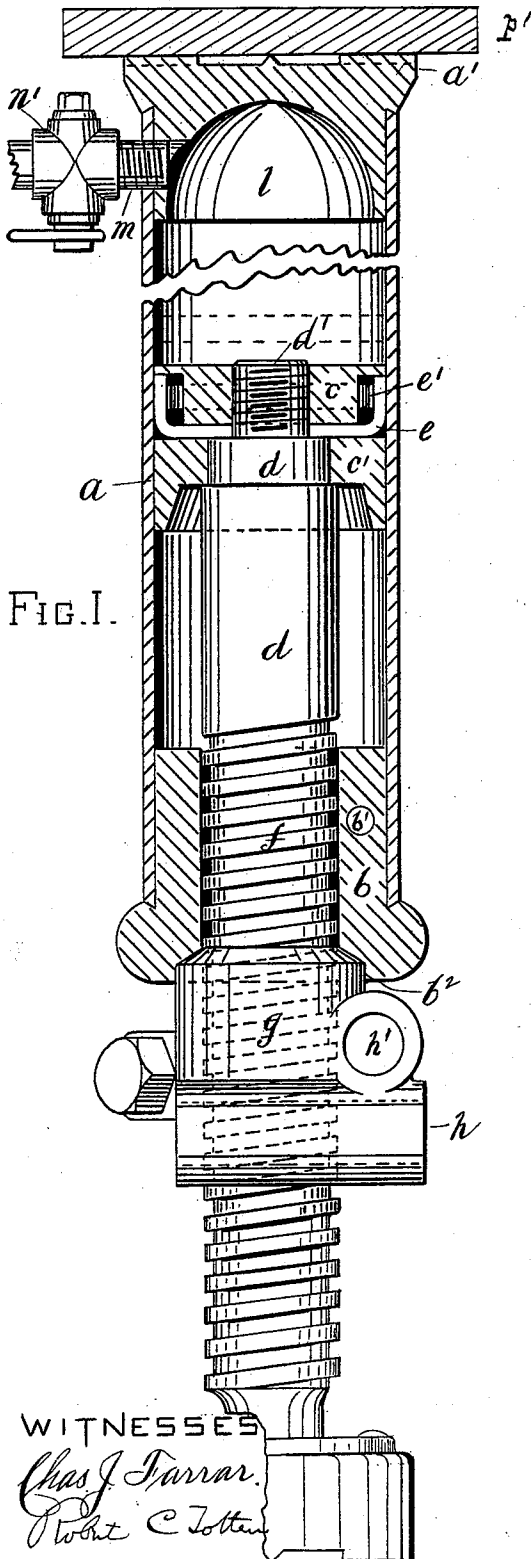


FIG. 2.

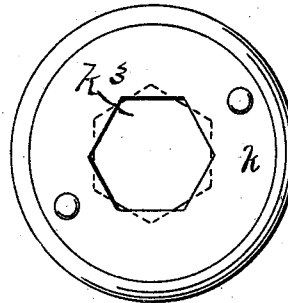
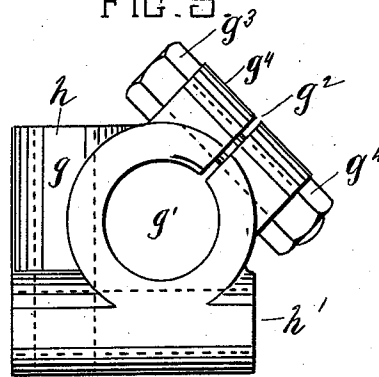


FIG. 3.



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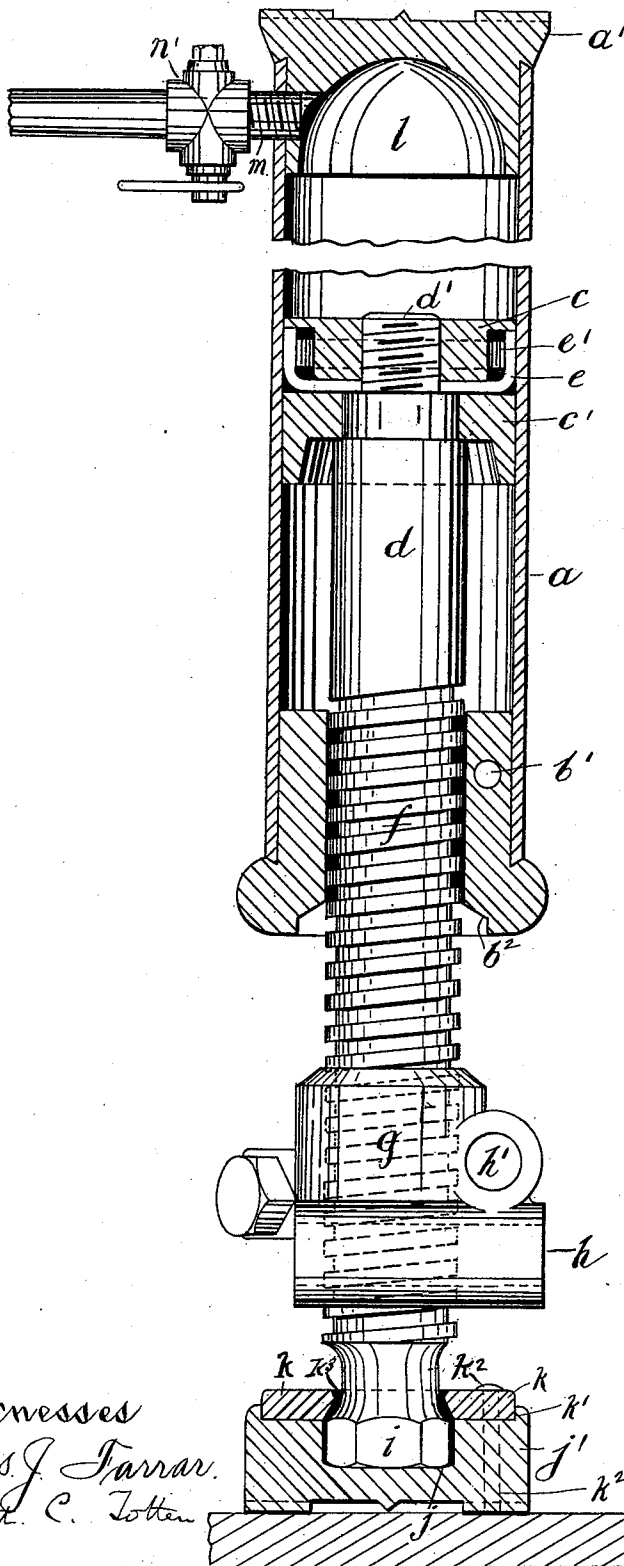


Fig. 4.

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UNITED STATES PATENT OFFICE.

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

DRILL-COLUMN.

SPECIFICATION forming part of Letters Patent No. 568,470, dated September 29, 1896.

Application filed September 24, 1895. Serial No. 563,479. (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-Columns; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to columns or posts for supporting rock or other drills.

The object of my invention is to provide a column which can be quickly and securely adjusted into position with reference to the blocking without the labor and difficulty heretofore encountered in the placing of the column. Heretofore the common method employed has been for one man to support the column while another tightened up the threaded rod forming the foot-piece. This, however, was a slow and tedious operation, as the blocking is liable to slip, and there is no certainty of its remaining secure in position until it is firmly pressed by the foot-blocks.

My invention comprises, generally stated, an extensible column having an air-chamber therein, foot-blocks for engaging with the blocking, a supply-pipe for delivering compressed air to said air-chamber, and a nut for holding said column in its raised position after the air has done its work.

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 a vertical section of my improved column. Fig. 2 is a view of the foot-block and plate for holding the threaded bar in position. Fig. 3 is a view of the revolving nut, and Fig. 4 is a view showing the nut lowered.

Like letters indicate like parts in each of the figures.

The main portion of the column consists of the hollow body portion *a*, which has at the upper end thereof the top head *a'* and at the lower end thereof the guide-bushing *b*, held in position by the pin *b'*. Within the hollow

body portion *a* is the piston, said piston consisting of the upper half *c* and of the lower half *c'*. The piston is mounted on the threaded bar *d*, the upper half *c* of said piston being engaged by the threaded portion *d'* of said bar, while the lower half *c'* of the piston is rigidly secured to said threaded bar *d*. The leather or other suitable packing *e* is placed between the upper and lower halves *c c'* of the piston and serves to make the joint tight and prevent the air passing by the piston-head. The spring *e'* is interposed between the upper half *c* of the piston and the leather packing *e* to force said packing out against the inner wall of the column, and so aiding to secure a tighter joint.

The threaded bar *d* has the threaded portion *f*, said threaded portion *f* being engaged by the revolving nut *g*. This revolving nut *g* has the threaded opening *g'*, and is separated, as at *g²*. A bolt *g³* passes through lugs *g⁴* on said revolving nut, whereby said revolving nut may be clamped securely to the threaded bar and prevent its working down while the drill is in operation. The revolving nut *g* has also the sockets *h h'* to receive the bar employed in turning said nut. The bushing *b* has the seat *b²*, adapted to receive the upper end of the revolving nut *g*, said seat acting as a guide for the top of said nut.

The threaded bar *f* has the hexagonal head *i*, which is adapted to fit within a correspondingly-shaped seat *j* in the foot-block *j'*. The locking-plate *k*, fitting within a recess *k'* in the foot-block *j'* and riveted to said foot-block by means of rivets *k²*, locks the hexagonal head *i* in the seat *j* of the foot-block *j'* and prevents the withdrawal of said head *i*.

The locking-plate *k* has the hexagonal opening *k³*, which permits said plate to be slipped over the hexagonal head *i*, whereupon said plate is turned to bring the angles at or about the mid-points of the sides of the hexagonal seat *j* of the foot-block *j'*, as shown in Fig. 2. The threaded bar *f* is thus held from turning, while the foot-block *j'* is free to adjust itself to the blocking. By having the locking-plate *k* within the rest *k'* of the foot-block *j'* there

is no strain upon the rivets k^2 except the clamping strain and that required to hold said plate in position. The compressed air, steam, or other force employed is admitted to the air-chamber l within the column by means of the pipe m , controlled by a valve n . This valve n is preferably a two-way valve, so that the air can be discharged readily from the column should the blocking prove to have been wrongly situated and it should be desired to change the position of the column.

When it is desired to adjust my improved column in position, the blocking p , usually a block of wood, is placed beneath the foot-block j' on the floor of the mine, while the blocking p' is held up against the roof of the mine above the top head a' . The compressed air is admitted to the chamber l by means of the pipe m , whereupon the hollow body portion a will be forced up until the top head a' is brought into contact with the blocking p' , as shown in Fig. 4. This will raise the column, the piston being lowered therein, and hold the foot-block and top head tightly against the blocking, whereupon the operator can quickly turn the revolving nut g and feed it up the threaded bar f until said nut comes into contact with the bushing b . Then by a few more turns the said nut g , in contact with the bushing b of the column, gives the necessary pressure to hold said column rigidly in place, as shown in Fig. 1. The air admitted to the chamber l can then be discharged, if desired, as the nut g of itself is sufficient to hold the column securely in place.

As stated before, the bolt g^3 may then be tightened up on the nut g to clamp said nut securely in position and prevent its working down during the operation of the drill. In the same manner when it is desired to lower the column the operator turns on the compressed air which holds the column in position until he lowers the nut the required distance, whereupon by discharging the air the body portion descends.

The column may be adjusted to position by one man, as it does not require any one to hold up the column while the nut g is being turned. The column being held up by the pressure of the air gives the one man plenty of opportunity to turn the revolving nut g until it of itself affords sufficient pressure to hold the column in position. In case the operator should not get the blocking quite in proper position, by simply allowing a portion of the air to escape, the column will be lowered sufficiently to allow him to adjust the blocking in proper position, when by turning on the air the top head will be forced into contact with the blocking. It will thus be seen that the device can be readily operated by one man and that without the labor or difficulty heretofore experienced in securing these columns in position.

I do not limit myself to a column used in a vertical position, as there may be cases in

which it may be applied in a horizontal position.

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

1. In a column for supporting drills, a hollow body portion, a piston within said hollow body portion, a threaded bar connected to said piston, a nut on said bar adapted to engage said hollow body portion, and means for supplying compressed air to said hollow body portion, substantially as and for the purpose set forth.

2. In a column for supporting drills, a hollow body portion having a valve-controlled inlet, a piston within said hollow body portion, a threaded bar secured to said piston, a revolving nut on said threaded bar, said nut being adapted to engage said body portion, a foot-block, said threaded bar having a non-rotary connection with said foot-block, substantially as and for the purpose set forth.

3. In a column for supporting drills, a hollow body portion having a valve-controlled inlet, a piston within said hollow body portion, a threaded bar secured to said piston, a revolving nut on said threaded bar, said nut being adapted to engage said body portion, a polygonal head on said threaded bar, a foot-block having a correspondingly-shaped seat therein adapted to receive said head, and a locking-plate for retaining said head within said foot-block, substantially as and for the purpose set forth.

4. In a column for supporting drills, a hollow body portion having a valve-controlled inlet, a piston within said hollow body portion, a threaded bar secured to said piston, a bushing at the inner end of said hollow body portion, a revolving nut on said threaded bar, said nut being adapted to engage said bushing, and a foot-block, substantially as and for the purpose set forth.

5. In a column for supporting drills, a hollow body portion having a valve-controlled inlet, a piston within said hollow body portion, a threaded bar secured to said piston, a revolving nut on said threaded bar adapted to engage said body portion, a polygonal head on said threaded bar, a foot-block having a correspondingly-shaped seat therein adapted to receive said head, a locking-plate having a polygonal opening therein, said foot-block having a recess formed therein to receive said locking-plate, and means for holding said locking-plate therein, substantially as and for the purpose set forth.

6. In a column for supporting drills, a hollow body portion having a valve-controlled inlet, a piston within said hollow body portion, a threaded bar connected to said piston, a nut on said bar adapted to engage said hollow body portion, said nut being split, and mechanism for tightening said nut around said threaded bar, substantially as and for the purpose set forth.

7. In a column for supporting drills a thread-

ed bar having a polygonal head, a foot-block
having a correspondingly-shaped seat therein
adapted to receive said head, a locking-plate
having a polygonal opening therein, said foot-
5 block having a recess formed therein to re-
ceive said locking-plate, and means for hold-
ing said locking-plate therein, substantially
as and for the purposes set forth.

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

ALBERT BALL.

Witnesses:

R. B. SHEPHERD,
F. A. BALL.