No. 717,702. PATENTED JAN. 6, 1903.

J. P. MURPHY.

STONE BORING MACHINE.

APPLICATION FILED JAN. 6, 1902.

NO MODEL.

Fig. 1.

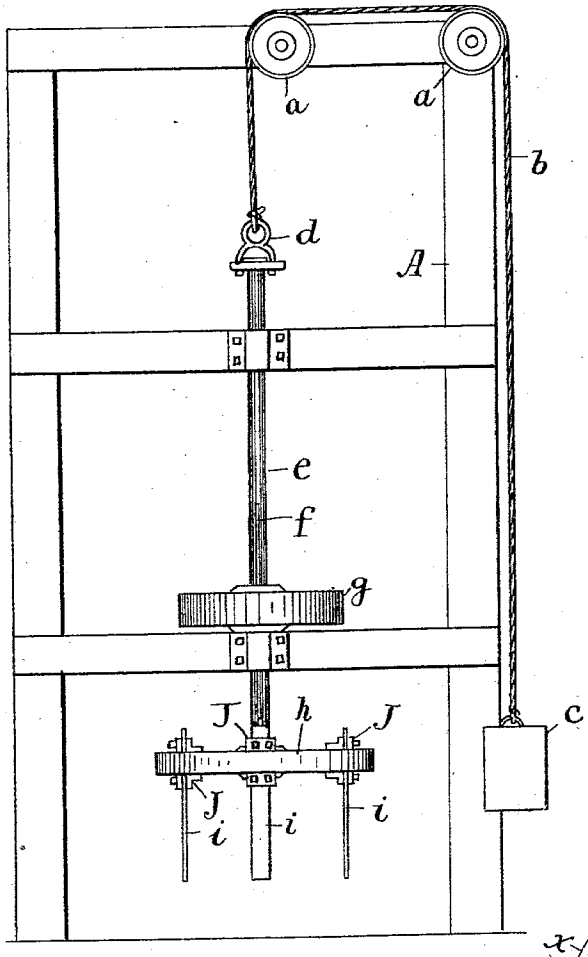


Fig. 2.

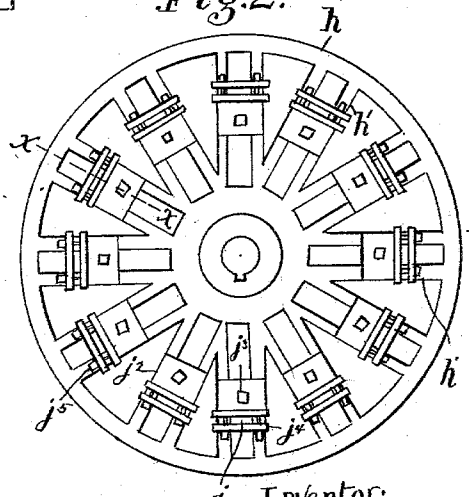
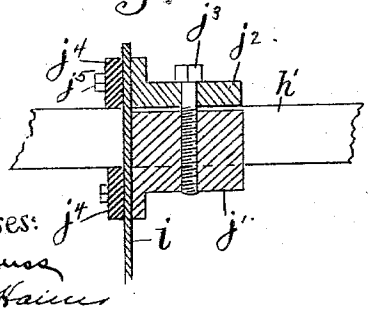


Fig. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN P. MURPHY, OF PORTLAND, MAINE.

STONE-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 717,702, dated January 6, 1903.

Application filed January 6, 1902. Serial No. 88,583. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. MURPHY, a citizen of the United States of America, and a resident of Portland, Cumberland county, State of Maine, have invented certain new and useful Improvements in Stone-Boring Machines, of which the following is a specification.

My invention relates to a machine for boring annular holes in stone, and it is designed particularly for boring out hollow columns and the like from granite or other hard stone, it being provided with a head having cutting-blades laterally and vertically adjustable therein, so that different-diametered columns and different depths may be produced and also several concentric holes can be made simultaneously.

With this end in view my invention consists of a vertical shaft, on the lower end of which is a cutter-head carrying vertical blades adapted to travel in the annular groove. The blades may by suitable fastening means be adjusted for different diameters, and they may be so set as to bore several concentric holes at the same time.

I illustrate my invention by means of the accompanying drawings, in which—

Figure 1 is a front elevation of the machine. Fig. 2 is a plan view of the cutter-head, and Fig. 3 is a section on the line $x\,x$ of Fig. 2.

A represents the framework of the machine, and e is the vertical shaft, held in suitable bearings in the frame, so that it has a longitudinal motion in its bearings, as herein shown. Power is applied to the shaft by the pulley g, connected to the shaft by means of the spline f, so that the shaft may move freely in a vertical direction, while the pulley remains stationary. On the lower end of the shaft is the cutter-head h, here shown as formed in one piece, with radial arms h', the outer ends of the arms being joined by means of a band or rim. The cutting-blades i are held in a vertical position and secured to the radial arms of the cutter-head by means of the clamps J. These clamps are composed of a lower block j', fitting in the radial groove which is formed in each arm, the upper block j^2, bolted to the lower block by the screw j^3, and the upper and lower clamps j^4, bolted to the blocks by screws j^5, by which the vertical blades are held to the adjustable clamp. The lower edge of the lower block has flanges or projections which impinge on the under side of the arm, and the upper block has like flanges, by which the two portions of the block are firmly fastened in position on the arm at any desired point. The blades extend up through the slots in the arms and are clamped to the outer face of the blocks by the upper and lower clamps. It will be seen that the clamps may be readily fastened at any point on the arm, and the blades may be fastened at any point in their height.

For the purpose of taking a portion of the weight of the cutter-head from off the blades i I provide a counterweight c, connecting with the top of the shaft by means of a cord b, running over pulleys $a\,a$, the end of the cord being secured to a yoke d on the upper end of the shaft e.

The operation of my machine is as follows: The blades i are set at the required point to cut the annular groove desired, and a shallow groove of the diameter desired is cut in the stone by hand. The stone is placed under the cutter-head and the blades caused to travel in the groove, chilled-iron shot being placed in the bottom of the groove, as is usual in stone-cutting tools. The blades will cut their way rapidly through the stone and take out a core of any desired diameter up to the capacity of the machine. In practice I start a groove with short blades, and after getting down into the stone I shift the blades for longer ones.

It will be seen that by setting a portion of the blades inside of the others two grooves may be cut at the same time of different diameters. Thus two or more hollow columns of different diameters may be cut at the same time on the machine.

It is evident that the cutter-head may be given a rotary and vertical motion otherwise than by the means here shown—as, for instance, by having the cutter-head splined to the shaft instead of being secured rigidly to it, as here shown; but such modification would come within the scope of my invention.

I claim—

1. In a stone-boring machine, the combination of a frame, a shaft mounted revolubly

and vertically movable in the frame, and a cutter-head carried by the lower end of the shaft and comprising a circular disk having a hub, a series of radiating arms provided each with a slot therethrough, and a peripheral rim, a clamp comprising a lower member having a portion entering the slot of each arm from below, and upper member adapted to span the slot of the arm, and means to draw the members together to hold the members upon the arm; and a flat blade projecting through the slot of said arm and adapted to be held vertically adjustable by the clamp.

2. In a stone-boring machine, the combination of a cutter-head, comprising a series of radiating arms each provided with a slot therethrough, a clamp made in two members one spanning the slot of each arm and the other entering the slot from below and provided with means to draw the members together and secure the clamp upon the arm, a flat blade projecting through the slot of each arm, and clamps adjustably secured to the first-mentioned clamp for adjustably securing the blades, so that they can be vertically adjustable.

Signed at Portland, Maine, this 26th day of December, 1901.

JOHN P. MURPHY.

Witnesses:
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HARRY B. RUSS.