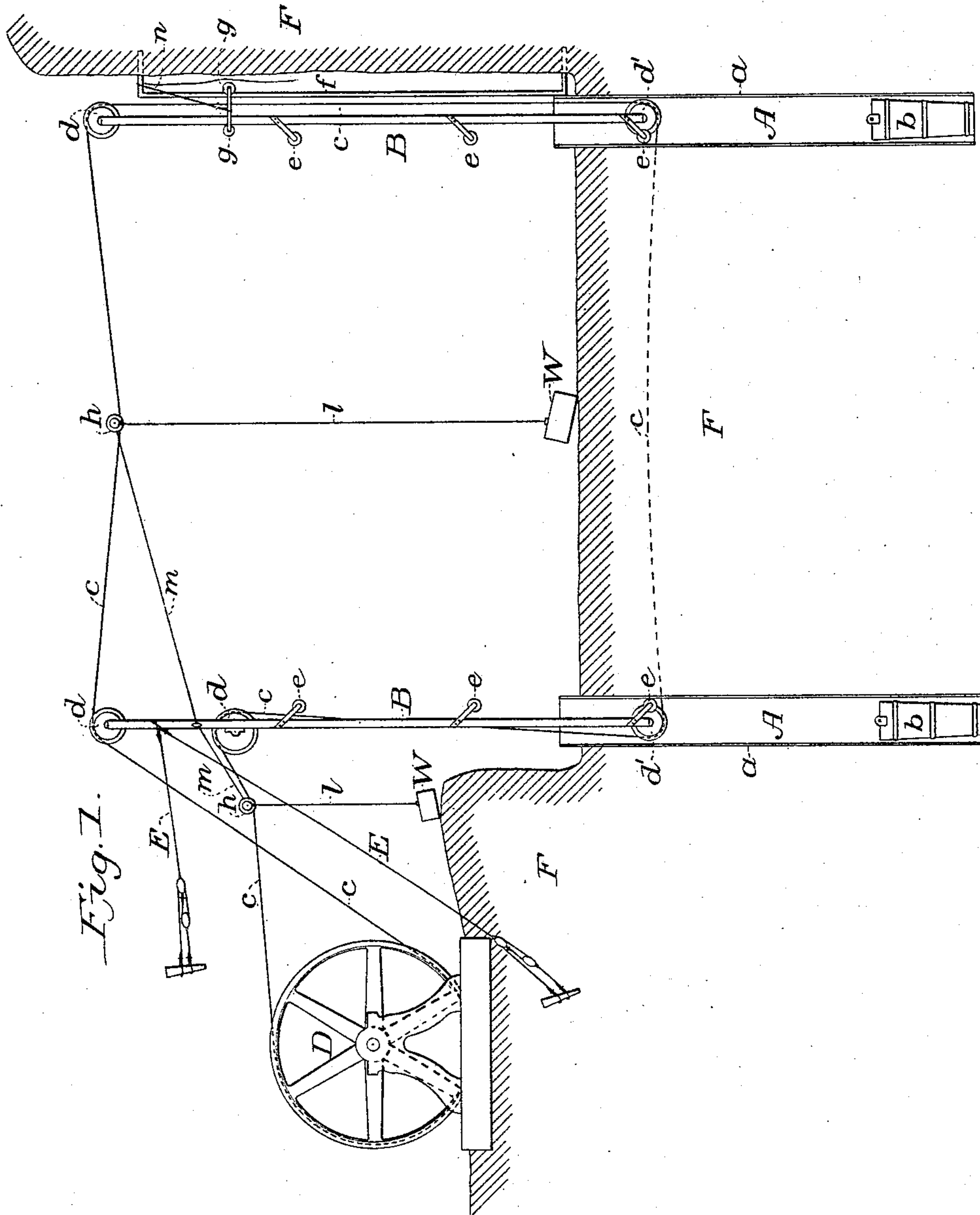


2 Sheets—Sheet 1.

METHOD OF AND APPARATUS FOR SAWING STONE.

Patented June 23, 1891.



Inventor:

J. F. Clark

per E B Stocking
Attorney.

(No Model.)

2 Sheets—Sheet 2.

G. F. CLARK.

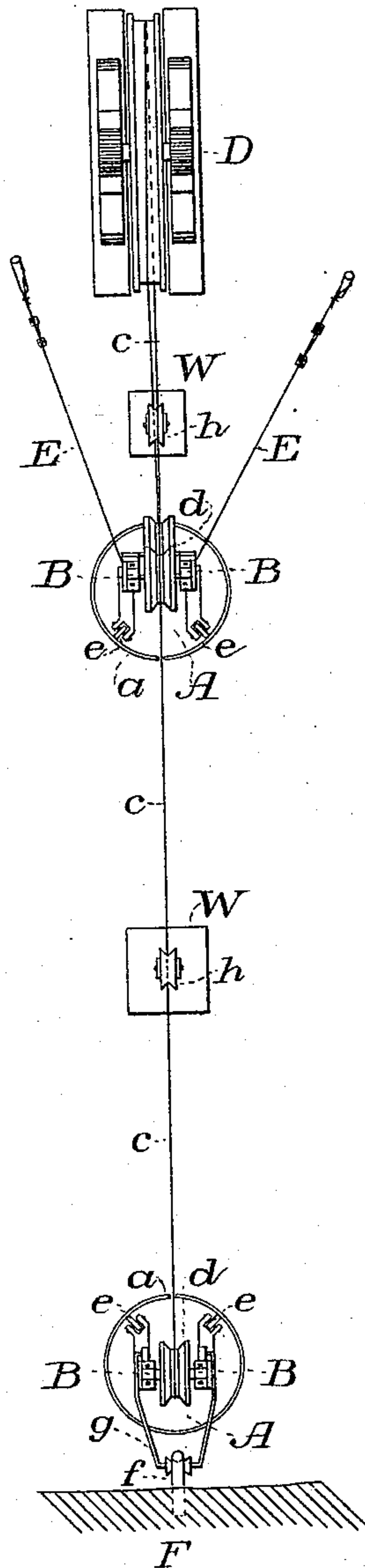
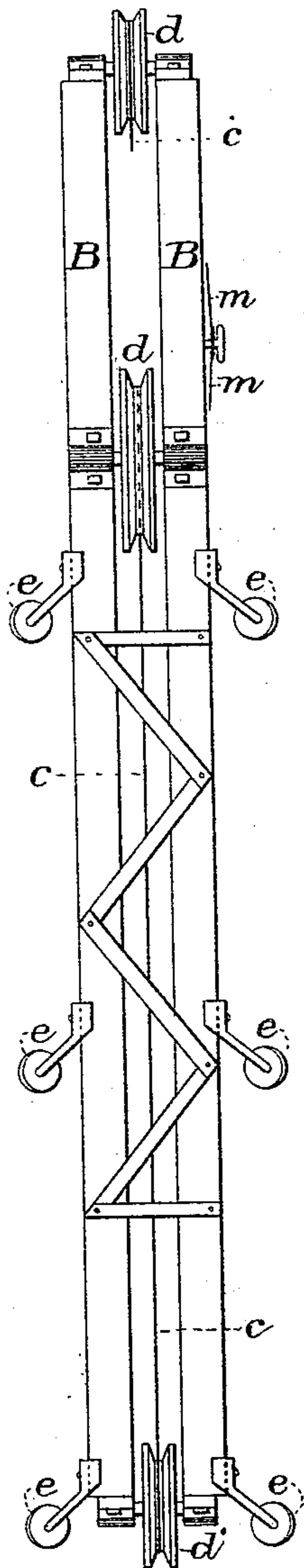
METHOD OF AND APPARATUS FOR SAWING STONE.

No. 454,712.

Patented June 23, 1891.

Fig. 3.

Fig. 2.



Witnesses:
E. A. Bond.
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Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE F. CLARK, OF RUTLAND, VERMONT.

METHOD OF AND APPARATUS FOR SAWING STONE.

SPECIFICATION forming part of Letters Patent No. 454,712, dated June 23, 1891.

Application filed September 29, 1890. Serial No. 366,469. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. CLARK, a citizen of the United States, residing at Rutland, in the county of Rutland, State of Vermont, have invented certain new and useful Improvements in Methods of and Apparatus for Sawing Stone, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in method of and apparatus for sawing stone, marble, &c.; and while it is designed primarily for use at the quarry for sawing the stone in the quarry, yet it is well adapted for use in sawing stone into slabs after it has been removed from the quarry.

It has for its object, among others, to provide simple and efficient means, readily applied and automatically causing the endless wire or wires to descend as the stone is cut. I provide receptacles at the bottom of the holes formed in the stone, whereby the substances remaining in the holes after the stone is sawed may be readily removed or the water and sawing material forced or pumped up through suitable piping and again deposited in the saw-cut above the wire. As a factor to aid in sawing the stone, there may be used with the wire or wires small grains of chilled iron, chilled steel, sand, emery, crushed stone, or other like hard substances, mixed with water and fed in any suitable manner into the cut until the sawing is completed. I provide for the keeping of the wire or wires taut by means of weights suspended from the wire or wires. I also at times provide suitable guides for the vertically-moving posts, and when necessary provide a lining to the holes in which said posts work.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation of my improved apparatus shown in position for operation in

the quarry, with the wire shown as having sawed partially into the stone. Fig. 2 is a top plan of the same, and Fig. 3 is a detail in side elevation of the post on an enlarged scale.

Like letters refer to like parts in all the figures of the drawings.

In carrying out my invention I employ, preferably, the form of apparatus shown, that being what I at present consider a preferable form; but it may be varied within certain limits without departing from the spirit of or sacrificing the advantages of the invention. In any suitable manner I first form in the stone holes A of the desired depth and diameter. These holes may be formed in any of the ways known and in use for testing quarries, one of which I will mention—that is, by means of a cylindrical metal tube placed with its end resting on the stone and caused to be rapidly revolved, the cutting-edge meantime to be fed with grains of emery or other hard substances, or the said cutting-edge may be studded with diamonds. When the cut is of the desired size, the metal tube may be withdrawn and the core then be removed. These holes may be formed in any other desired manner, if preferred.

After the holes have been made in any of the above ways, a metal bucket or pail b, nearly equal in diameter to that of the hole A, can then be lowered into the bottom of the same. The object of these buckets or pails b is that when the sawing is completed and the posts or frames B removed the materials that remain in the hole A may be removed by means of said buckets b.

Instead of a bucket or pail, a box, tube, or pipe may be placed in the hole and sawing materials be pumped or forced up through the pipe or tube, and through a connecting-pipe be again deposited in the saw-cut above the wire, or any other suitable means may be employed, thus making the feed process continuous and using the same materials a number of times until the sawing is completed.

In case the sides of hole A are found to be too rough for the proper working of the radial guide-wheels e, a lining a, with a slot for the passage of the wire c, may, if necessary, be lowered into said hole A, with the top of said

lining projecting above the surface a sufficient distance to allow the guide-wheels *e* to properly hold the posts or frames B in position when commencing to saw.

5 The upright posts or frames B are placed in position and the wire or wires *c* are placed on the pulleys *d* and *d'* and the fly-wheel D. The wire or wires *c* may be drawn tight by means of weights W, suspended by wires or
10 ropes *l* from the endless wire *c*, by trolleys *h*. The trolleys may be held in place by the wires or ropes *m*.

The posts or uprights B may be held in place and guided in their descent by means
15 of the guide-wheels *e*, guy-ropes E, or by clamps *f*, fastened into the walls of the quarry and connected with the posts B by suitable friction-wheels *g*, or by other like contrivances held in place by the wire or rope *n*.

20 The operation will be readily understood, and is as follows: Motion is imparted to the wheel D in any suitable manner, (not shown,) and motion thus conveyed to the endless wire or wires *c*. As the saw proceeds, the posts B
25 with their pulleys over which the wire or wires pass, automatically feed downward, being guided by the guides *e*, and as the saw proceeds the dust formed by the wires is deposited in buckets *b*, which may be emptied
30 after the wire has made one complete cut through the stone, or when they become filled. Reciprocatory movement may be given to the wire by slight changes in details of construction of apparatus, but the construction shown
35 is preferred. After one or more saw-cuts have been made in one direction and it is required to make cuts crossing the same, a thin strip of wood or metal may be placed vertically in the
40 posed new saw-cut, and the space between those pieces filled with plaster-of-paris or other material for the purpose of preventing the sand or other material from escaping into the cut previously made. In place of using the holes
45 A in which to allow the posts B to descend, a space for the purpose can be channeled out by any quarrying or channeling machine or drill. When it becomes necessary to put a
50 new wire or wires *c* in the apparatus, one end of the wire or wires can be fastened to the old wire and drawn over or around the pulleys by setting the old wire or wires in motion.

What I claim is—

1. The herein-described improvement in
55 the art of sawing stone in the quarry, which consists in first providing openings in the stone for the movement of the support of the cutting means, then dividing the stone by the action of an endless wire, wires, or band, and
60 automatically advancing said wire, wires, or band into said openings and through the stone as the sawing advances, substantially as described.

2. The herein-described improvement in
55 the art of sawing stone in the quarry, which consists in forming holes vertically in the stone, arranging vertically automatically-

movable wire-supporting devices above said holes, dividing the stone in the quarry by the action of an endless wire or band around said
70 means, and keeping the said endless band or wire taut by the application of weights bearing upon said wire or band, substantially as described.

3. The combination, with the fly-wheel and
75 the vertically-adjustable or movable posts carrying guide-pulleys, of the endless band, wires, or wire passed over said pulleys and around the drive-pulley, substantially as described.
80

4. The combination, with the fly-wheel and vertically-movable posts free to automatically move in holes in the stone, of the removable receptacles at the bottom of the
85 holes, and the endless wire passed around the fly-wheel and over the pulleys on said posts, substantially as described.

5. The combination, with the vertically-movable posts, the guide-sheaves thereon, and the removable receptacles beneath the posts,
90 of the guide-pulley, the endless wire passed around the same and over the pulleys on the posts, and weights suspended from said wire, substantially as described.

6. The combination, with the vertically-movable posts, the guide-sheaves thereon, and the removable receptacles beneath the posts,
95 of the guide-pulley, the endless wire passed around the same and over pulleys on posts, and the weights suspended from trolleys on
100 said wire, substantially as described.

7. The combination, with the drive-pulley and the vertically-movable posts free to move vertically in holes in the stone, of the endless wire passed around the drive-pulley and
105 over pulleys on the posts, and the weights suspended from the trolleys supported by the said wire, substantially as described.

8. An improved method of sawing stone in the quarry, which consists in the forming of
110 vertical holes in the stone and then severing the stone into slabs by the continuous action of an endless cutter moving into and between said holes, and gradually causing the cutter to descend as the sawing proceeds
115 without interrupting the continuous action of the cutter, substantially as described.

9. An improved method of sawing stone in the quarry, which consists in the forming of
120 vertical holes in the stone and then severing the stone into slabs by the continuous action of an endless cutter moving into and between said holes, and gradually causing the cutter to descend as the sawing proceeds
125 without interrupting the continuous action of the cutter, and automatically collecting in said holes the dust and chippings formed by the cutter, substantially as described.

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

GEORGE F. CLARK.

Witnesses:

HENRY W. SMITH,
P. R. KENDALL.