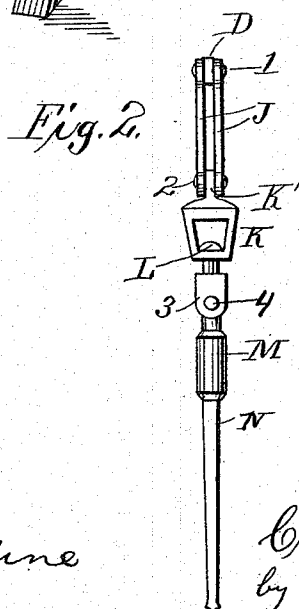
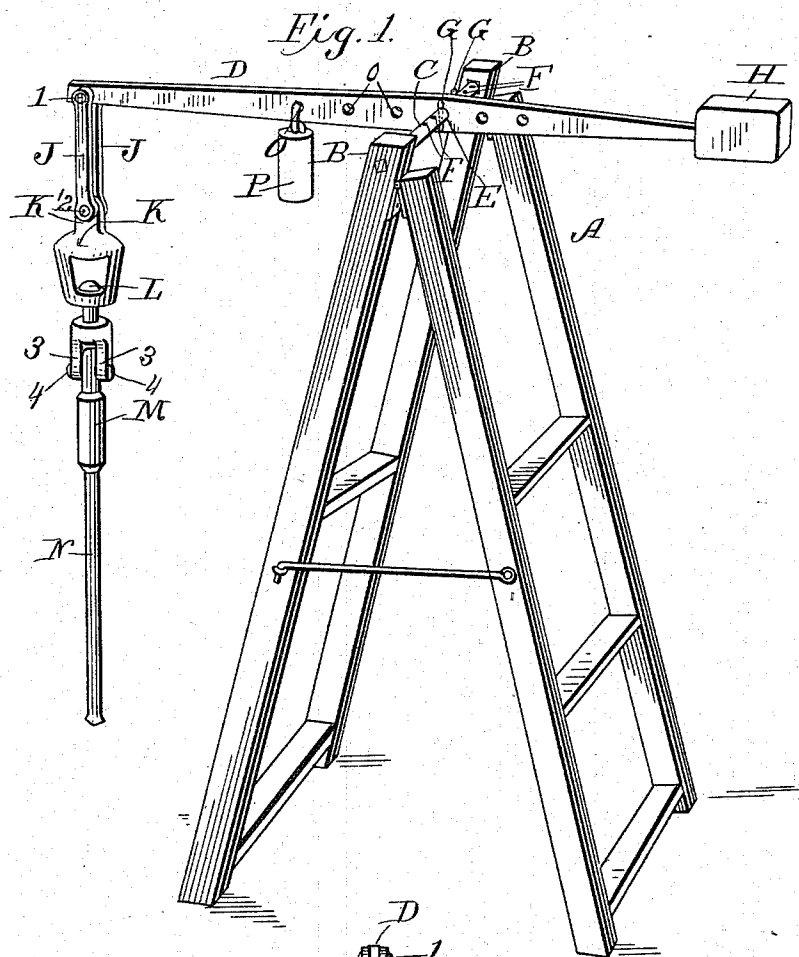


(No Model.)

C. A. BENTRUP.
DRILLING MACHINE.

No. 527,929.

Patented Oct. 23, 1894.



WITNESSES

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UNITED STATES PATENT OFFICE.

CARL AUGUST BENTRUP, OF CLINTON, IOWA.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 527,929, dated October 23, 1894.

Application filed May 9, 1894. Serial No. 510,597. (No model.)

To all whom it may concern:

Be it known that I, CARL AUGUST BENTRUP, a citizen of Germany, residing at Clinton, in the county of Clinton and State of Iowa, have
5 invented certain new and useful Improvements in Drilling-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-
10 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specifica-
tion.

15 My invention has reference to improvements in drilling machines and has for its object the providing of a vertically oscillating beam, one end of which is pivotally connected with the upper end of the drill or drill-
20 holder.

One of the defects of the present system of drilling by hand is the liability to oscillation at the upper end of the drill, which results in deflecting the lower and operative end of the
25 drill causing the latter to leave a true line and bind in the opening.

My invention has more particular application to drilling in the process of quarrying rock, and is intended to be light, cheap, and
30 portable and a desirable substitute for the hand drill.

In the process of drilling, greater or less depth of holes are requisite, depending upon the condition and circumstances of each case.
35 This of course involves the use at certain times of quite a considerable weight of drill which is very burdensome and laborious to the operators where they are compelled to continually lift the same by hand as well as
40 keep the tool in the true line of the opening; also the deeper the hole, the greater the amount of friction to be overcome by the operative in raising the drill.

In my invention, the oscillating beam to
45 which the drill is attached as aforesaid, is fulcrumed at or near its longitudinal center and provided at its end opposite to that attachment of the drill with a counterpoise of any desired weight. A series of openings are
50 formed in the bar on each side of its pivotal support and a weight of any desired amount

can be optionally attached to said bar in any of said openings. By shifting the weight in any of the openings on the counterpoise side of the pivot, the lifting influence of the coun- 55 terpoise can be proportionately increased, and therefore, when a greater amount of drill shank is required, the labor of the men in raising the same, can be greatly lessened. On the other hand, where the rock is unusu- 60 ally hard, or for any other reason, the drill is not deemed heavy enough to enter the rock with a sufficient progress, the force of the successive impacts of the drill may be in- creased to any desirable degree by placing 65 said weight in some one of the openings in said drill supporting arm, and on the drill side of the pivotal seat of said arm. Of course recesses or deep notches on the upper surface of the said oscillating bar could be 70 used for the same purpose as the aforesaid openings.

I attain the purposes aforesaid by the mechanism illustrated in the accompanying draw- 75 ings, in which—

Figure 1, is a perspective of a machine em- bodying my invention. Fig. 2, is an eleva- 80 tion of the drill end of the same.

Similar letters and numerals refer to similar parts in each figure.

A. is the supporting frame which may consist either of a light step ladder having its supporting braces projected above its apex or in a tripod similarly provided. On the upper end of the frame A. there are formed up- 85 wardly projecting and oppositely seated standards B B. The transverse bar C. is seated in standards B and rigidly held therein. A suitable portion of the bar C between the standards B is rounded to receive the oscil- 90 lating beam D. by being projected through a round opening E. in said beam. The bar C is provided with a series of radial openings F F. and by the insertion of pins G G therein, the beam D may be adjusted laterally. A 95 counterpoise weight H. is seated on one end of the beam D about the weight of the drill and its attachments at the other end of said beam, when the smallest size and length of drill is being used. On the drill end of the 100 beam D, there are pivotally attached to said beam two vertical links J J by a cross bolt 1

passing through the upper end of said links and transversely through the ends of said beam. A head K. is held between the lower ends of the links J by means of a projection
 5 K' on the upper surface of head K which projects between links J and is suspended by a cross pivot bolt 2. In the lower portion of the head K, is pivotally seated the swivel L. between the downwardly projecting limbs 3
 10 of which is projected the upper end of the chisel socket M. and which is carried in swivel L by means of transverse bolt 4 passed through the limbs 3 and the upper end of socket M.

15 It will be noticed that there is a double flexion between the head K and beam B afforded by the link connection J J; also that the swivel attachment of swivel L to head K permits free lateral rotation of said swivel
 20 its appendages, the chisel and chisel socket. The bolt 4 furnishes a pivotal movement to the chisel socket M radial to and independent of its axial rotation with swivel L. The chisel N is seated in any of the usual modes
 25 in socket M and it may be necessary at times to use a chisel in sections, but the vertical sweep of the end of beam D will of itself afford space for the use of chisels of varied lengths.

30 In the beam D, and at each side of its pivotal bearing and at variant distances therefrom are formed openings O for the optional attachment to said beam of the weight P as aforesaid. As the latter weight may be of
 35 any desired amount and can be used in any of the openings O, in beam D on either side of the pivotal support of the latter, it is obvious that there is afforded a great range as

to the kind and extent of power exercised by beam D over chisel N.

One of the main advantages of my invention consists in suspending the chisel at the top whereby it naturally hangs in a vertical position. The flexible connections shown between the chisel and beam D are necessary
 45 to permit the axial rotation of the chisel and it sometimes required deflection in drilling diagonally, but the connection between said chisel and beam is rigid in a direct line (as distinguished from a chain connection) so
 50 that any movement of either the chisel or beam is immediately imparted to the other.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

In a drilling machine, the combination, with a suitable base, the top of which is provided with a transverse bar provided with radial openings, of two removable pins in said openings, a beam on the bar between said pins,
 60 said beam being provided with a series of openings for adjusting the same longitudinally on said bar, a weight permanently secured to one end of the beam, and a chisel flexibly and pivotally supported from the opposite end of the beam, and a weight provided with means for suspending it from any
 65 opening in the beam on either side of the bar, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CARL AUGUST BENTRUP.

Witnesses:

JOHN G. MANAHAN,
 EARNEST HOWELL.