

(No Model.)

2 Sheets—Sheet 1.

J. SEITZ.

APPARATUS FOR FORMING LEADERS IN BLAST HOLES.

No. 507,759.

Patented Oct. 31, 1893.

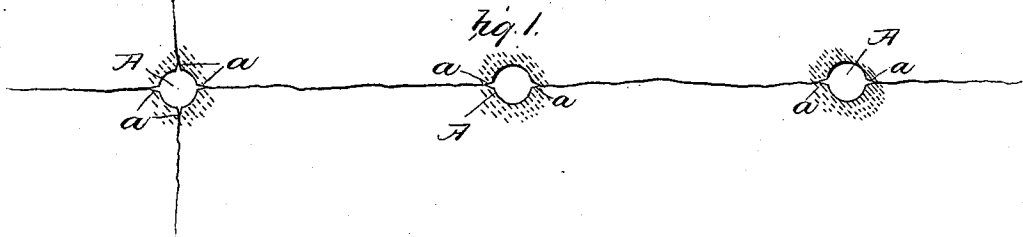


Fig. 1.

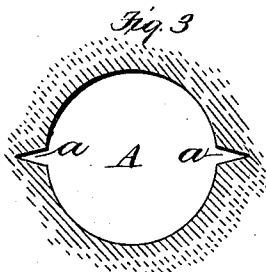
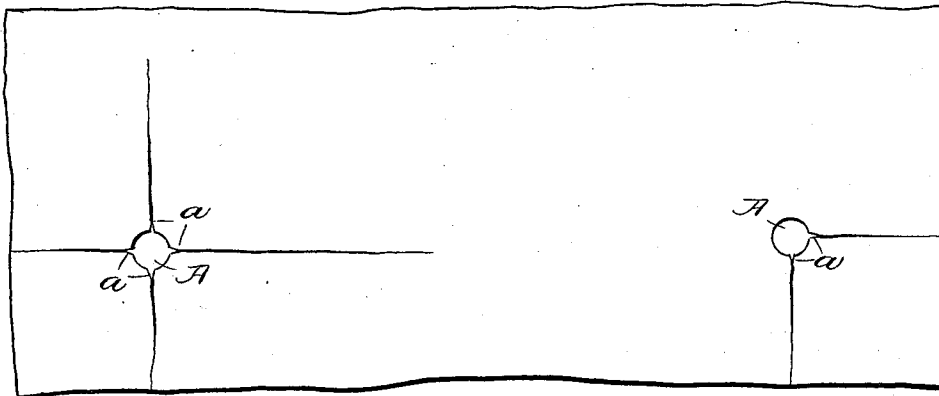


Fig. 3.

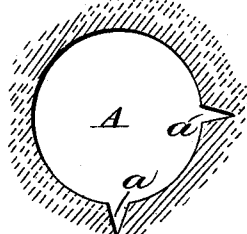


Fig. 4.

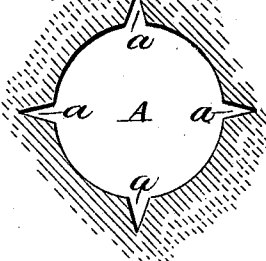


Fig. 5.

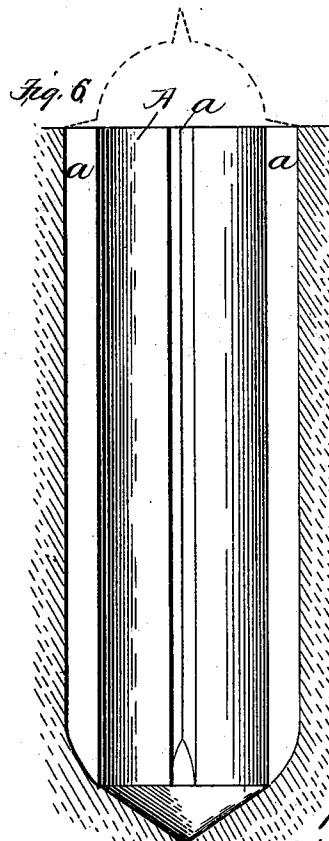


Fig. 6.

Witnesses  
J. P. Cornwall  
A. Ramel

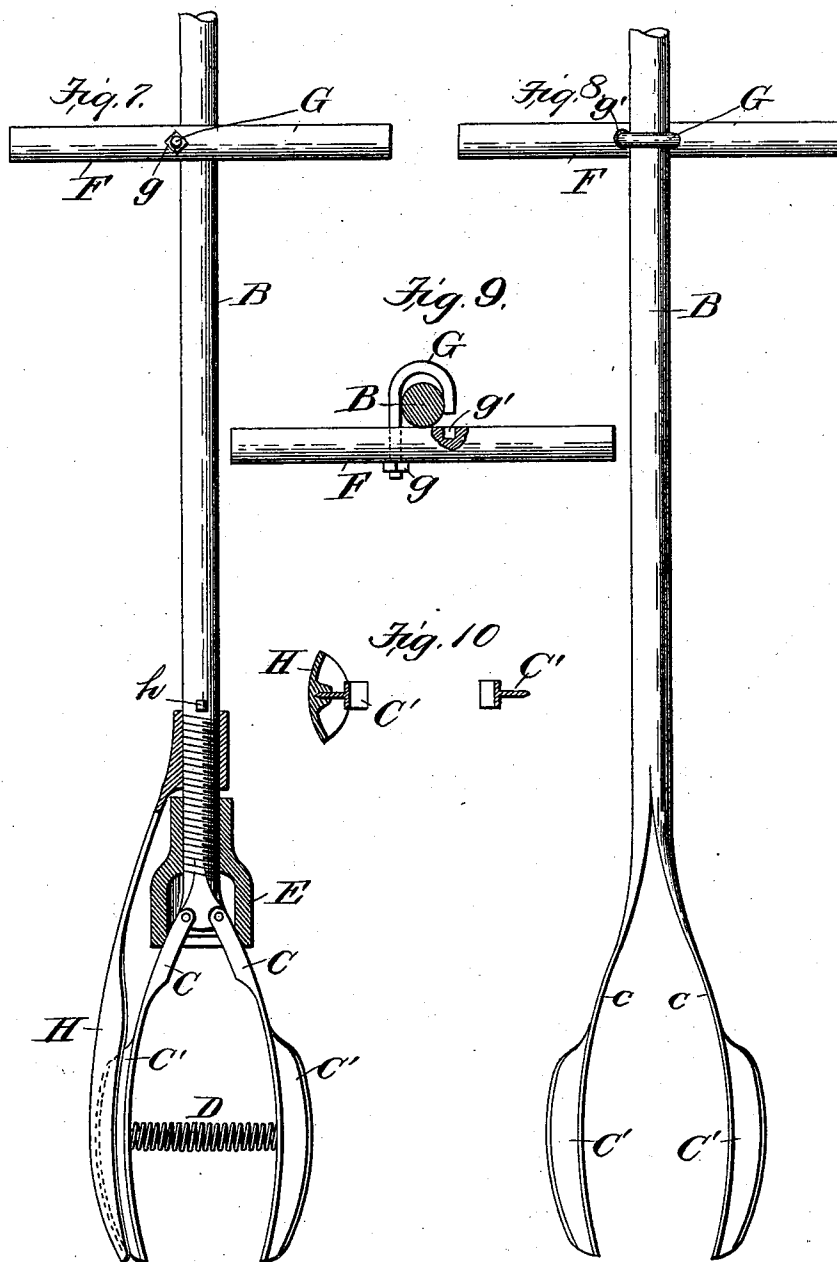
Inventor  
John Seitz  
By Paul Baranell atty.

J. SEITZ.

APPARATUS FOR FORMING LEADERS IN BLAST HOLES.

No. 507,759.

Patented Oct. 31, 1893.



Witnesses  
J. P. Cornwall  
A. Ramel

Inventor  
John Seitz,  
By Paul Bakewell  
Atty.

# UNITED STATES PATENT OFFICE.

JOHN SEITZ, OF HAYSVILLE, ASSIGNOR OF ONE-HALF TO JOHN T. CORN, OF JASPER, INDIANA.

## APPARATUS FOR FORMING LEADERS IN BLAST-HOLES.

SPECIFICATION forming part of Letters Patent No. 507,759, dated October 31, 1893.

Application filed February 15, 1893. Serial No. 462,361. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN SEITZ, a citizen of the United States, residing at Haysville, in the county of Dubois, State of Indiana, have invented certain new and useful Improvements in Apparatus for Forming Leaders in Blast-Holes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, wherein like symbols of reference refer to like parts wherever they occur, and in which—

Figure 1 is a diagrammatical view of the location of the blasting holes, showing the position of the leader and the lines followed by the crack. Fig. 2 is a similar view of the position of several differently formed blasting holes showing the effect of the blast. Figs. 3, 4, and 5 are enlarged views in cross section of blast holes provided with leaders in different positions. Fig. 6 is a longitudinal section of a blast hole provided with leaders as shown in Fig. 5. Fig. 7 is a side elevation, partly in section, of my improved groove or leader former, one of the blades thereof being housed. Fig. 8 is a similar view of a modification. Fig. 9 is a plan view of the handle showing the rod of the tool in section. Fig. 10 is a sectional view through the blades, showing the housing in position, on line X—X in Fig. 7, looking in the direction of the arrow.

Heretofore, the method generally employed in obtaining slabs, flags, or blocks from large rocks for commercial purposes, consisted in drilling a series of holes along the predetermined line of separation, and then inserting wedges and forcing the rock apart. This method is not only tedious and expensive in the extreme, but the results are not always satisfactory, on account of the liability of the rock tending to split in a direction different from that desired.

My invention consists in the peculiar construction of a tool for forming a groove or grooves (which I shall term a leader) in the side walls of a blast hole, which will indicate the line of direction it is desired for the separating crack to run, and in placing a blast therein, so that when the explosion occurs the force thereof will be directed against the the side walls of the drilled hole, and not

finding ready escape there, will force or rend the rock at the easiest and most convenient point, which will be at the point of location of the leaders. To form these grooves or leaders, I have illustrated an approved form of tool, whose special features reside in its adaptability for use in different sized openings, and at the same time providing means for yieldingly holding the cutting edges to their work. The tool is used to form the grooves or leaders, by reciprocating it in the drilled hole.

Of course it will be understood that as many leaders as may be desired may be formed in the blast hole, but in practice I have found that four are as many as are convenient in small holes. These I have indicated at *a*, Figs. 3 and 4, *A* representing the core of the drilled hole.

The grooving tool consists of a rod *B*, threaded at its lower portion, and formed at its extreme end with ears or pivot bearings upon which the arms *C* of the blades *C'* are pivoted. The blades *C'* as shown are preferably two in number, radially disposed on their pivoted arms and held in a normally projected position by an interposed compression spring *D*. Mounted upon the threaded end of the rod *B*, is a collar *E*, provided with a flange on its lower side, which is adapted to come in contact with and close the arms *C* against the pressure of the spring *D*, in order that the blades *C'* may be adjusted to fit in any sized opening. The handle for operating the tool, is preferably in the form of a bar *F*, provided with an opening about its middle through which passes a threaded long-arm of a substantially U-shaped clamping rod *G*, which, when in position surrounds the rod *D* its long end passing through the opening in the rod or handle *F*, while its short arm is received in the recess *g* in a bar or handle *F*, thus permitting the adjustment and removal of the handle at any time.

In order to form leaders as shown in Fig. 4, *i. e.*, leaders not diametrically opposite each other, provision must be made to house one of the blades *C'* during the operation of the grooving tool. I accomplish this by mounting on the rod *B* a concavo-convex blade *H*, concentrically disposed to the tool as a

whole, whose concave or inner side is preferably provided with a lug or raised seat for the reception of one of the blades C' to prevent displacement of the housing when in use. I retain the housing against longitudinal movement by a pin *n* in the rod B.

In Fig. 8 I have shown a modified form of grooving tool in which the blades C' are integral with the rod B, their shanks flattened at *c* to make them yielding, thus dispensing with the compression spring D as shown in Fig. 7.

I am aware that many minor changes may be made in the construction and arrangement of the several parts of my improved grooving tool, without in the least departing from the nature and principle of my invention.

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

1. In a tool for forming leaders in blast-holes, the combination with the main rod, of arms yieldingly mounted on the lower end thereof and curved cutting blades on the outer faces of the arms, and a removable housing for one of the blades substantially as described.

2. In a tool for forming leaders in blast holes, the combination with a main rod, of arms pivoted to the lower end thereof, blades on the outer faces of the arms, which blades are formed with curved cutting edges, and a removable housing for one of the blades substantially as described.

3. In a tool for forming leaders in blast holes, the combination with the main rod,

threaded at its lower end, of arms pivoted to said main rod, curved cutting blades on the lower outer extremities of said arm, a spring interposed between the arms, a flanged collar, which is threaded on the rod and adapted to close the arms and their carried blades against the action of the spring, and a housing which is removably mounted on the rod, which housing is adapted to fit over one of the blades and be interposed therebetween and the sides of the blast hole substantially as described.

4. In a tool for forming leaders in blast holes, the combination with the main rod and its cutting blades of a housing adapted to be fitted over one of said blades, thereby preventing its cutting edge coming in contact with side walls of the blast hole, substantially as described.

5. In a tool for forming leaders for blast holes, the combination with the main rod and its cutting blades, of a housing mounted on the main rod and adapted to be fitted over one of said blades, said housing being of concavo-convex form, its concave or inner side being provided with a seat for the blade to prevent lateral displacement, and means on the handle to prevent longitudinal movement, substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 2d day of February, 1893.

JOHN SEITZ.

Witnesses:

F. R. CORNWALL,  
H. K. WAGNER.