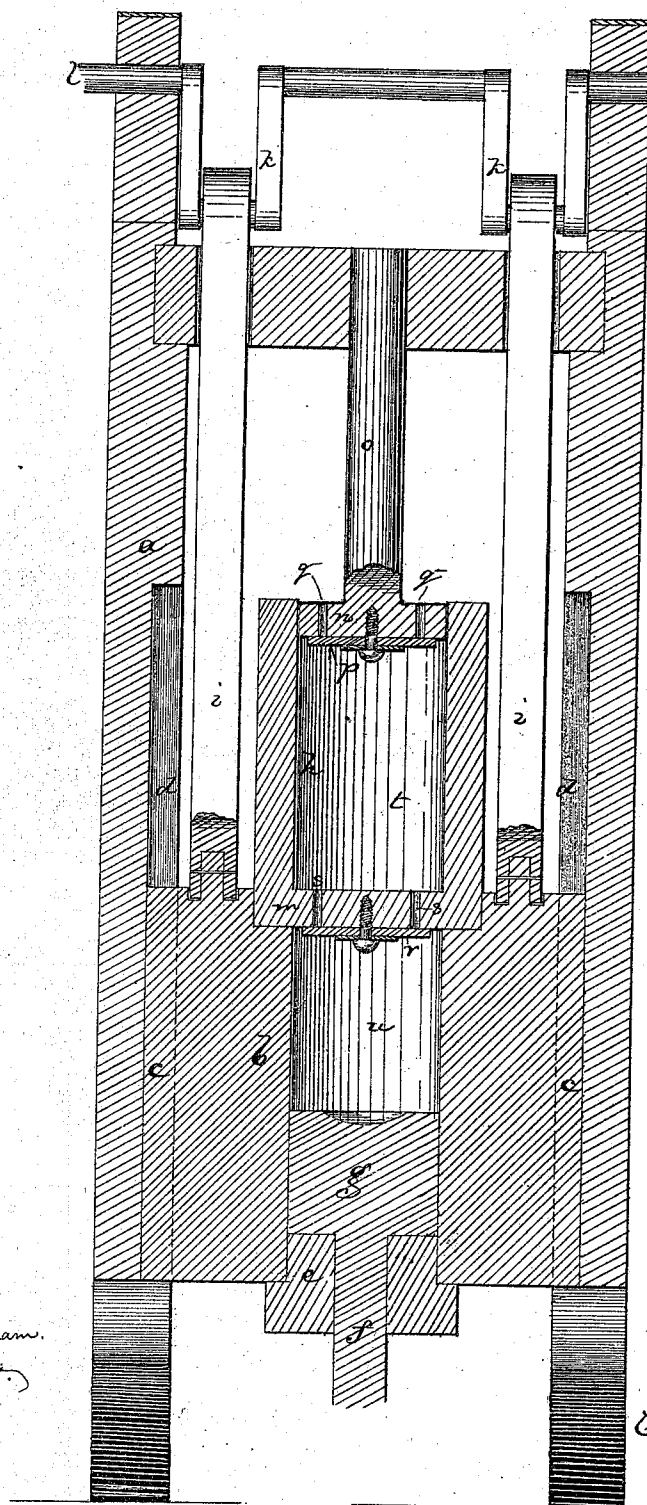


D. TILLSON.
Improvement in Machines for Cutting Stone.
No. 131,797. Patented Oct. 1, 1872.



Witnesses
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UNITED STATES PATENT OFFICE.

DAVIS TILLSON, OF ROCKLAND, MAINE.

IMPROVEMENT IN MACHINES FOR CUTTING STONE.

Specification forming part of Letters Patent No. **131,797**, dated October 1, 1872.

To all whom it may concern:

Be it known that I, DAVIS TILLSON, of Rockland, in the county of Knox and State of Maine, have invented an Improvement in Stone-Cutting Machines; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to that class of stone-dressing machines in which engine-impelled drills are used, the invention having particular reference to provision for cushioning the drill-carriers in their reactionary movement. My invention consists, primarily, in making the drill-carrier as a piston located in a reciprocating-cylinder, the piston being at the forward end of the cylinder, and its rebound after the blow being against the body of air between it and the cylinder-head. I use in connection with the drill-cylinder an air-compressor cylinder, by means of which the air is driven into and compressed within the drill-cylinder, so that the drill holder or piston reacts against the body of compressed air.

The drawing represents a sectional elevation of a drilling-engine embodying my invention.

a denotes the frame; *b*, a reciprocating drill-cylinder, having at its opposite sides slides *c*, which slide on the guide-ways *d* of the frame *a*. At the front or lower end of the cylinder is a cylinder-head, *e*, through which passes a shank or drill stock, *f*, which carries at its outer end the drill. This drill-shank or holder extends from a drill-head or piston, *g*, in the cylinder *b*. At the opposite end of the cylinder *b*, and in axial line with it, is another cylinder, *h*, which is an air-compressor cylinder, and is attached to or forms a part of the cylinder *b*, the slides *c* of the cylinder *b* being connected by pitmen *i* with cranks *k* of a driving-shaft, *l*, rotation of the shaft effecting the reciprocation of both cylinders. At the front end of the cylinder *h* is a head, *m*, which forms a partition between the two cylinders, and in said cylinder *h* is a piston, *n*, which is, at the end of a rod, *o*, fixed to and extending from the frame *a*, the rod and piston being station-

ary, and the cylinder *h* sliding upon the piston. At the inner side of the piston *n* is a valve, *p*, which controls air-inlets *q* passing through the piston, and in the front of the head *m* is a similar valve, *r*, controlling openings *s* through said head, said openings extending from the compressor-cylinder chamber *t* into the drill-head cylinder-chamber *u*.

The operation is as follows: When, by turning shaft *l* the cranks *k* are brought to the opposite position to that shown in the drawing the cylinder *h* slides upon the piston *n*, the valve *p* closes, preventing escape of the air through the inlets *q*, and the air in the cylinder is therefore forced through the holes *s* in the head *m* into the cylinder-chamber *u*, the valve *r* opening for that purpose, and by the pressure of the air. This operation compresses the air in the cylinder-chamber *u*, and as the shaft next turns to drive the drill forward the valve *r* closes, and as the drill-point strikes the stone, the rebound of the drill carries its head *g* against the body of confined and compressed air in the cylinder *b*, the reaction being spent upon the air, and not upon the machine.

Although I have shown but one drill-shank or holder, it will be obvious that the machine may be made with a series of drills, to be simultaneously operated to act over or across the face of a block of stone, the drill-shanks extending from one or from several heads, and there being one or more air-cushioning cylinders, the drills being worked very rapidly, and reducing the stone by the rapidity of action rather than by the great force of each blow.

I claim—

1. A stone-cutting or drilling machine, the cutters of which are fixed to a piston or pistons, which react wholly against confined and compressed air, as set forth.

2. Also, the combination and arrangement of the reciprocating cylinders, the stationary piston, the valves, and the drill-head, substantially as shown and described.

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Witnesses:

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