(No Model.) 2 Sheets—Sheet 1.

N. MILLER & J. RITCHIE.

ROCK DRILL.

No. 387,096. Patented July 31, 1888.

Fig. 1.

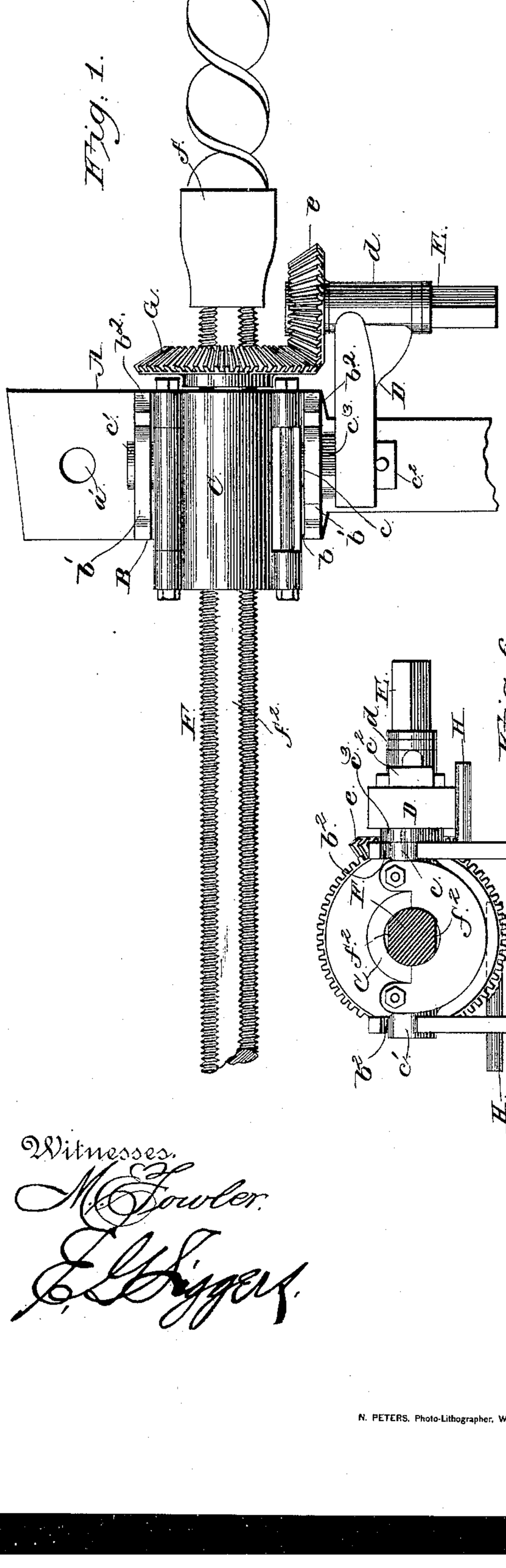

Fig. 2.

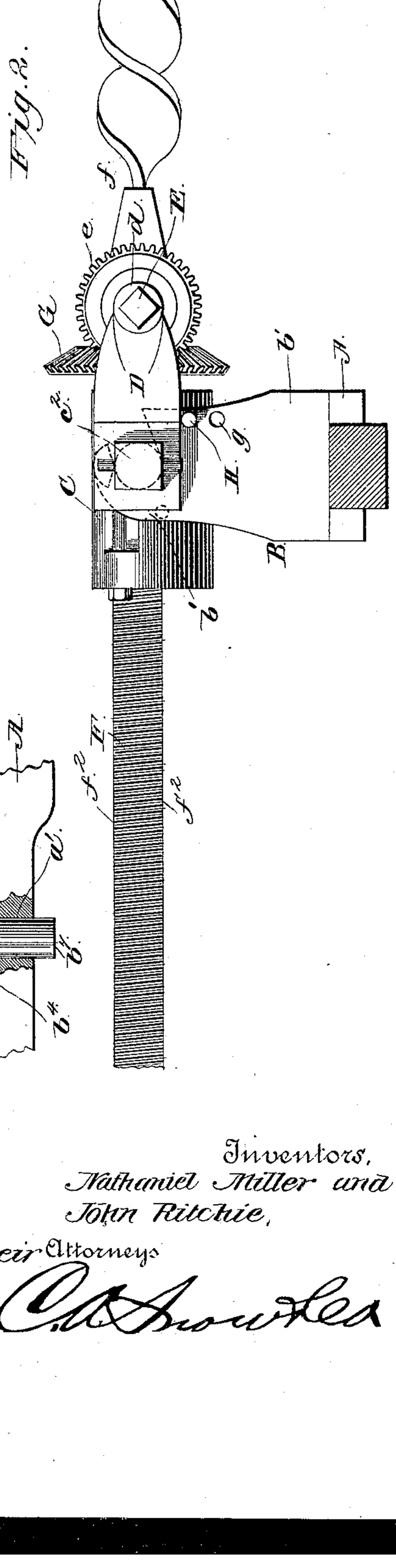

Fig. 6.

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(No Model.) 2 Sheets—Sheet 2.

N. MILLER & J. RITCHIE.

ROCK DRILL.

No. 387,096. Patented July 31, 1888.

Fig. 3

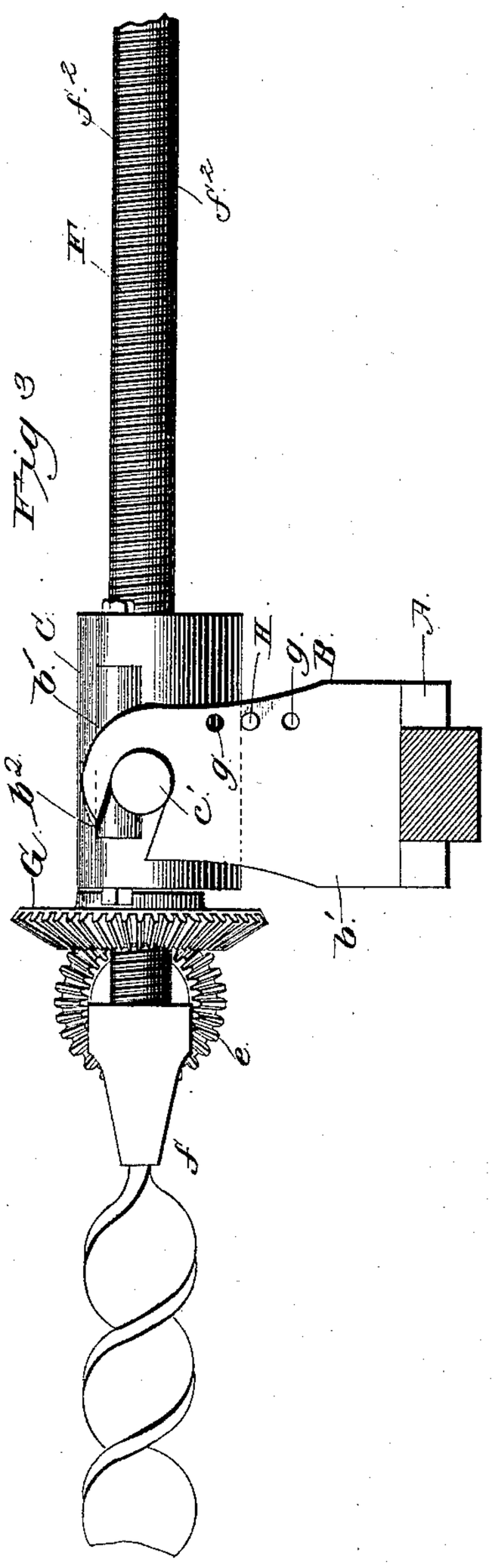


Fig. 5.

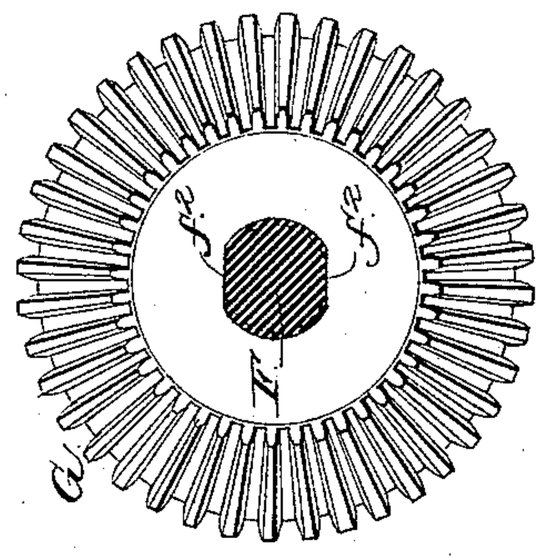
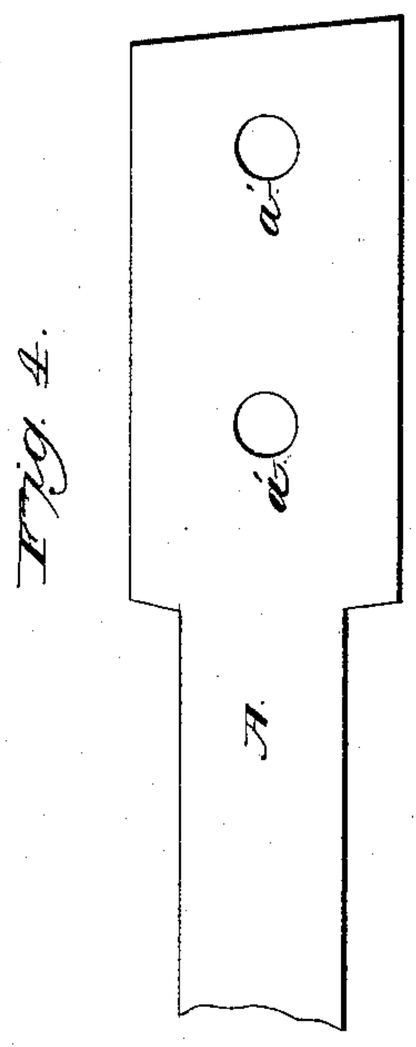


Fig. 4.



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UNITED STATES PATENT OFFICE.

NATHANIEL MILLER AND JOHN RITCHIE, OF WHAT CHEER, IOWA.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 387,096, dated July 31, 1888.

Application filed February 14, 1888. Serial No. 263,991. (No model.)

To all whom it may concern:

Be it known that we, NATHANIEL MILLER and JOHN RITCHIE, citizens of the United States, residing at What Cheer, in the county of Keokuk and State of Iowa, have invented new and useful Improvements in Rock-Drills, of which the following is a specification.

Our invention relates to improvements in rock-drills, especially such as are adapted for soft coal and other similar materials; and it consists in the construction and novel combination of parts hereinafter described, illustrated in the drawings, and pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of drill mechanism embodying the invention. Fig. 2 is a view of one side of the same. Fig. 3 is a view of the opposite side thereof. Fig. 4 is a plan view of the grip-arm detached. Fig. 5 is a transverse section of the feed-screw with the gear-wheel thereon. Fig. 6 is a rear view, partly in section.

In the drawings, A designates the grip-arm, to which the drilling mechanism is attached, provided with the two bolt-openings a' a', for the attachment of the bracket B. The said bracket is composed of the base-plate b and the side plates, b' b', having the downwardly-inclined bearing-notches b^2 b^2 in their edges for the feed-screw-box bearings.

b^4 is the central bolt-opening in the base-plate b, which opening is surrounded by the square flange b^5, to receive the head b^6 of the bolt b^7. By means of the bolt-head resting and fitting within said flange, the bolt cannot turn while the bracket is being tightened to the grip-arm. This prevents a loose bracket, which is apt to turn slightly toward the handle when operating the machine, and, the drill also being similarly turned, the drill-hole will not be straight, and will cause the succeeding drill to bind therein.

C is the feed screw or sleeve, internally threaded in the usual manner, and made in two parts suitably secured together, as shown.

c c' are the trunnions of the said sleeve, which trunnions rest in the bearings b^2 b^2. The trunnion c is extended beyond its bearing and squared, as at c^2, the squared portion being separated from the bearing by the collar c^3. The said squared portion passes through an opening in the arm D, which is secured in place by a pin or bolt passing through an opening in the squared portion outside of said arm. The arm D has at its free end a transverse bearing-sleeve, d, for the drive-shaft E, rotated by mechanism, (not shown,) and having on its inner end the bevel gear-wheel e.

F is the feed-screw, having on its end the drill f, and flattened equally at f^2 f^2 at diametrically-opposite points, as shown.

G is a bevel gear-wheel, having a central opening that fits accurately upon the feed-screw, having correspondingly-flattened surfaces, so that one will not turn without the other. The said gear-wheel meshes with and is rotated by the gear-wheel e.

H represents a pair of steel pins adapted to be inserted into any opposite ones of the series of openings g g in the side plates of the bracket, one pin passing under the feed-screw sleeve and the other under the arm D. These openings are made near the front edge of the side plate adjacent to said arm and near the rear edge of the opposite side plate, so that when the pins are put in place through corresponding openings in the plates the same will support the feed-screw sleeve and arm D at any desired adjustment, either in a horizontal or in an inclined position.

The rotation of the wheel G by turning the feed screw causes the same to travel forward in the sleeve and carry the drill forward, and as it conforms to and fits over the said screw the latter can easily travel through it.

By making the arm D detachable from the trunnion of the feed-screw sleeve, instead of integral therewith, as is usually the case, a great saving of expense is obtained, for the said arm breaks frequently, rendering it necessary to get an entirely new sleeve, whereas the detachable arm can be quickly and easily replaced.

The object of making the feed-screw flat on two sides is to prevent loose motion thereon of the gear-wheel G, as will frequently happen with a slotted feed-screw and key, in which the key wears and turns laterally in the slot in a short time, allowing the gear-wheel G to assume a non-rectangular position on the feed-screw and cut the corners from the threads of the same. This of course causes ragged threads that cut the threads of the sleeve.

When the drill strikes a bed or layer of

sulphur, which is much harder than the soft coal the machine is intended for, the drill would become depressed but for the support given it by the steel pin, and the hole would be drilled out of alignment.

By using the two openings in the grip-arm the first and second drills, which are used more and wear faster than the third drill, may be advanced when worn, so as to permit the third drill when inserted to make the hole deep enough.

Having described our invention, we claim—

1. In a rock-drill, the combination of the bracket having the bearing-notches, the feed-screw sleeve having the trunnions in said notches, and the arm D, detachably secured to the extended squared end of one of the trunnions having the sleeve for the drive shaft, substantially as specified.

2. In a rock-drill, the combination of the grip-arm, the bracket pivoted thereon, the feed-screw sleeve having the trunnions journaled in the bracket, the arm detachably secured to one of the said trunnions and having the right-angled sleeve, the drive-shaft journaled in said sleeve, and the gear-wheel on said shaft, the feed-screw flattened on opposite sides, and the gear-wheel fitted on said screw and meshing with the gear-wheel on the drive-shaft, substantially as specified.

3. In a rock-drill, the combination of the bracket having a series of openings in the front edge of one side plate and a similar series in the rear edge of the opposite side plate, and the pins H, arranged to pass through corresponding openings in the two series, with the trunnioned feed-screw sleeve and the arm detachably connected to the trunnion, said sleeve and arm being engaged by the pins, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

NATHANIEL MILLER.
JOHN RITCHIE.

Witnesses:
WM. H. LAWLER,
GEO. A. THOMAS.