No. 847,339. PATENTED MAR. 19, 1907.

A. F. JONES.

STONE DRESSING MACHINE.

APPLICATION FILED MAY 21, 1904.

7 SHEETS—SHEET 1.

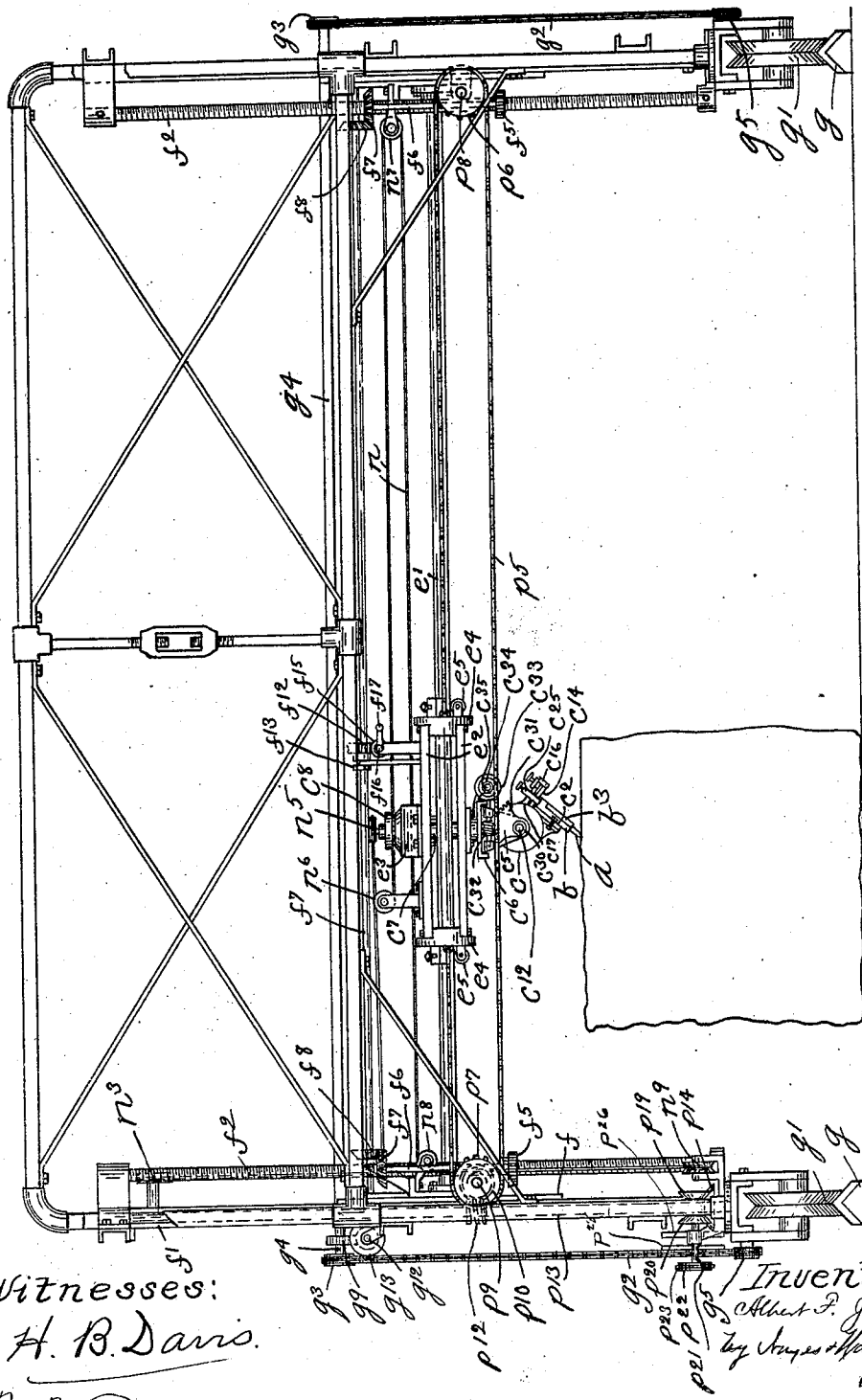


Fig. 1.

Witnesses:
H. B. Davis.
M. M. Piper

Inventor:
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THE NORRIS PETERS CO., WASHINGTON, D. C.

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7 SHEETS—SHEET 2.

Fig. 2.

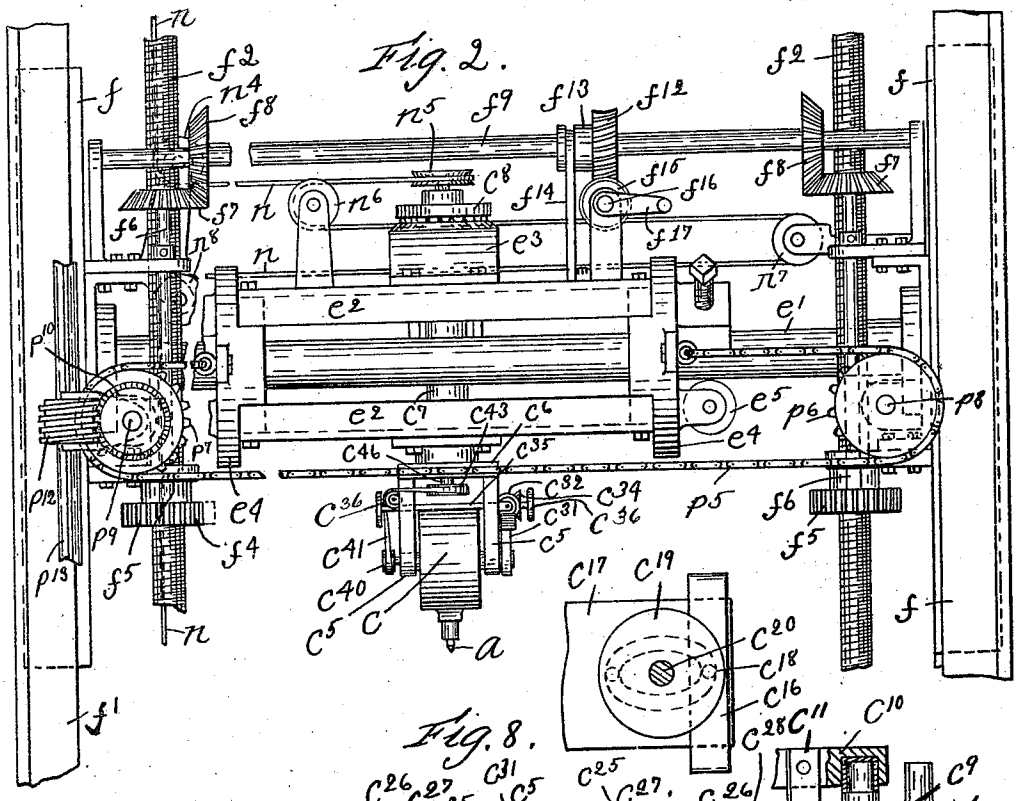


Fig. 8.

Fig. 5.

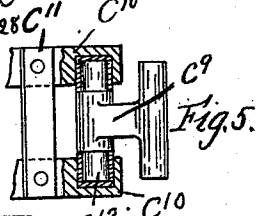


Fig. 3.

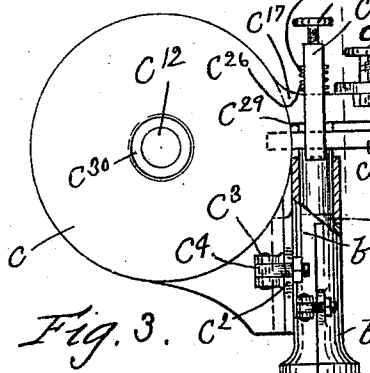


Fig. 6.

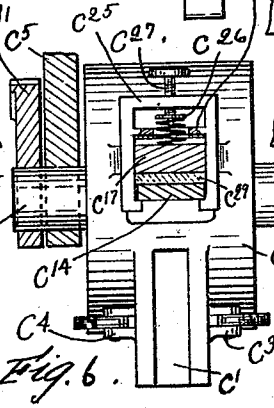


Fig. 7.

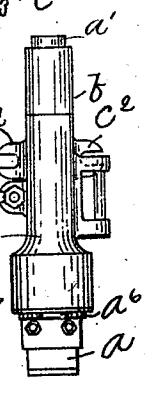
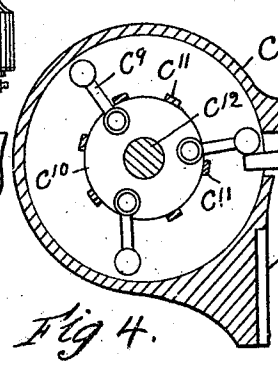


Fig. 4.



Witnesses:

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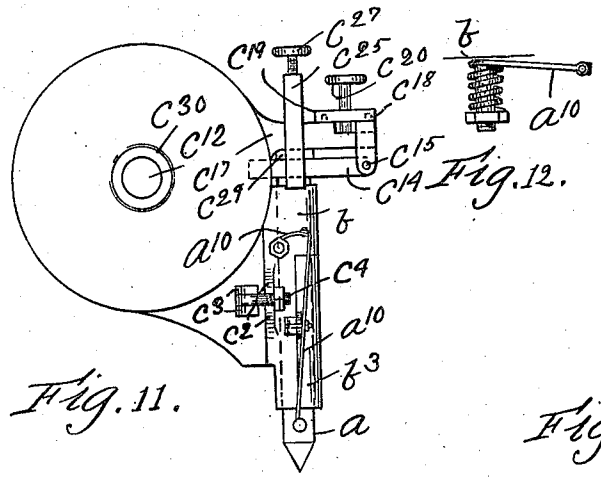


Fig. 11.

Fig. 12.

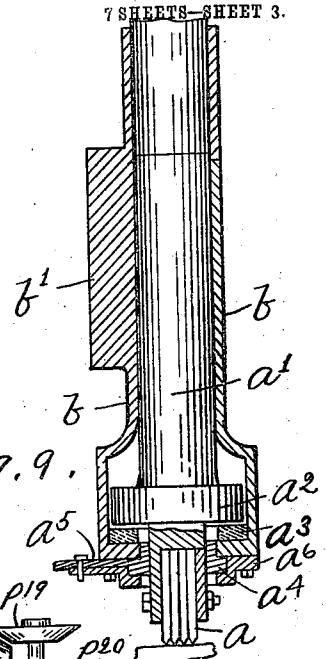


Fig. 9.

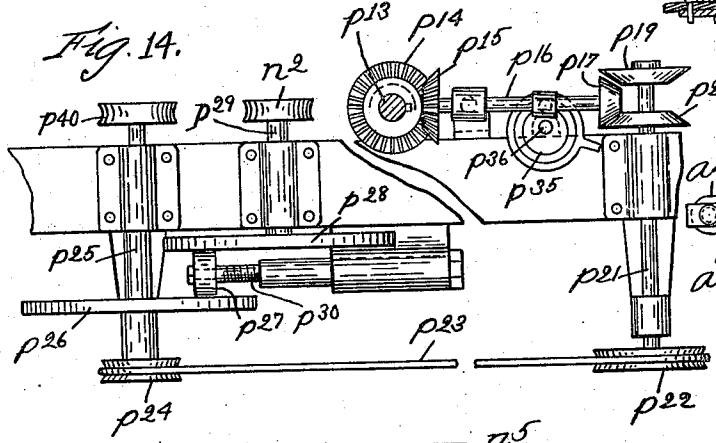


Fig. 14.

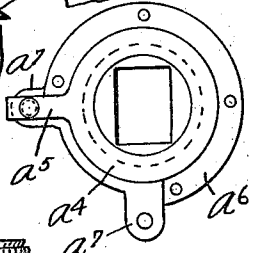


Fig. 10.

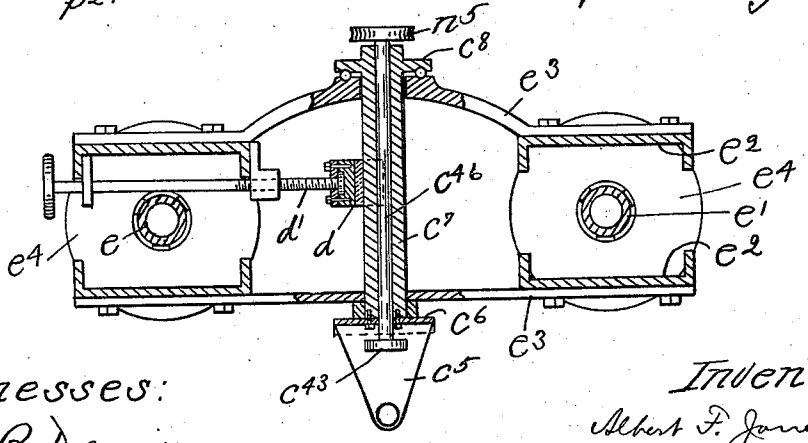


Fig. 13.

Witnesses:

H. B. Davis.

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THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 847,339. PATENTED MAR. 19, 1907.

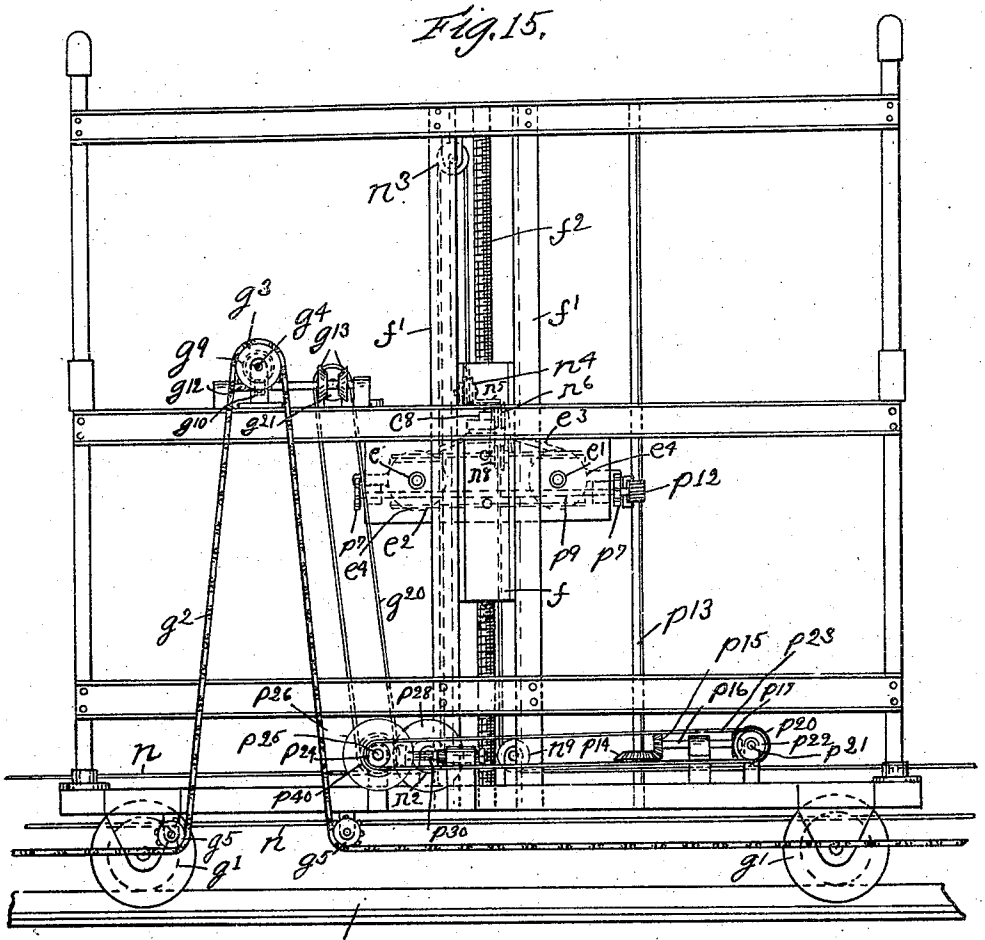
A. F. JONES.

STONE DRESSING MACHINE.

APPLICATION FILED MAY 21, 1904.

7 SHEETS—SHEET 4.

Fig. 15.



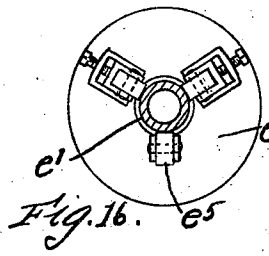


Fig. 16.

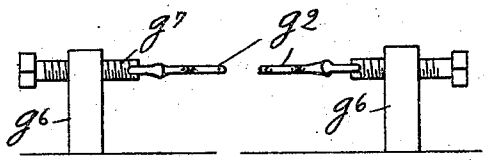


Fig. 17.

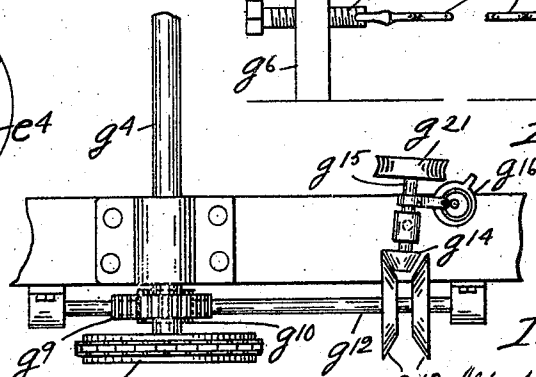


Fig. 18.

Witnesses:

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THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 847,339. PATENTED MAR. 19, 1907.

A. F. JONES.

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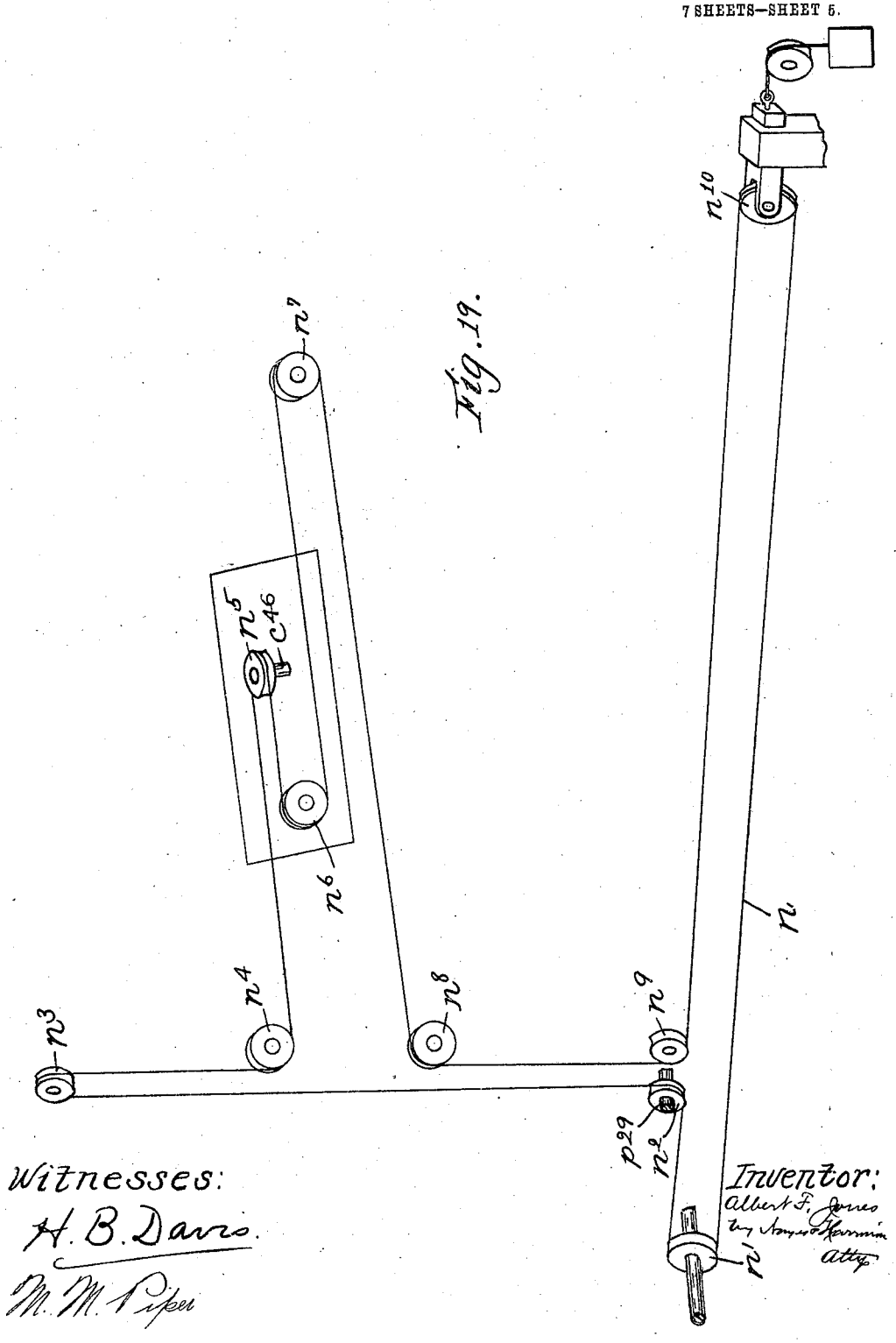


Fig. 19.

Witnesses:
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THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 847,339. PATENTED MAR. 19, 1907.

A. F. JONES.

STONE DRESSING MACHINE.

APPLICATION FILED MAY 21, 1904.

7 SHEETS—SHEET 6.

Fig. 20.

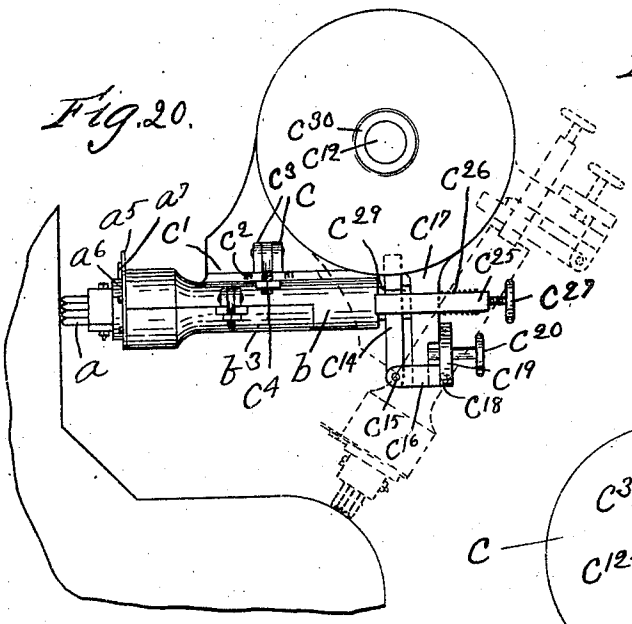
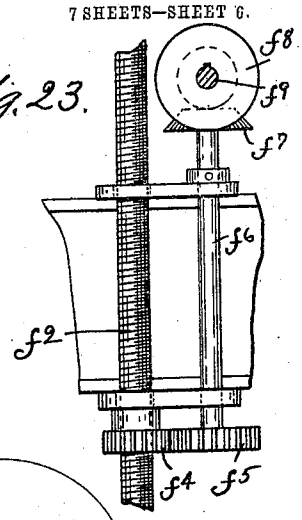


Fig. 23.



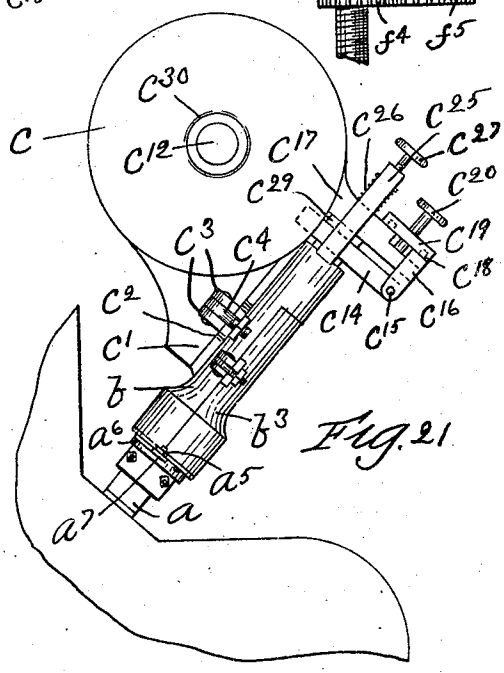


Fig. 21.

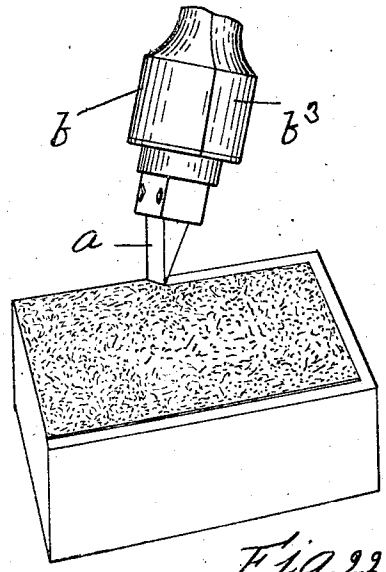


Fig. 22.

Witnesses:

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THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 847,339. PATENTED MAR. 19, 1907.

A. F. JONES.

STONE DRESSING MACHINE.

APPLICATION FILED MAY 21, 1904.

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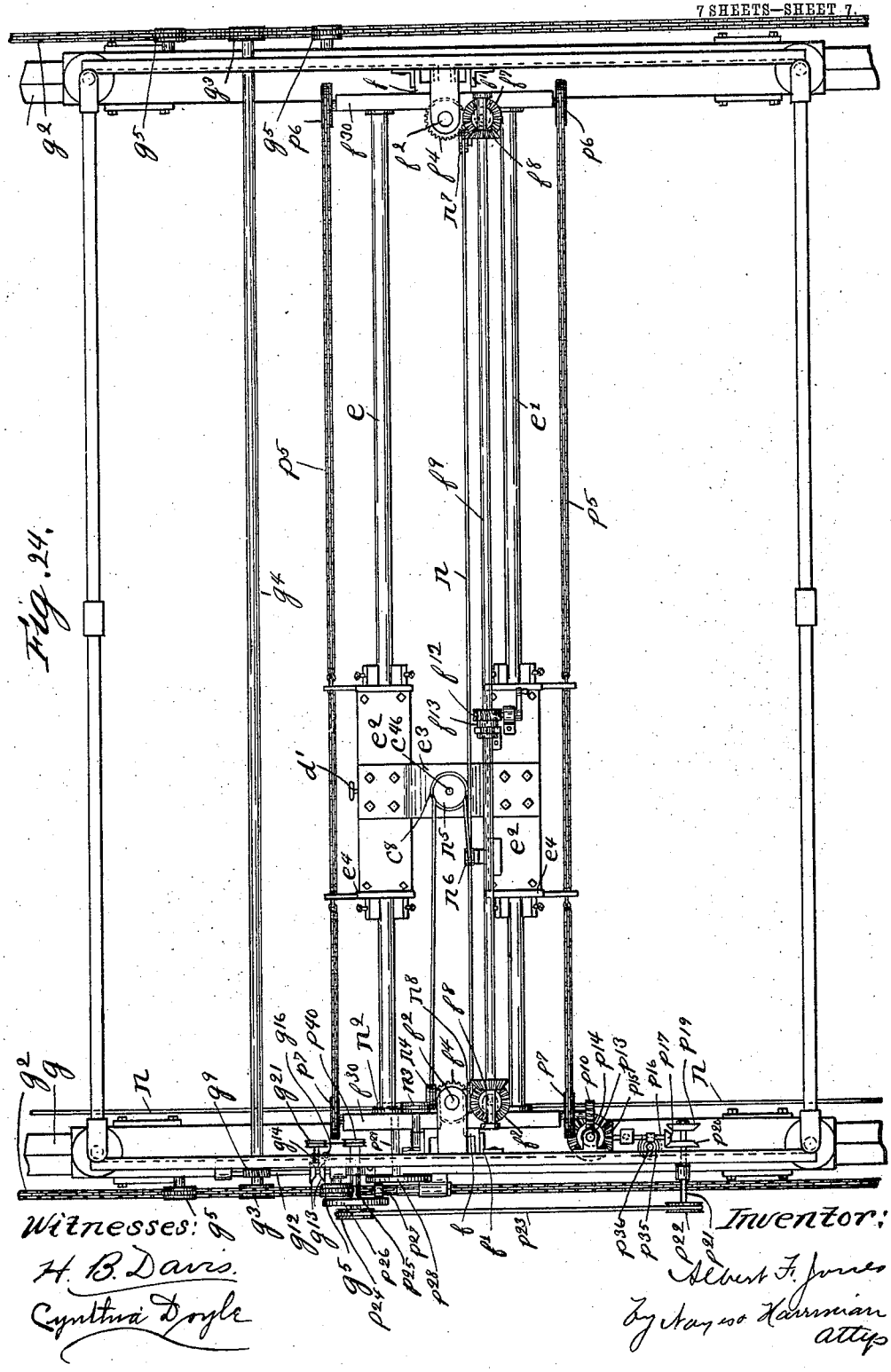


Fig. 24.

Witnesses:
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Cynthia Doyle

Inventor:
Albert F. Jones
By Hayes & Harriman
attys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALBERT F. JONES, OF SALEM, MASSACHUSETTS.

STONE-DRESSING MACHINE.

No. 847,339. Specification of Letters Patent. Patented March 19, 1907.

Application filed May 21, 1904. Serial No. 208,999.

To all whom it may concern:

Be it known that I, ALBERT F. JONES, of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Stone-Dressing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object to improve the construction of stone-dressing machines, to the end that are bounding tool may be employed, which may be a bushing-tool or pointing-tool or other tool adapted to perform any of the well-known functions desired for use in cutting or dressing stone. I find in practice that by employing a tool which when struck will immediately rebound I can deliver light blows with great rapidity, and therefore can proceed with the work rapidly; also, to the end that a rebounding hammer may be employed for the rebounding tool and means for operating said hammer rapidly, and in practice I preferably provide a plurality of hammers which will be brought into action successively, so that a great number of blows may be struck in a short period of time; also, to the end that a striking-plate may be employed which is adapted to be struck by the hammers and which in turn will impart the blows to the tool, said striking-plate being movable into and out of engagement with the hammers.

My invention furthermore consists in providing the rebounding tool with a limiting-stop to limit its stroke in the direction toward the stone; also in providing stops for the hammers designed to check their movements backward and forward.

My invention also consists in the construction of the hammers and the support therefor and the operating mechanism for the hammers; also, in providing means for adjusting the rebounding tool on its axis; also, in means for varying the angle of the tool relative to the face of the stone being cut; also in means for varying the position of the tool relative to the stone.

My invention also consists in means for moving the rebounding tool and rebounding hammer or hammers over the stone, so that the work may be accurately yet quickly performed, and in providing such means with variable-speed gearing, whereby the speed may be varied at will; also, in constructing an organized machine adapted for operating any one of the many different tools now in common use in accordance with this invention.

Figure 1 shows in front elevation a stone-dressing machine embodying this invention. Fig. 2 is an enlarged detail of a portion of the machine, showing particularly the tool-carrying head and means for moving it over the stone. Fig. 3 is a side elevation of the tool, its holder and support therefor, and the carriage. Fig. 4 is a sectional detail showing the rebounding hammers which serve as and constitute the tool-actuator. Fig. 5 is a sectional detail of one of the rebounding hammers and the hammer-support. Fig. 6 is a detail showing a front view of the carriage. Fig. 7 is a detail showing the rebounding tool, tool-holder, and support removed from the machine. Fig. 8 is a detail of the adjusting device for the striking-plate. Fig. 9 is a vertical section of the rebounding tool, its holder, and support. Fig. 10 is a detail of the means employed for turning the tool on its axis independently of its support. Fig. 11 is a side view showing a rebounding pointing-tool, its holder, and carriage. Fig. 12 is a detail of the spring provided on the pointing-tool shown in Fig. 11. Fig. 13 is a sectional detail of the turret and carriage supporting it. Fig. 14 is a detail showing a part of the variable-speed gearing and driving mechanism for the tool-carriage, to be referred to. Fig. 15 is an end view of the machine. Fig. 16 is a detail showing one of the supports for the tool-carriage. Figs. 17 and 18 are details to be referred to. Fig. 19 is a diagram of the main driving-belt. Figs. 20, 21, and 22 are different views of the rebounding tool; and Fig. 23 is a detail of the means for varying the elevation of the tool-carriage, to be referred to. Fig. 24 is a plan view of the machine shown in Fig. 1.

The tool a, which may be a bushing-tool, as shown in Figs. 3, 9, 20, and 21, or a pointing-tool, as shown in Figs. 11 and 22, or a tool adapted for performing any other function, is fixed in or to a holder, and said tool is so constructed, supported, and manipulated as to freely and instantly rebound whenever struck by a hammer or other tool-actuator. The tool-holder shown in Fig. 9 consists of a cylindrical body a', having its lower end formed to receive and hold the bushing tool or tools a and having a circumferential projection a^2, which by striking an abutment limits the movement of the tool in the direc-

tion toward the stone. The tool-holder a' is guided by the support which embraces its cylindrical body. The tool-holder support consists of a cylindrical shell b, adapted to be attached to the tool-carrier, having a cylindrical portion which loosely embraces the cylindrical body a' of the tool-holder and having an enlarged cylindrical chamber at its lower end, which receives the projection a^2 and provides ample space for the requisite movement of said projection as the tool-holder or tool operates. The lower end of the cylindrical shell a is closed, except for a central hole, through which the tool-carrying end of the tool-holder projects. Upon the upper side of said closed end a washer a^3, of leather or other suitable material, is placed, which serves as the abutment against which the stop a^2 strikes. The tool-holder being thus loosely held will normally rest by gravity with its stop a^2 bearing upon the abutment a^3; but when a stone is placed beneath said tool, as shown in Fig. 9, it will be raised by the stone, and when said tool or its holder is struck a severe blow the tool will cut into the stone until the stop a^2 strikes the abutment a^3 and being loosely supported will then instantly rebound. In Fig. 11 the tool a will be held elevated a short distance above the stone against a stop by the spring a^{10}, one end of which is attached to the tool and the other end to the support; but in this instance the tool is likewise free to rebound instantly. When bushing a stone, it is frequently necessary to change the angle of the bushing-tools—say ninety degrees—and to accomplish this result the lower tool-carrying end of the tool-holder a' is slidably engaged by a ring a^4, (see Figs. 9 and 10,) which enters and turns in the central hole in the closed end of the cylindrical shell b and has a laterally-projecting arm a^5 for turning it, and a circular supporting-ring a^6 is attached to the lower end of the shell b, which underlies the ring a^4 and serves to hold said ring in place, and said supporting-ring a^6 is recessed at one side to provide ample space in which the arm a^5 may work, and said ring a^6 has two ears a^7 projecting from it, over which the arm a^5 will be brought and to which it will be connected by a bolt to thereby hold the ring a^4 in either one of its adjusted positions. The tool and tool-holder will be turned with said ring a^4. In Fig. 11 a pointing-tool is shown, and the body or shank of this tool subserves the same function as the tool-holder a' so far as holding the tool is concerned. Hence the words "tool" and "tool-holder bearing a tool" are intended to mean the same.

As a means of attaching the tool-holder support b to its carrier said support is formed or provided upon its rear side with a vertical rib b', (see Fig. 9,) which enters a groove c', (see Fig. 6,) formed in the carrier c, and said support is provided with a pair of slotted ears c^2, (see Fig. 7,) which bear upon the carrier at opposite sides of said grooves when the rib is in the groove, and at each side of said groove a pair of ears c^3 are formed on the carrier, to which eyebolts c^4 are pivoted, the threaded ends of which are adapted to be brought into position in the slots in the ears c^2, and when the nuts are turned onto said threaded ends the tool-holder support will be firmly attached to its carrier. The upper end portion of the tool-holder a' is made long enough to extend a short distance above the upper end of the tool-holder support b, so as to be engaged by the actuating mechanism which is provided for delivering thereupon blows in rapid succession.

The cylindrical body a' of the tool-holder is preferably composed of two or more pieces (see Fig. 9) disposed in vertical alinement and contained in the tool-holder support. This is done for the purpose of providing for the easy removal of the tool-holder and tool, as in such case only the lower tool-carrying end portion need be removed. The cylindrical shell b is provided at one side with a removable side wall b^3, which is hinged to the main portion of the shell and which is adapted to close an opening in the shell and to be swung open to expose the interior of the shell in order that the tool-holder or portion thereof bearing the tool may be removed whenever desired. This side wall or door b^3 when closed will be secured by an eyebolt connected to the main body of the shell, the threaded end of which enters the slot of an ear on the door and receives upon it a nut.

The carrier c for the tool-holder consists of a horizontally-disposed cylindrical shell or casing located between and supported by a pair of arms c^5, depending from a plate c^6, which is secured to the lower end of a tube or sleeve c^7, disposed vertically in suitable bearings in a movable carriage. The tube or sleeve c^7 has an annular flange c^8 at its upper end, which rests upon a set of balls supported upon a plate forming a part of the tool-carriage to thereby provide a ball-bearing support for said tube or sleeve. The tube or sleeve c^7 and the yoke attached to its lower end, comprising the plate c^6 and depending arms c^5, constitutes a turret which bears the tool-carrier, and said turret is movable on a vertical axis to change the positions of the tools relative to the stone which is being acted upon.

The carrier c contains within it the tool-actuator, which, as herein shown, (see Figs. 4 and 5,) consists of a plurality of rebounding hammers c^9, loosely connected at equidistant points to a hammer-support fixed to a shaft c^{12}. The shaft c^{12} is horizontally disposed in the carrier and is adapted to be rotated. The hammer-support comprises two end disks c^{10}, located a short distance apart, which are rigidly connected together by several cross-bars

c^{11}, and the inner or adjacent faces of said disks c^{10} have trunnion-sockets which receive trunnions c^{13}, which project in opposite ways from the inner ends of the hammer-arms and which serve as pivots for the hammers. The heads of the hammers are elongated, as shown in Fig. 5. The several hammers c^9 (three being herein shown, being thus loosely connected to the hammer-support at points remote from the axis of the shaft) will be caused to travel around in a circular path as the shaft revolves, and as said shaft will be revolved rapidly said hammers will be extended outward or radially to the axis of the shaft by centrifugal action, so that the heads of the hammers will then be brought into position to strike the blows. As a preferable manner of sriking the blows the hammers do not strike directly upon the upper end of the tool-holder or tool, but instead a striking-plate c^{14} is provided, which overlies the upper end of the tool-holder or tool and which is movable into and out of the path of movement of the hammers, so as to be struck by said hammers as the shaft bearing them revolves. This striking-plate is movable in and out, so as to be engaged by the hammers or not. When moved into the path of the hammers, it will be struck by them and will impart a blow to the tool-holder or tool; but when moved out of said path said hammers will pass by without engaging it. Whenever one of the hammers strikes the striking-plate c^{14}, said hammer will immediately rebound, and such rebounding stroke of the hammer will be checked by the cross-bar of the hammer-support, which is located back of the rebounding hammer. A rebounding hammer as well as a rebounding tool is thus provided.

When the striking-plate c^{14} is moved into the path of engagement with the hammers, it will remain in such position while the hammers operate, but will be removed whenever it is desired to cease cutting the stone. Whenever one of the hammers strikes the striking-plate and rebounds, it will then strike the cross-bar c^{11} back of it and then bound forward and fall against the cross-bar c^{11} in front of it. Therefore the cross-bars c^{11} in the rear of the hammers serve as back stops for said hammers and those in front of the hammers serve as front stops therefor. The striking-plate c^{14}, which overlies the upper end of the tool-holder or tool, is pivoted at c^{15} to a block c^{16}, which is adapted to slide along on a lug c^{17}, projecting from the carrier c, and said block has a pin c^{18} projecting from it, (see dotted lines, Figs. 3 and 8,) which enters a groove formed in the under side of a cam-plate c^{19}, secured to the shaft of a hand-wheel c^{20}, which has its bearing in the lug c^{17}. By turning said hand-wheel the cam-plate will be turned and the block c^{16} will be slid along on the lug c^{17} and the striking-plate c^{14} thereby moved into and out of the path of movement of the centrifugally-acting hammers. It is frequently desirable to vary the force of the blows which are struck by the hammers, and to accomplish this result a yoke c^{25} (see Figs. 3 and 6) is provided, the lower ends of the arms of which are formed with lateral extensions which project beneath the striking-plate c^{14}, and thereby act to support said striking-plate, and the arms of said yoke bestride the lug c^{17}, and a spring c^{26} is placed between the upper side of said lug and the lower end of a screw c^{27}, which latter passes through the crown of the yoke, said spring thereby acting to hold up the striking-plate. By turning the screw c^{27} the force of the spring which acts upon the yoke may be varied, and the striking-plate will be held up by a force varying according to the strength of the spring as the screw is turned.

Whenever the hammer strikes a blow upon the striking-plate, the yoke c^{25} will yield and the force of the blow not taken up by the spring c^{26} will be imparted to the tool-holder and tool.

The yoke c^{25} is provided with stops c^{28}, which by striking upon the lug c^{17} limit the downward movement of the yoke. A yielding cushion c^{29} is placed between the striking-plate c^{14} and the lug c^{17}, which will be compressed more or less as the yoke is drawn up by compression of the spring c^{26}.

The hammers act suddenly to strike the blow, and the blow is in turn suddenly imparted to the tool, and as the hammers rebound the striking-plate rebounds with the tool, thereby relieving the thrust of the tool on the work. The spring c^{26} serves as a yielding support for the striking-plate, which acts to return the striking-plate quickly as soon as the blow is struck, which is important in order that the tool may instantly rebound, yet it is also very desirable that this yielding support be made adjustable to vary the force of the blow; but I do not desire to limit this feature of my invention to the adjustability of the yielding support.

A tubular support or trunnion c^{30} projects from each side or end of the cylindrical shell of the carrier c, and said trunnions are centrally disposed on the shell and have their bearings in arms c^5, and the horizontal hammer-operating shaft c^{12} extends through said tubular supports. The tubular support at one side of the carrier projects through and beyond the arm c^5, and on said projecting end a sector c^{31} is secured, the teeth of which are engaged by a worm c^{32}, secured to a shaft, to which a bevel-gear c^{33} is secured, which is engaged by a bevel-gear c^{34}, secured to a shaft c^{35}, which passes through both arms c^5 and has secured to it at each end a hand-wheel c^{36}, by which it may be turned. As the shaft c^{35} is turned the sector will be moved and the carrier c will be turned on its horizontal axis, to thereby vary the angle of the

tool held by it, as best shown in Figs. 20, 21, and 22.

To one end of the shaft c^{12}, which projects through and beyond the end of the tubular hub c^{30}, a belt-pulley c^{40} is secured, around which a belt c^{41} passes, which passes over a pair of idle pulleys c^{42}, supported upon one of the arms c^5, and said belt then passes around a belt-pulley c^{43}, which is secured to the lower end of a vertical shaft c^{46}, which passes up through the tubular support c^7 of the turret and has secured to its upper end a belt-pulley n^5, around which passes the main driving-belt.

As the shaft c^{46} is revolved the shaft c^{12} will be rotated and the hammers operated, and it will be seen that while the shaft c^{46} is revolving the turret comprising the tubular support c^7 and depending arms c^5 may be turned to change the position of the tool relative to the stone and also the carrier may be adjusted to vary the angle of the tool.

To hold the turret in fixed position, a brake-shoe d, (see Fig. 13,) is provided, which is secured to the end of a screw d', supported by the framework of the carriage and having a hand-wheel by which it may be rotated. By turning said screw said brake-shoe is movable into and out of engagement with the tubular support c^7 of said turret. In case it is desired to turn the turret the brake-shoe will be withdrawn from its engagement with its tubular support and then the turret may be turned by hand, as may be required, by engaging any projecting part thereof—as, for instance, by engaging one of the hand-wheels c^{42}.

The tool-carriage (see Fig. 13) is adapted to slide on a pair of horizontal bars or tracks e e^1, supported at their ends by end supports mounted on the framework of the machine. and said tool-carriage consists, essentially, of a frame comprising several longitudinal bars e^2 and several transverse bars e^3, bolted together and which are connected to circularly-formed end pieces e^4, which have center holes through them and which bear a set of friction-rolls e^5, (see Fig. 16,) disposed at equal distances apart around the center holes, and which bear upon the horizontal bars e e'. The tool-carriage thus constructed is free to move along on the horizontal bars.

The opposite ends of chains p^5 are attached to the opposite ends of the tool-carriage, there preferably being two such chains provided, one at each side of the tool-carriage, and said chains pass over sprocket-wheels p^6 p^7. (See Figs. 1 and 2.) The sprocket-wheels p^6, two in number, are secured to a shaft p^8, having its bearing in brackets at one end of the machine, and the sprocket-wheels p^7, two in number, are secured to a shaft p^9, having its bearings in brackets at the opposite end of the machine. The shaft p^9 bears a worm-wheel p^{10}, which is engaged by a worm p^{12}, splined on a vertical shaft p^{13}, having its bearings in the main framework, said shaft p^{13} having secured to it near its lower end a bevel-gear p^{14}, (see Figs. 14 and 15,) which is engaged by a bevel-gear p^{15}, secured to a shaft p^{16}, which bears a bevel friction-gear p^{17}, located between the pair of bevel friction-gears p^{19} p^{20}, secured to a shaft p^{21}, bearing a belt-pulley p^{22}, over which a belt p^{23} passes, which in turn passes around a belt-pulley p^{24}, secured to a shaft p^{25}, bearing a friction-disk p^{26}, which is engaged by a roll p^{27}, which is placed between it and another friction-disk p^{28}, secured to a shaft p^{29}. The roll p^{27} is secured to a screw p^{30}, which latter may be turned to vary the relative position of the roll to the two friction-disks between which it is placed, and thereby vary the speed of the driving-shaft p^{21}. By this gearing or actuating mechanism the tool-carriage will be moved along on its supporting-bars at any speed desired. The bevel friction-gear p^{17} is movable into engagement with either the bevel friction-gear p^{19} or p^{20}, to thereby turn, the gear-shaft p^{16} in one or the other direction, and as a means of moving said bevel friction-gear a pin projects from a collar loosely mounted on the gear-shaft p^{16}, which enters a groove formed in an eccentric disk p^{35}, pivoted at p^{36} to a suitable support. By turning the disk p^{35} the gear-shaft p^{16} will be moved. By means of this device the tool-carriage may be driven in either direction.

By splining the worm p^{12} on the vertical shaft p^{13} the driving mechanism for the tool-carriage will be slidably connected with the sprocket-wheel-carrying shaft p^9, so that the tool-carriage and the tracks on the main frame which support it may be adjusted to different elevations.

The stone to be cut or dressed is laid upon the ground or upon any suitable platform, and the tool-carriage is adjusted to the proper horizontal plane for the tool or tools to operate upon the stone. The parallel tracks or bars e e', which support the tool-carriage, occupy a horizontal position and are secured at their opposite ends to cross-pieces f^{30}, which are secured to blocks f, and each block f is placed between and guided by a pair of upright bars f', which form a part of the main framework, and said blocks f have secured to them brackets or other supports for the sprocket-wheel-carrying shafts p^8 p^9 and also for the vertical screws f^2, which latter are furthermore supported at their upper and lower ends in the main framework. The two blocks f are moved up and down in the vertical guideways between the bars f' f' by means of the vertical screws f^2 f^2. To turn the vertical screws f^2, and thereby vary the elevation of the tool-carriage, a gear-wheel f^4 (see Figs. 2 and 23) is secured to a nut on each screw f^2, which is engaged by a gear-wheel f^5, secured to a vertical shaft f^6,

having at its upper end a bevel-gear f^7, which is engaged by a bevel-gear f^8, and the two bevel-gears f^8 f^8 are secured to a horizontal shaft f^9, supported by brackets or stands attached to the blocks f. A worm-wheel f^{12} is splined on said shaft f^9, having a hub f^{13} grooved circumferentially to receive a projection f^{14}, rising from the tool-carriage, so that the worm-wheel f^{12} will be moved along on the shaft f^9 by the tool-carriage. The worm-wheel f^{12} is engaged by a worm f^{15}, secured to a shaft f^{16}, having its bearing in a stand on the tool-carriage, and said shaft has fixed to it a hand-crank f^{17} for turning said shaft. By revolving the shaft f^{16} the shaft f^9 will be revolved and the two vertical screws f^2 simultaneously turned and the tool-carriage thereby raised or lowered.

The main frame is supported upon tracks g by rollers g', any desired number of which may be employed, and to move said main frame along on said tracks g two sprocket-chains g^2 are provided, arranged one at each side of said main frame, and each chain passes around a sprocket-wheel g^3, secured to a horizontal shaft g^4, (see Figs. 1, 15, 18, and 24,) which extends from end to end of the main frame, and said chains extend down from said sprocket-wheels g^3 and pass beneath idlers g^5 and then continue in opposite ways to fixed stands or supports g^6, which bear adjusting-screws g^7, (see Fig. 17,) to which the ends of the chains are attached. The ends of the chains g^2 are thus held fixed, and as the shaft g^4, bearing the sprocket-wheels, revolves the main frame will be moved along on the tracks.

The shaft g^4 has secured to it at one end a worm-wheel g^9, (see Fig. 18,) which is engaged by a worm g^{10}, secured to a shaft g^{12}, bearing a pair of friction bevel-gears g^{13} g^{13}, and between said friction bevel-gears a friction bevel-gear g^{14} is placed, adapted to be moved into engagement with either gear g^{13} at will. The gear g^{14} is secured to a shaft g^{15}, which is moved by an eccentric disk g^{16}, and said shaft g^{15} bears a belt-pulley g^{21}, by which it is rotated. The main frame may thus be moved along on the tracks g in either direction.

n represents an endless power-driven belt, (see Fig. 19,) which serves to transmit the power to the operating parts of the machine. This belt passes around a driving-pulley n', secured to a main power-driven shaft, which is located at any convenient point with respect to the machine, but independent of it. The belt also passes around a belt-pulley n^2, which is secured to the driving-shaft p^{29}, and then passes around a belt-pulley n^3, located at the top and at one end of the main frame, and then passes around a belt-pulley n^4, journaled in a stand on one of the end supports of the tool-carriage support, then around a belt-pulley n^5, secured to the vertical driving-shaft c^{46}, which passes through the tubular support of the turret, and then around a belt-pulley n^6, journaled to a stand on the tool-carriage, and then around a belt-pulley n^7, journaled to a support on the other end support of the tool-carriage support, and then around a belt-pulley n^8, journaled to the first-named end support of the tool-carriage support, and then over a belt-pulley n^9, journaled to a stand on the main frame, and then around a belt-pulley n^{10}, supported by a fixed support which is located at any convenient point with respect to the machine, but independent thereof, and then to the belt-pulley n'. This endless belt is driven by the power-driven shaft bearing the belt-pulley n'. The power-driven endless belt thus rotates the shaft c^{46}, by which the tool is operated in any position or elevation of the tool-carriage or turret, and also drives the shaft p^{29}, by which the tool-carriage is moved back and forth on the tracks on the main frame, and also, as will be described, drives a shaft by which the main frame is moved along.

The shaft p^{25} is driven by the friction-gearing from the shaft p^{29}, and a belt-pulley p^{40} is secured to said shaft p^{25}, over which a belt g^{20} passes, which passes up over a belt-pulley g^{21}, secured to the shaft g^{15} for the purpose of driving said shaft g^{15}, and thereby driving the shaft g^4 to move the main frame along on the tracks g.

The spring is provided on the pointing-tool, as shown in Fig. 5, for the purpose of lifting the tool in case the tool should not strike the stone when struck and consequently would not rebound. Such cases frequently occur owing to the excessively irregular formation of the stone at the time the pointing is being done.

I do not desire to limit my invention to the employment of all of the many features herein shown, as it is obvious that some of them may be eliminated or that the machine may be modified in some particulars and yet retain one or more of the novel features or combinations of elements.

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

1. In a stone-dressing machine, the combination of a tool-holder bearing a tool, a support therefor, one or more rebounding hammers for imparting blows to said tool, a carrier for said support, a turret bearing said carrier, a tool-carriage bearing said turret, and means for moving it back and forth, a main frame movable on tracks and bearing a pair of tracks on which the tool-carriage moves, which are disposed at right angles to the tracks on which it moves, and means for operating said hammers in any position of the turret and tool-carriage and main frame, substantially as described.

2. In a stone-dressing machine, the combination of a tool-holder bearing a tool, a support therefor, one or more rebounding hammers for imparting blows to said tool, a carrier for said support, adjustable on a horizontal axis, a turret bearing said carrier, a tool-carriage bearing said turret, and means for moving it back and forth, a main frame movable on tracks and bearing a pair of tracks on which the tool-carriage moves, which are disposed at right angles to the tracks on which it moves, and means for operating said hammers in any position of the carrier, turret, tool-carriage and main frame, substantially as described.

3. In a stone-dressing machine, the combination of a rebounding tool, a support for said tool, a carrier bearing said support, a turret bearing said carrier, a tool-carriage bearing said turret, means for moving it back and forth, a main frame movable on tracks and bearing a pair of tracks on which said tool-carriage moves, which are disposed at right angles to the tracks on which it moves, and means for operating said tool in any position of the turret, tool-carriage and main frame, substantially as described.

4. In a stone-dressing machine, the combination of a rebounding tool, a support for said tool, a carrier bearing said support, adjustable on a horizontal axis, a turret bearing said carrier, a tool-carriage bearing said turret, means for moving it back and forth, a main frame movable on tracks and bearing a pair of tracks on which said tool-carriage moves which are disposed at right angles to the tracks on which it moves, and means for operating said tool in any position of the carrier, turret, tool-carriage and main frame, substantially as described.

5. In a stone-dressing machine, the combination of a rebounding tool, a support therefor, a carrier bearing said support, a turret bearing said carrier, one or more rebounding hammers for said tool supported by said carrier, a tool-carriage bearing said turret, a main frame bearing tracks on which said tool-carriage moves, means for moving said tool-carriage back and forth, tracks on which said main frame moves, which are extended at right angles to the tracks borne by said frame, and means for operating said hammers in any position of the turret, tool-carriage and main frame, substantially as described.

6. In a stone-dressing machine, the combination of a rebounding tool, a support therefor, a carrier bearing said support, adjustable on a horizontal axis, a turret bearing said carrier, one or more rebounding hammers for said tool, supported by said carrier, a tool-carriage bearing said turret, a main frame bearing tracks on which said tool-carriage moves, means for moving said tool-carriage back and forth, tracks on which said main frame moves which are extended at right angles to the tracks borne by said frame, and means for operating said hammers in any position of the carrier, turret, tool-carriage and main frame, substantially as described.

7. In a stone-dressing machine, the combination of a rebounding tool, a striking-plate for said tool, a hammer for engaging said striking-plate, a carrier bearing the tool, a turret bearing the carrier, and means for operating said hammer in any position of adjustment of the turret, substantially as described.

8. In a stone-dressing machine, the combination of a tool-holder bearing a tool, a striking-plate for said tool, a rebounding hammer for engaging said striking-plate, a carrier bearing the tool, a turret bearing the carrier and means for operating said hammer in any position of adjustment of the turret, substantially as described.

9. In a stone-dressing machine, the combination of a tool-holder bearing a tool, a striking-plate for said tool, a yielding support for said striking-plate, an adjusting device for said support, a tool-actuator for engaging said striking-plate and means for operating said tool-actuator, substantially as described.

10. In a stone-dressing machine, the combination of a tool-holder bearing a tool, a pivoted striking-plate for said tool, a block to which said striking-plate is pivoted, a tool-actuator for engaging said striking-plate, means for operating said tool-actuator and means for moving said block to move the striking-plate into and out of the path of engagement with said tool-actuator, substantially as described.

11. In a stone-dressing machine, the combination of a tool-holder bearing a tool, a striking-plate for said tool, centrifugally-acting rebounding hammers for striking said plate, means for operating said hammers and means for moving said striking-plate into and out of the path of said hammers, substantially as described.

12. In a stone-dressing machine, the combination of a tool-holder bearing a tool, a striking-plate for said tool, a hammer for striking said plate, means for moving said striking-plate into and out of the path of engagement with said hammer, actuating mechanism for said hammer and means for moving the tool and hammer actuating mechanism over the stone, substantially as described.

13. In a stone-dressing machine, the combination of a tool-holder bearing a tool, a striking-plate for said tool, a rebounding hammer for striking said plate, means for operating said hammer, and means for moving the striking-plate into and out of the path of engagement with the said hammer, substantially as described.

14. In a stone-dressing machine, the combination of a rebounding tool, a support therefor, a striking-plate for said tool, one or more rebounding hammers for engaging said striking-plate, means for operating said hammers and means for moving said striking-plate into and out of engagement with said hammers, substantially as described.

15. In a stone-dressing machine, the combination of a rebounding tool, a support therefor, a striking-plate for said tool, a carrier bearing said support, a turret supporting said carrier, one or more rebounding hammers borne by said carrier and means for operating said hammers to engage said striking-plate, substantially as described.

16. In a stone-dressing machine, the combination of a rebounding tool, a support therefor, a striking-plate for said tool, a carrier bearing said support, an adjusting device for said carrier for adjusting it on a horizontal axis, a rotating shaft borne by said carrier, a hammer-support on said shaft, one or more hammers loosely connected to said hammer-support for engaging said striking-plate, a turret bearing said carrier movable on a vertical axis, a vertical driving-shaft extending through the turret, means connecting said vertical shaft with said hammer-operating shaft and means for moving the turret and parts borne by it over the stone, substantially as described.

17. In a stone-dressing machine, a turret turning on a vertical axis bearing a tool and means for operating it, combined with a brake-shoe movable into and out of engagement with said turret, and means for moving said brake-shoe, substantially as described.

18. In a stone-dressing machine, the combination of a rebounding tool, a support therefor, a carrier bearing said support, means for adjusting said carrier on a horizontal axis, a rebounding hammer for said tool, a rotating shaft for said hammer bearing a belt-pulley, a turret movable on a vertical axis bearing said carrier, a vertical driving-shaft extending through the turret-support having at its lower end a belt-pulley, a belt passing around said belt-pulley, and also around the belt-pulley on the hammer-operating shaft, substantially as described.

19. In a stone-dressing machine, the combination of a main frame movable on tracks and bearing a pair of tracks disposed at right angles to the tracks on which it moves, a tool-carriage movable on the tracks on said main frame, chains connected to the opposite ends of said tool-carriage, a shaft at each end of the machine, each bearing a pair of sprocket-wheels over which said chains pass, a worm-gear shaft connected with one of the sprocket-wheel-carrying shafts, a gear-shaft connected with the worm-gear shaft, a driving-shaft bearing two gears, and means for moving said gear-shaft into engagement with either gear on said driving-shaft to revolve said gear-shaft in opposite directions, and variable-speed gearing connected with said driving-shaft for revolving it at different speeds, substantially as described.

20. In a stone-dressing machine, the combination of a main frame movable on tracks and bearing a pair of tracks disposed at right angles to the tracks on which it moves, a tool-carriage movable on the tracks on said main frame, a turret borne by said carriage adapted to turn on a vertical axis, a carrier thereon bearing a tool, a tool-actuator, a shaft extending through the turret, and means for operatively connecting it with the tool-actuator, and an endless power-driven belt for rotating said shaft in any position of the turret, tool-carriage and main frame, substantially as described.

21. In a stone-dressing machine, the combination of a main frame movable on tracks and bearing a pair of tracks disposed at right angles to the tracks on which it moves, means for adjusting said tracks vertically on the main frame, a tool-carriage movable on the tracks on said main frame, a turret borne by said carriage adapted to turn on a vertical axis, a carrier thereon bearing a tool, a tool-actuator, a shaft extending through the turret, and means for operatively connecting it with the tool-actuator and an endless power-driven belt for rotating said shaft in any position of the turret, tool-carriage and main frame, substantially as described.

22. In a stone-dressing machine, a main frame movable on tracks, a tool-carriage movable on tracks supported by said main frame and disposed at right angles to the tracks on which said main frame moves, end supports for the tracks bearing the tool-carriage, vertical screws for moving said end supports and parts borne by them, a horizontal rotating shaft bearing gears which are connected with gears on said vertical screws, a worm-wheel splined on said horizontal shaft, a worm engaging it mounted on the tool-carriage, means for rotating said worm, and means connected with the tool-carriage for sliding said worm-wheel along on the shaft, substantially as described.

23. In a stone-dressing machine, a main frame bearing a tool-carriage, combined with sprocket-wheels mounted on a shaft supported by said main frame, sprocket-chains passing over said sprocket-wheels, supports, independent of the machine, for the opposite ends of said sprocket-chains, a power-driven shaft on the main frame, operatively connecting it with the sprocket-wheel-carrying shaft, and an endless power-driven belt for transmitting power to said power-driven shaft, substantially as described.

24. In a stone-dressing machine, a main frame bearing a tool-carriage, combined with sprocket-wheels mounted on a shaft support-

ed by said main frame, sprocket-chains passing over said sprocket-wheels, supports, independent of the machine, for the opposite ends of said sprocket-chains, a power-driven shaft on the main frame, variable-speed gearing operated by it, means for operatively connecting said variable-speed gearing with said sprocket-wheel shaft, and an endless power-driven belt for transmitting power to said power-driven shaft, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT F. JONES.

Witnesses:
B. J. NOYES,
H. B. DAVIS.