No. 675,904. Patented June 11, 1901.

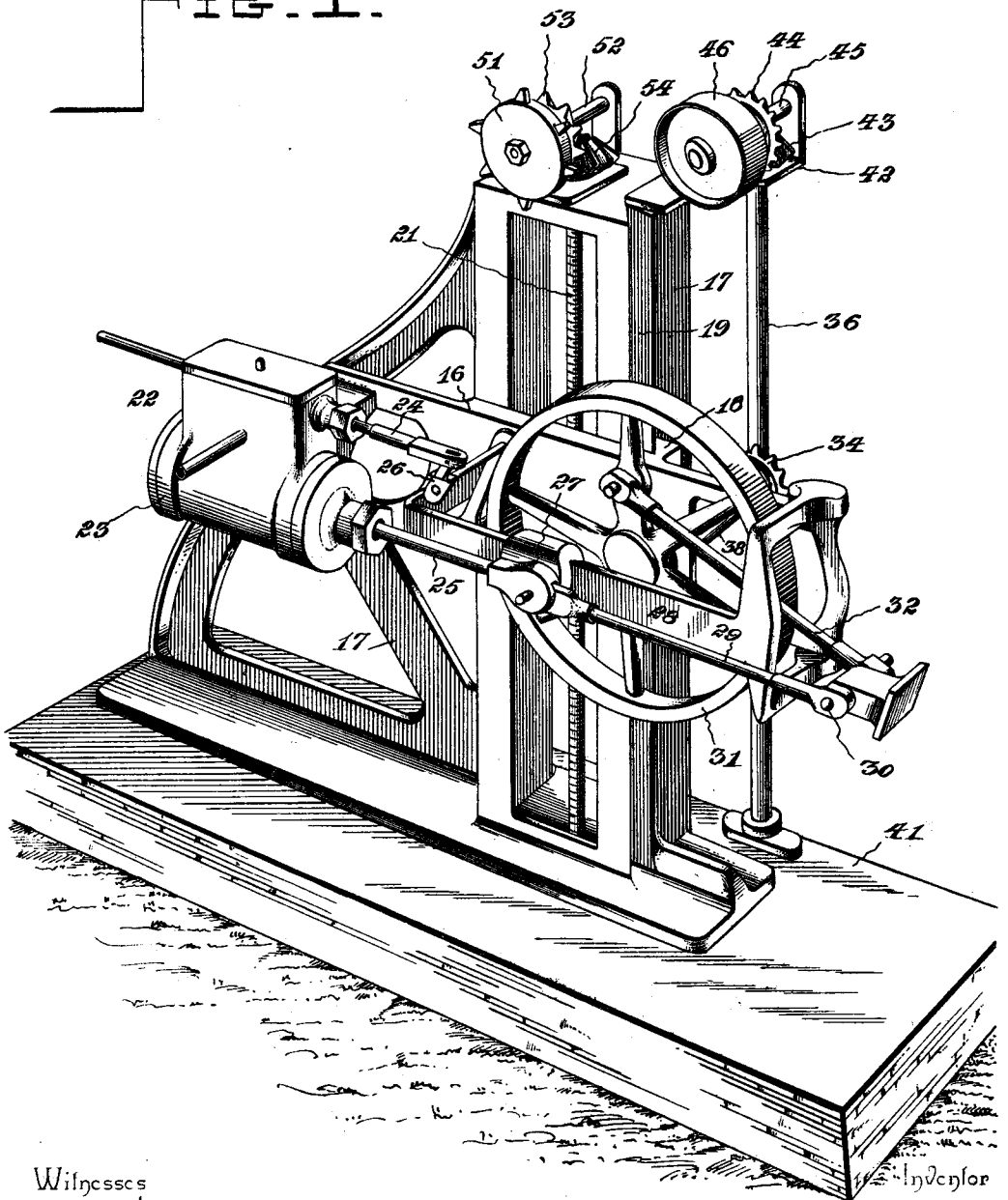
H. F. PERKINS.

STONE SAWING MACHINE.

(Application filed Oct. 25, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



Witnesses

John T. Dufferwiel

By Their Attorneys.

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C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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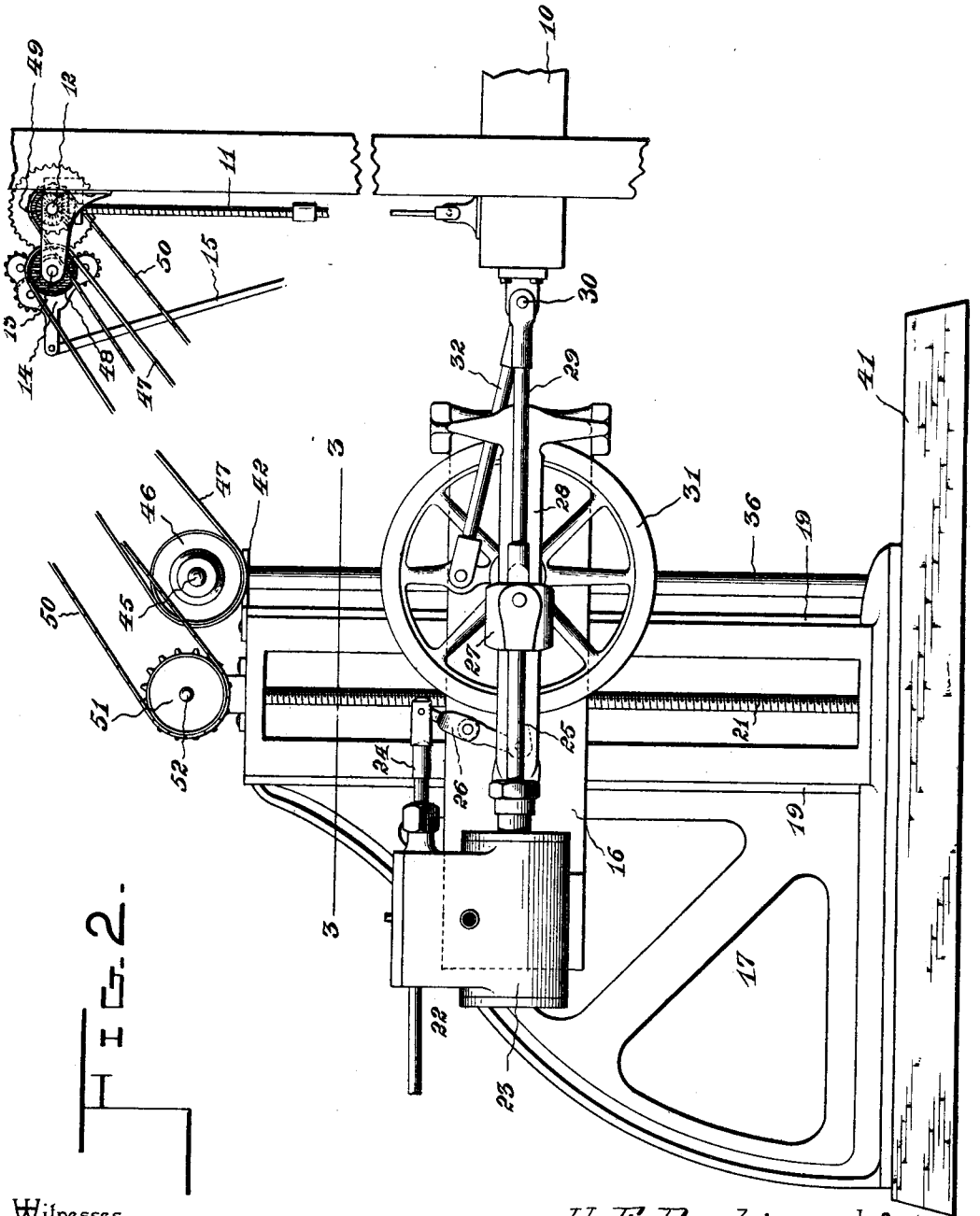


FIG. 2.

Witnesses
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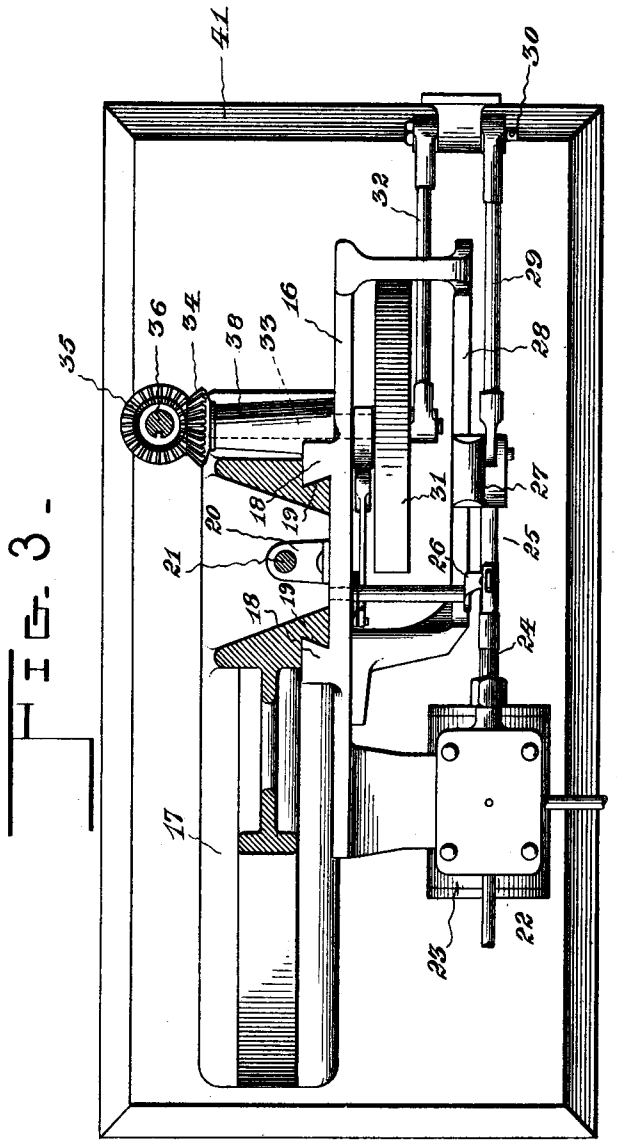


FIG. 3.

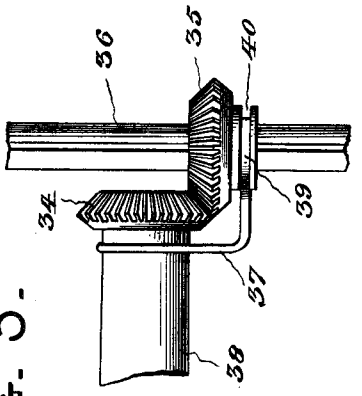


FIG. 5.

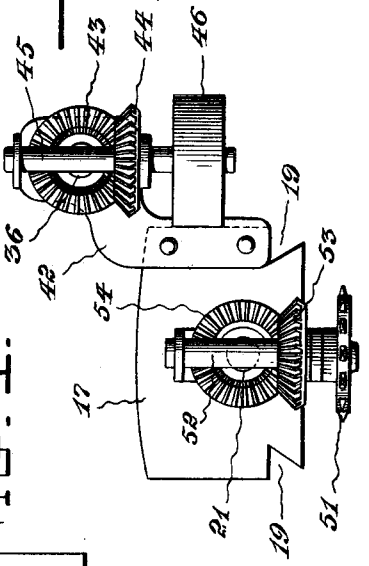


FIG. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

HIRAM F. PERKINS, OF MALONE, NEW YORK.

STONE-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 675,904, dated June 11, 1901.

Application filed October 26, 1899. Serial No. 734,756. (No model.)

To all whom it may concern:

Be it known that I, HIRAM F. PERKINS, a citizen of the United States, residing at Malone, in the county of Franklin and State of New York, have invented a new and useful Stone-Sawing Machine, of which the following is a specification.

My invention relates to stone-sawing machines, and particularly to saw-frame-operating mechanism of the short-pitman type adapted for use in connection with the gang-saw and other forms of machines; and the object in view is to provide a saw-frame-operating mechanism wherein the crank-frame carries the motor adapted to be actuated by fluid-pressure, such as steam or compressed air, or by energy of any of the other kinds in use in analogous relations.

A particular object of the invention is to provide means whereby the connecting-rod or pitman is maintained accurately in alinement with the plane of reciprocatory movement of the saw-frame in all positions of the latter to insure a direct communication of motion from the motor to the saw-frame and in this connection to provide crank-frame or motor-frame feeding mechanism which is operatively connected with the saw-frame feeding mechanism to insure the positive and simultaneous actuation and adjustment of both frames.

A further object of the invention is to provide simple and efficient means whereby motion may be communicated from the motor on its adjustable carrying-frame to the saw-frame feeding mechanism.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a saw-frame-operating mechanism constructed in accordance with my invention. Fig. 2 is a side view of the same, showing the mechanism arranged in operative relation with the adjacent portions of a sawing-machine, the pitman being connected with the saw-frame. Fig. 3 is a plan view, partly in horizontal section, on the line 3 3 of Fig. 2, of the operating mechanism. Fig. 4 is a detail plan view of the feed-shaft-operating devices and the means whereby motion is communicated from the saw-frame feeding mechanism to the crank-frame or motor-frame feeding devices. Fig. 5 is a detail side view of the means for communicating motion from the shaft of the crank-wheel to the feed-mechanism drive-shaft.

Similar reference characters indicate corresponding parts in all the figures of the drawings.

In the drawings I have shown the saw-frame-operating mechanism embodying my invention arranged in operative relation with a stone-sawing machine of the ordinary type, wherein 10 represents the saw-frame, which may be supported in any suitable manner for reciprocatory movement; 11, one of the saw-frame-adjusting feed-screws; 12, one of the saw-frame feed-shafts, which are connected by suitable gearing with the feed-screws; 13, a counter-shaft which is adapted to rotate continuously in one direction, and 14 a shifting mechanism whereby motion may be communicated from the counter-shaft to the feed-shaft 12 to cause rotary motion in either direction of the latter, according to whether the saw-frame is to be elevated or depressed, all of said parts being of the ordinary and well-known construction and the shifting device being adapted to be manually operated by means of a handle or lever 15.

In my improved construction of operating mechanism a crank-frame or motor-frame 16 is mounted for vertical adjustment upon a supporting-frame 17, said crank-frame being provided with guide-blocks 18, which engage guideways 19 in the supporting-frame, and carried by said crank-frame is a feed-nut 20, with which engages a crank-frame feed-screw 21, terminally mounted in suitable bearings and arranged parallel with the path of movement of the crank-frame, whereby the rotation of the feed-screw in one direction or the other will cause the elevation or depression of the crank-frame. The crank-frame consists, essentially, of a bed-plate upon which is arranged a motor 22, adapted to be actuated by any suitable fluid pressure or energy, such as steam or compressed air or the equivalent thereof, said motor in the construction illustrated including a piston-cylinder 23, having valve mechanism, including a valve-

stem 24, a piston-rod 25, and a rocker 26 for actuating the valve-stem. Said piston-rod is preferably connected with a cross-head 27, mounted upon a guide 28 on the motor-frame, and extending from the piston-rod is a pitman or connecting-rod 29, which is pivotally connected, by means of a wrist-pin or noddle 30, with the saw-frame. Also mounted upon the crank-frame is a crank-wheel 31, which may be of a size and weight adapting it to perform the function of a balance-wheel, and it is actuated by a second pitman 32, extending from said wrist-pin or noddle on the saw-frame. The crank-wheel shaft 33 is mounted in a bearing on the bed-plate of the crank-frame and carries a bevel-gear 34, meshing with a traveling bevel-gear 35, which is feathered upon the feed-shaft-operating spindle 36, a hanger or bracket 37, which extends from the bearing 38 of the crank-wheel shaft, being provided with a yoke 39, engaging a circumferential groove 40 in the hub of the traveling gear 35, whereby the vertical movement of the crank-frame is communicated to the traveling gear to cause a simultaneous and equal movement of the latter parallel with its spindle 36, while rotary motion may be communicated from the crank-wheel through the intermeshing gears 34 and 35 to said spindle in all positions of the parts.

The feed-shaft-operating spindle is terminally mounted in suitable bearings, respectively formed in a suitable base 41 and a bracket 42, carried by the supporting-frame 17, and by means of suitable intermediate gearing or connections motion is adapted to be communicated from this spindle to the counter-shaft 13 of the saw-frame. In the construction illustrated said spindle 36 is provided at its upper end with a bevel-gear 43, meshing with a bevel-gear 44 on a counter-spindle 45, carrying a belt-pulley 46, and said belt-pulley is connected by a belt 47 with a pulley 48 on the counter-shaft 13. In operation the spindle 36 is driven in a uniform direction, and hence communicates motion in a uniform direction to the counter-shaft 13, and the desired motion in either direction of the feed-shaft 12 is communicated thereto by the reversing or shifting mechanism 14, or the feed-shaft may be allowed to remain at rest when no adjustment is required, as in the ordinary practice. In order, however, that the adjustment of the crank-frame 16 may be accomplished simultaneously with that of the saw-frame and through an equal distance in order to maintain the piston-rod or other reciprocatory member of the motor in accurate alinement with the path of reciprocatory movement of the saw-frame, I employ return connections between the feed-shaft 12 or other feed member of the sawing-machine to the feed-screw 21 of the operating mechanism, and in the construction illustrated these connections consist of a sprocket-wheel 49 on the feed-shaft 12, a sprocket-chain 50, and a second sprocket-wheel 51, having its spindle 52 connected by intermeshing bevel-gears 53 and 54 with the feed-screw 21, said second sprocket-wheel having its spindle mounted in suitable bearings on the supporting-frame 17. Thus from the motor which is supported by the crank-frame of the operating mechanism a continuous rotary motion is communicated through the intermediate connections to the counter-shaft by which the feed mechanism of the sawing-machine is actuated, the communication of motion from said counter-shaft to the feed-shaft of the saw-machine being controlled by reversing or shifting mechanism of any preferred type adapted for actuation by the operator or attendant. Also said feed mechanism of the saw-frame is directly connected by intermediate return-gearing with the feed-screw of the crank-frame, whereby when the feed mechanism of the saw-frame is actuated in either direction to cause the elevation or depression of the saw-frame the crank-frame is correspondingly moved in the same direction to maintain the alinement of the operating reciprocatory member of the motor with the path of movement of the saw-frame.

I am aware that it is not broadly new to mount a crank-frame for vertical movement with and proportionate to that of the saw-frame; but it will be seen that in the illustrated construction the crank-frame also carries the motor, whereby complicated connections between the motor and the reciprocatory member on the crank-frame are avoided, the motor being carried with the crank-frame in its adjustments to correspond with the movements of the saw-frame.

Furthermore, it will be obvious to those skilled in the art to which my invention appertains that the mechanism described is compact and occupies a comparatively small space outside of that required for the saw-machine and that when the saw-machine is not in use the motor whereby it is actuated may be stopped, and thus terminate the expenditure of fuel while the saw-machine is idle, thus accomplishing an economy in the expense of running the mechanism.

Furthermore, it will be understood that a uniformity of operation may be attained by applying any suitable governing mechanism to the motor to control the supply of motive agent thereto, such governing mechanism, however, forming no part of my present invention, as any of the ordinary forms now in common use may be employed in connection therewith.

Furthermore, it will be understood that the operating mechanism which I have disclosed may be used in connection with either of the types of saw-machines employed in this art, the connection therewith being accomplished by the attachment to the saw-frame of the double wrist-pin or noddle 30, which arranges the described pitmen 29 and 32 in operative positions, and by making suitable connection between the feed-mechanism drive-spindle

and the feed-shaft of the operating mechanism with the feed mechanism of the saw-machine.

Furthermore, it is obvious that various changes in the form, proportion, size, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having described my invention, what I claim is—

1. The combination with a stone-sawing machine, having a reciprocatory saw-frame and feed mechanism for raising and lowering the saw-frame, of a supporting-frame, a bed-plate mounted for vertical movement upon the supporting-frame, a motor carried by the bed-plate, a pitman connecting a reciprocatory member of the motor with the saw-frame, a crank-wheel actuated by the motor, a feed-mechanism-operating spindle arranged parallel with the path of movement of the bed-plate, connections between said crank-wheel and the spindle, including a traveling gear on said spindle and adapted to rotate therewith, operating connections between said spindle and the feeding mechanism of the sawing-machine, a feed-screw arranged parallel with the path of movement of the bed-plate and operatively engaged therewith, and return connections between the feed mechanism of the sawing-machine and said feed-screw, substantially as specified.

2. The herein-described operating mechanism for sawing-machines, the same comprising a supporting-frame, a bed-plate mounted upon the supporting-frame for movement parallel with the saw-frame of the sawing-machine, a motor carried by said bed-plate, a crank-wheel, a wrist-pin adapted for attachment to the saw-frame of the sawing-machine, pitmen respectively connecting said wrist-pin with a reciprocatory member of the motor and said crank-wheel, an operating-spindle arranged parallel with the path of movement of the bed-plate, operating connections between said crank-wheel and the spindle, and including a member carried by the bed-plate and having a sliding connection with the spindle, a feed-screw mounted in fixed bearings in the supporting-frame and engaging a feed-nut on the bed-plate, and means connected respectively with said spindle and feed-screw for imparting motion to and receiving motion from the feed mechanism of the sawing-machine, substantially as specified.

3. The herein-described operating mechanism for sawing-machines, the same comprising a supporting-frame, a bed-plate mounted upon the supporting-frame for movement parallel with the saw-frame of the sawing-machine, a motor carried by said bed-plate, a crank-wheel, a wrist-pin adapted for attachment to the saw-frame of the sawing-machine, pitmen respectively connecting said wrist-pin with a reciprocatory member of the motor and said crank-wheel, an operating-spindle arranged parallel with the path of movement of the bed-plate, operating connections between said crank-wheel and the spindle, and including a member carried by the bed-plate and having a sliding connection with the spindle, a feed-screw mounted in fixed bearings in the supporting-frame and engaging a feed-nut on the bed-plate, a belt-pulley operatively connected with said spindle for communicating motion to the feed mechanism of the sawing-machine, and a gear operatively connected with said feed-screw for receiving motion from the feed mechanism of the sawing-machine, substantially as specified.

4. In power apparatus for stone-sawing machines, the combination with the frame having the vertical guides, and the vertical screw-shaft and power-shaft, of the motor, to actuate the saw-frame, and having its supporting-bed adapted to travel vertically in said guides, the crank-shaft of said motor having a gear engaging a traveling gear on the vertical power-shaft, whereby the latter may be rotated by the motor, the vertical screw-shaft engaging the said supporting-bed of said motor, and adapted to raise and lower the latter, and connections, substantially as set forth, between said vertical screw-shaft and said vertical power-shaft, whereby the former is driven by the latter, for the purpose set forth, substantially as described.

5. In power apparatus for stone-sawing machines, the combination with the frame and the motor-supporting bed movable vertically thereon, of the crank-shaft carried by said motor-supporting bed, the pitman 29 connected to the cross-head of the motor, the pitman 32 connected to the crank, the outer ends of said pitmen being adapted to be connected to the saw-frame of a stone-sawing machine, and connections, substantially as specified, between said crank-shaft and said motor-supporting bed, to raise and lower the latter, substantially as described.

6. In a power attachment for stone-sawing machines, the combination of a supporting-frame, a motor movable vertically thereon, a reciprocatory member movable vertically with and actuated by the motor, a pitman connected to said reciprocatory member and adapted at its free end for attachment to a reciprocatory saw-frame, mechanism for raising and lowering the motor, and return connections between said pitman and said raising and lowering mechanism, to actuate the latter, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HIRAM F. PERKINS.

Witnesses:

NEWCOMB H. MUNSILL,

CHAS. E. PERKINS.