No. 676,870.

Patented June 25, 1901.

A. E. BROWN.

SETTING-UP MACHINE.

(Application filed July 9, 1900.)

(No Model.)

4 Sheets—Sheet 1.

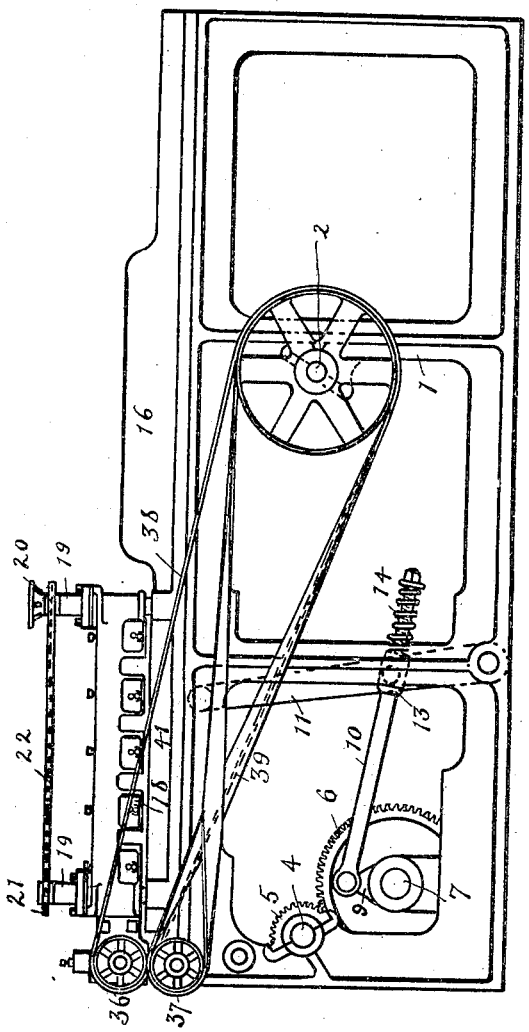

Fig. 1.

Witnesses:
Selden H. Hall
A. W. Macomber.

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(No Model.) 4 Sheets—Sheet 2.

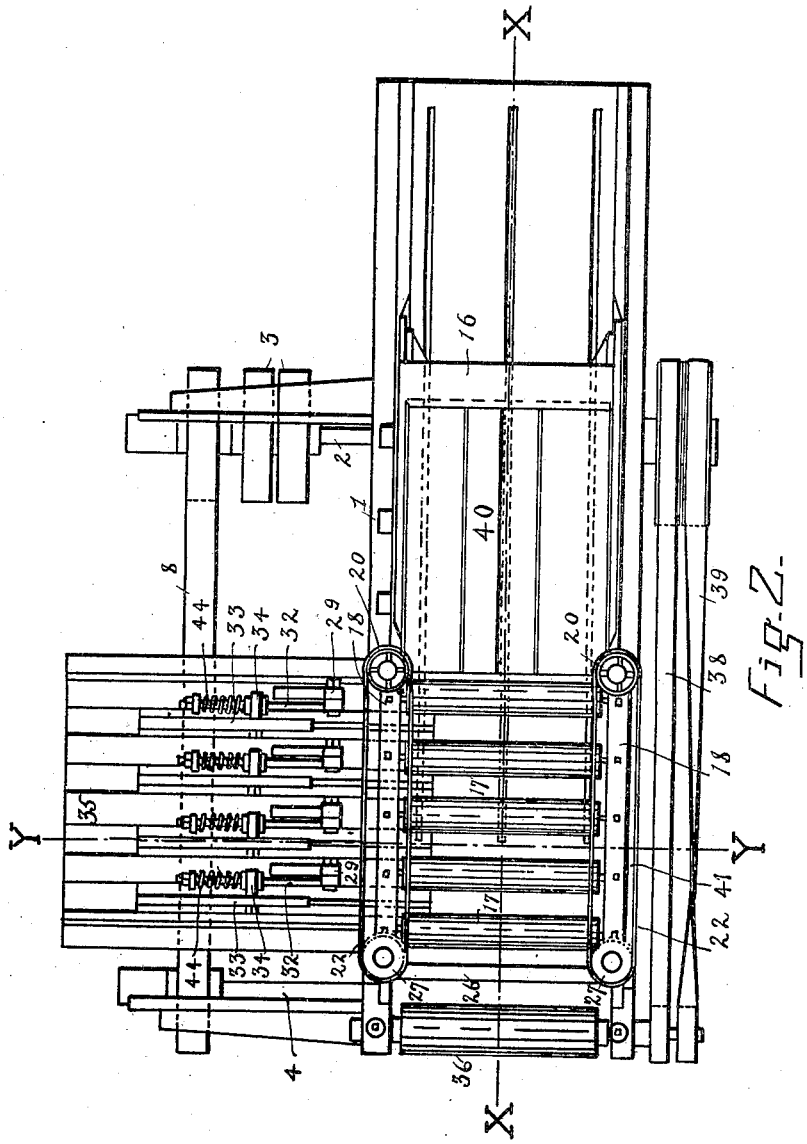

Fig. 2.

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4 Sheets—Sheet 3.

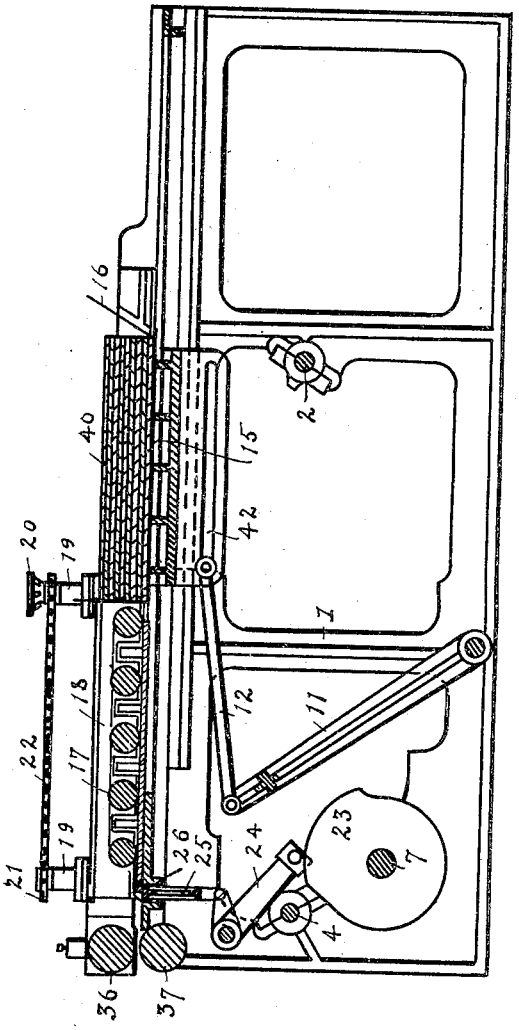

Fig. 3.

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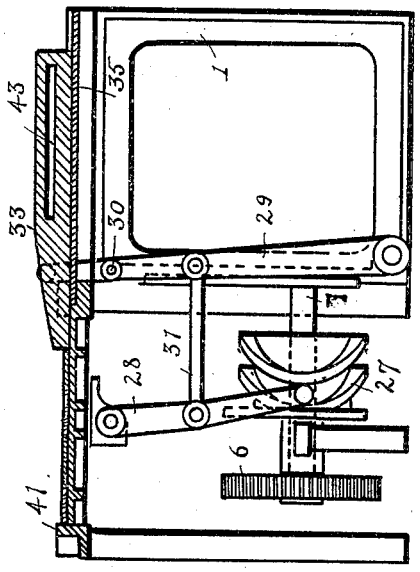

Fig. 4.

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UNITED STATES PATENT OFFICE.

ALBERT E. BROWN, OF TORONTO, CANADA.

SETTING-UP MACHINE.

SPECIFICATION forming part of Letters Patent No. 676,870, dated June 25, 1901.

Application filed July 9, 1900. Serial No. 22,963. (No model.)

To all whom it may concern:

Be it known that I, ALBERT E. BROWN, a subject of the Queen of Great Britain, residing at Toronto, in the Dominion of Canada, have invented certain new and useful Improvements in Setting-Up Machines, of which the following is a full, clear, and exact description.

My invention relates to setting-up machines, and more particularly to machines for setting up jointed or matched sections of lumber for the purpose of making box-shooks and similar uses where a plurality of pieces of jointed or matched lumber are to be set up.

My invention further relates to means and mechanism for setting up a plurality of jointed or matched sections in a single operation and to means for automatically feeding in the sections, automatically discharging the same, and to means for rendering the machine adaptable to shooks or superfices of lumber of varying widths and lengths.

Referring to the drawings herewith, consisting of four sheets, in which like figures refer to like parts, Figure 1 is a side elevation of my machine. Fig. 2 is a plan view of the same. Fig. 3 is a longitudinal section on the line $x\,x$ of Fig. 2. Fig. 4 is a transverse section on the line $y\,y$ of Fig. 2.

1 represents the frame of the machine, upon which the mechanism is mounted and which carries the bed-plates upon which the lumber rests and is carried in the process of setting up and which also carries the shovers which set up the lumber-sections.

2 represents the driving-shaft, which is provided with the usual pulleys and belt-shift, as shown at 3 in Fig. 2.

4 is a driven shaft, carrying a pinion 5, which meshes with a spur-gear 6, rigidly mounted upon the shaft 7. The shaft 4 is driven by a belt 8, (see Fig. 2,) connecting the driving and driven shafts through ordinary pulleys. The shaft 7 carries a crank 9, to which is pivoted a pitman 10. 11 is a lever-arm pivoted at its lower end to the frame of the machine and at its upper end is pivoted to a connecting-rod 12, which in turn is pivoted to the shover 15. The pitman 10 is pivoted yieldingly to the lever-arm 11 by means of a pivot-block 13, pivoted to the arm 11 and through an opening in which the pitman 10 passes. The outer free end of the pitman 10 is provided with a compression-spring 14, interposed between said block 13 and a nut and washer on the end of the pitman. The pitman being properly shouldered or collared against the block 13 on the one side and held up to work by the spring 14 on the other will give a positive action to the arm 11 in the one direction and a yielding action in the other. This mechanism gives a reciprocating motion to the shover 15, which slides upon ways upon the bed-plate of the machine.

16 is a hopper into which the sections of the lumber to be set up are placed. At its forward end there is a transverse opening of sufficient width and depth to allow only the lowest or bottom set of sections to pass out, as hereinafter fully described.

Adjustably secured to the frame of the machine is a set of pressure-rolls 17, which bear down upon the incoming sections of lumber and which hold them in plane while being set up. These rollers are mounted revolubly in bearings 18, which are adjustable vertically upon screw-threaded studs 19 and threaded hand-wheels 20 and threaded sprockets 21. The hand-wheels 20 and sprockets 21 are connected in pairs by sprocket-chains 22, so that each bearing may be raised or lowered without disturbing its horizontality. By this means the pressure-rolls may be adjusted to lumber of any given thickness.

Secured to the shaft 7 is a cam 23. Pivoted to the frame of the machine is a bell-crank lever 24, the lower and longer member of which is provided with a trolley which travels upon the cam 23. The upper and shorter arm is pivoted to a connecting-rod 25, which at its upper end is pivoted to a transverse stop 26. This stop, actuated by the cam 23, and consequently synchronized to the reciprocating action of the shover 15, moves into the path of an incoming set of sections in time to even the ends and moves out of the path in time to allow the set of sections set up to be carried forward by the following set, as hereinafter more fully described.

Secured to the shaft 7 is a cam 27. (See Fig. 4.) Pivoted to the frame of the machine is a lever 28, which at its lower end is provided with a trolley which travels in the cam-

groove of the cam 27. Pivoted to the frame of the machine is a series of levers 29. These levers are connected up rigidly by a transverse rod 30, which is shown in Fig. 4. Thus the series of levers 29 act unitedly. A connecting-rod 31 connects the lever 28 with one of the levers 29, thus imparting action to all of the series connected together, as hereinafter more fully described. The upper ends of the levers 29 are pivoted to connecting-rods 32, (see Fig. 2,) which connect with the setting-up mechanism, which I will now describe.

Referring particularly to Fig. 2, 35 is a bed transverse to the main bed of the machine. Mounted upon ways upon said bed 35 is a series of shovers 33, corresponding in number to the number of levers 29. In the drawings I have shown four; but it is evident that the number may be varied to meet the demands of different work. Secured to each shover is a lug 34, through which the connecting-rods 32 take. These connecting-rods 32 are provided with collars, which strike against the lugs 34 upon their inner sides, and also with compression-springs 44, which impart to the shovers a yielding action in their forward movement.

Journaled to the frame are two friction-rollers 36 and 37. These are rotated by belts 38 and 39, which take over pulleys on the driving-shaft 2. The belt 39 is crossed to give the necessary reverse rotation. The bearings of roller 36 are vertically adjustable to adapt the feed to lumber of different thicknesses. The line of friction of the roller 37 is in the plane of the bed, while that of roller 36, as above stated, is adjustable to the plane of the upper surface of the lumber.

Having now indicated generally the several parts of my invention, I will next describe its operation.

A stack of lumber-sections sawed and matched up in sets in the usual manner is placed in the hopper 16, as shown at 40 in Figs. 2 and 3. The shover 15 is driven back by the action of the crank 9 and the connecting mechanism above described until the bottom set of sections rests flat upon the bed of the machine. Then the shover 15 is driven forward and striking against the ends of the bottom set of sections shoves it forward through the slot in the front end of the hopper 16, while the remaining sets will strike against the end of the hopper and be prevented from traveling forward. Coincident with the forward action of the shover 15 the stop 26 is raised by the cam 23. The section driven forward will abut against the stop, and the yielding action of the spring 14 on the pitman 10 will exert sufficient pressure upon the shover 15 substantially after the forward movement is complete to insure the evening up of the ends of the sections against the stop 26. With this forward action the sections have been pressed down by the rollers 17, so as to insure perfect alinement of the tongues and grooves. The section being thus in place and squared up against the stop 26, the shovers 33 are driven forward by the cam 27 and the intervening mechanism, above described. A stop 41, (see Fig. 4,) parallel to the length of the machine, holds the set of sections upon the one side while the shovers 33 drive them into joint from the other. The yielding action of the springs against the lugs 34 insures the sections being driven together without strain upon the machine. While the shovers 33 have been doing their work the shover 15 has receded and is ready to bring forward another set of sections. The stop 26 has been carried down out of the way, and thereupon the next set of sections is carried forward. It is evident that the forward ends of the incoming set of sections will strike against the back ends of the set just set up and will drive them forward into the bite of the rollers 36 and 37. These rollers having a constant rotation at a greater peripheral speed than the speed at which an incoming set of sections is driven will remove the set-up set of sections in time for the stop 26 to rise and engage the ends of the incoming set. Thus the shover 15, the stop 26, and the shovers 33 are timed in action, and the action of the rollers 36 and 37 is such as to give the stop 26 opportunity to rise in time to meet each incoming set.

It now remains to explain how the machine is adjustable to sections of different lengths and sets of different widths. It has already been shown how it is adjustable to varying thicknesses.

The connecting-rod 12 is adjustably pivoted to the shover 15 by means of a slot 42, which is clearly shown in Fig. 3. By changing the pivotal point the limit of the forward action of the shover is changed accordingly. The rear end of the hopper 16 is made movable to prevent the sets of sections from shoving back and forth in the hopper when short lengths are employed. In like manner the shovers 33 are rendered adjustable by means of slots 43, (see Fig. 4,) engaging the lugs 34; but if all of the shovers 33 were in action when the shover 15 is driven far down in setting up short lengths those nearest the hopper would strike against the side of the shover 15 before it could be withdrawn. This accounts for the peculiar construction of the shovers 33 and the several lever-arms 29 and the means of connecting them by transverse rod 30. When setting up sections, say, one-half the maximum length, I avoid the difficulty referred to by uncoupling, say, two of the lever-arms 29 by means of the transverse bolt 30 and throwing the two shovers nearest the hopper out of action, and by pivoting the connecting-rod 31 to the lever-arm 29 adjacent to the end of the machine I am able to set up lengths of less than one-fourth the maximum-length capacity of a machine such as shown in the drawings.

The ready adjustment of the machine, particularly in making box-shooks, is of the great-

est importance. By the construction shown I am able to cover in a single machine the entire range of standard sizes of box-shooks.

Having thus described my invention and its method of operation, what I claim is—

1. In a setting-up machine, a horizontal bed, a reciprocating shover for feeding the lumber-sections, a reciprocating transverse stop, moving in a plane at right angles to the bed and rising above and falling below the plane of said bed to even the ends of the lumber-sections and to allow them to pass out upon the surface of the bed, rollers for holding the sections in plane, a fixed stop, against which one edge of the section strikes, and a reciprocating shover for setting up the sections, and means for actuating said mechanisms, substantially as and for the purposes set forth.

2. In a setting-up machine, a horizontal bed, a hopper for holding a stack of sets of lumber-sections, having a transverse opening at its forward end to permit of the removal of the bottom set of the stack, a reciprocating shover for removing the bottom set of sections and carrying them to place, transverse pressure-rollers for holding the sections in plane, a reciprocating transverse stop for evening the ends of the sections, moving in a plane at right angles to the bed and rising above and falling below the plane of said bed, a fixed stop against which one side of the section strikes, a reciprocating shover for setting up the sections, feed-rollers for removing the set-up sections having a constant speed in excess of the speed at which the sections are fed into the machine, and means for actuating said mechanisms, in proper order and time, substantially as and for the purposes set forth.

3. In a setting-up machine, a reciprocating shover for feeding in the lumber-sections having a yielding action upon its forward stroke, rollers for holding the lumber in plane, a reciprocating stop for evening the ends, a reciprocating shover for setting up the sections having a yielding action in its forward movement, and feed-rollers for removing the set-up section, and mechanism timed in action to said several operations for actuating said mechanisms, substantially as and for the purposes set forth.

4. In a setting-up machine, a horizontal bed, a reciprocating shover, having a yielding action, for feeding in the lumber-sections, which shover is adjustable as to the limit of its forward stroke to adapt the machine to sections of different lengths, a transverse reciprocating stop, reciprocating at right angles to the plane of the bed for evening the ends of the sections, rollers for holding said sections in plane and adjustable vertically to adapt the machine to lumber of different thicknesses, and a shover for setting up the sections, having a yielding action and adjustable in its forward action to adapt the machine to sets of sections of different widths, and means for actuating said several mechanisms, substantially as and for the purposes set forth.

5. In a setting-up machine, a reciprocating shover for feeding in the lumber-sections, which shover is adjustable as to the limit of its forward stroke to adapt the machine to sections of different lengths, a stop for evening the ends of the sections, rollers for holding them in plane, a plurality of shovers for setting up the sections, which shovers are adjustable as to the limit of their forward stroke to adapt the machine to sets of sections of different widths, and which shovers are detachably united in their action to further adapt the machine to sets of sections of different widths and lengths, and means for actuating said several mechanisms, substantially as and for the purposes set forth.

6. In combination with a horizontal bed-plate, a feed-plate arranged to travel to and fro along its upper surface, guides for material fed onto the bed, a movable stop for temporarily limiting the feed of the material, rams or drivers arranged to move crosswise over the bed and act laterally on the material, and rolls for carrying off the finished product, substantially as set forth.

7. In a cramping-machine, the combination of a bed-plate, rams or drivers adapted to traverse crosswise thereover, a vibrating lever joined to each ram by a yielding connection, and means such as shown for operating the entire set of levers from a single cam, substantially as set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ALBERT E. BROWN.

Witnesses:
ROBERT GIRVEN,
HARRIET M. SNYDER.