(No Model.) 2 Sheets—Sheet 1.

D. RETTIGER.

STONE CUTTING MACHINE.

No. 457,213. Patented Aug. 4, 1891.

Fig. 1

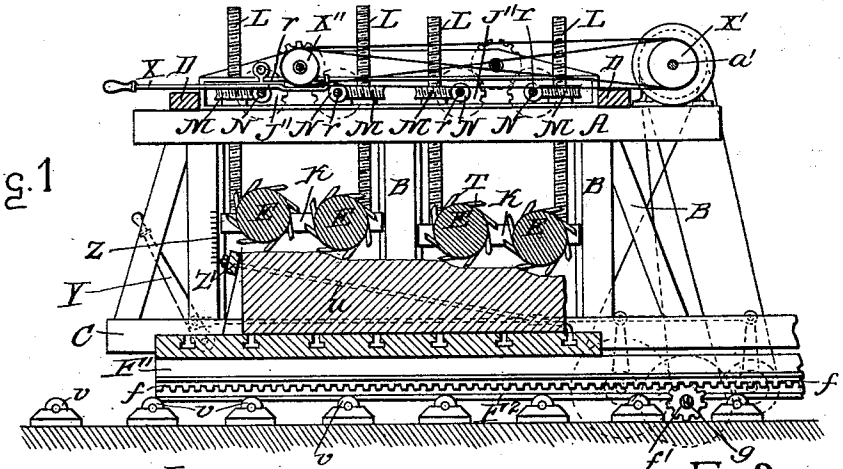


Fig. 3

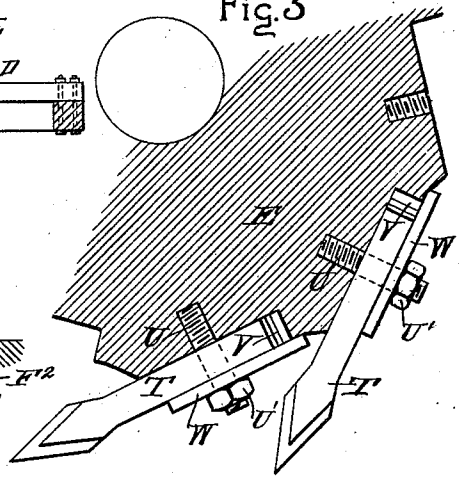


Fig. 2

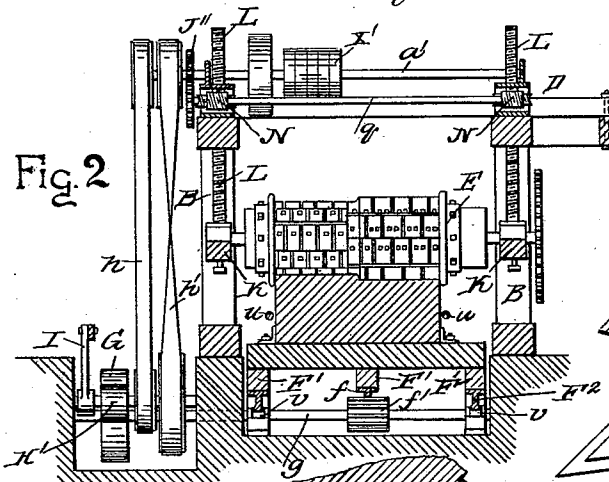


Fig. 4

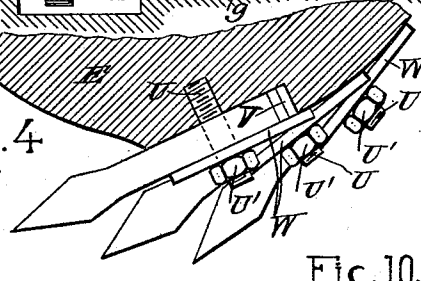
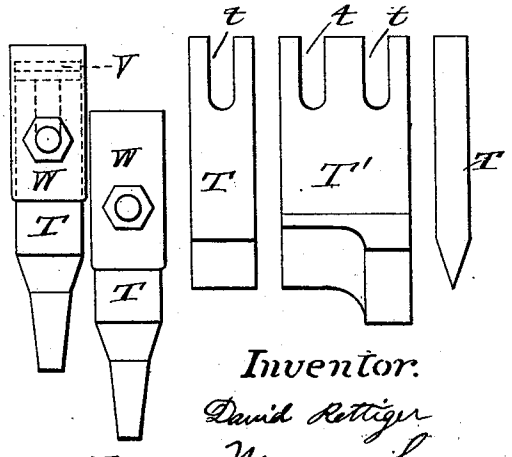


Fig. 10.



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(No Model.) 2 Sheets—Sheet 2.

D. RETTIGER.

STONE CUTTING MACHINE.

No. 457,213. Patented Aug. 4, 1891.

Fig. 5.

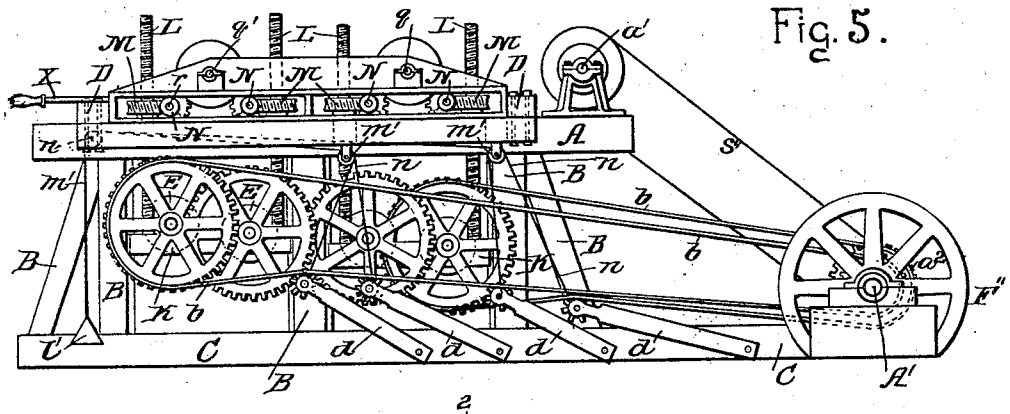


Fig. 6.

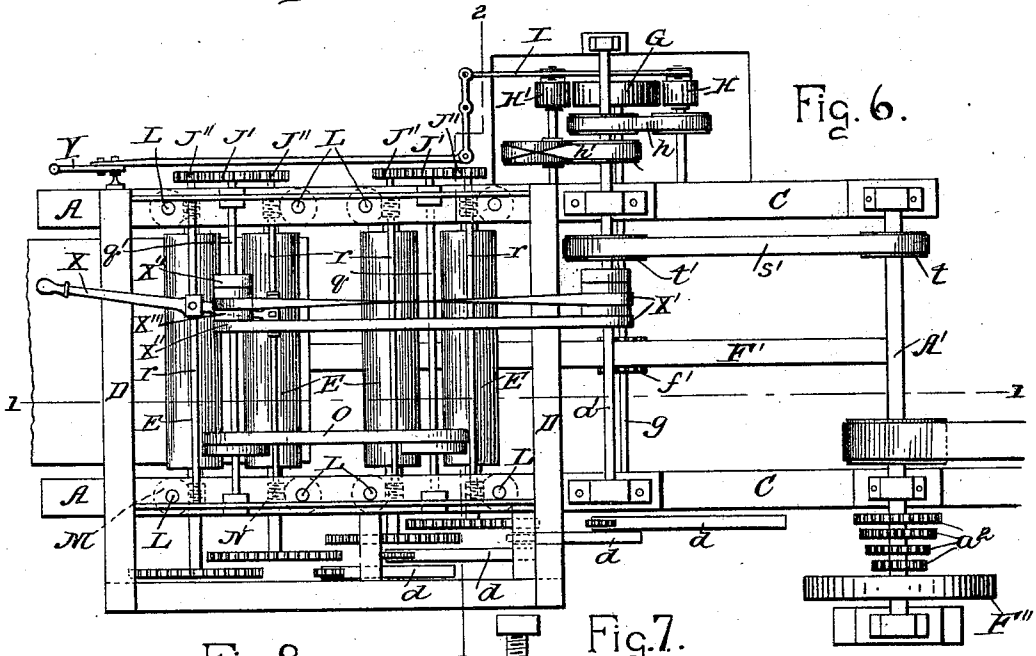


Fig. 7.

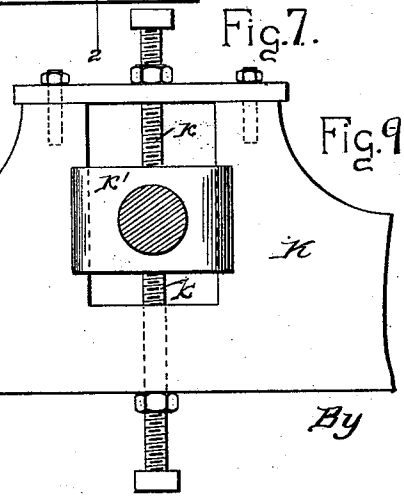


Fig. 8.

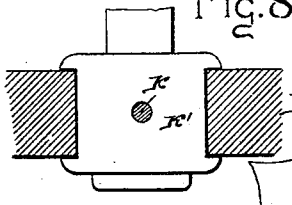
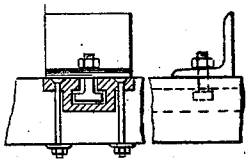


Fig. 9.



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UNITED STATES PATENT OFFICE.

DAVID RETTIGER, OF STRONG CITY, KANSAS.

STONE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,213, dated August 4, 1891.

Application filed November 15, 1890. Serial No. 371,535. (No model.)

To all whom it may concern:

Be it known that I, DAVID RETTIGER, residing at Strong City, in the county of Chase and State of Kansas, have invented certain new and useful Improvements in Stone-Cutting Machines, of which the following is a specification.

My invention relates to improvements in stone-cutting machines in which a revolving cylinder or cylinders having steel cutters is used in combination with a longitudinally-movable carriage, the objects of my invention being, first, to reduce stone from the rough quarry-face to a finished surface, either planed or molded, more rapidly and perfectly than has heretofore been possible with the expenditure of the same amount of energy; second, to adjust the cutters or chisels so as to do the greatest amount of cutting with the least wear on the machinery and the least frequent sharpening and replacing of chisels; third, to so arrange the chisels that, as they become of various lengths from sharpening or wear, they may be readily and quickly set with the cutting-edges at proper distances and the butt-ends be made solid against the cylinder by means of wedges; fourth, in one operation to cause the surface of a rapidly-moving stone to be first scabbled off, making spawls large enough to be merchantable, and then planed smooth or molded, (for such purpose a machine may consist of any number of cylinders;) fifth, to afford facilities for the proper adjustment of chisels independently of each other, so that a broken chisel may be speedily removed and replaced without disturbing any of the others; sixth, to provide for an automatic adjustment of the speed of the stone to the resistance met with, so that extreme pressure or extraordinary resistance suddenly applied or met with in the process of cutting will be met by an automatic temporary halt or reduction of speed in feeding and a slight rebound of the chisels; seventh, to provide a means for raising and lowering the cylinders to suit any thickness of stone by means of worm-gears operated by friction-feed; eighth, to provide a certain steady uniform method of feeding by a combination of a cogged rail attached to the feeding-car and a set of friction-pulleys.

To these ends my invention consists in the peculiar combination and novel arrangements of the several parts of the mechanism illustrated in the accompanying drawings, all of which will hereinafter be fully described in the annexed specification, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a vertical longitudinal section on the line 1 1, Fig. 6. Fig. 2 is a vertical transverse section on the line 2 2, Fig. 6. Fig. 3 is a detailed section of a portion of the metal cylinder, showing chisels as set for cutting moldings. Fig. 4 is a section of a portion of the metal cylinder, showing the chisels set for scabbling or planing. Fig. 5 is an elevation of one side of the machine. Fig. 6 is a top view of the machine. Fig. 7 shows a part of the cylinder-shaft beam, with adjustable journal-box of one cylinder in each beam. Fig. 8 is a horizontal view of the adjustable journal-box in the cylinder-shaft beam. Fig. 9 is a detailed section of the cast-iron slot in the car, showing the manner of holding the stone in place, in connection with the rod and wedge shown in Fig. 1; and Fig. 10 illustrates some of the chisels used in connection with this machine.

In the accompanying drawings, A indicates the upper longitudinal beams; B, the supports; C, the sills; D, the cross-beams, which are bolted together and constitute the frame-work of the machine, which is securely anchored in a heavy stone foundation.

F′ denotes a longitudinal beam secured centrally under the reciprocating car F, the outer edges of which are formed with longitudinal runners F^2, which ride upon the rollers *v v*, journaled in the stone base, as clearly shown in Fig. 1 of the drawings. The beam F′ is formed with a cogged rail or rack *f*, which meshes with a cogged wheel *f′*, fixed on a transverse shaft *g*, journaled under the car, upon the outer end of which is fixed an iron friction-pulley G, which is revolved in reverse directions by means of the adjustable paper friction-pulleys H H′, which are arranged to be alternately brought in contact with the pulley G, such operation being accomplished by means of a lever and bar attachment I. (See Fig. 6.) When the pulley G is held free of the pulleys H H′, the car remains stationary, and the movement of the car in either direction corresponds with the

movement of the pulley G through the medium of the cog-wheel and rack ff'. The pulley H, Fig. 6, is revolved by means of a straight belt h from the counter-shaft a', and the pulley H′ is revolved by means of a crossed belt h' from the same shaft, such shaft being driven by the belt s', which connects its pulley t' with a pulley t on the main or drive shaft A′, provided with a fly-wheel F″ and driven in the usual manner.

Cast-iron or steel cylinders E are provided, of which any number may be used, though the drawings show only four, said cylinders being supported in vertically-adjustable iron beams K K, provided with bearing-boxes for the cylinder-shafts. Said beams K (see Fig. 1) are arranged so each set of beams will carry a pair of cylinders. One of such cylinders has its bearings so arranged that it may be slightly raised or lowered without interference with the other cylinder on the same beam. This lowering and raising of the cylinder is accomplished by means of the set-screws k, operating on the cylinder-shaft boxes k' k', which move up and down, being flanged over both sides of the machine, and each beam bears one end of two cylinders. These beams are sustained by the screw-rods L, held in place by cast-iron tracks fastened on the posts B, which serve to guide the beams K K. These rods have their threads arranged to be screwed through the internally-threaded worm-wheels M M M M, which, when turned in either direction, raise or lower the rods L L, and therefore the cylinder-shaft beams K, and with them the cylinders.

The wheels M have bearings on the cast-iron crown-plate, which sustains the weight of the cylinders, said wheels being operated by the worm-gears N on the transverse shafts r, which are provided with cog-wheels J″, which engage with cog-wheels J′ on the outer ends of the shafts q and q', which are connected by a belt O, as shown in Fig. 6, whereby when the shaft q' is revolved in different directions the shaft q will revolve in the same direction with it. To provide simple means whereby the shaft q' may be reversed or remain idle, I provide two pulleys x' x', fixed on the counter-shaft a', which are connected with loose pulleys x'' x'' on the shaft q' by means of a straight belt and a crossed belt, respectively, as shown in Fig. 6.

x''' is a double pulley beveled on each side toward the loose pulleys x'' x'' and attached to a shifting-lever X, by means of which it may be jammed into contact with and render fixed either of the loose pulleys x'', according as it is desired to raise or lower the cylinders E. When the lever X is adjusted centrally between the pulleys x'' x'' the shaft q' will be stationary.

Each of the cylinders E has one end of its shaft projected and provided with a cog-wheel, each of which is connected by means of a sprocket-belt b with a series of sprockets a^2 on the power-shaft A′, only two of such belts b being shown in Fig. 5 and none in Fig. 6, so as to avoid confusion in the drawings. A series of tighteners d are provided, one for each belt b, which consist each of a heavy beam pivoted at its lower end and having a sprocket-wheel at its upper end, which works in the sprocket-chain belt. These tighteners are kept in position against the said belts by means of cords n n, passing over pulleys m' m' and provided with counter-weights l', as shown. The tighteners serve to take up slack of the chain belt and operate as a sort of automatic check when the chisels strike a flinty substance—*i. e.*, by the use of the tighteners the chain belts may be run slack, so as to afford them an opportunity to give when the resistance suddenly becomes greater than the normal.

Each of the cylinders E is of cast-iron or steel, made with pockets to receive the chisels. These pockets are arranged tangentially to the drum and are formed by chiseling them out to the required arrangement, such pockets being also so arranged that the cutting force is transmitted longitudinally through chisels as the points or edges thereof come in contact with the stone.

T T indicate the chisels, which are of different shapes, according to the degree of hardness of the stone, the character of the cutting required, or the detail of molding to be cut. Each of the chisels is formed with a slotted upper end t, through which pass the holding-bolts U, which are threaded into the cylinder, as shown, their outer ends being also threaded to receive the lock-bolts U′, whereby the chisels are rigidly held in their respective pockets.

V indicates wedges placed between the butts of the chisels and the shoulder of the pocket to hold the chisels solidly against the cylinder whenever they have been shortened by sharpening, said wedges being securely held in place by means of the elongated washers W, which are held by the nutted bolts U and lap the pockets in the cylinders, as clearly shown in Fig. 3 of the drawings.

In Fig. 10 various shapes of cutters or chisels are shown, the one marked T′ being used for molding.

The use of the paper friction-pulleys forms an automatic check in that the chisels striking a particularly flinty stone feeding is temporarily stayed. The lever X controls the raising and lowering of cylinders to suit the thickness of the stone to be faced, dressed, or molded. The rear post has a scale-plate Z, which, with the aid of a pointer on the end of the adjacent bearing-box of the cylinder, shows the thickness to which the stone is being cut. The direction of the car in or out is governed by the adjustment of lever Y.

The duty of the studs or bolts U which hold the chisels in place in relation to the force from the heavy iron cylinder communicated to the butt of the chisel from the shoulder of the pocket parallels somewhat the ac-

tion of a workman's hand in holding a chisel, which is being struck upon the end by a heavy hammer. It merely affords direction and support therefor.

Z′ indicates a wedge at the back of the stone, which, together with the rod *u*, fastened at the front of the car, is used to hold the stone steady on its car and against the chisels and prevent it from bounding.

From the foregoing description, taken in connection with the drawings, the advantages and complete operation of my machine will readily appear.

The arrangement of the machine is practical. It is strongly yet compactly built and will effectually accomplish in a simple manner the work for which it is constructed.

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

1. The combination, with the reciprocating car, a cog-and-gear mechanism for operating it, and a drive-shaft for operating such mechanism, said shaft provided with a friction-pulley G, of a set of friction-pulleys H H′, arranged to engage the opposite sides of the pulley G and to be alternately thrown into or out of engagement with said pulleys, lever mechanism for forcing such wheels into frictional contact with the wheel G and arranged relatively, whereby the said pulley G is caused to slip and rebound slightly when the chisels strike flinty portions of the stone and great resistance is met, substantially as and for the purposes described.

2. The combination of the reciprocating car, rack-and-gear mechanism for operating it, a series of cylinders transversely of the car carrying chisels arranged tangentially, sprocket-wheels on the shaft of the cylinders, the main drive-shaft, chain connections between the shafts and sprockets, the tighteners *d*, engaging said chains, and the friction-pulley devices for operating the rack-and-gear mechanism of the car, all arranged substantially as shown and described.

3. The combination of the cutting-cylinders having their shafts provided with sprocket-wheels, the drive-shaft, the chain connections between the drive-shaft and sproket-wheels, and the tighteners *d*, having toothed wheels pressing against the said chain connections, all substantially as and for the purposes set forth.

DAVID RETTIGER.

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