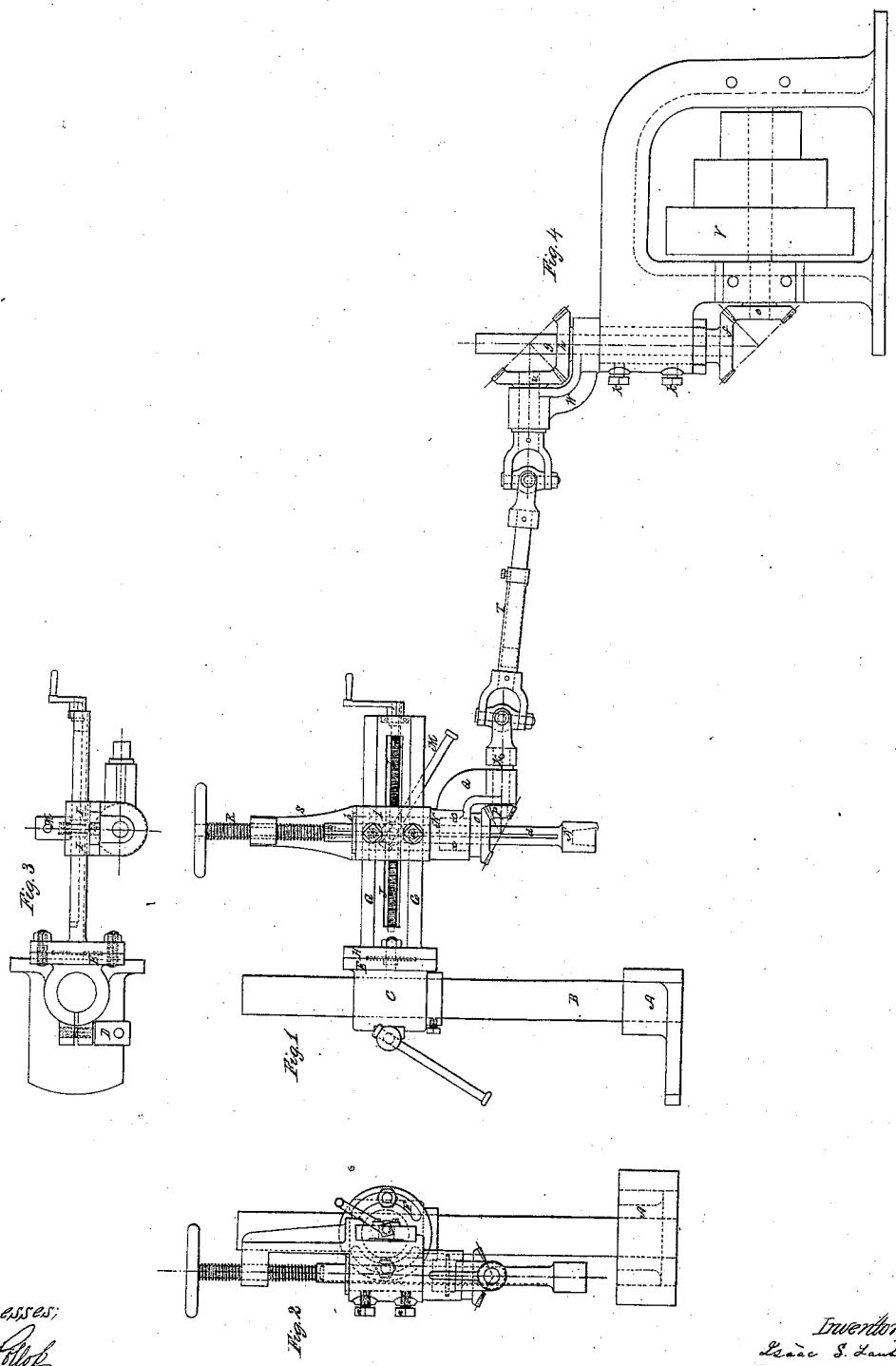
I. S. Laubach,

Metal Drill,

No. 46478. Patented Feb. 21, 1865.



Witnesses:
A. Pollok
L. Brown

Inventor:
Isaac S. Laubach
By his Atty
Amos Bradley

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ISAAC S. LAUBACK, OF NEW YORK, N. Y.

DRILLING-MACHINE.

Specification forming part of Letters Patent No. **46,478**, dated February 21, 1865.

To all whom it may concern:

Be it known that I, ISAAC S. LAUBACK, of the city and county and State of New York, have invented certain new and useful Improvements in Portable Machines for Drilling Metals, and in the manner of attaching and operating the same; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation showing the connection of the machine with the moving power; Fig. 2 an end elevation, Fig. 3 a top view, and Fig. 4 a side elevation, of the driving apparatus.

This invention consists of improvements on the drilling-machine for which Letters Patent were granted to me on the 9th day of February, 1864.

These improvements consist of an adjustable joint in the arm of the machine by which the drill-spindle can be set at an angle with the supporting-column of the machine, and also in the combination, with said machine, of an improved driving attachment by which the application of power to the machine is greatly facilitated.

To enable any one skilled in the arts to which this invention appertains to make and use the same, I will proceed to describe the nature and extent of said improvements.

Similar letters of reference represent corresponding parts of the different figures above referred to.

In the drawings, G represents the arm or rest of the machine, upon which the spindle-head I is moved and adjusted by means of the screw L; and *c* represents the socket by which the said arm or rest is supported and adjusted on the column B.

The improvement first above alluded to—viz., the joint in the arm or rest of the machine—is shown by E H; and it consists of two flanges or disks, one made on the socket *c*, and a similar one made on the arm G, the two being united by means of bolts *b' b'*. In the flange or disk H two circular slots are cut, marked F, through which the bolts *b'* pass, and screw into the disk E, so that by slacking up the bolts the one flange can swing about its own axis against the other, and the arm and spindle-head can be slewed or twisted over to the right or left on a vertical plane with the column B, thus enabling the operator to set the drill-spindle across the standard B of the machine and drill a hole at an angle with it, a great advantage in this class of machines.

The second improvement above referred to consists in combining and uniting the swing adjustable bracket Q on the spindle-head with a similar adjustable bracket, W, on the driving-head U by means of an adjustable connecting-rod, T, coupled by means of universal joints, as shown. The arm of the adjustable bracket Q on the spindle-head, it will be seen, passes up through said head, and is held by means of a collar, *b*, from dropping out of its socket, and is adjusted by means of set-screws *a a*, passing through the head and bearing against the arm of the bracket. The bracket W bears substantially the same relation to the driving spindle *g* and head U that the bracket Q does to the spindle and spindle-head I.

The arm of the bracket, it will be seen, passes through the head U, and is adjusted by means of set-screws K, the driving-spindle passing up through the center of the arm, carrying the two driving-wheels *h f*, the wheel *h* matching in the wheel *i*, by which the power and motion are conveyed to the connecting or driving rod, which consists of one rod slipped in the axis of another, the two being held together by means of a set-screw, as shown.

By means of this combination of mechanical devices it will be seen that the drilling-machines can be moved about the driving-head from place to place and put in a great variety of positions without materially interfering with the application of the power thereto, for by means of the adjustable connecting-rod the distance between the machine and the driving-head can be increased or diminished at pleasure, and by means of the two adjustable brackets and the universal joints on the connecting-rod the power can be applied from almost any direction.

The remaining parts of this machine are substantially the same as those described in the said patent granted to me on the 9th of February, 1864, so that a detailed description

of it is unnecessary here; but if a more perfect understanding of the detail parts of the machine should be required, reference is made to that patent.

Having now described the nature and extent of my improvements, what I claim as my invention, and desire to secure by Letters Patent, is—

Combining and uniting the two adjustable brackets Q and W by means of the adjustable connecting-rod T, fitted with one or more universal joints, the one of said brackets to be combined with the driving-head, and the other with the spindle-head, of the machine substantially in the manner described, for the purpose specified.

ISAAC S. LAUBACK.

Witnesses:

AMOS BROADNAX,

ED. BARTLETT.