May 12, 1931. W. H. VAN SICKEL 1,805,269

STONE DRESSING MACHINE

Original Filed June 22, 1927 3 Sheets-Sheet 1

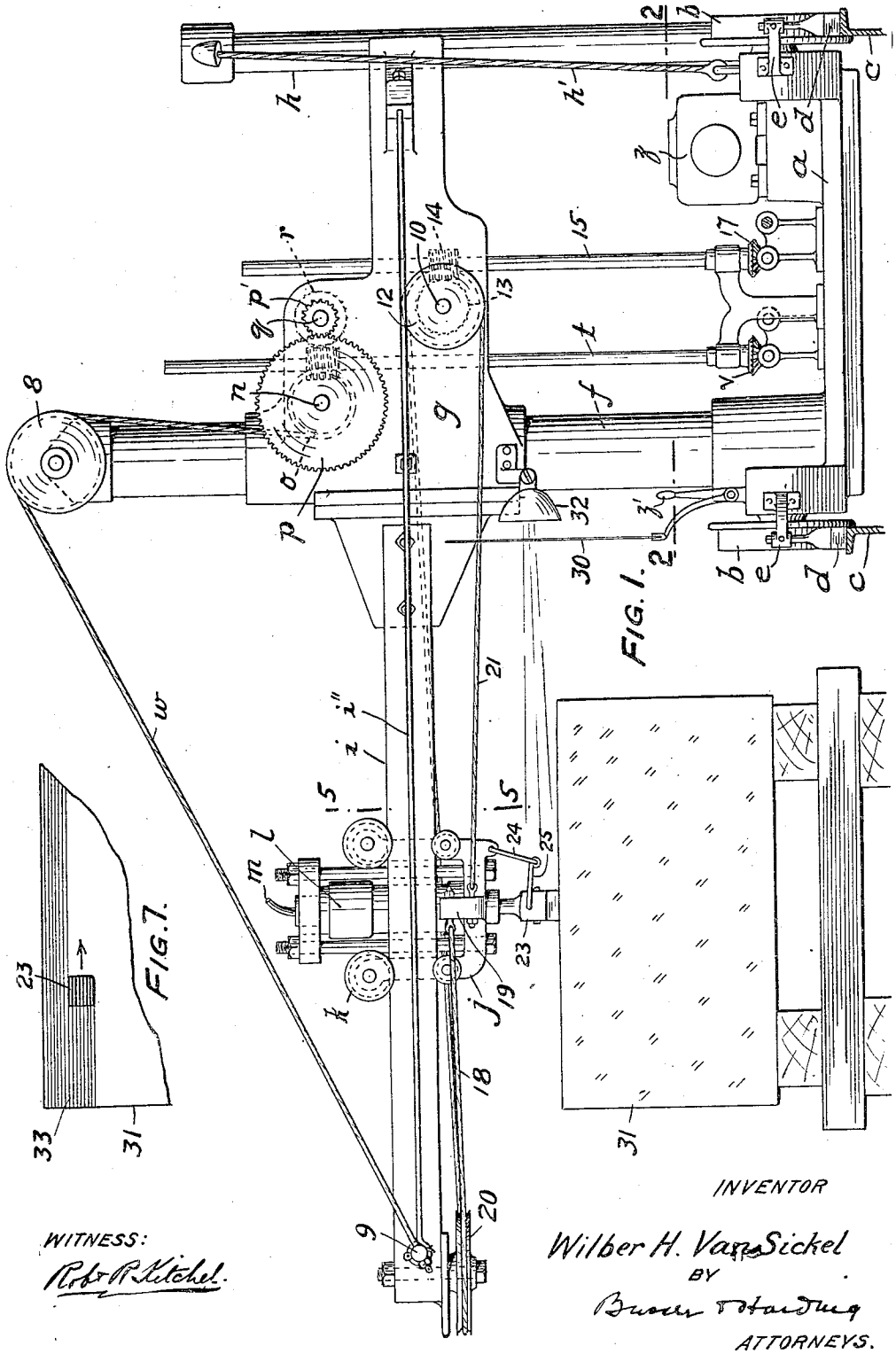


FIG. 1.

FIG. 7.

WITNESS:
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STONE DRESSING MACHINE

Original Filed June 22, 1927 3 Sheets-Sheet 2

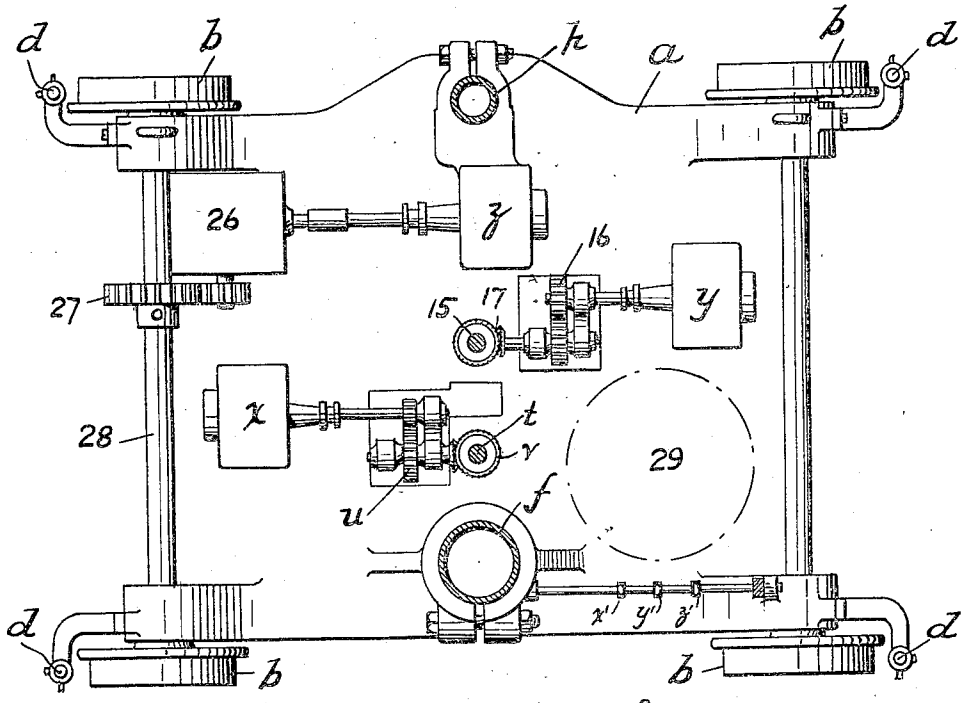


FIG. 2.

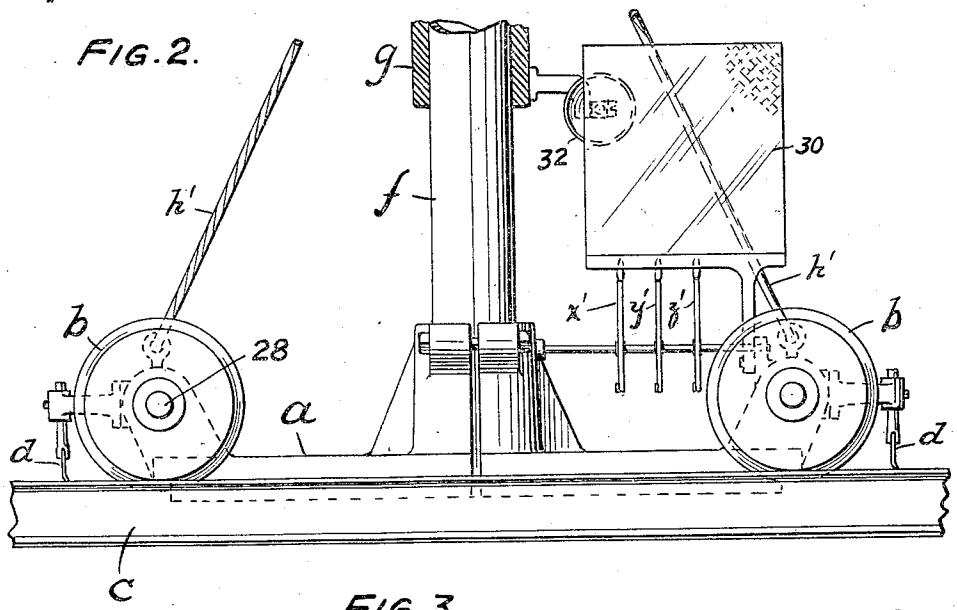


FIG. 3.

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STONE DRESSING MACHINE

Original Filed June 22, 1927 3 Sheets-Sheet 3

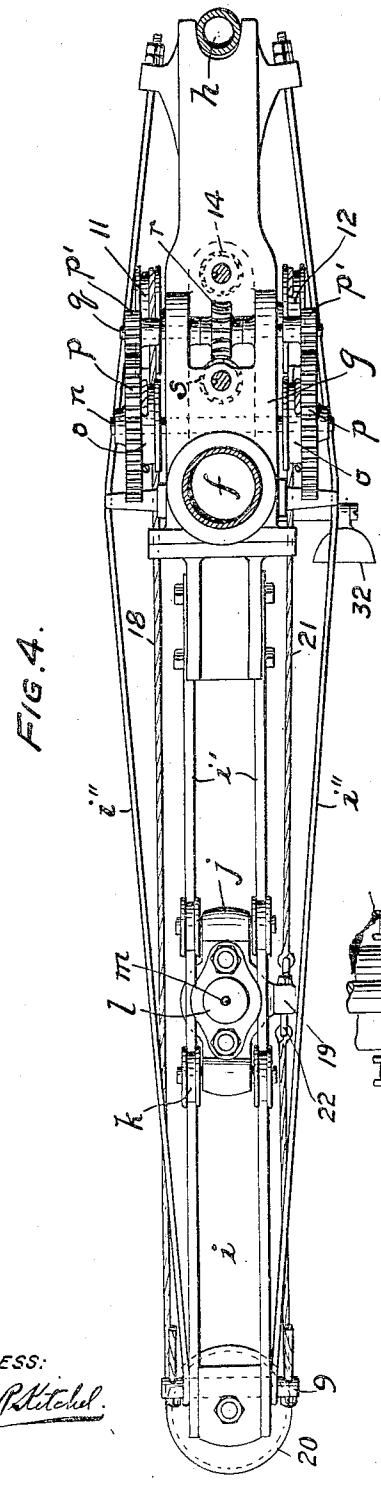


FIG. 4.

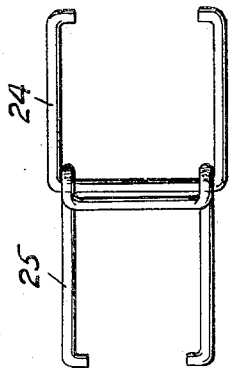


FIG. 6.

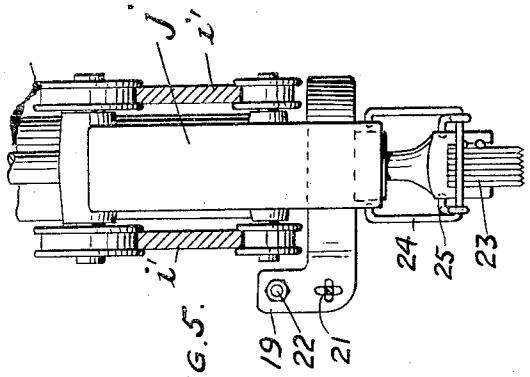


FIG. 5.

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UNITED STATES PATENT OFFICE

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STONE DRESSING MACHINE

Application filed June 22, 1927, Serial No. 200,613. Renewed October 18, 1930.

My invention relates to stone dressing machines and has for its object the provision of a machine which will be wholly operated by power.

Heretofore in the dressing, or providing of a finished surface on stone, it has been customary to utilize a point or a bush chisel operated by a pneumatic hammer. The pneumatic hammer has been customarily mounted on a carriage adapted to travel on a horizontal arm pivotally supported from a suitable post. In the dressing of the surface of a block of stone, with such apparatus as has heretofore been available, an operator moved the hammer supporting carriage back and forth on the horizontal arm and periodically turned the arm about its supporting post in order to cause the point or bush chisel, operated by the hammer, to work over the surface of the block. In dressing stone with a bush chisel it is essential that the chisel marks be in parallel lines, hence the operator has also been required to hold and rotate the chisel with respect to the hammer, as the hammer and chisel are moved back and forth and about the arm supporting post in order to maintain the parallelism of the chisel cuts.

The dressing of stone with the apparatus heretofore available has been difficult and the operator has of necessity been required to stand close to the pneumatic hammer with consequent risk of injury from chips. Such apparatus, especially the hammer and chisel, has also been definitely limited in size and speed of operation by the necessity for keeping the weight within the physical capacity of the operator to handle and hence the capacity of such apparatus as a whole has been limited. Further, such apparatus has required highly skilled operators in order to obtain the desired bush chisel finish, since the chisel has heretofore been wholly under the control of the operator so far as its guidance over the surface to be finished is concerned.

Now, as has been indicated, it is the object of my invention to provide a stone dressing machine which will be operated entirely by power under the control of an operator stationed at a distance from the work, and in which the chisel will be guided automatically.

The machine according to my invention may be of any desired weight or size and may be operated at relatively high speed, and will be capable of producing an accurate finish without dependence upon the skill of the operator. Thus, by virtue of my invention a stone dressing machine of greatly increased capacity and accuracy may be produced and in the use of which the operator may be protected from flying chips and the necessity for a highly skilled operator is eliminated.

Having now indicated, in a general way, the nature and purpose of my invention, I will proceed to a detailed description thereof with reference to the accompanying drawings in which there is illustrated a preferred embodiment and in which:

Fig. 1 is an end view of a stone dressing machine embodying my invention.

Fig. 2 is a sectional view of the machine on line 2—2, Fig. 1.

Fig. 3 is a side view of the machine shown in Fig. 1, partly in section and partly broken away.

Fig. 4 is a plan view of the tool supporting arm with the guides therefor shown in section.

Fig. 5 is a sectional view on line 5—5, Fig. 1.

Fig. 6 is a plan view of means for guiding the bush chisel.

Fig. 7 is a plan view of a portion of the partially bush tooled surface of a block of stone.

The machine in accordance with my invention is adapted to be supported from a base *a* provided with wheels *b* preferably adapted to run on rails *c* laid on the ground. Brushes *d* supported by brackets *e* are positioned in front of the several wheels in order to brush from the rails obstructions, as stone chips, which might derail the machine.

On the base *a* is mounted a main guide post *f* on which is slidably mounted a body *g*, the rear end of which is forked and slidably engages the sides of a guide post *h* mounted on the base and braced by guy wires *h'*. A horizontal arm *i* is secured to the front of the body *g* and extends laterally from the base *a*. The arm *i* is formed of spaced par-

allel members i' braced by truss rods i'' and between which is positioned a carriage j provided with wheels k, which engage the top and bottom edges of members i' upon which the carriage is adapted to travel. To the carriage j is secured a pneumatic hammer l of any usual construction and adapted to be supplied with air under pressure, from any suitable source, through a flexible conduit m.

Journalled in the body g is a shaft n upon which is loosely mounted a pair of drums o, to each of which is secured a gear p. The gears p mesh with gears p' mounted on a shaft q, journalled in the body g, and upon which is also mounted a worm wheel r engaged by a worm s on a vertical shaft t suitably supported from the base a and body g, adapted to be driven by a motor x through reduction gears u and bevel gears v. Cables w each secured at one end to one of the drums o pass over pulley wheels 8 mounted at the top of post f and are secured at their outer end to pins 9 at the outer end of arm i. It will now be observed that on operation of motor x in one direction or the other the drums o will be rotated and the cables w wound thereon or unwound therefrom with the result that the body g and arm i will be raised or lowered on the post f, the guide post h serving to prevent swinging of the arm about post f.

Journalled in the body g is a shaft 10, upon opposite ends of which are mounted drums 11 and 12. A worm wheel 13 is mounted on shaft 10 intermediate its ends and meshes with a worm 14 splined on a vertical shaft 15 suitably supported from the base a and body g and adapted to be driven by a motor y, through reduction gears 16 and bevel gears 17. A cable 18 is shackled at one end to an extension 19 on carriage j, led around a pulley wheel 20, mounted horizontally beneath the arm i adjacent its outer end, and fastened at its other end to the drum 11. A second cable 21 is shackled at one end to the extension 19 on carriage j and is secured to the drum 12. The cables 18 and 21 are shackled to the extension 19 through the medium of eye bolts 22 by which adjustment of the cables to keep them both taut is enabled and the cables are passed over the drums 11 and 12 in opposite directions, as shown, cable 18 over drum 11 and cable 21 under drum 12. The drums 11 and 12 are of large diameter and of a width sufficient to receive two wraps of the cables. The two wraps equal in length the total range of travel of the carriage j on arm i. It will now be observed that if the motor y be operated in one direction or the other, the drums 11 and 12 will be rotated in the same direction with the result that, if for example, the drums are rotated clockwise, the cable 18 will be wound on drum 11 and cable 21 will be wound off drum 12 causing carriage j and the tool supported thereby to be moved outwardly on arm i. Reversal of the direction of operation of the motor and hence of the direction of rotation of drums 11 and 12 will result in movement of the carriage inwardly on arm i.

As has been indicated, a pneumatic hammer is secured to the carriage j. The hammer is adapted to receive a bush chisel 23, the shank of which is inserted in the tool receiving end of the hammer casing in the usual manner. The free ends of a member 24, pivotally connected to a similar member 25, are sprung into opposite apertures in the carriage j, while the free ends of the member 25 are sprung into opposite apertures in the body of the bush chisel 23. The members 24 and 25 connected to the carriage and chisel prevent rotation of the chisel and at the same time they permit it to reciprocate vertically, as when in operation.

The base a and the apparatus supported therefrom is adapted to be moved on the rails c by means of a motor z connected through reduction gearing 26 and gears 27 with the axle 28 of a pair of the wheels b.

The motors x, y and z may be, for example, pneumatic or electric motors and are adapted to be controlled by means of levers x', y' and z' positioned adjacent to an operator's station 29 and suitably connected to valve mechanisms, or switches, as the case may be.

Adjacent to the operator's station 29 is provided a shield 30, preferably of wire glass or other unbreakable glass, which serves as a protection for the operator against flying chips, without impairing his vision of the work, as a suitably supported block of stone 31, and a lamp 32 is adjustably supported from the body g to be directed on the surface of a block of stone in process of surfacing. The lamp 32 enables night work and the shadows thrown by inequalities in the stone's surface assist the operator in regulating the tool.

In the operation of the machine involving my invention, it being assumed that a block of stone 31, properly leveled up, is placed alongside the track c, the machine is run along the tracks by operation of the motor z to a point such that the arm i will extend above the block of stone. The arm i is then lowered by operation of the motor x to bring the bush chisel down on the upper surface of the block. It will be understood that the arm i is initially positioned so that when lowered to bring the bush chisel down on the surface of the block, the bush chisel will be adjacent an edge of the surface and preferably in a corner. The pneumatic hammer l is then put into operation causing the bush chisel to act upon the surface of the stone and the motor y is operated to cause the carriage j, by which the pneumatic hammer is supported, to be drawn across the surface of the block. The bush chisel actuated by the hammer finishes

the surface over which it is drawn. On reaching the end of the surface the motor *y* is stopped and the motor *z* operated to move the base *a* along the rail *c* a distance slightly less than the surface finished by the bush chisel. The motor *y* is then operated in reverse direction and the carriage drawn back across the surface of the block. The movement of the bush chisel back and forth across the surface of the block finishes the surface of the block in parallel lines as indicated at 33, Fig. 7. The parallelism of the bush chisel is insured by the rigidity of the arm *i* and by the provision of the members 24 and 25, which prevent the bush chisel from turning in the hammer or with reference to the direction of the travel of the chisel.

In finishing the surface of a block, the bush chisel, actuated by the hammer, is carried back and forth across the surface of the block by operation of the motor *y* and by intermittently moving the platform along the rails by operation of the motor *z*. It will be observed that the entire operation of the chisel is under the control of an operator at the operator's station 29, who controls the several motors by manipulation of the levers *x'*, *y'*, *z'*. It will be further noted that the operator is stationed at a distance from the point at which the chisel is working and that he is fully protected from flying chips by means of shield 30. It will be noted that the operation of the bush chisel is effected entirely under power. The weight of the arm *i*, and the size and power of the hammer and chisel may be increased, substantially without limitation. It will be noted that the accuracy of the finish effected by the chisel is insured by the rigidity of the arm *i* and by the fact that the chisel is prevented from turning, in operation, by the members 24 and 25.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. A stone dressing machine comprising a mobile base, an arm adjustably supported from said base, a power actuated tool supported by and adapted to travel relative to said base, means for adjusting said arm and for moving said tool relative to said arm, prime movers supported on said base and adapted to actuate said means, a prime mover for moving said base, an operator's station on said base and means for the control of said prime movers located at said operator's station.

2. A stone dressing machine comprising a mobile base, an arm adjustably supported from said base and adapted to extend horizontally over a block of stone to be surfaced, a power actuated tool supported by and adapted to travel relative to said base, means for adjusting said arm and for moving said tool relative to said arm, prime movers supported on said base and adapted to actuate said means, a prime mover for moving said base, an operator's station on said base, means for the control of said prime movers located at said operator's station and a shield supported by said base at a point between the operator's station and the block of stone.

3. A stone dressing machine comprising a base, a post mounted on said base, a horizontal arm slidably engaging said post, a windlass carried by said arm, a cable supported by said post and connected to said arm and to said windlass, a motor mounted on the base and a driving connection between said motor and said windlass operative in all positions of adjustment of the arm.

4. A stone dressing machine comprising a base mounted on wheels, a post mounted on said base, a horizontal arm slidably engaging said post, a windlass carried by said arm, a cable supported by said post and connected to said arm and to said windlass, a motor, a driving connection between said motor and said windlass, a carriage adapted to travel on said arm, a tool carried by said carriage, a pair of winding drums mounted on a common shaft, cables connected to said carriage and respectively in opposite directions to said drums, a motor and a driving connection between said motor and said shaft, a motor mounted on said base, means affording a driving connection between said motor and a pair of said wheels, an operator's station on said base and means for controlling said motors located at said operator's station.

5. A stone dressing machine comprising a base, a supporting member carried by the base, a horizontal arm carried by the supporting member and vertically adjustable thereon, a tool carried by the arm and movable therealong, means carried by the arm operable to move the tool along the arm, a motor mounted on the base, and connections through which the motor may operate said means in any adjusted position of the horizontal arm.

6. A stone dressing machine comprising a base, a supporting member carried by the base, a horizontal arm carried by the supporting member and vertically adjustable thereon, a tool carried by the arm and movable therealong, means carried by the arm operable to move the tool along the arm, a motor mounted on the base, and connections through which the motor may operate said means in any adjusted position of the horizontal arm, said connections including a vertical shaft mounted on the base and driven by the motor, and a rotatable member splined on the shaft and arranged to drive said means.

In testimony of which invention, I have hereunto set my hand, at Philadelphia, Pennsylvania, on this 20th day of June, 1927.

WILBER H. VAN SICKEL.