

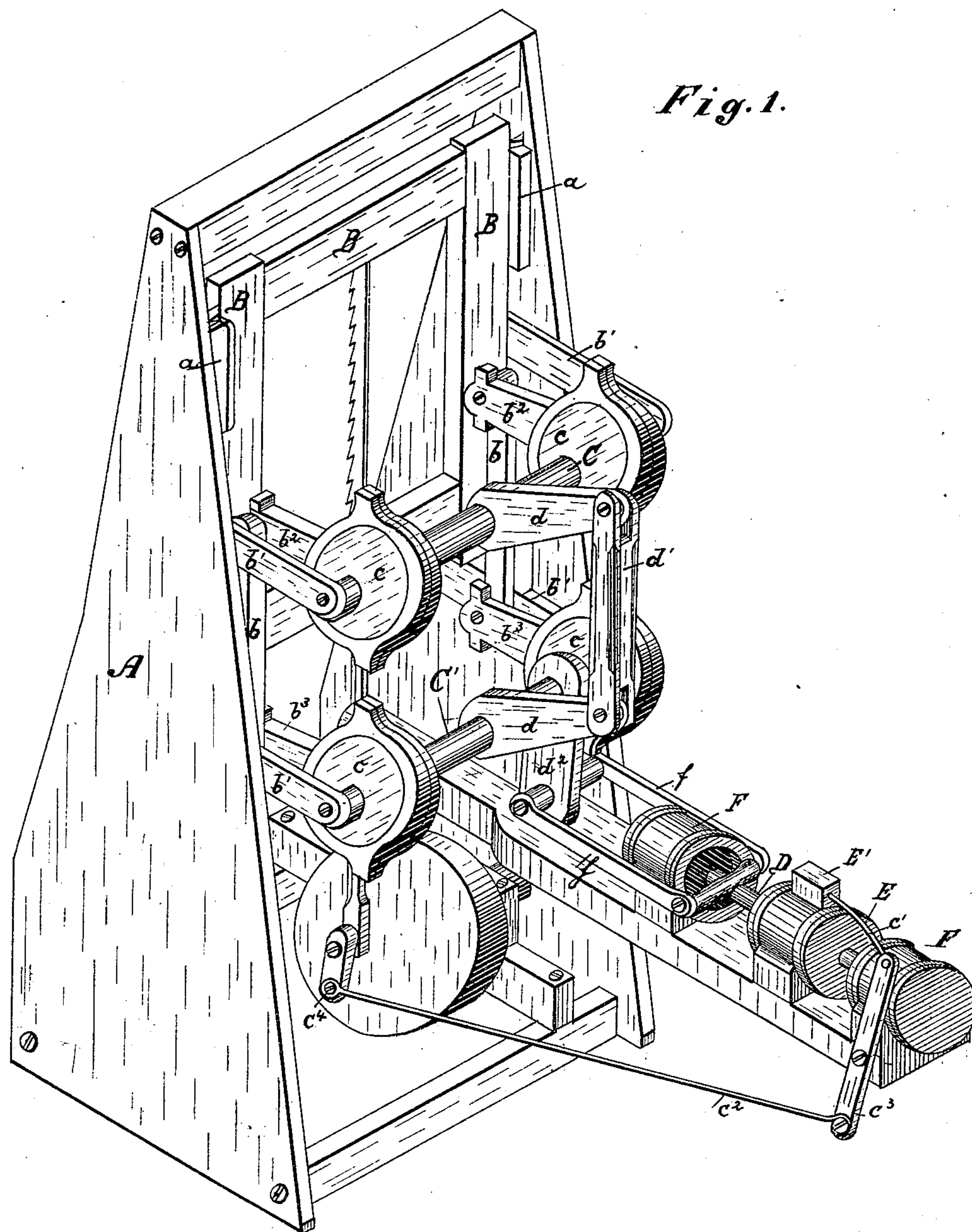
(No Model.)

2 Sheets—Sheet 1.

J. H. BERKSHIRE.
RECIPROCATING SAW MILL.

No. 272,630.

Patented Feb. 20, 1883.



Witnesses:

Chas. J. Bawr.
T. C. Bright

Inventor:

John H. Berkshire
By W. T. Purvis
Att'y.

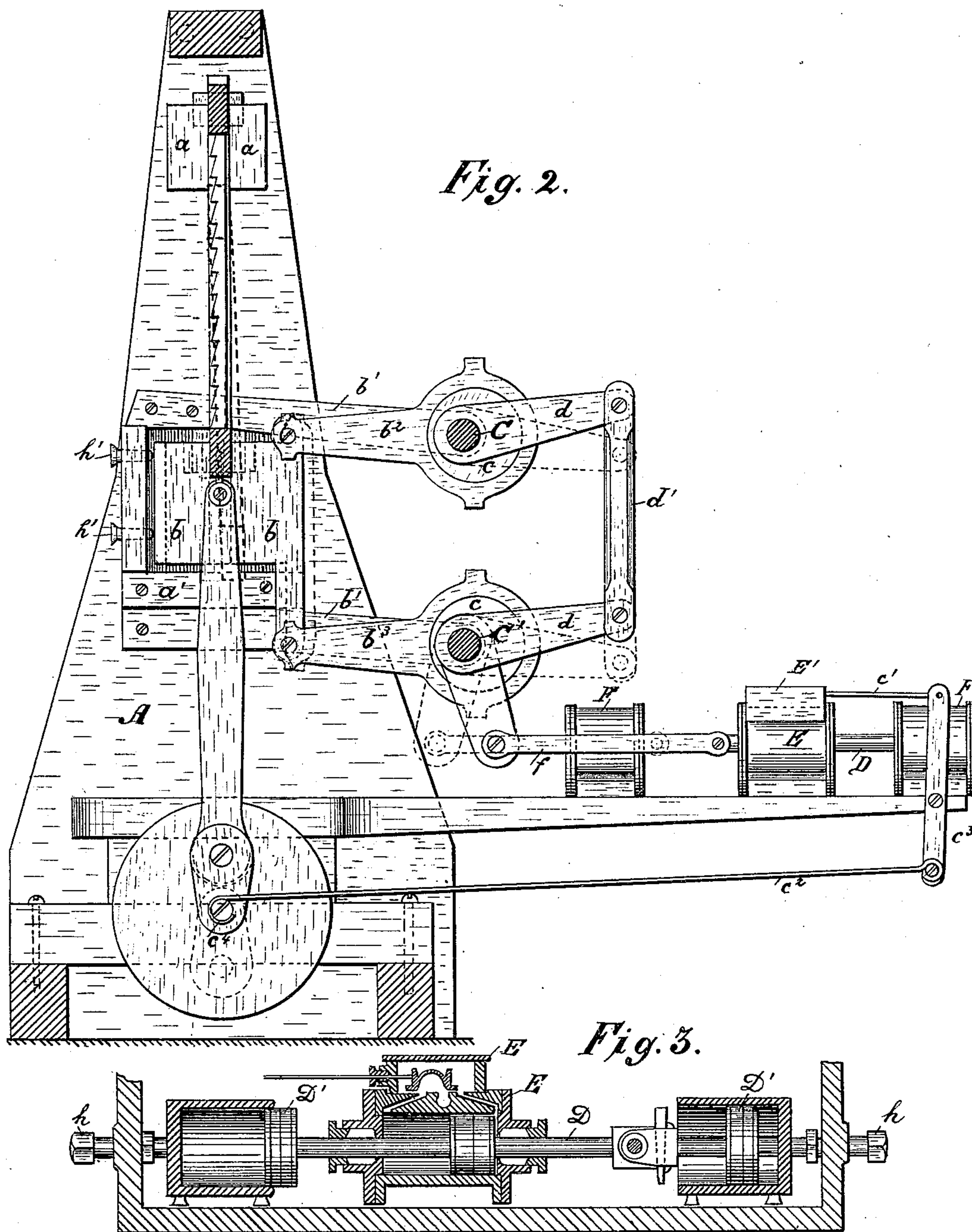
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2 Sheets—Sheet 2.

J. H. BERKSHIRE.
RECIPROCATING SAW MILL.

No. 272,630.

Patented Feb. 20, 1883.



Witnesses:

Chas. D. Barry,
J. C. Brecht,

Inventor.

John H. Berkshire
By W. Burris
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UNITED STATES PATENT OFFICE.

JOHN H. BERKSHIRE, OF MUSCATINE, IOWA.

RECIPROCATING-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 272,630, dated February 20, 1883.

Application filed October 31, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. BERKSHIRE, a citizen of the United States of America, residing at Muscatine, in the county of Muscatine and State of Iowa, have invented certain new and useful Improvements in Reciprocating Saws, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention consists of the method and means of imparting lateral or vibratory movements to reciprocating saws at the completion of the strokes and while the saws are reversing their vertical movements, and carrying the saws in straight lines the entire length of their strokes, as hereinafter fully set forth.

In the drawings, Figure 1 is a perspective view. Fig. 2 is a vertical section. Fig. 3 is a longitudinal sectional view of the reciprocating engine-cylinder and dash-pots.

A is the supporting frame, and B is the saw-sash, adjusted to reciprocate in the upper and lower guides, *a b*. The guides *b* are adjusted to be reciprocated laterally in the grooved plates *a'*, attached to the frame A. The upper end of the sash has pivotal connections with slides in the guides *a*, to allow the vibratory movements of the lower end of the sash.

C C' represent rock-shafts, having their bearings in the arms *b'*, attached to the frame A. Each rock-shaft is provided with two eccentrics or cams, *c*—one cam near each end of the shaft. The cams on the upper shaft, C, are connected with the upper ends of the guides *b* by means of the cam-arms *b²*, and the cams on the lower shaft, C', are connected with the lower ends of the guides *b* by means of the cam-arms *b³*. For the purpose of imparting the same movement to both ends of the guides the rock-shafts are connected together by the crank-arms *d d* and connecting-arm *d'*, and the shaft C' is provided with a crank-arm, *d²*, which is connected with the reciprocating-engine piston-rod D by means of the arms or rods *f*.

E is a steam or air cylinder, having a steam or air chest, E', on its side, the cut-off valve in which is operated by means of the connecting-rods *e' e²* and pivoted arm *e³*, one end of the rod *e²* being connected to an entraining crank or eccentric, *e⁴*, located at any suitable position on the main gang-shaft.

F F represent air-cylinders, forming dash-pots to cushion the strokes of the pistons D' on the ends of the piston-rod D. The ends of these dash-pots are provided with set-screws *h h* to adjust their lengths to the lengths of the strokes of the pistons.

Set-screws *h' h'* are arranged in front of the guides *b*, forming dead-stops to them to stop the forward movement of the saws at the precise points required.

The dotted lines in Fig. 2 show the relative positions of the devices when the saws have completed their downward stroke, and have been moved backward in position for the upward stroke, and the full lines in the same figure show the position of the devices when the saws have completed their upward stroke and have been moved forward into position for the downward stroke.

Heretofore the lateral or vibratory movements of the saws depended entirely upon the movements of the devices connected with the gang-saw mechanism, which failed to effect the complete vibratory movements in sufficiently short time, and hence the saws necessarily moved in lines somewhat curved, not taking their full cut at the start of their downward strokes and commencing to move back from the timber before the completion of the stroke.

By my invention the gang mechanism does nothing in relation to the vibratory movements of the saws, except to operate the cut-off valve of the reciprocating engine, by means of which the guides and saws are vibrated. The stroke of the piston D is made almost instantly, being so very short (only from two to four inches) or sufficient only to move the saws back far enough to perfectly clear the teeth.

The cut-off valve may be set to reverse the steam slightly in advance of the completion of the strokes of the saws, so as to secure the complete vibratory movements of the saws at the beginning of each stroke. For example, the valve being properly set, the engine receives the pressure of the steam slightly in the advance of the completion of the downward stroke, and by the time the vertical movement of the saws is reversed, and before any perceptible upward movement, the guides *b* are moved backward to the position shown by dotted lines in Fig. 2, and are held in this position while

the saws make their upward stroke, and slightly in advance of the completion of that stroke the valve reverses the steam-pressure, and by the time the saws change from the upward to the downward movement, or at most before there is any perceptible downward movement, the guides *b* are moved forward, placing the saws in a line plumb with the line of their downward movement, giving them their full cut at the start, and holding them in that line to the completion of the cut, avoiding thus the tremor and the increased strain attending the operation of saws inclined from the line of their movement.

What I claim as new, and desire to secure by Letters Patent, is—

1. Reciprocating saws adjusted to ascend and descend in straight lines, and vibrated, while reversing their vertical movements, by devices connected with and actuated by the piston of a direct acting or reciprocating en-

gine, the cut-off valve of which is reversed by devices connecting the valve with and actuated by the gang-shaft, substantially as and for the purposes described.

2. Reciprocating saws adjusted to ascend and descend in straight lines, and vibrated, while reversing their vertical movements, by the means herein set forth, consisting of the rock-shafts *CC'*, having cams *c*, connected with the guides *b*, and the piston *D* of a reciprocating engine; the cut-off valve of which is reversed by devices connecting the valve with and actuated by the gang-shaft, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. BERKSHIRE.

Witnesses:

T. R. FITZGERALD,
A. N. GARLOCK.