(No Model.)

J. H. JACOBS.

METHOD OF QUARRYING STONE.

No. 410,165. Patented Sept. 3, 1889.

Fig. 1.

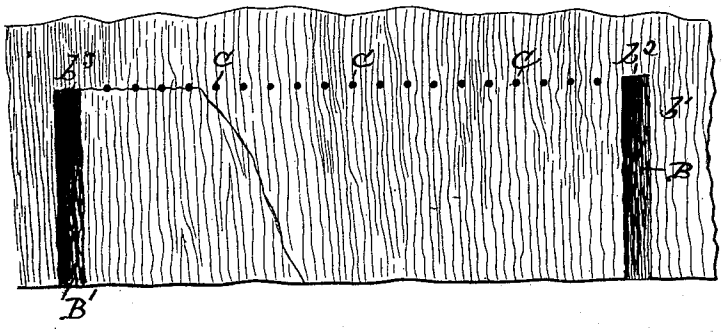


Fig. 2.

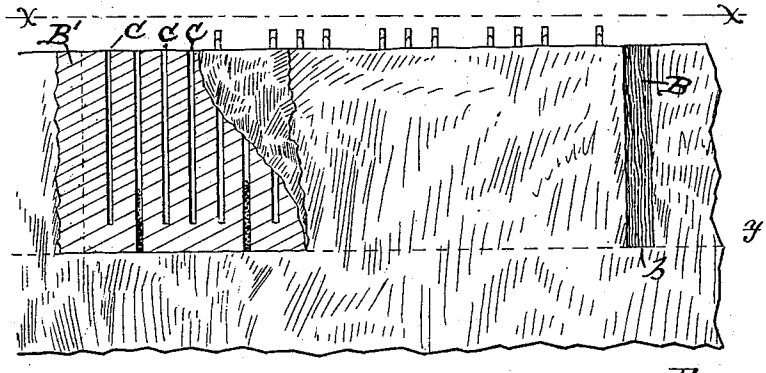


Fig. 3.

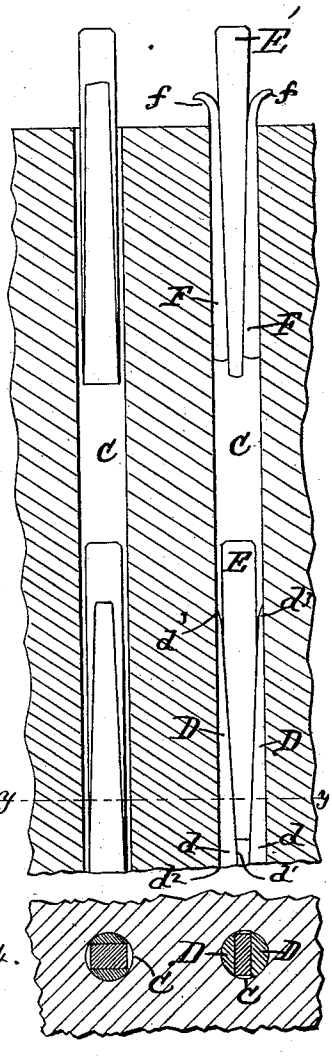


Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN H. JACOBS, OF MARQUETTE, MICHIGAN.

METHOD OF QUARRYING STONE.

SPECIFICATION forming part of Letters Patent No. 410,165, dated September 3, 1889.

Application filed October 1, 1887. Renewed July 20, 1889. Serial No. 318,158. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. JACOBS, a citizen of the United States, residing at Marquette, in the county of Marquette and State of Michigan, have invented certain new and useful Improvements in the Method of Quarrying Stone; 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 appertains 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 specification.

Figure 1 is a top view of a portion of a quarry-bed, showing the first steps of the invention; Fig. 2, a side view showing other steps. Fig. 3 is an enlarged vertical section on line $x\,x$. Fig. 4 is a section on line $y\,y$.

This invention relates to quarrying stone; and it consists in the method hereinafter set forth.

In the annexed drawings, the letter A indicates a portion of a quarry ready for taking out a section of stone. At the proper distance apart for the desired length of stone are cut two channels B B′, of the due depth b and length b' for the desired section to be removed. Along the back of the stone from the inner end b^2 of one channel to the inner end b^3 of the other channel is made a line of vertical holes C, the well-known distance apart, of a depth equal, or nearly so, to that of the channels B B′, according to the kind of stone. After these holes are made, two feathers D D are dropped to the bottom of each hole C. These feathers are larger at their lower ends or bases d, and have their inner faces d' oblique to their backs d^2, thus running to a taper at their points d^3. These feathers are semicircular in cross-section, so as to fit the holes C. The space between these feathers is thus wedge-shaped. Down the holes C and into this space is dropped a wedge E, of shape to fit into this space, but a little larger. These wedges E are then driven by means of rods and any proper power down farther between the feathers D. After these wedges are driven sufficiently in, the rods are removed and feathers F, similar to feathers D, except that the former have backwardly-curved tops f, slipped into the holes D, the curved tops f preventing their dropping down into the holes. These other wedges E′, similar to wedges E, are driven down between the feathers F. The action of these wedges E E′ is to strain or fracture the stone along the line of the holes C. In putting these feathers and wedges into the holes they are not placed into all of the holes, but in groups, say, of three, with one hole between the groups. After the wedges are driven in sufficiently, then powder or other explosive is put into the empty holes and fired by electricity or otherwise in the usual manner. This causes the stone along the line of the holes to break off to the depth of the channels and to be dislodged from its bed. By having the double set of feathers and wedges this action is insured, as the stone is strained or cracked along the bottom as well as the top of the holes, which causes the explosive to break it off in a plane with the bottom of these holes and that of the channels.

I am aware that there are many methods of quarrying stone, and that holes and channels of various sorts have been made.

In carrying out my invention the main idea is that next to a hole where there is a set of wedges there shall be a hole containing an explosive, and any arrangement which preserves this relation is within the scope of the invention. Hence the holes containing the wedges may be in groups with the powder-holes between them, or the holes with wedges may simply alternate with those having the explosive; also, only one set of wedges to a hole need be used, though two sets are preferable.

What I claim is—

1. The method of quarrying stone which consists in making a channel at the ends of the section to be removed and a line of holes at its back, then putting feathers and wedges into some of the holes and driving the wedges to exert a tensile strain along the line of intended fracture and an explosive into the others, the arrangement being that a hole with an explosive will have on each side of it a hole with the wedges, then exploding the explosive, as set forth.

2. The method of quarrying stone which consists in making a channel at the ends of the section to be removed and a line of holes

at its back, then putting feathers and wedges into such holes in groups, then driving the wedges to exert and maintain a tensile strain along the line of intended fracture, with an empty hole between the groups, then putting an explosive into such empty holes and firing the explosive, as set forth.

3. The method of quarrying stone which consists in making a channel at the ends of the section to be removed and a line of holes at its back, then putting at the bottoms of the holes a set of feathers and driving wedges between the feathers, then putting a set of feathers and wedges at the top of the holes, these feathers and wedges being placed into the holes in groups, with an empty hole left between, then putting an explosive into the empty holes and firing it, as set forth.

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

JOHN H. JACOBS.

Witnesses:

CHAS. A. TOWNE,

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