(No Model.) 2 Sheets—Sheet 1.

P. McG. CHISHOLM.

SAW MILL.

No. 300,216. Patented June 10, 1884.

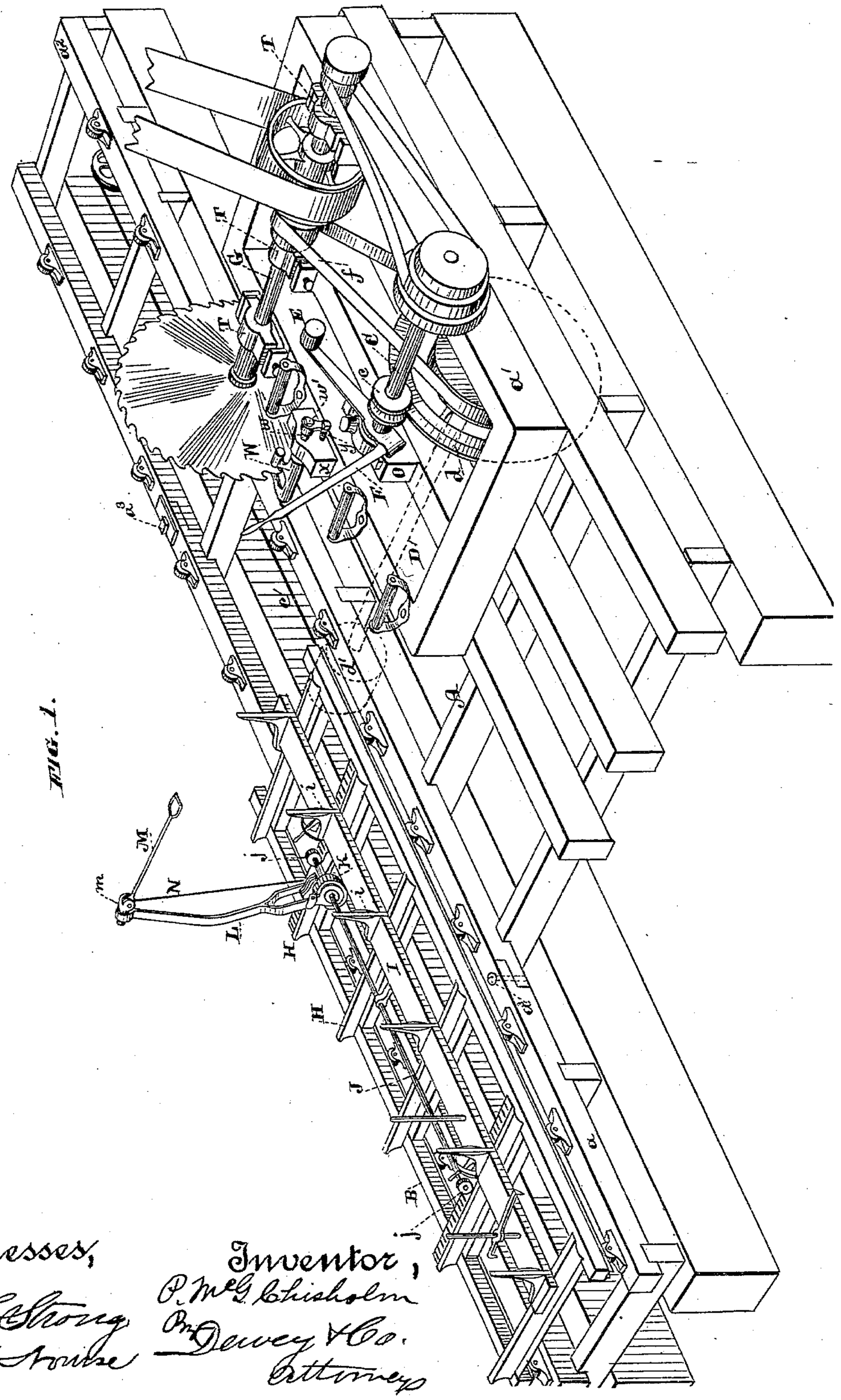

FIG. 1.

Witnesses,
Geo. H. Strong
J. L. Snibe

Inventor,
P. McG. Chisholm
By Dewey & Co.
Attorneys

(No Model.) 2 Sheets—Sheet 2.

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FIG. 2.

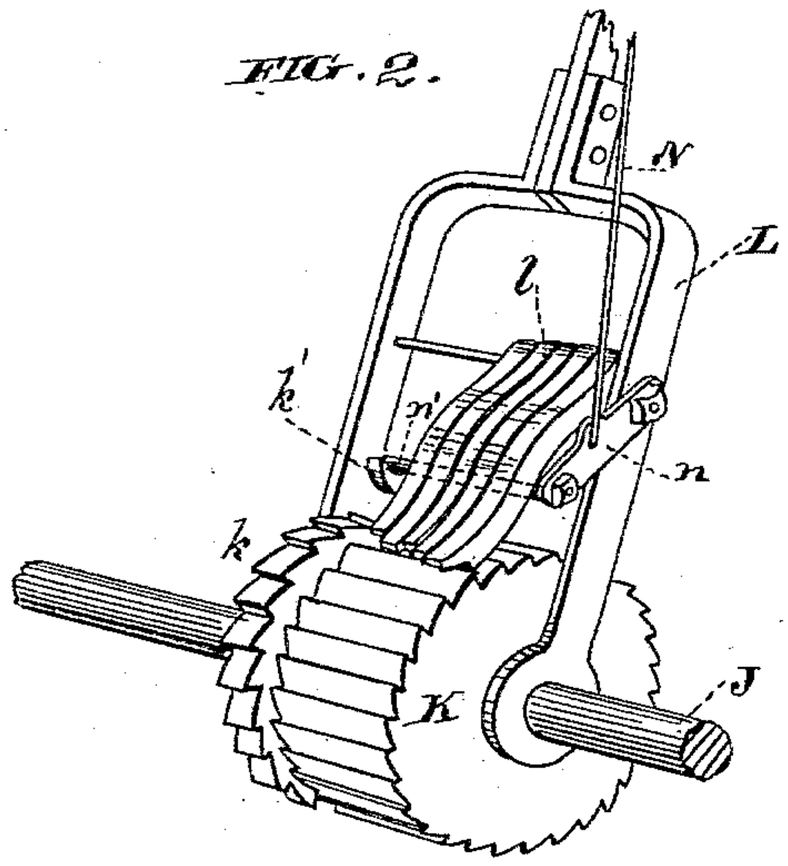


FIG. 3.

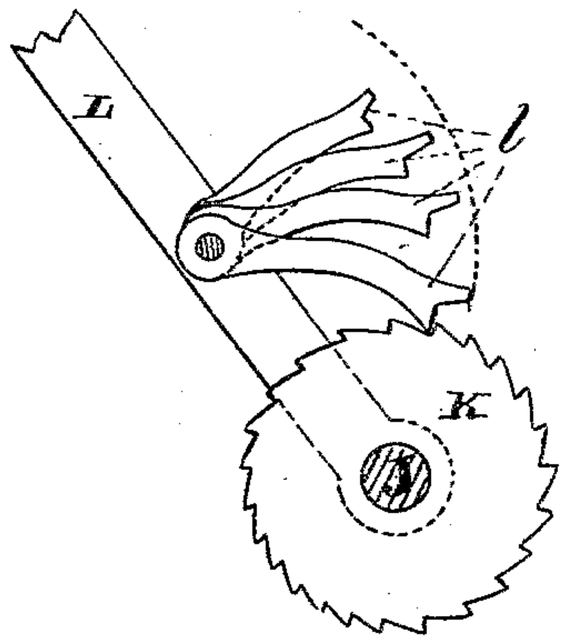


FIG. 4.

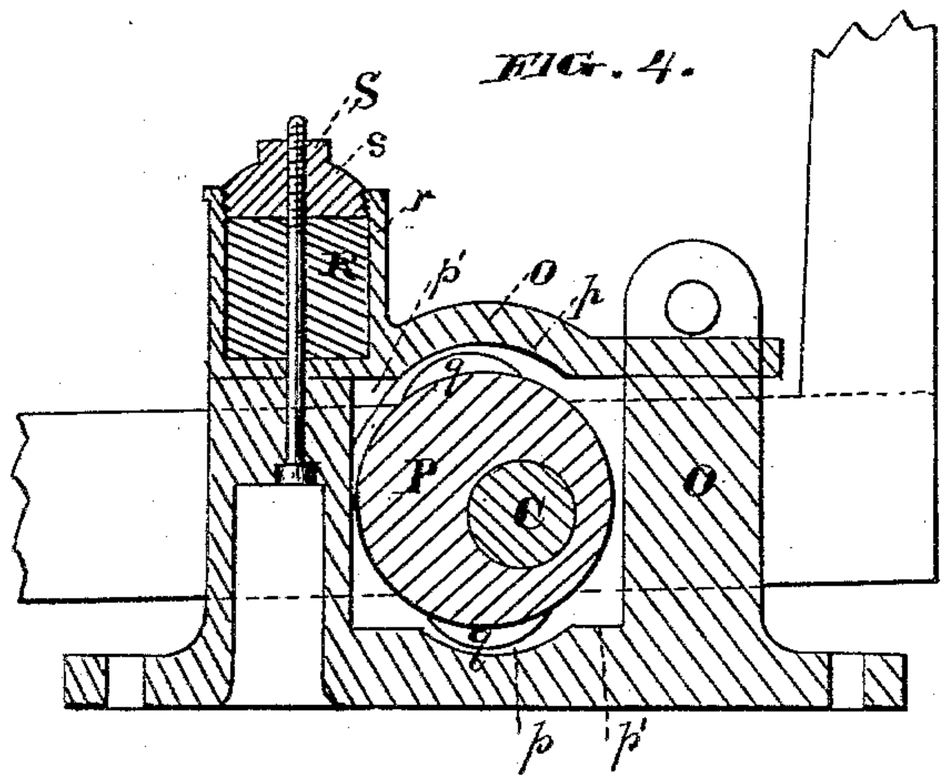


FIG. 6.

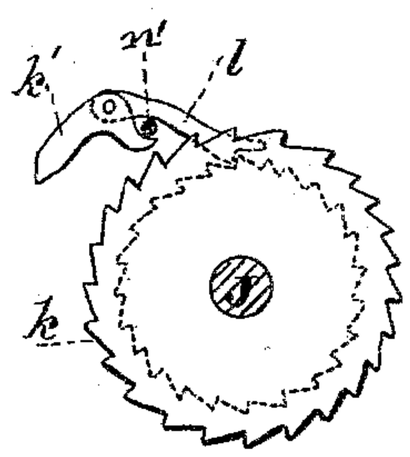
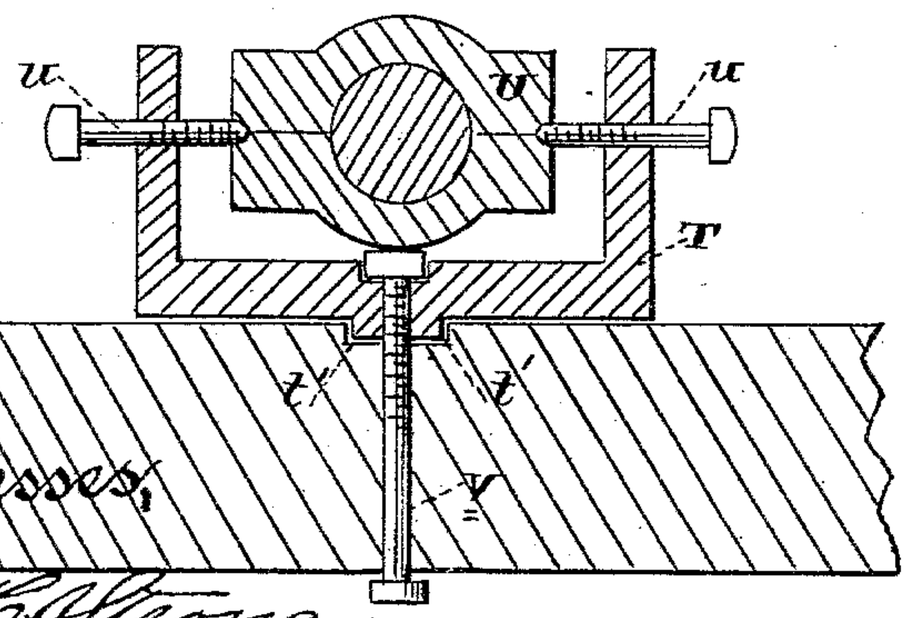


FIG. 5



Witnesses,
Geo. H. Strong.
J. L. Norris

Inventor,
P. McG. Chisholm
By Dewey & Co.
Attorneys

UNITED STATES PATENT OFFICE.

PETER McG. CHISHOLM, OF SAN FRANCISCO, CALIFORNIA.

SAW-MILL.

SPECIFICATION forming part of Letters Patent No. 300,216, dated June 10, 1884.

Application filed November 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, PETER McG. CHISHOLM, of the city and county of San Francisco, and State of California, have invented an Improvement in Saw-Mills; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the class of saw-mills, and to certain new and useful improvements therein, consisting in a portable frame, a pawl-and-ratchet mechanism for adjusting the set-beam, a friction bush or boxing for friction-shaft, an adjustable box for the saw-shaft, and a guide for the saw, all of which I shall hereinafter fully explain, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view of my saw-mill. Fig. 2 is a perspective view showing the pawl-and-ratchet mechanism for adjusting the set-beam. Fig. 3 is a side elevation of same, showing the independent pawls *l*. Fig. 4 is a vertical section of my improved friction-bush. Fig. 5 is a vertical section of my adjustable boxes for the saw-shaft. Fig. 6 is a side elevation of the mechanism shown in Figs. 2 and 3, to show the reversing-pawl.

The object of my improvements is generally to render more perfect and operative the several parts.

A represents, generally, the main framework of the mill; and it consists of suitable longitudinal and cross beams. This frame is made, for the sake of portability, in three separate divisions—an end section being designated by *a*, the central section by *a'*, and the other end by a^2. These sections are framed together, when set up, by halving their ends in and securing them by bolts a^3. By removing these bolts they may readily be separated and laid on one another for convenience in transportation.

B is the reciprocating carriage, operating by means of the friction-shaft C, carrying friction-pulley *c*, shaft D, carrying friction-wheel *d*, and cable-pulley *d'*, and the cable *c'*, said carriage being reversed by a friction-roller, E, operated by an elbow-lever, F, against a belt, *f*, extending from the shaft D to the saw-shaft G. These devices constitute no part of my invention, and are referred to simply to give a better understanding of my improvements.

Upon the carriage are the cross-beams H, over which the adjustable set-beam I, carrying the knees *i*, moves. The means for adjusting this set-beam forward or back constitute my second improvement. Two of the beams H are made into racks, with which mesh pinions *j* on the ends of a shaft, J, mounted in bearings extending backwardly from the set-beam. Near one end this shaft carries a ratchet-wheel, K, Fig. 2.

Journaled upon the shaft, on each side of the ratchet, by means of its forked end, is a lever, L, in the fork of which, above the ratchet, are pivoted a number of independent pawls, *l*, adapted to engage with the teeth of said ratchet on the forward stroke of the lever, in order to set the beam up. Each of these pawls has its own adjustment as to engaging with the ratchet, by reason of each being formed with its engaging-notch in a different position, plane, or line from the others, as shown in Fig. 3. By means of this the spaces or pitch of the ratchet-teeth are practically reduced, as a slight movement of the lever will cause some one of the pawls to engage, and at the same time the more desirable result of holding the ratchet where set is obtained, because some of the pawls are always ready to or are in actual engagement therewith, no matter where set.

In the upper end of lever L is journaled a a short arm, *m*, Fig. 1, adapted to be oscillated in its bearing. In its forward end is pivoted the lever-handle M, adapted thus to have a vertical movement and also an oscillating one. A rod, N, is connected at its upper end to the arm *m*, and at its lower end to a crank, *n*, pivoted on the fork of lever L, Fig. 2. With the end of this crank, Fig. 2, is connected a a rod, *n'*, passing under all the pawls. By moving handle M in a direct line the lever L is vibrated to cause the operation of its pawls in engaging the ratchet-wheel, and by turning said handle the arm *m* is turned, raising the rod N, crank *n*, and rod *n'*, to lift and hold all the pawls out of engagement with the ratchet-wheel, when it has to be reversed by the means I shall now describe. This ratchet-wheel is a double one, here shown as having

formed on one edge teeth *k* in a reverse direction, Fig. 2. With these engages a gravitating pawl, *k'*, also pivoted in the lever L, Fig. 6. The rod *n'* extends its end over the forward end of pawl *k'*, and is heavy enough to hold its rear end up out of engagement with the ratchet-teeth *k*, so that said pawl does not engage at all as long as the series of pawls *l* are operating to turn the ratchet forward; but when these are raised by the rod *n'* the pawl *k'* is released from said rod and drops its rear end into the teeth *k*, and every stroke of the lever L reverses the ratchet and throws the set-beam back.

My next improvement relates to the boxing in which the end of shaft C is mounted, and adapted to be pressed down or raised up by the lever F, in order to throw the friction-rollers *c d* or the roller E and belt *f* into engagement, respectively, to accomplish the reciprocation of the carriage, as is usual in saw-mills. This boxing is seen in section in Fig. 4. It consists of a casing, O, having a cap, *o*. In the bottom of the casing and lower surface of the cap are concaved surfaces *p*, on each side of which are straight surfaces *p'*. The shaft C passes through an eccentric, P, within the box, having convex lugs or projecting surfaces *q*, adapted to fit within the concaved surfaces *p* of the casing and cap. The lever F is loose upon shaft C, but is firmly connected with the outer face of eccentric P. One end of the cap is provided with a cylindrical chamber, *r*, in which is a rubber cushion, R, upon top of which is a cap, *s*, lying on the rubber alone and held down by a bolt, S, passing through it, the rubber, the cap *o*, and secured in the main casing O. The other end of the cap *o* is loosely bolted, hinged, or pivoted to the casing.

The operation is as follows: The lever F, which is fast on the eccentric P, and when operated to turn said eccentric, the latter operating within the boxing, raises or lowers the shaft for the purpose described; but without some further device it would require the operator to keep hold of lever F to make it stay in the position set; but in this case the convex lugs on the eccentric move from their concave bearings against the straight portions on either side. Against these they are bound with sufficient friction to hold them in place, because the cap *o*, which is pressed upward by them, is under the influence of the rubber cushion pressing down by reason of the construction described. Therefore the operator need not keep hold of lever F, as it will stay where set, and yet may be readily moved by sufficient pressure.

Fig. 5 represents my next improvement. It is for the purpose of allowing the saw to be turned at an angle to cut in or out, as desired. In Fig. 1 it will be seen that the saw-shaft G is journaled in three boxes. These consist (Fig. 5) of an outer frame, T, provided with a circular lug, *t*, in the bottom, which finds a bearing in a corresponding socket, *t'*, in the beams of the frame, and of a sleeve, U, through which the shaft passes. This sleeve is set within the outer frame, and is adjusted by means of oppositely-placed set-screws *u*, as shown. Instead of allowing the weight of the sleeves and shaft to come upon the outer frames, which would cause them to turn hard, they are supported on the heads of bolts *v*, rising through the frame-beams and frame T. By loosening the set-screws the outer frames, T, may be turned to any desired inclination, and the sleeves may again be adjusted to the changed inclinations by the screws.

In Fig. 1 I show the means by which I adjust the guide or set W for the saw. This is a forked piece embracing the rim of the saw, as usual. It has a shank, *w*, passing through a block, *x*, and having an arm, *w'*, on its end, through which a set-screw, *y*, passes and impinges against the block. By moving this set-screw the guide may be properly adjusted.

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

1. In a saw-mill, the beam-setting ratchet-wheel K, having teeth *k* on one edge, reversed as described, in combination with the lever L, having the series of independent pawls engaging with the ratchet *l*, to turn it forward, and the gravitating reversed pawl *k'*, engaging with teeth *k*, to reverse said ratchet-wheel, the oscillating bearing *m* in the top of the lever, the lever-handle M, pivoted to move vertically in said bearing, the rod N, connected with the bearing, the crank *n*, connected with the rod, and the cross-rod *n'*, connected with the crank and passing under the series of pawls *l* and over the rear end of pawl *k'*, whereby when said pawls *l* are down in engagement the pawl *k'* is thrown out, and vice versa, substantially as herein described.

2. In a saw-mill, the shaft C, eccentric P loose thereon and having the convex lugs or projections *q*, and the lever F on the eccentric, in combination with the boxing consisting of the casing O and cap *o*, each having the concave or recessed surfaces *p* and straight surfaces *p'*, and a means for connecting the cap to the casing to allow it to yield when the eccentric is turned, and yet press upon said eccentric, substantially as and for the purpose herein described.

3. In a saw-mill, the shaft C, eccentric P loose thereon and having the convex lugs or projections *q*, and the lever F on the eccentric, in combination with the boxing consisting of the casing O and cap *o*, each having the concaved or recessed surfaces *p* and straight surfaces *p'*, said cap having a hinge or pivot connection to the casing at one end, the chamber *r* at the other, the rubber cushion R therein, the cup *s* on top of said cushion, and the bolt S, binding the cushion to the casing O, substantially as and for the purpose herein described.

4. In a saw-mill, the adjustable boxes for the saw-shaft, consisting of the outer casings, T, having bottom bearings adapted to turn in beams of the frame, the sleeves U, through which the saw-shaft passes, and the set-screws *u*, passing through the outer casing and impinging against the sleeves, substantially as herein described.

5. In a saw-mill, the adjustable boxes for the saw-shaft, consisting of the outer casings, T, mounted to turn in the beams of the frame, the sleeves U and set-screws *u*, and the bolts *v*, supporting the sleeves, substantially as herein described.

In witness whereof I have hereunto set my hand.

PETER McG. CHISHOLM.

Witnesses:

S. H. NOURSE,

C. D. COLE.