

(No Model.)

2 Sheets—Sheet 1.

J. B. KELLY.
STEAM POWER CROSSCUT SAW.

No. 503,665.

Patented Aug. 22, 1893.

FIG. 1.

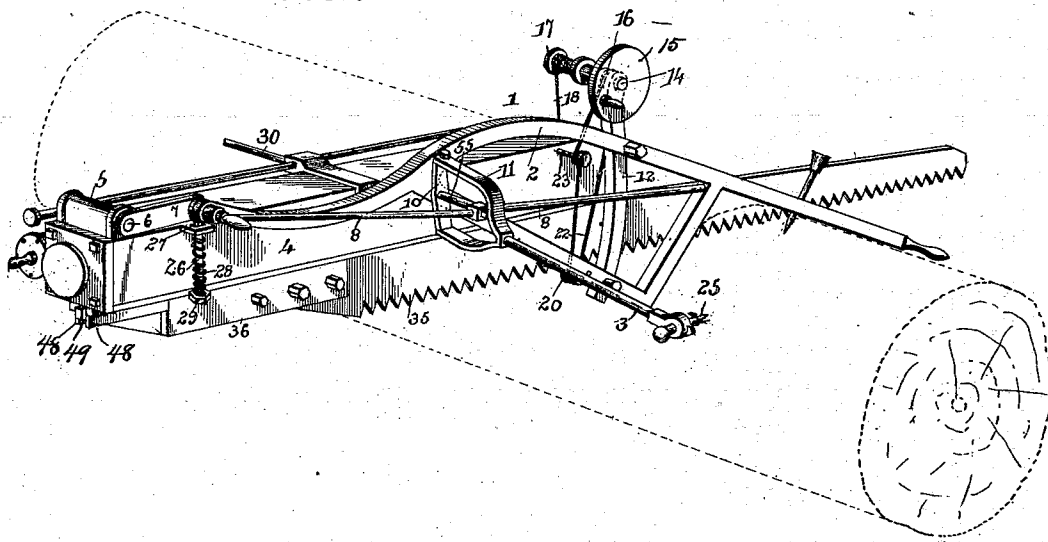


FIG. 2.

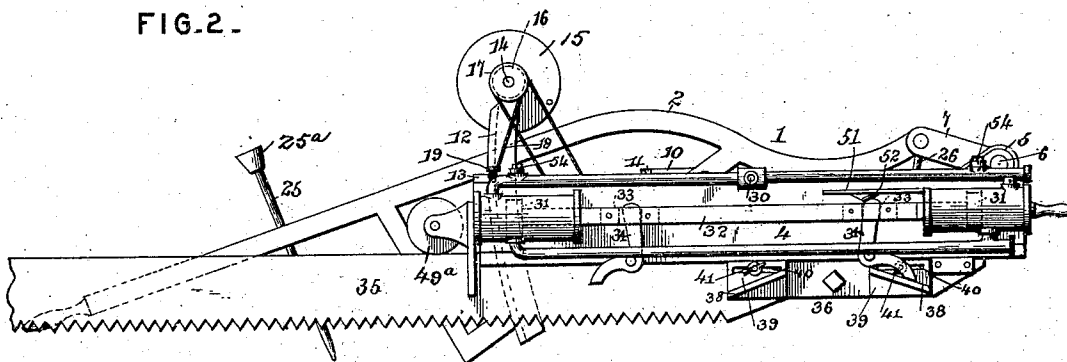


FIG. 3.

Witnesses

Jas. K. McLathran

J. B. Kelly

Inventor

John B. Kelly

By His Attorneys,

C. A. Snow & Co.

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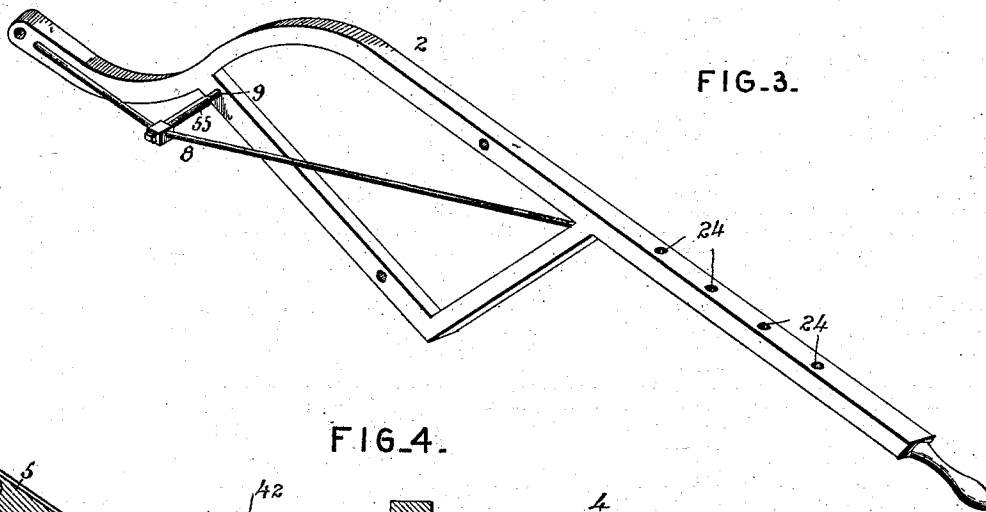


FIG. 3.

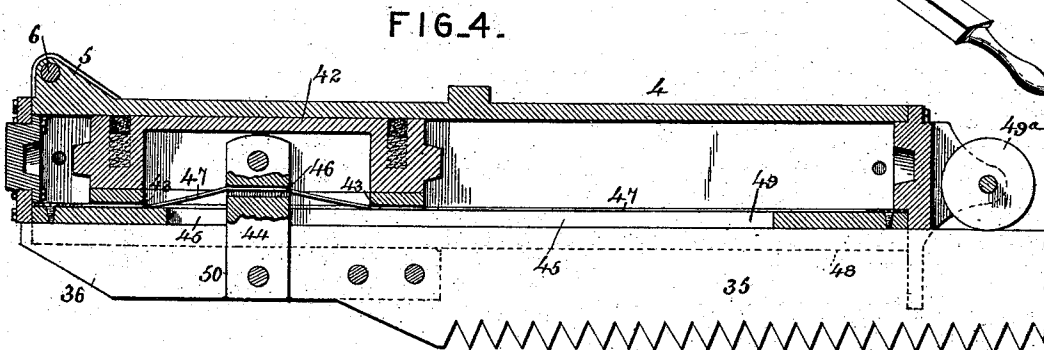


FIG. 4.

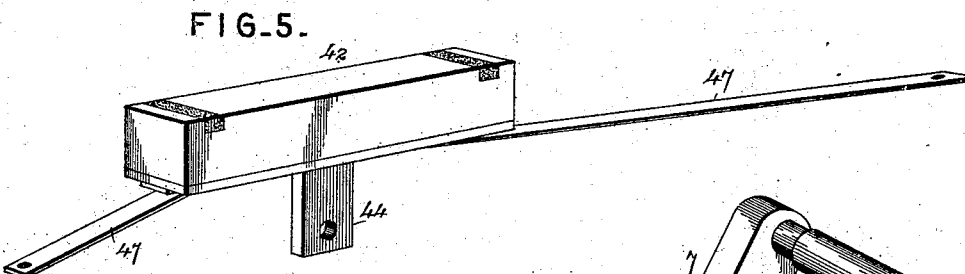


FIG. 5.

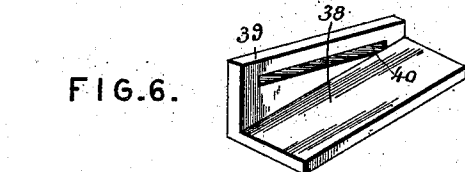


FIG. 6.

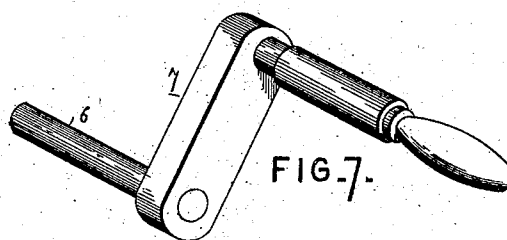


FIG. 7.

Witnesses

Jas. H. McLathran
O. E. Doyle

Inventor

John B. Kelly

By his Attorneys,

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOHN B. KELLY, OF PLEASANT HOME, OREGON.

STEAM-POWER CROSSCUT-SAW.

SPECIFICATION forming part of Letters Patent No. 503,665, dated August 22, 1893.

Application filed August 13, 1892. Serial No. 443,049. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. KELLY, a citizen of the United States, residing at Pleasant Home, in the county of Multnomah and State of Oregon, have invented a new and useful Steam-Power Crosscut Saw, of which the following is a specification.

My invention relates to improvements in cross-cut saws in which steam-power is employed for the operation thereof.

The objects and advantages of my invention will appear hereinafter in the description, and the novel features thereof will be particularly pointed out in the claims.

In the drawings: Figure 1 is a perspective view of a saw embodying my improvements, arranged in operative position. Fig. 2 is a side view, showing the opposite side from that shown in the perspective. Fig. 3 is a detail view of the supporting-frame. Fig. 4 is a longitudinal sectional view of the cylinder. Fig. 5 is a detail view of the piston and attaching arm with the flexible strap shown in connection therewith. Fig. 6 is a detail view of one of the cams for operating the valve-stem. Fig. 7 is a similar view of the rock-shaft and crank. Fig. 8 is a detail view of the pin with removable head detached.

The supporting-frame 1 comprises, essentially, the pivoted arm 2, to which is fulcrumed the dog 3, the cylinder to which said arm is pivotally connected being indicated at 4. In the rear end of said cylinder, in a bearing 5, is mounted a rock-shaft 6, carrying a crank 7, upon the lateral arm of which is fulcrumed the rear end of the supporting arm. Said arm is trussed and is provided at the center of the truss 8 with a spindle 9, upon which is fulcrumed a cross-bar 10. The bifurcated inner end of the shank 11, of the dog 3, is pivotally connected to the ends of the said cross-bar, whereby said dog is capable of any desired angular adjustment to suit the shape and size of the timber to which the saw is applied. The supporting-arm is further provided, at an intermediate point in advance of the pivoted dog with a segmental guide 12, which operates in a clip 13, attached to the front end of the cylinder, whereby the front end of the latter is capable of elevation and depression with relation to the supporting arm to allow of the necessary adjustment

of the saw carried by the cylinder, as hereinafter explained. At the upper end of the segmental guide is mounted a transverse windlass shaft 14, carrying a suitable operating-wheel 15 and provided with a pulley 16 and a spool 17. A cable 18, which is attached permanently at its lower end to a pin 19 at the front end of the cylinder, is reeled upon the said spool. A pulley 20 is mounted upon the supporting arm below the pulley carried by the windlass and around the said pulleys passes an endless belt 22, which is attached at an intermediate point to a stationary pin 23, carried by the cylinder, whereby by the operation of the windlass the elevation or depression of the front end of the cylinder may be regulated. The supporting arm is further provided at its front end with a series of perforations 24, adapted to receive a securing-spike 25, to be driven into the log which is to be sawed.

Attached to the free end of the crank-arm above described, which is fulcrumed to the rear end of the cylinder, is a guide-pin 26, operating in a guide-eye 27, carried by the cylinder and provided with a tension-spring 28, held in place by an adjusting-nut 29, whereby the end of the crank-arm is normally held close to or in the plane of the upper side of the cylinder.

30 represents the steam supply pipe communicating at its ends with the slide-valves 31, which in turn communicate with the ends of the cylinder. The valves are connected by the stem 32, provided with keepers 33, pivoted angle-levers 34 being oppositely disposed upon the cylinder and having their upper arms engaged in said keepers, and their lower arms, which project, respectively, toward the front and rear ends of the cylinder, arranged below the plane of the lower side of the latter.

35 represents the saw carried by the sliding saw-head 36, the latter being provided at its opposite ends with cams 38, to engage the lower ends of the angle-levers alternately. Said cams are in the shape of oppositely-inclined webs, carried by plates 39, which are longitudinally slotted, as seen at 40, said slots being engaged by adjusting bolts 41, whereby the cams may be adjusted toward or from each other to lengthen or shorten the length of stroke of the piston.

The piston 42 is provided in its lower side

with a slot 43, in which is pivotally mounted an attaching arm 44, the lower end of which projects through a longitudinal slot 45, in the bottom of the cylinder. The ends of the recess or slot in the under side of the piston are beveled, and a flexible strap of spring-steel or other elastic metal is secured at its ends to the inner surface of the cylinder at the ends of the longitudinal slot therein and passes at an intermediate point through a transverse slot 46, which is located in the attaching arm above the plane of the lower side of the piston. It will thus be seen that the flexible strap shown at 47 lies close to the longitudinal slot in the cylinder and closes the latter, except at the one point that it rises to pass through the transverse slot or guide in the piston. The ends of the piston being formed to fit snugly in the cylinder will hold the flexible strap firmly in contact with the lower side of the cylinder, and thus prevent the escape of the steam. A guide 48, at the front end of the cylinder, holds the upper edge of the saw to its proper path, in combination with a guide-groove 49, which communicates with the longitudinal slot in the lower side of the cylinder, an anti-friction-roller 49^a being arranged in position to receive the upward thrust of the saw. The saw-head, which slides in contact with the lower side of the cylinder, is provided with a slot 50, to receive the lower end of the attaching arm, and is thus held firmly to its place and caused to operate with the piston. A retaining-spring 51 is arranged to engage the upper end of one of the angle-levers to hold the valve-stem in either of its adjusted positions, said spring carrying a beveled block 52, as shown clearly in Fig. 2.

In operation, my improved saw is first applied to the log by arranging the supporting arm in a transverse position thereto, and bringing it, approximately, into the position shown in Fig. 1, with the rear end of the supporting arm in the same horizontal plane with the center of the log. After driving in the spike or peg which is carried by the supporting arm, and similarly adjusting the pivoted dog and attaching the steam-pipe from the boiler, the machine is in position for operation. The valves admit the steam alternately to opposite ends of the cylinder in the ordinary manner, thereby causing the reciprocation of the piston and a corresponding movement of the saw which is carried thereby, the valve-stem being operated by the valve-mechanism consisting of the cams and angle-levers, as above described.

When it is desired to elevate the saw from the work, it is accomplished by means of the windlass operating upon the cable and reeling the latter upon the spool.

The saw is fed into the work by means of the windlass operating upon the endless belt.

The operation of the rock-shaft and crank which are used as the means of connection between the supporting arm and the rear end of the cylinder, is as follows: When the steam

is admitted to the rear side of the piston, the recoil of the cylinder causes its rear end to swing rearwardly and upwardly, while at the same time, the saw is forced forwardly and downwardly by the motion of the piston, thus causing the saw in its forward motion to cut upon the far side of the log. When the steam is admitted at the opposite side of the piston, the recoil of the steam against the front end of the cylinder causes the latter to swing forwardly and downwardly, thus drawing the rear end of the cylinder downwardly and causing the saw, in its rearward movement, to cut upon the near side of the log. Thus a rocking motion is imparted to the saw, as the steam is alternately admitted into opposite ends of the cylinder.

In order to prevent the piston from striking the heads of the cylinder, I have provided the supply pipe with check-valves 54, thus forming an air-cushion between the piston and the cylinder-heads at each stroke.

By means of the adjustable cams the length of the stroke of the piston may be adjusted at will to increase or diminish the length of stroke of saw.

The dog is made adjustable to logs of all sizes by its pivotal connection to the frame, and it is locked firmly at any desired adjustment by tightening its pivot-bolt, which is provided with a shoulder 55, to bear upon the outer surface of the pivotal cross-bar.

The pin 25 is adapted to be driven into the log when the machine is arranged in the operative position, and when it is desired to remove the machine to apply to another log the removable head, 25^a, is removed from the pin and the perforation in the arm of the frame is slipped over the upper end of the pin without removing the latter from the log. The pin is subsequently removed or may be allowed to remain.

Having thus described my invention, I claim—

1. The combination with a cross-cut saw, of the supporting-frame comprising a pivoted supporting arm provided with a retaining peg, and a dog pivotally connected at one end to a cross-bar fulcrumed to said supporting arm, substantially as specified.

2. The combination with a longitudinally-slotted cylinder, and a piston arranged therein and provided with an attaching arm projecting through the slot in the cylinder, of the flexible strap arranged within the cylinder to cover said slot and passing through a guide in the piston, the saw-head secured to said attaching arm and carrying the saw, and valve-mechanism for operating the piston, substantially as specified.

3. The combination with the cylinder, the piston, the saw-head carrying the saw, and attached to said piston, and the valve-mechanism for operating the said parts, of the supporting-frame loosely connected with said cylinder by a rock-shaft, and spring-actuated crank, substantially as specified.

4. The combination with the cylinder and the steam-actuated saw-head mounted upon said cylinder, of the rock-shaft mounted in a bearing at one end of the cylinder and provided with a crank-arm, the supporting frame fulcrumed upon said crank-arm, and the segmental guide carried by the supporting-frame and engaging the front end of the cylinder, and carrying means to adjust the cylinder with relation to the supporting-frame, substantially as specified.

5. The combination with the cylinder and steam-actuated saw-head, of the supporting-frame, the rock-shaft mounted in a bearing at the rear end of the cylinder and carrying a crank-arm, a guide-pin connected to said crank-arm and operating in a guide-eye on the cylinder and provided with a spring, the segmental guide carried by said supporting-frame and operating in a guide upon the front end of the cylinder, and a windlass carrying an endless belt which is connected with the cylinder, substantially as specified.

6. The combination with the cylinder and steam-actuated saw-head, of the rock-shaft mounted upon said cylinder and carrying a

crank-arm, the free end of which is connected to the cylinder by a spring-actuated guide-pin, the supporting-arm connected to the free end of said crank-arm, and an adjusting windlass carried by the said arm and connected by a belt to the front end of the cylinder, substantially as specified.

7. The combination with a cylinder provided with a longitudinal slot and communicating guide-groove, the piston carrying an attaching-arm which projects through said slot and groove, means for operating said piston, and a supporting-frame to which said cylinder is pivotally connected, of the saw-head connected to the projecting end of the attaching-arm, the saw carried by said saw-head, and the guide and guide-roller attached to the front end of the cylinder to guide and receive the upward thrust of the saw, substantially as specified.

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

JOHN B. KELLY.

Witnesses:

JOE STEPHENS,
I. STEPHENS.