

G. J. Wardwell,
Stone-Channeling Machine.

No 51,272.

Patented Nov. 28, 1865.

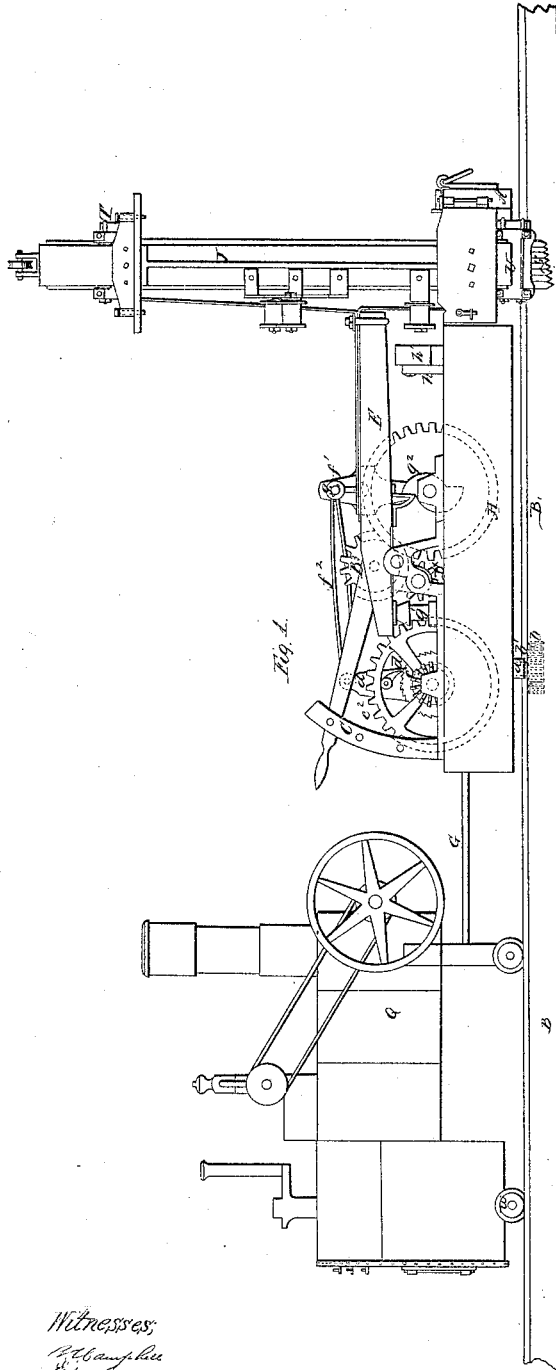


Fig. 1.

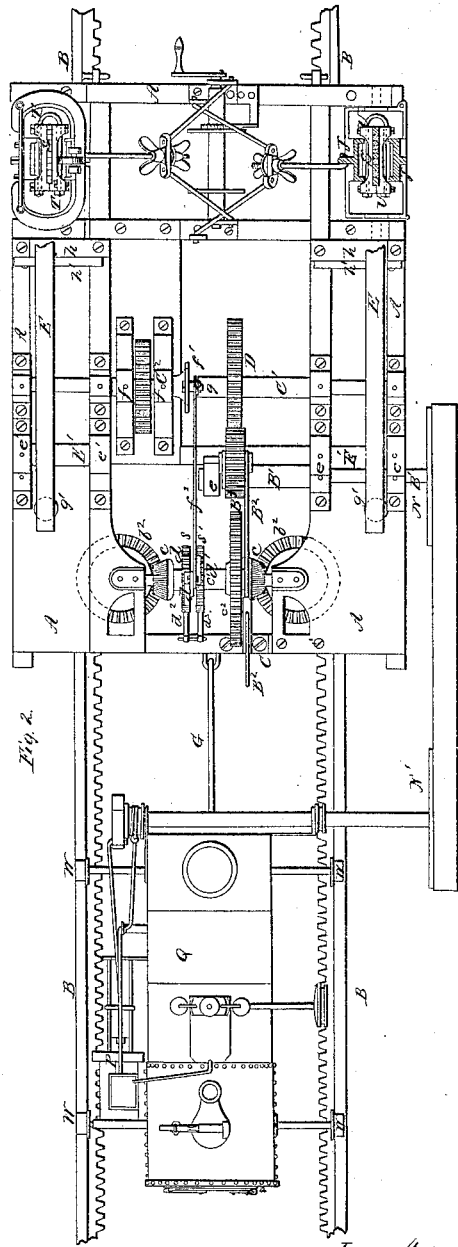


Fig. 2.

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IMPROVED MACHINERY FOR CUTTING STONE.

Specification forming part of Letters Patent No. 51,272, dated November 28, 1865.

To all whom it may concern:

Be it known that I, GEORGE J. WARDWELL, of Rutland, in the county of Rutland and State of Vermont, have invented a new and useful Improvement in Machinery for Cutting Stone; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an elevation of one side of a stone-cutting machine, and an engine for moving the same mounted upon the same track. Fig. 2 is a top view of Fig. 1.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates particularly to stone-cutting machinery which is mounted upon a carriage that moves upon a track, and wherein are employed rectilinear reciprocating cutters that penetrate the stone by repeated blows.

It is very important in the operation of this class of machinery to apply the motive power or engine in such manner that it will not be subjected to the injurious jars and concussions occasioned by the striking of the cutters upon the stone, which, if communicated to the engine, would soon render it inoperative. It is also important to have the engine of the stone-cutting machinery applied to the same in such manner that it can be detached therefrom when it is required to move the machinery about from one quarry to another, or from one bed of stone to another.

The nature of my invention consists in the employment of a portable steam-engine in conjunction with a stone-cutting machine, which will be hereinafter described, in such manner that both are supported independently upon the same track and are connected together so that they can be detached at pleasure for moving them separately from one quarry or bed of stone to another, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the frame or carriage of the stone-cutting machine, which is provided with shoes or slides *a a*, that support and guide it upon a track, B.

These shoes *a a* embrace the rails of the track for the purpose of preventing lateral movement of the carriage during the operation of cutting stone. The rails are united together in sections by means of cross-ties and these sections are laid down and properly beveled upon the bed of stone which it is desired to quarry.

I have represented in the accompanying drawings a double machine—*i. e.*, a machine carrying two gangs of cutters, one gang being arranged on each side of the frame A, outside of the carriage A—but in some instances I shall employ a single machine, or one which has but a single gang of cutters.

On the inside of the rails of the track B are teeth, as shown in Fig. 2, for receiving the teeth of two spur-wheels, one of which, *b*, is indicated in dotted lines, Fig. 1. These wheels *b* are keyed on the lower ends of vertical shafts *b'*, which carry on their upper ends bevel spur-wheels *b² b²*, that engage with the teeth of bevel pinions *c c* on a horizontal transverse shaft, *c'*. This shaft *c'* has a large spur-wheel, *c²*, keyed on it, and also two ratchet-wheels *s s'*, between which latter an arm, *d*, vibrates loosely. The arm *d* has a pawl, *d'*, on each side of it, which palls can be engaged with or detached from their respective ratchet-wheels at pleasure. The ratchet-teeth of these twin-wheels are pitched in opposite directions, and their respective pawls are adapted to engage with them and to give the shaft *c'* and shafts *b' b'* a forward or backward movement, whichever direction it is intended to move the frame A.

Two stay-dogs, *d² d²*, are pivoted on top of the rear beam of the frame or carriage A, for the purpose of preventing the backlash. These dogs can be engaged or disengaged with their respective ratchet-wheels at pleasure.

The main driving-shaft B' is supported in bearings *eee*, and carries on one end, outside of the frame A, a large belt-wheel, N, which is shown in Fig. 2, for receiving motion from a belt-wheel, N', on an engine that is behind the frame A, and which will be hereinafter further described. The opposite end of the shaft B' carries a pinion spur-wheel, B*, and a vibrating lever B², which latter supports as pur-wheel, B³, that is constantly in gear with the teeth of the pinion B*. Lever B² extends backward and passes between an upright seg-

ment-guide, C, that is secured upon the rear beam of frame A, to which guide the lever is affixed by means of a transverse-pin in an elevated or depressed position, according to the movement it is required of the machine. When said lever is depressed so as to engage the spur-wheels B³ and C², the machine can be moved backward or forward rapidly without actuating the cutting-tools, provided both of the ratchet-wheels s s' are released from their pawls.

In front of the main driving-shaft B' is a longitudinal transverse-shaft, C', which carries a two-throw cam on each end, as will be hereinafter more fully described. This shaft C' has a large spur-wheel, D, keyed on it in a plane with the spur-wheels B³ C², so that by raising the rear end of the lever B² its driving-wheel, B³, will be engaged with the teeth of wheel D, as shown in Figs. 1 and 2. The cam-shaft C' also has another spur-wheel keyed on it for giving motion to a pinion spur-wheel, C², which is keyed on a short transverse shaft that is supported in bearings f f, shown in Fig. 2.

A slotted arm, f', is secured to one end of the short shaft of wheel C², to which the forward end of a pitman-rod, f², is pivoted. The rear end of this rod is pivoted to the upper end of the vibrating pawl-arm d' above-described. The slotted arm or crank f' projects on each side of the center of its shaft, and the pitman f² is pivoted to this arm by means of a stud, g, which passes through the slot, and which can be adjusted and fixed nearer to or farther from the axis of the shaft of the arm, according to the amount of throw which it is required to give the vibrating arm d'. By this arrangement the length of strokes of the vibrating pawl-arm d' can be adjusted to a nicety.

E E are two longitudinal beams, which extend forward of the main driving-shaft B', and which are arranged near the sides of the frame A, as shown in Fig. 2. These beams are secured, near their rear ends, to rock-shafts E' E', which are supported in bearings e e' e', and beneath the rear ends of these beams india-rubber or metallic springs are suitably applied, as shown at g', Fig. 1, the object of which is to move the forward ends of the beams downward with considerable force. These beams E E are acted upon by cams g², on the cam-shaft C', which cams may be so arranged as to elevate and depress the beams simultaneously or alternately, as may be desired.

Near the forward ends of the beams E E, and arranged beneath the same upon the frame A, are stop-blocks h h, upon which said ends of the beams may strike when they are allowed to fall.

Two props, h' h', may be pivoted to the stop-blocks h h, for supporting the forward ends of the beams E E in an elevated position and free from their respective cams when desired.

The forward ends of the beams E E are connected in any suitable manner to their respective cutters S S, which consist of a number of flat steel strips bolted and clamped together by means of head and foot clamps T U. These cutters are supported and guided by means of standards J J, which may be permanently secured in vertical positions to the forward part of the frame or carriage A; or these standards may be secured to boxes which will admit of their being inclined and secured at any desired angle.

Provision may be made for reversing the cutters in their standards, or for removing the cutters, and substituting others in their stead.

In rear of the machine for cutting stone I arrange an engine, P, which is mounted upon its boiler Q, and suitably connected to the shaft of the belt-wheel N', so that this belt-wheel can be rotated forward or backward by reversing the engine. The engine, together with its boiler, fire-box, and smoke-stack are mounted upon wheels W W, and connected to the frame or carriage A of the stone-cutting machine by means of a coupling-link, G. The wheels W W are flanged like car-wheels, and they roll upon the track B as the machine is moved forward or backward.

The movement of the engine upon its track is effected by means of the feed mechanism applied to the frame of the stone-cutting machine. Consequently the movements of the carriage upon which the cutters are supported, and the reciprocating movements of these cutters can be timed to a nicety, so that the carriage will only be moved while the cutters are making their upward strokes—a feature which is very important to secure success in the operation of my machinery.

It is obvious that any feed mechanism which will operate substantially in the manner above-described may be employed upon the carriage A, and for this reason I do not confine my invention to the contrivances which I have above described for this purpose.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination of a feed mechanism, a stone-cutting machine, and a steam-engine, substantially as and for the purposes described.

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Witnesses:

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