(No Model.)

2 Sheets—Sheet 1.

S. W. DOUGLASS.

ROCK DRILL SUPPORT.

No. 511,074. Patented Dec. 19, 1893.

Fig. 1.

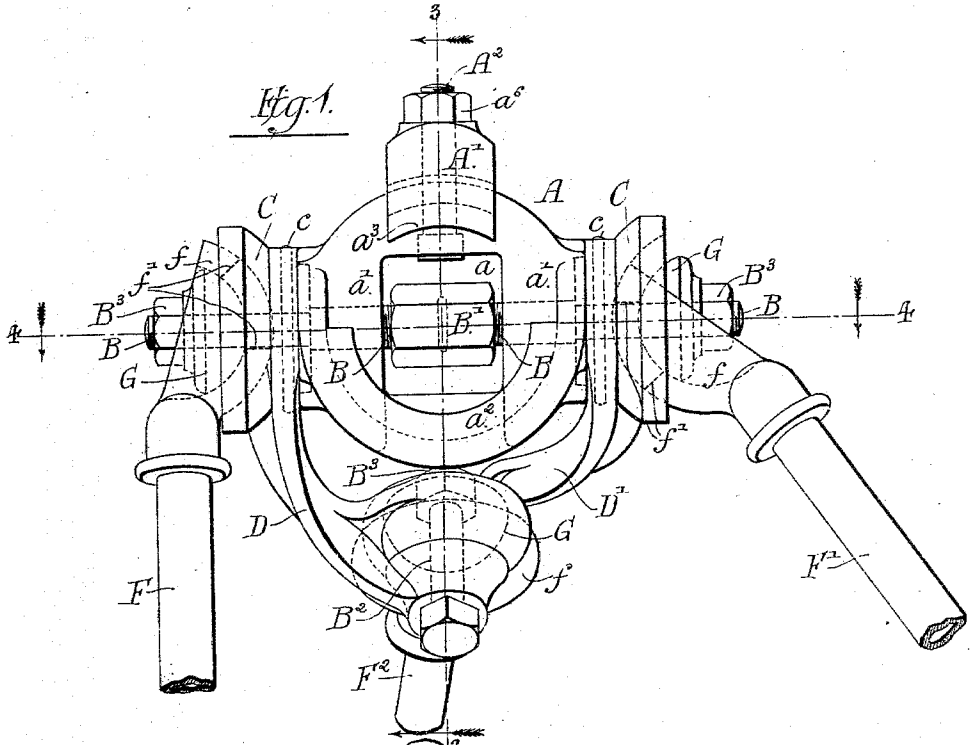
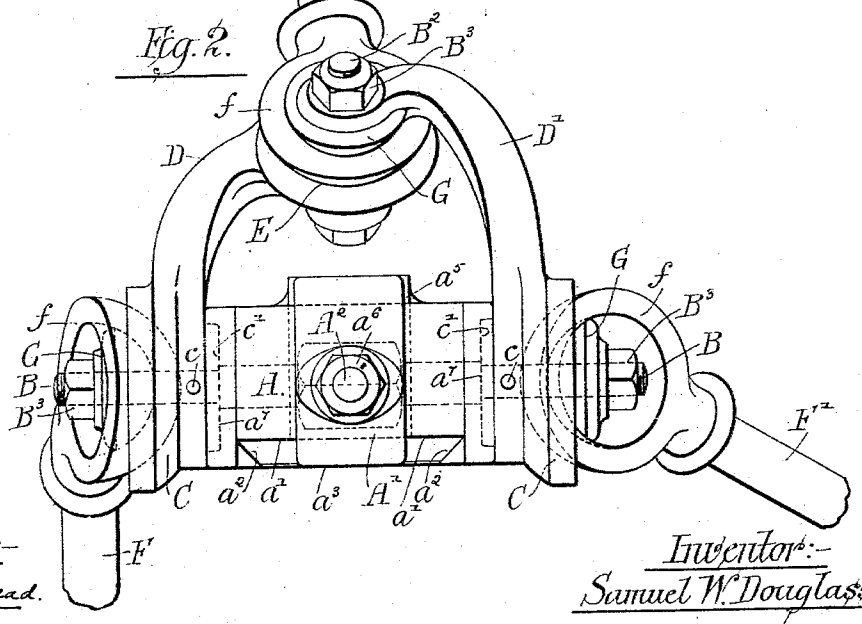


Fig. 2.



Witnesses:—
Louis M. Whitehead.
Irvine Miller.

Inventor:—
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his Attorneys.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

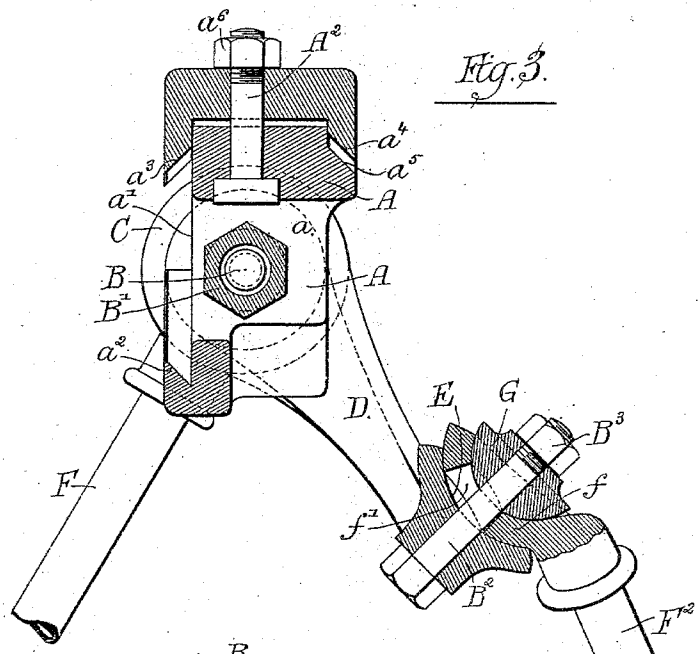
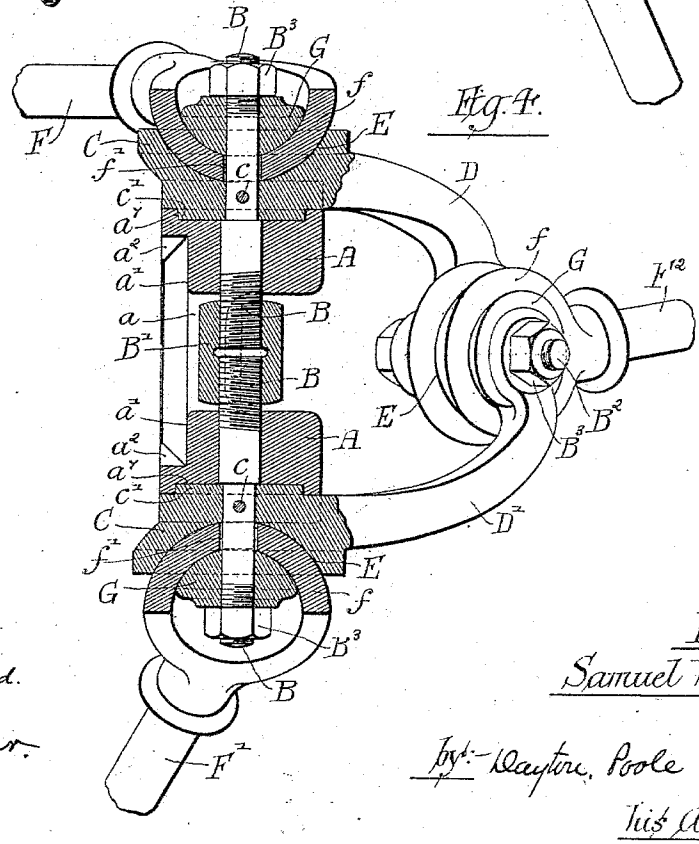


Fig. 4.



Witnesses:-
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Irvine Miller.

Inventor:-
Samuel W. Douglass.

by:- Dayton, Poole & Brown
his Attorneys.-

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL W. DOUGLASS, OF CHICAGO, ILLINOIS, ASSIGNOR TO MILAN C. BULLOCK, OF SAME PLACE.

ROCK-DRILL SUPPORT.

SPECIFICATION forming part of Letters Patent No. 511,074, dated December 19, 1893.

Application filed February 20, 1891. Serial No. 382,199. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL W. DOUGLASS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rock-Drill Supports; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to rock-drill supports, and more particularly to that class known as tripods.

Among the objects of my invention are the adjustment of the legs independently of each other and of the saddle, whereby the loosening of one or more of these parts for this purpose will in no way affect the fixed relation or rigidity of connection of the remaining ones; and also to obtain a construction permitting the saddle, and drill mounted thereon, to be moved laterally without displacing the lower ends of the legs, in a manner whereby certain important advantages may be obtained in the practical operation of drilling, as will be hereinafter pointed out.

Referring now to the drawings: Figure 1 is a front elevation of a support embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1. Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 1.

In the construction shown in the drawings, A represents the saddle of the support, provided with a central aperture *a* from front to rear for the purpose hereinafter set forth. This saddle has the usual plane face *a'* to form a bed for the drill proper, and the semicircular flange or lip a^2 on the lower portion of said face to form the fixed jaw of the clamp which holds the drill in position on the saddle. Co-operating with this fixed jaw is the movable jaw A' of the drill-clamp, which embraces the upper margin of the saddle, as shown in Fig. 3, being recessed to fit the same. The upper margin of the saddle has parallel front and rear faces and the jaw A' has parallel depending flanges, thus causing the said jaw to fit the saddle snugly. The jaw A is provided at its lower edges with a beveled lip a^3 in front to engage and hold the drill, and with a reversely beveled lip a^4 at the rear, co-operating with a corresponding incline a^5 on the rear of the saddle to draw the drill toward the face *a'* of the saddle. A bolt A^2 extends up through the saddle and loosely through the clamp jaw A', and receives on its projecting end a nut a^6, which serves to force this latter toward the fixed jaw to clamp the drill in position. The saddle A is apertured horizontally from side to side to receive the bolts B, which fit the apertures formed for their reception and are free to move longitudinally and to rotate therein. The inner threaded ends of the bolts B extend into the central aperture *a* of the saddle A, and are there connected by a right-and-left nut, B', by means of which said bolts may be drawn toward or thrust from each other, the aperture *a* permitting access to the nut B' for this purpose. The outer ends of the bolts B extend beyond the saddle A, and are preferably reduced, as shown in Fig. 4, and on these extensions are mounted the trunnions C of the yoke arms D D' of the yoke supporting the rear leg. These trunnions are connected with their respective bolts by means of pins *c* or other suitable means of rigid connection. Each trunnion is preferably provided on its inner face with a boss or projection *c'*, conical in shape, which fits within a corresponding recess a^7 in the side of the saddle A. It will be seen that by turning the nut B' in the proper direction, the bolts B and the attached trunnions C will be drawn toward each other, and the said trunnions, bearing firmly against the sides of the saddle A, will hold the same in any position in which it may be adjusted around the bolts B as a center. The spring of the arms D D' and the slight play of the rear leg-joint hereinafter described, allow a sufficient movement of the trunnions for this purpose. A reverse motion of the nut of course unclamps the saddle.

In the outer face of each trunnion C, and in the rear end of the lower yoke arm D, there is formed a cup-shaped or spherical socket E, as shown more particularly in Figs. 3 and 4, and on the upper end of each of the legs F F' F^2 there is provided a similarly formed lug *f*, having the shape of a segment of a hollow sphere or ball, and fitting within the cup or

socket E. Each cup-shaped lug *f* is provided with a slot *f'* in the direction of the longitudinal axis of the leg, and is secured in position by a bolt passing through said slot, in connection with a suitable washer and nut. In the case of the front legs F and F', this bolt is simply a lateral extension of the corresponding bolt B, while in the case of the rear leg F^2 a separate bolt B^2 is employed, as hereinafter set forth.

G G indicate the washers, which are spherical on their inner side to fit the cup-shaped lugs, their outer face being flat to form a bearing for the clamping nuts B^3 on the bolts B B^2. It will be observed that the washer G of the hind leg-joint forms a part of the upper arm D' of the yoke support, instead of being in a separate piece, as in the front leg-joints. The bolt B^2 passes, either from above or below, as desired, through the socket and washer formed on the ends of the arms D and D' respectively, and also through the intermediate lug *f* on the rear leg F^2, and by means of the nut B^3 clamps these three parts, *i. e.* the leg and the two yoke arms, firmly together in any desired position.

By reason of the construction above described it will be seen that the adjustment of the saddle is entirely independent of the adjustment of the legs, and conversely, so that the saddle may be set at any desired angle without in any way affecting the relations of the yoke and legs, while these latter may be adjusted to any desired position without loosening the connection between the yoke arms and saddle. Moreover the adjustment of each leg is entirely independent of that of the other legs, and does not affect their position. It will also be seen that the ball-and-socket leg-joint employed, in which the leg is slotted as described, not only permits a free rotation of each leg around its clamping bolt as a center, but also enables me to obtain an adjustment thereof in or out, the two movements combined allowing an adjustment of the legs into any desired position within reasonable limits. Moreover, the slots act as stops to limit the motion of the several parts when the clamping nuts are loosened.

In the tripod as heretofore constructed there has always been an element of danger present, owing to the liability of the structure to collapse when one of the leg-joints is either accidentally or purposely loosened, since the entire apparatus will, if not otherwise supported, incline toward the loose leg, and in the absence of a stop for the connecting joint, when the loose leg passes beyond an upright position, the entire apparatus will topple over. Serious and even fatal accidents have happened in this way. In the construction which I have devised, the bolt will come into contact with the end of the slot when the leg is upright and will therefore check the movement of the apparatus and prevent it from falling. A similar danger, due to the sudden swinging downward of the drill when the front leg-joints are loosened, exists when the same clamping means which hold the said joints are employed to hold the saddle in a fixed position, and it will be seen that, by reason of the construction which I have devised, this danger is entirely done away with, since the saddle is held in position independently of the leg-joints, as hereinbefore set forth.

I have already stated that one of the chief objects of my invention is to obtain a lateral movement of the saddle and drill without displacing the lower ends of the legs, or, in other words, without displacing the entire apparatus bodily. This movement is desirable, for instance, in drilling a row of parallel holes arranged in the same plane. Heretofore the desired result has been only approximately obtained, since only the first or central hole is in the true direction, the adjacent ones being bored by turning the drill in its seat in the saddle, so that all the holes bored in one position of the apparatus are radial to the center of revolution of the drill on the saddle, and are consequently not parallel. By reason of the construction which I have devised, after drilling the first hole, by loosening all three of the leg-joints, the saddle and the drill mounted thereon may be moved laterally until the center of the clamping circle comes in line with the next hole to be drilled. The drill may then be rotated upon the saddle to correct any inclination of the axis of rotation of said saddle due to this lateral movement, and when the drill is properly adjusted a second hole may be drilled exactly parallel to the first. This operation may be repeated on both sides of the hole first drilled, until the limit of motion of the apparatus is reached. I am thus enabled to drill holes strictly parallel without lifting the entire weight of the heavy drill, and without danger of collapse of the apparatus during adjustment.

What I claim is—

1. In a drill-support, the combination with the saddle, of the yoke arms pivotally connected at their rear ends and having inwardly projecting fixed bolts affording pivotal support for the saddle, and means adjustably connecting the inner ends of said bolts, substantially as described.

2. In a drill support, the combination with the saddle and supporting legs, of the yoke arms pivotally connected at their rear ends to each other and to the rear leg, and having at their forward ends inwardly projecting fixed bolts affording pivotal support for the saddle, and means adjustably connecting the inner ends of said fixed bolts, substantially as described.

3. In a drill support, the combination with the saddle, of the yoke arms and supporting legs, the rear leg being provided with an apertured semispherical hollow lug, and the yoke arms being pivotally connected at their front ends with the yoke and being provided at their rear ends, one with a semispherical

socket to receive the lug of said rear leg, and the other with a semispherical boss to fit the hollow of said lug, and a clamping bolt passing through said parts, substantially as described.

4. In a drill-supporting tripod, the combination, with the rear leg, provided with an apertured semispherical hollow lug, of the yoke arms, one having formed on its rear end a semipherical socket to receive said lug, while the other is provided at its rear end with a semipherical boss or washer to fit the hollow of the lug, and a bolt passing through the several parts and provided with a clamping nut, substantially as described.

5. In a drill support, the combination with the yoke arms provided with fixed inwardly projecting bolts, and a right and left nut connecting the same, of the saddle located between said yoke arms, substantially as described.

6. In a drill support, the combination, with the yoke arms having the fixed inwardly projecting bolts, and the right and left nut connecting said bolts, of the saddle mounted on said bolts between the yoke arms, and provided with a central aperture for said nut, substantially as described.

7. In a drill support, the combination, with the yoke arms having trunnions C with fixed inwardly projecting bolts, and right and left nut connecting said bolts, of the saddle mounted on said bolts and adapted to be clamped between the said trunnions, said saddle being provided with a central aperture for the nut, substantially as described.

8. In a drill support, the combination, with the yoke arms, of the bolts B fixed in the arms and extending inward and outward therefrom, the saddle mounted on the outer portions thereof, means adjustably connecting the inner ends of said bolts, and suitable clamping devices for securing the front legs on the outer portions of said bolts, substantially as described.

9. In a drill support, the combination with the saddle, of the yoke arms pivotally joined together at their rear ends by a universal joint, and having fixed supporting bolts at their forward ends on which the saddle is mounted, and means adjustably connecting the inner ends of said bolts, substantially as described.

10. In a drill supporting tripod, the combination of the yoke arms, having their rear ends shaped to form a semispherical socket, the rear leg provided with a cup-shaped slotted lug to fit said socket, and a clamping bolt for the joint thus formed, the forward ends of said yoke arms having their inner faces adapted to clamp the saddle and provided in their outer faces with semispherical sockets, bolts fixed in said forward ends of the yoke arms, and projecting both inward and outward therefrom, front legs provided with slotted cup-shaped lugs fitting the sockets and mounted on the outward projections of the bolts, suitable clamping nuts on said outward projections of the bolts and adapted to be clamped between the trunnions, and a right and left nut connecting the inwardly projecting portions of said bolts, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

SAMUEL W. DOUGLASS.

Witnesses:

C. CLARENCE POOLE,

GEORGE W. HIGGINS, Jr.