3 Sheets--Sheet 1.

J. H. MANDEVILLE.

Adjustable Tripod for Mining-Drills.

No. 164,315. Patented June 8, 1875.

Fig. 1.

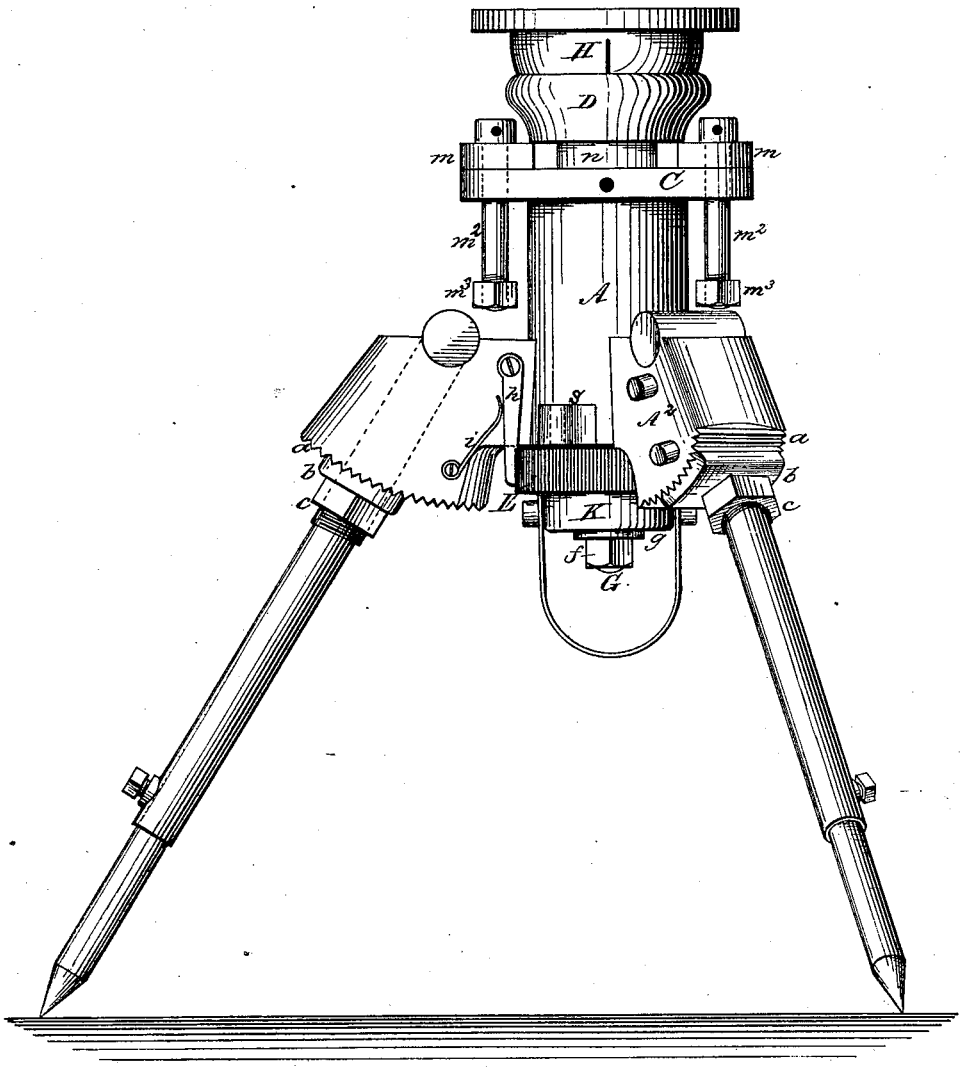
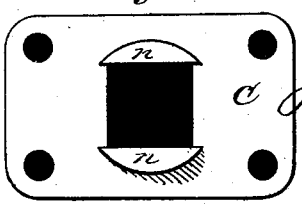


Fig. 6.



Witnesses:
Stephen J. Fields
Benjamin C. Dole
Engineer

Inventor:
James H. Mandeville

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

3 Sheets--Sheet 2.

J. H. MANDEVILLE.

Adjustable Tripod for Mining-Drills.

No. 164,315. Patented June 8, 1875.

Fig. 2.

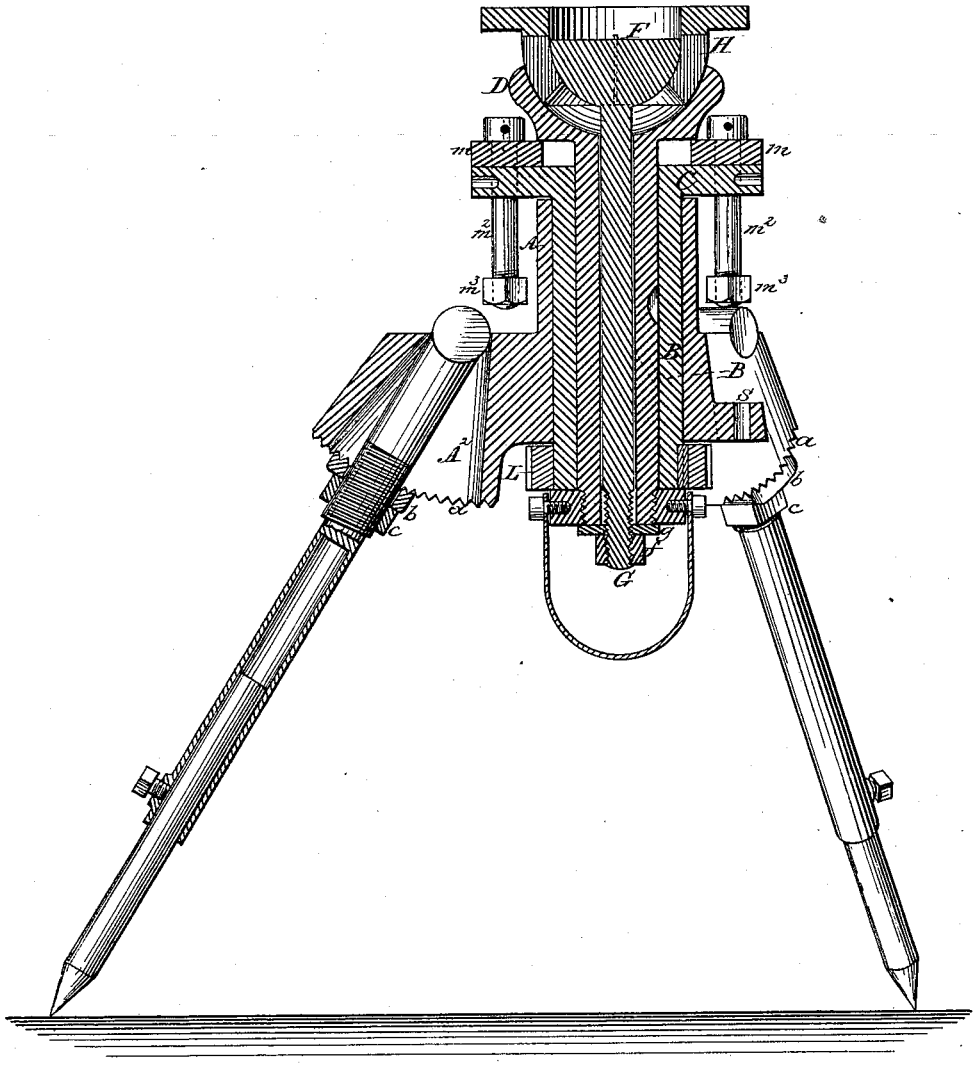
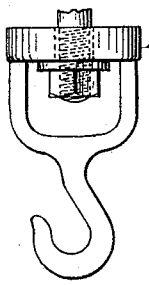


Fig. 4.



Witnesses:
Stephen F. Fields
Benjamin C. Dole
Engineer

Inventor:
James H. Mandeville

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

3 Sheets--Sheet 3.

J. H. MANDEVILLE.

Adjustable Tripod for Mining-Drills.

No. 164,315. Patented June 8, 1875.

Fig. 3.

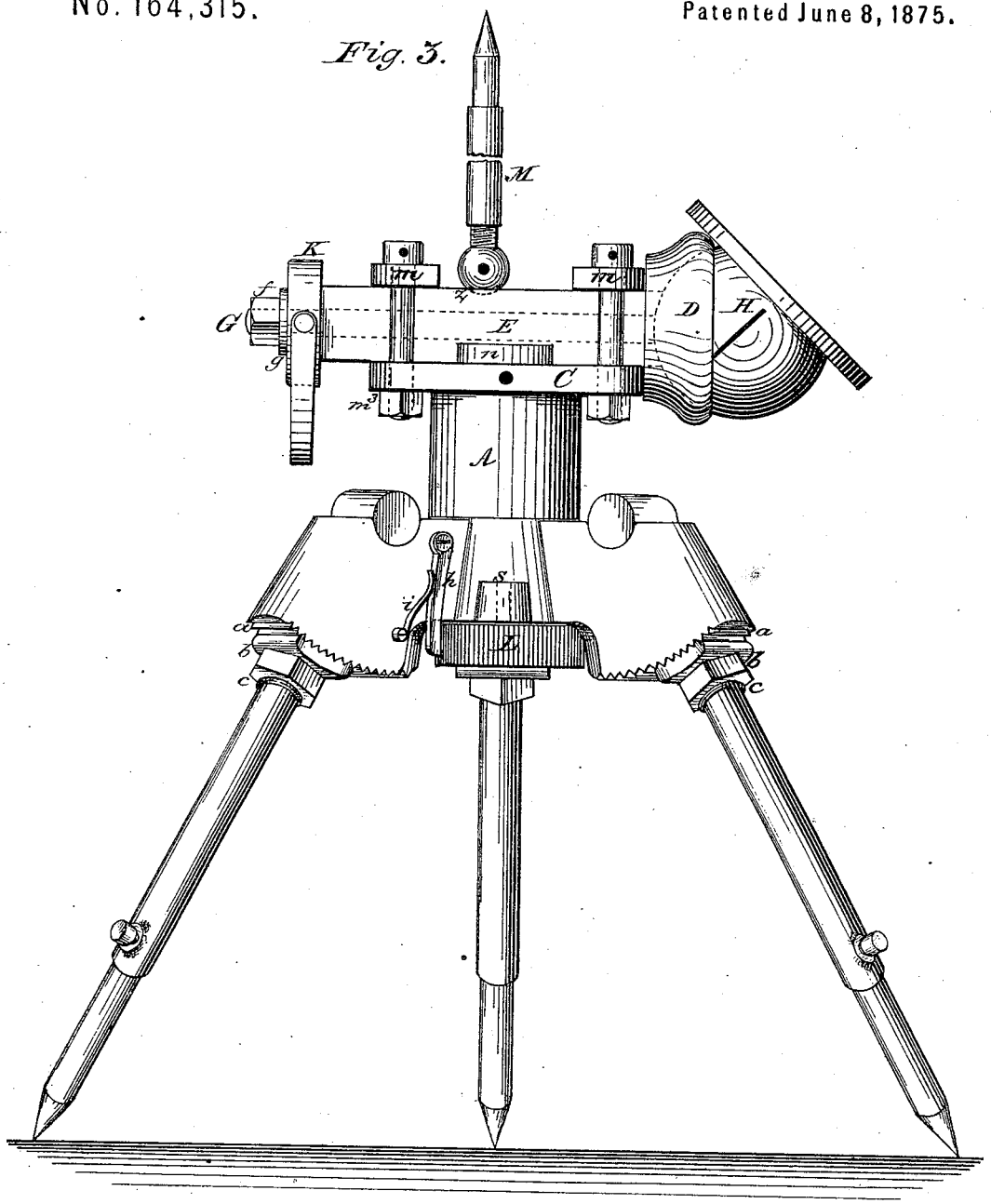


Fig. 5.

Witnesses:
Stephen J. Fields
Benjamin C. Pole.
Engineer

Inventor:
James H. Mandeville

UNITED STATES PATENT OFFICE.

JAMES H. MANDEVILLE, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN ADJUSTABLE TRIPODS FOR MINING-DRILLS.

Specification forming part of Letters Patent No. **164,315**, dated June 8, 1875; application filed May 27, 1875.

To all whom it may concern:

Be it known that I, JAMES H. MANDEVILLE, of the city of Washington, in the District of Columbia, have invented certain new and useful Improvements upon Adjustable Tripods for Mining-Drills, of which the following specification, with its accompanying drawings, is a full, clear, and exact description.

This invention is specially designed for mining purposes where steam or air drills are used; and among the objects attained in its construction are, first, a utilization of the ball-and-socket joint for a ready and certain adjustment of the drill itself, (not shown in the drawings,) and also of the tripod upon which it is mounted; second, readjustment of the drill by a change of angle alone. By this second result a drill mounted upon this tripod can bore any number of holes upon the same plane (from a radial center) without readjusting the drill, whereas in tripods for rock-drills heretofore constructed the drill must be not only set again every time that a new hole is bored, but it must be secured in its new position by means of bolts and nuts, or other equivalent means.

In this invention I have utilized the invention described in Letters Patent No. 159,471, dated February 2, 1875, and granted jointly unto myself and William F. Tallman, master mechanic of the Port Henry Iron Ore Company, of Mineville, Essex county, New York. In that invention, as a means for working steam or air drills at any angle, we showed a ball-and-socket-joint fastening applied in the mounting of it upon an adjustable tripod, precisely as the ball-and-socket joint is employed for a like purpose in the present case. The feature there patented was a cup slit upon its bowl or bottom, so that the cup would yield and spread in its socket when the ball was drawn down into the cup by tightening a nut upon a bolt connected to the ball. In that patent the hub of the tripod, which supports the drill, is journaled upon an axis, and the third or shifting leg is joined thereto by means of a yoke, so as to permit the hub to be rocked upon its axis in the arc of a circle; but this can be done only by adjusting the nuts upon the axis on both ends of the hub.

In other tripods for rock-drills, where the hub is dispensed with and the drill is journaled directly to the legs of the tripod, the yoked leg is still an indispensable element. This invention I deem a great improvement in this respect, that each time a new hole is bored with a drill, which is journaled on an axis, the drill must be readjusted, thereby causing wear and consuming time and labor, whereas in the present case, unless the angle of the drill is changed, no readjustment of the drill is necessary.

My invention consists, first, in the combination, with a tripod, of a rotating cylinder and a ball-and-socket-joint fastening for adjusting a drill to work at any angle, so that the drill may readily be set to bore any number of holes upon the same plane, without readjustment, simply by rotating the cylinder. Second, in a rotating cylinder, in combination with a ball-and-socket-joint fastening composed of the following elements: the ball, the bolt and nut, the sleeve and socket of one piece, and the cup to which the drill is fastened, the sleeve passing through the entire length of the rotating cylinder. Third, in the combination, with a rotating cylinder, of a table, and a clamping device for holding the ball-and-socket-joint fastening in a horizontal position upon the tripod, whenever it is required to work the drill above or below an angle of forty-five degrees. In other words, the salient improvement herein described consists in the combination, with a tripod, of a rotating cylinder so constructed that, whether the ball-and-socket-joint fastening is used in a vertical position or in a horizontal position, a rock-drill may be set to bore any number of holes upon the same angle of elevation or depression, without readjustment, simply by turning the cylinder. Fourth, in the combination, with a rotating cylinder, of a serrated wheel, lever, and spring-pawl, or any equivalent stopping device, so that when the drill has been set to bore a new hole, the cylinder may be firmly locked. Fifth, in a swinging bail, or a stationary hook, upon the sleeve, (which may also be screwed upon the cylinder,) for readily inserting a bar or attaching a weight, so as to steady the tripod; and, sixth, in an adjustment for the legs of a tripod, consisting of serrated washers on said legs, which fit into like serrations made upon the bottom of the hub, so that by tightening a nut below the washers, the full power and

effect of a ball-and-socket-joint fastening may be obtained.

In the drawings, Figure 1 is a side elevation of the tripod, with the ball-and-socket-joint fastening in a vertical position within the rotating cylinder. Fig. 2 is a vertical section of the same. Fig. 3 is a side elevation of the tripod with the ball-and-socket-joint fastening clamped in a horizontal position upon the table of the rotating cylinder; and Figs. 4, 5, and 6 are details of the invention.

The hub of the tripod, consisting of a fixed cylinder, A, and hollow supports A^2, is constructed so that the legs may be swung in or out within the supports any necessary distance to give the tripod perfect stability; and, to permit this, the under surface of the supports is made in the arc of a circle, the curvature of which may be greater or less, as desired. A socket is made on top of the supports for holding the top or T-head of the legs, and serrations *a* are cut on the bottom of the supports, to receive a washer, *b*, serrated in like manner, the washer being rigidly held fast against the hub by a nut, *c*, thus locking the legs with all the simplicity and power which is afforded by the well-known ball-and-socket-joint fastening.

The legs are telescopic and adjusted by set-screws, so that when the tripod stands upon uneven ground, or upon a side hill, it can be set level by regulating the length of the legs.

Within the fixed cylinder or hub A is a rotating cylinder, B, on top of which and cast with it is a table, C. (Shown in plan view, Fig. 6.) On the bottom of the cylinder is a cog-wheel, L, and engaging therewith is a stop-lever, *h*, and a spring-pawl, *i*, for preventing accidental disengagement of the lever.

It is evident that the cogs of this wheel must be very close together, else a turning of the cylinder, if only for a single cog, would move too far the point of the drill. It is also obvious that a wheel having conical holes, into which is firmly set—from the hub—a bolt having a conical point, would be an equivalent of the cog-wheel; but the devices shown are simple and effective. It is sufficient to say that for a stop mechanism I do not limit myself to the devices shown in the drawings.

The steam or air drill is bolted upon the rim of the hemispherical cup H, and the cup is slit at right angles upon its bottom for a portion of its depth, so that pressure upon its surface is equalized by a spreading of the cup in its socket.

Gun metal or steel is the material from which the cup ought to be constructed, which, in this place, will stand any amount of pressure without breaking.

The cup rests in a socket, D, preferably cast as a part of the square or polygonal sleeve E. When the sleeve is in a vertical position, it exactly fills a space cut lengthwise through the rotating cylinder, made conformable to the shape of the sleeve.

Though I have shown a square sleeve, it is evident that a sleeve of polygonal form, or a round sleeve with a spline, (so as to make both sleeve and cylinder turn together,) will accomplish the result which I desire—that is, a sleeve constructed with one or more surfaces, so that it may be firmly clamped upon a corresponding surface on the table whenever it is necessary to use the fastening in a horizontal position. The socket D rests upon the two clamping-plates *m* and the projections *n*, cast on top of the rotating cylinder, and the bottom of the sleeve projects below the cog-wheel sufficiently to receive the swinging bail K or nut K^2, which is used for the purpose of affording a ready insertion of a bar or the attachment of a weight, when it is necessary to steady the tripod. Lugs *s* are cast upon the hub to admit of the use of wire-rope for a kindred purpose.

The ball F within the cup is attached or cast to a bolt, G, which extends through the center of the sleeve, and projects far enough beyond the bail to receive a nut, *f*, and washer *g*. It is designed to make all bolts used upon this tripod with square shoulders *o*, so that the bolts cannot turn when the nuts are being adjusted.

Whenever the drill is to be worked above or below an angle of forty-five degrees the ball-and-socket-joint fastening is lifted out of its vertical position, and then laid over in a horizontal position upon the table of the tripod.

The clamping device consists of the two plates *m*, each held upon the table by two bolts, m^2, (though in the drawings only one bolt is shown for each plate,) which pass through both plate and table, and, when not in use, hang pendent under the table, though high enough to clear the hub during a rotation of the cylinder. In order to hold the sleeve upon the table the clamping-plates are raised high enough to slide the sleeve under the plates between the bolts m^2, and also between the projections *n n* above the rotating cylinder.

It will thus be seen that the bolts and projections also serve to prevent side motion, as they closely fit the sides of the sleeve, which is secured, when in position on the table, simply by tightening nuts m^3 beneath the table.

The drill, then, may be set to bore straight overhead, or straight underneath, or upon any angle above or below an angle of forty-five degrees, the intermediate angles being obtained for the drill when the sleeve sets vertically in the rotating cylinder.

To counterbalance the weight of the drill and provide against shocks occasioned by drilling at a high speed, the legs are made separately adjustable, and means for anchorage are provided. A brace, M, set in a cavity, *z*, in the sleeve, is also provided for use whenever there is a support overhead.

In drifting and tunneling a shorter sleeve may be used, so as temporarily to lay aside

the tripod and use the ball-and-socket-joint fastening upon a bar.

Referring, now, to my statement of the nature of this invention as an interpretation of my claims, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a tripod, of a rotating cylinder and a ball-and-socket-joint fastening, for adjusting a drill to work at any angle, substantially as described.

2. A rotating cylinder, in combination with a ball-and-socket-joint fastening, when constructed substantially as described.

3. The combination, with a rotating cylinder, of a table and clamping device, substantially as described.

4. In a tripod for mining-drills, the combination of a stop mechanism with a rotating cylinder, substantially as described.

5. The swinging bail, or its equivalent, in combination with the sleeve or with the tripod, substantially as described.

6. The combination, with a serrated hub, of the T-headed legs, the serrated washers, and the fastening-nuts, substantially as described.

In witness whereof I hereunto subscribe my name this 26th day of May, 1875, at the city of Washington, in the presence of two attesting witnesses.

JAMES H. MANDEVILLE.

Witnesses:
M. S. HOPKINS,
ELLIS SPEAR.