

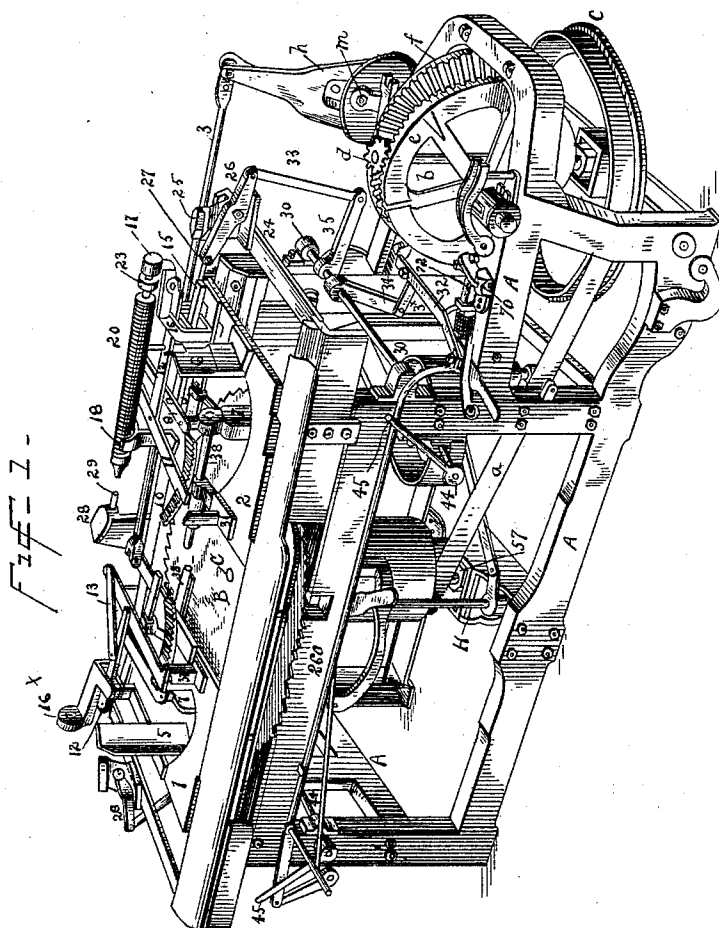
(No Model.)

4 Sheets—Sheet 1.

W. J. PERKINS.
BLOCK SAWING MACHINE.

No. 463,233.

Patented Nov. 17, 1891.



Witnesses
Norris A. Clark
O. W. Johnson.

Inventor
Willis J. Perkins
By his Attorney W. A. Bartlett

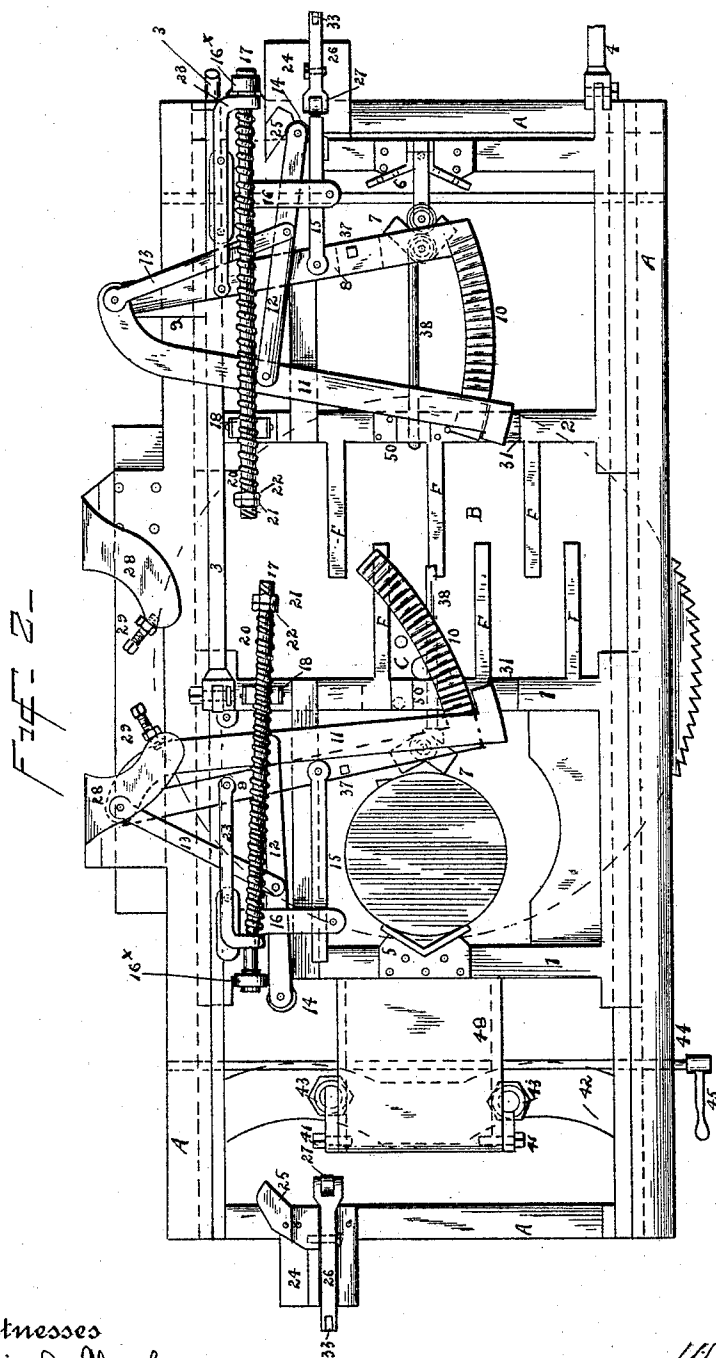
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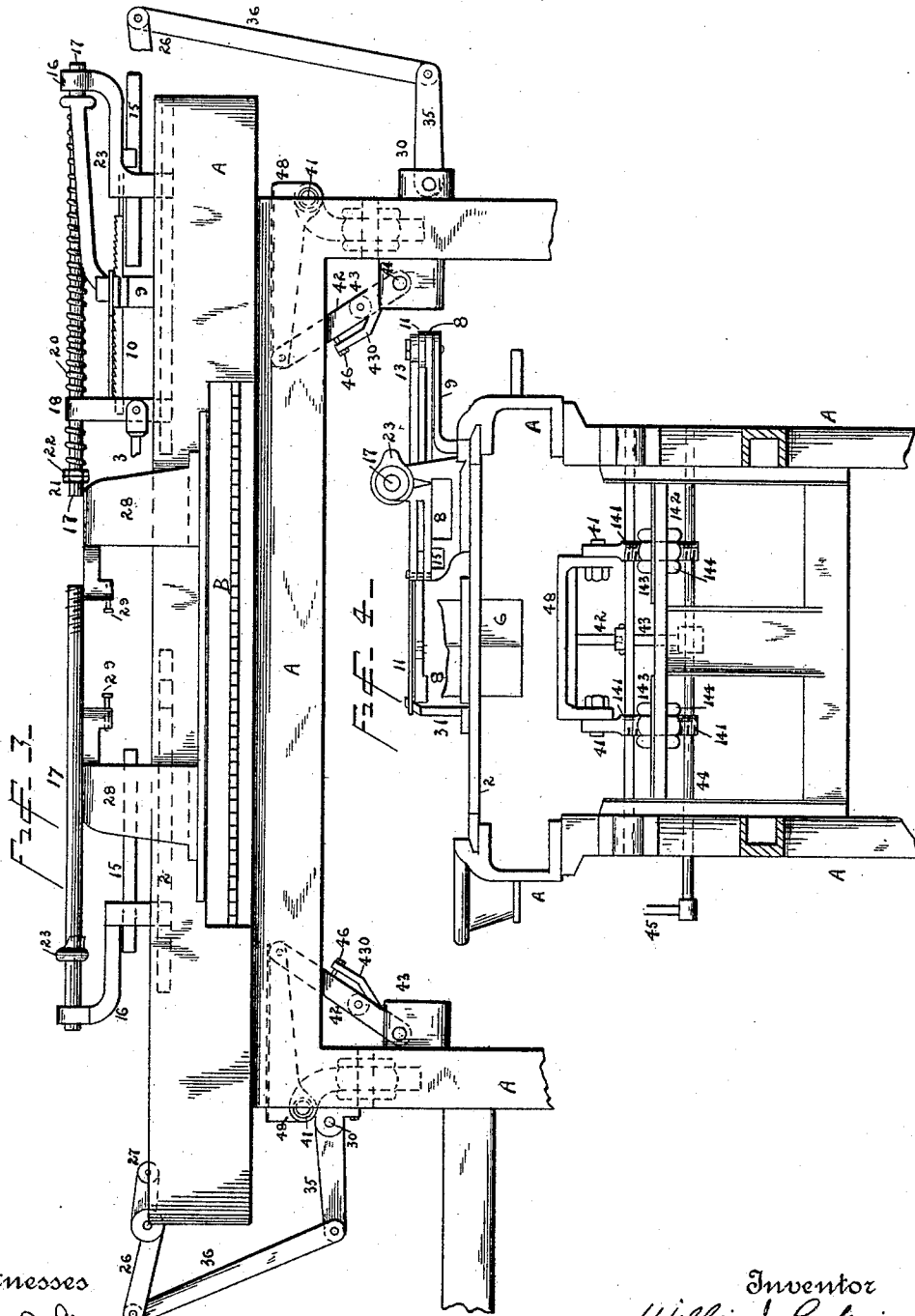
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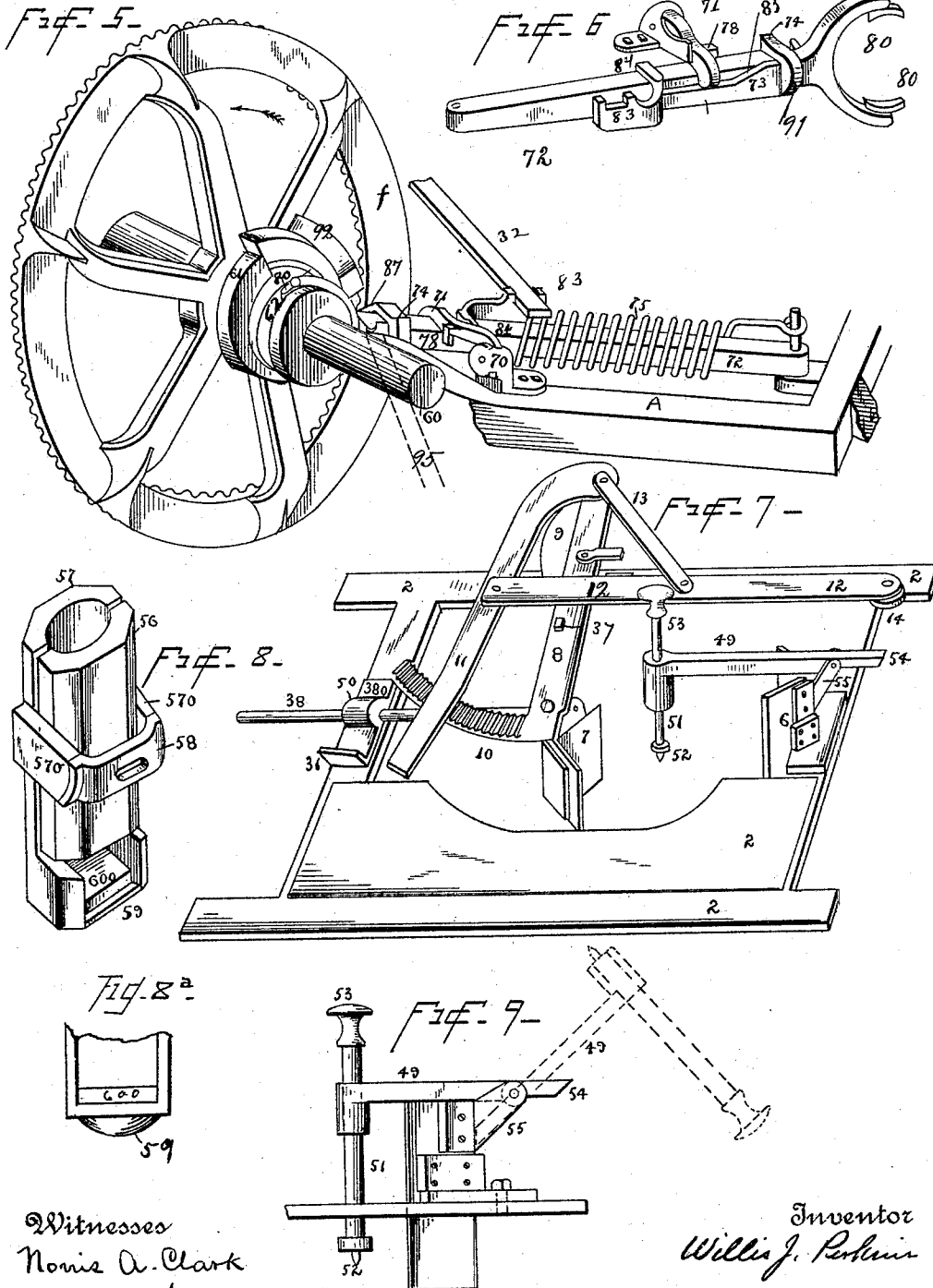
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UNITED STATES PATENT OFFICE.

WILLIS J. PERKINS, OF GRAND RAPIDS, MICHIGAN.

BLOCK-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 463,233, dated November 17, 1891.

Application filed September 10, 1889. Serial No. 323,517. (No model.)

To all whom it may concern:

Be it known that I, WILLIS J. PERKINS, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Block-Sawing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to block-sawing mechanism of the general character described in my patent, No. 348,050, of August 24, 1886, for shingle-machines, in which the blocks to be sawed are carried to the saw in reciprocating carriages, which move above the plane of the horizontal saw.

The object of the invention is to provide mechanism by which the carriages may be stopped at any predetermined place for the removal of the spalt or the insertion of a block, and by which the stoppage of the carriage simultaneously opens the dogs to full expansion, while ordinarily the dogs are opened but to a limited extent; also, to provide mechanism which automatically controls the amount of movement of the dog in opening; also, to provide for supporting the last end of the bolt when not grasped by the dogs in the carriages; also, to improve or provide mechanism for supporting the saw, delivering the saw-dust, ejecting the last block from the machine, preventing bolts from getting between carriages, and in general to improve the machine.

Figure 1 is a perspective view of the machine, parts being omitted. Fig. 2 is a top plan, parts being omitted. Fig. 3 is a broken side elevation, and Fig. 4 an end view, details being omitted in each case. Fig. 5 is a perspective view of part of the driving-gear. Fig. 6 is a detail of the same. Fig. 7 is a perspective of one of the carriages and block-holding mechanism. Fig. 8 is a perspective of the box for arbor, and Fig. 9 a side elevation of the spalt-holding attachment. Fig. 8^a is a broken front view of the lower end of the box for the arbor.

The blocks are carried to the saw by reciprocating carriages 1 and 2, one of said carriages being supported in suitable ways at each end of the machine, and the reciprocation being effected by gearing which it is unnecessary to describe, as the same may be similar to that described in my patent, No.

348,050, of August 24, 1886. The connecting-rods 3 and 4 are connected to the carriages and to the driving-gears. Each carriage has a stationary dog at the side farthest from the center of the saw. The stationary dogs are indicated at 5 and 6, Figs. 1 and 2. These dogs crowd the blocks onto the saw-teeth.

As the carriages are generally similar in construction, a description of one will answer for both. In the drawings some parts are omitted from one carriage and shown in the other for convenience and clearness of illustration.

A movable dog 7 is pivotally connected to dogging-lever or dog-carrier 8, the dog 7 facing away from the saw. Lever 8 is pivoted to the bracket 9, which bracket is fastened to the carriage end. (See Fig. 7.) A supporting guide-rod 38 is attached to and extends backward from the dog 7—that is, in the direction in which the carriage moves in approaching the saw—and rod 38 is above the plane of the saw. The guide-rod 38 slides and is guided in box 50 in the carriage. A swinging lever or bar 11 is connected to bracket 9 by the pivot on which dogging-lever 8 works. This bar 11 is above the curved ratchet 10 and engages said ratchet, except when it is lifted away from the ratchet. This disengagement occurs when at the limit of movement away from the saw the end of bar 11 is lifted by incline 31 on the carriage. An arm 12 is fastened to bar 11, and this arm has a friction-roller 14 on its outer end. A link or connecting-brace 13, extending from the bar 12 to the pivot of bar 11, holds the arm 12 in rigid relation to said bar 11 so far as movement about the pivot is concerned. A stop-bar 15 is pivoted to the dogging-lever 8 and slides in a box on the under side of arm 16, which arm is rigidly attached to the carriage.

A spring-supporting rod 17, Figs. 1, 2, and 3, has one end bearing in a bracket-arm 16^x, which is rigidly attached to the carriage. The coil-spring 20 is mounted on rod 17, and one end of said spring presses against the arm or link 23, which arm is pivotally connected to the dogging-lever 8. (See Fig. 2.) The tension of spring 20 may be regulated by adjusting the nuts 21 and 22 on the rod 17. The spring 20 thus has a tendency to press on the

arm or bar 23, which bar in turn draws on the dogging-lever 8, tending to close said lever (and the dog 7, pivoted beneath said lever) onto the bolt or block interposed between the dog 7 and the fixed dog on the carriage.

A bracket 28 extends upward from the frame or slideway of the machine outside the path of movement of the carriage. The bracket 28 has an adjusting-screw 29 threaded therein in the plane of travel of the bar 11. The adjusting-screw 29 is set to engage the bar 11 as the carriage in its movement toward the saw brings said bar 11 into contact with this screw. When the bar 11 bears against screw 29 it will be stopped by said screw acting as an abutment, and as the carriage movement is continued the bar will swing on its pivot, the free end traveling over the face of the curved rack 10 and being drawn by gravity into engagement with the teeth of said rack 10. The teeth of rack 10, with which bar 11 will finally engage, will thus be determined by the position of abutment 29. The lever or bar 11 will be lifted from its engagement with rack 10, when by the carriage movement said bar 11 is carried up the incline 31. A stop 37 on dogging-lever 8 projects upward into the pathway of bar 11 and limits the forward movement of said bar.

A bracket 24 at each end of the machine-frame forms a support for the incline or engaging surface 25, which incline is in the plane of travel of the roller 14, carried by arm 12. When the carriage moves away from the saw, the roller 14 engages incline 25, and this forces the outer end of the bar 12 to swing about the pivot of bar 11, thus crowding bar 11 backward, and as bar 11 is normally in engagement with the rack or ratchet 10 of lever 8 this engagement draws back the dogging-lever 8 and frees the block or bolt from dog 7, at the same time compressing spring 20. When bar 11 is pressed back so as to ride up incline 31, rack 10 will be released and spring 20 will close dog 7. As the carriage moves toward the saw the roller 14 moves away from the incline 25, allowing the spring 20 to act on the link 23 and lever 8 to close the dog 7 onto the bolt. The bracket 24 supports a pivoted arm 26, which has an anti-friction roller 27 on its inner end. This roller may be raised into position to engage the stop-bar 15 as the carriage completes its movement away from the saw. The pivoted arm 26 is connected by link 33 to an arm 35, rigidly secured to the rock-shaft 30. The shaft 30 is mounted in suitable bearings in the frame and has a rigid arm 34 connected thereto. A link 3^x connects arm 34 to shifting-lever 32, which lever 32 is connected to the stop-motion for the bolt-holding carriage, as has been described in my patent, No. 348,050, but with changes hereinafter explained.

When the lever 32 is shifted so as to stop the carriage away from the saw, as described in my patent referred to, the arm 26 will carry its roll 27 in front of the stop-bar 15, thus

throwing back the dogging-lever 8 and dog 7 to the extreme open position, and at the same time compressing spring 20, so that said spring will force the dog onto the block when permitted to do so.

It is quite apparent that the abutment 27 will press back the dog if it encounters any part of the dog or carrier, consisting of lever 8 and bar 11 and their connections, during the forward movement of the carriage. Therefore I do not desire to limit my claim to precise location of parts.

The opposite ends of the machine are practically alike, so far as the carriage and dogging mechanism are concerned, and levers 32, connected by means of rod 260.

When the bolt is interposed between the two dogs of the carriage, the lever 32 is shifted so as to depress the stop 27 through the train of mechanism described, and the dog 7 may then grasp the bolt as the carriage moves toward the saw. The dog 7 will be opened enough to release the bolt and permit it to fall onto the tilt-table by the shifting of the dogging-lever 8 through bar 11 engaging rack 10 on said lever, when bar 11 is moved by the roll 14, engaging incline 25; but when bar 11 has been pressed back far enough to loosen the dog said bar 11 will be released from rack 10 by riding up the incline 31, and the lever 8 will then be pressed forward by its spring and connections, forcing the dog 7 against the bolt. The completion of the carriage movement toward the saw brings bar 11 against the abutment formed by screw 29, Fig. 2, and forces bar 11 off from incline 31, permitting it to again engage rack 10.

The carriages 1 and 2 preferably have fingers or guards F extending over the saw, as shown in Fig. 2, to prevent the dropping of a bolt onto the saw between the carriages and generally to act as saw-guards. These guards extend in alternate or offset position from the carriages, so as to extend by each other without engaging.

The main frame A, saw B, and arbor C do not differ materially in construction and location from the corresponding parts in my patent referred to. The bolt-supporting tables 48 are placed below the position occupied by the blocks when the carriages are drawn away from the saw. The tables 48 are pivoted at their outer ends on rods or bolts 41. (See Figs. 3 and 4.) The supports 41 are vertically adjusted by means of screw-threaded risers 141, which pass through the cross-bar 142 of the main frame, and are held in adjusted position by the set-nuts 143 and 144. The ends of the tables toward the saw are supported on toggle-levers 42 and 43. The lever 42 is pivotally connected to the inner end of the table, while lever 43 is pivoted to lever 42 and rigidly secured to rock-shaft 44, which shaft is supported in suitable bearings in the frame and has an operating-handle 45 outside the frame. The lever 43 has a branching arm 430, extending past the

toggle-joint, and a set-screw 46, passing through a threaded hole in this arm, serves as an abutment to determine the amount of flexure of the toggle in making nice adjustments to compensate for the adjustment of the risers. By turning the shaft 44 the operator drops the inner end of the table 48, thus causing the spalt to slide off from said table.

It frequently happens that it is desirable to saw cuts from the bottom of a bolt when the bolt is too short for the dogs to hold said bolt firmly. To permit the sawing of the bolt to the last, I have devised an auxiliary or supplementary dog, which is attached to the fixed dog of the carriage (see carriage 2, Figs. 2, 7, and 9) and only used when the bolt is nearly used up. A supporting-lug 55 is attached to the fixed dog 6. An arm 49 is pivoted to this lug, the rear outer end 54 of said arm being beveled, so that when the arm is thrown back out of operating position, as in dotted lines, Fig. 9, the device will be out of the way of the fixed dog. The inner end of arm 49 serves as a socket for the sliding spindle 51, which spindle has a dogging-spud 52 at one end and a handle 53 at the other. When the bolt has been reduced to such length that but one more cut can be sawed, the arm 49 is thrown over so as to be above the bolt, and the spud is driven into the bolt by a blow on the handle 53. The handle 53 is supported by arm 49 at such distance above the saw that one finished cut will remain attached to the spud 52 of the spindle. When this cut is made the spalt will drop below the saw, leaving the last finished cut attached to the spud of the auxiliary dog.

The bearing-box for the lower end of arbor C is shown in Figs. 1, 8, and 8^a. The bearing-box is inclosed in bridge-pot H, which bridge-pot is similar to that described in my patent referred to. The box proper is indicated at 57, and has two arms or ears 570, which project from the side of the box, as shown, and these arms or ears are connected by plate 58. The cap or cover 56 is inclosed between these arms. The bottom 59 of the box 57 is a segment of a sphere. (See Fig. 8^a.) A step 600 rests on the upper face of said segment, which forms the bottom of the box. This upper face will be practically horizontal in all adjustments of the box. The arbor is adjustable, as described in my patent hereinbefore referred to. The step 600 is never changed with relation to the arbor, but the spherical bottom 59 of the box slides and rocks on the bottom of the bridge-pot when the arbor is adjusted, and the box thus adjusts itself without cramping the arbor.

In my patent, No. 348,050, I have described stop mechanism for one or both of the reciprocating carriages while permitting the saw to rise. In practice I find the clutch therein described sometimes works out of mesh with a lug on the gear-wheel.

In the present invention, as in the patent referred to, a belt *a*, Fig. 1, from the main arbor C, drives the shaft *b* by means of pulley *c*, and the carriage-driving gears *e* and *f* are driven in opposite directions by the gear *d* on shaft *b*, one of these gears *e* serving to drive carriage 2, and the other *f* driving carriage 1, through the medium of lever *h* and rod 3 and an interposed clutch now about to be described. The gears *e* and *f* are mounted on separate shafts and are free to turn thereon except when clutched thereto. Thus gear *f* is mounted on a shaft 60, Fig. 5. The shaft 60 has a crank-arm *m*, Fig. 1, which enters the slot *o* in arm *h* to drive one of the carriages, and a corresponding crank-arm at the other side of the machine drives the other carriage. One clutch member, as 61, is free to turn on shaft 60. The other member 62 must rotate with the shaft, but is movable lengthwise of the shaft to engage or disengage the clutch, as is common in clutches. A bar 72 is pivoted to the frame, and has fingers 80, which enter a groove in the clutch member 62. The swinging of bar 72 on its pivot will thus shift the clutch member 62 lengthwise of shaft 60 and engage or disengage the clutch. A hook 71 is hung in a bracket 70 on the frame. Hook 71 has a side projection 78. A sliding piece 73 lies alongside of bar 72 and is held to said bar by loops 74 and 84. The slide 73 has a notch 83 and an incline 85. The hand-lever 32 (for starting or stopping one part of the machine) lies in notch 83. When this hand-lever 32 is swung in one direction, the incline 85 engages the end of hook 71, thus lifting the hook and releasing bar 72, so that it may swing on its pivot. The cam-surface 91 on the sliding piece 73 is by the sliding of this piece brought into the path of movement of the inclined surface 92 on the wheel *f*. Then the first rotation of the wheel after the piece 73 has been moved will bring this incline 92 on the wheel against the cam-surface 91 on the sliding piece, and thus swing the bar 72 on its pivot and force the clutch members apart, as in my patent referred to. The spring 75 pulls on the slide 73 with a tendency to force the incline 85 toward or under the hook 71. A spring 95 (dotted lines) presses the bar 72 toward the wheel *f* to couple the clutch, as in the patent referred to. When slide 73 is drawn along so that incline 85 lifts the hook 71, the bar 72 will be released from said hook and swing by spring 95 into position to couple the clutch. The projection 78 on the hook then lies against the piece 74 on the slide-bar, holding the bar in its coupled position. To uncouple, the slide 73 is moved by its lever into the position shown in Fig. 6. The piece 74 moving away from projection 78 at the side of the hook permits the bar 72 to swing when struck by incline 92, and as soon as bar 72 swings under the hook 71 it will be caught by said hook and held in its uncoupled position. Hook 71 thus holds the clutch coupled by the engage-

ment of its shoulder 78 and holds it uncoupled by the engagement of its hooked point with the bar.

What I claim is—

5 1. In combination with the reciprocating bolt-carriage, a fixed dog at one side of said carriage, a movable dog at the other side of said carriage, a lever pivoted to the carriage and connected to the movable dog, and a
10 movable abutment on the frame in position to engage and press back said lever as the carriage moves toward the abutment, and thereby open the dog, substantially as described.

15 2. The reciprocating carriage having a fixed dog thereon, a movable dog opposite said fixed dog, a lever pivoted to the carriage and connected to the movable dog, a bar pivoted on same pivot with said lever, and a rack
20 connection, in combination, substantially as described, whereby the dogging-lever and pivoted bar may be thrown into engagement, as set forth.

3. The reciprocating carriage, the dogging-
25 lever pivoted thereon, the swinging bar pivoted concentrically with the dogging-lever, the rack connected with the dogging-lever, and the incline on the frame in position to disengage the swinging bar from the rack as the carriage completes its movement in one
30 direction, all combined substantially as described.

4. The reciprocating carriage, the movable dog carried thereby, the dogging-lever having a rack and the bar pivoted concentric
35 with said dogging-lever in position to engage the rack, and an adjustable stop on the frame in position to engage said bar as the carriage moves and carry the bar into a different position with relation to the rack, in combination,
40 substantially as described.

5. The moving carriage having a fixed dog at one side thereof, a movable dog at the opposite side and facing said fixed dog, and a
45 movable abutment in the path of travel of some part of said dog, in combination, whereby the dog may be forced open by said abutment as the carriage moves, substantially as described.

50 6. The combination of the reciprocating carriage, a dog-carrier pivoted thereto, and a dog supported by said carrier, a spring tending to force said dog-carrier forward, and an abutment on the frame capable of movement
55 into position to engage some part of the dog-carrier as the dog moves away from the saw.

7. The combination of the moving carriage, the dogging-lever having a segmental rack attached, the bar pivoted concentric with said
60 lever in position to engage said rack, an adjustable abutment or bearing on the frame in position to engage said bar and force it along to a predetermined relation with the rack, and an incline on the carriage in position to
65 disengage said bar from the rack, substantially as described.

8. The combination of the movable carriage,

the movable dog carried thereby, the pivoted dogging-lever having a rack thereon, the bar pivoted near said lever in position to engage
70 said rack, an extension arm from said bar, and an incline on the carriage acting against said arm as the carriage moves away from the saw to throw back the bar and dogging-lever, substantially as described.

9. The moving carriage and movable dog
75 carried therewith, an engaging surface in proximity to the path of movement of the carriage and in position to force said dog back from the bolt, and a movable abutment,
80 which when shifted to proper position throws the dog wide open, in combination, substantially as described.

10. The reciprocating carriage, the spring-
85 actuated dog thereon, the dogging-lever having a rack, a movable bar in position to engage said rack, a stop independent of the carriage in position to engage said bar and determine
90 its relation with the rack, and an incline on the carriage to disengage the bar from the rack, in combination, substantially as described.

11. The reciprocating carriage, a spring-
95 actuated dogging-lever pivoted to one side of said carriage and having an arm, as 15, extending away from the saw, and a lever on the frame adjustable to position to engage this arm, and thus move the dogging-lever relatively to the carriage, in combination, substantially as described.

12. The combination, with the two reciprocating carriages, each having a movable dog and each moving toward and away from the saw, of a pair of movable stops or abutments at opposite ends of the frame and connecting
105 links and levers, substantially as described, whereby the abutments may be shifted into the path of movement of the dog and the dogs on both carriages be thrown wide open as they recede from the saw, substantially as
110 described.

13. The combination of the carriage, the dogging-lever pivoted thereon, said lever having an upward projection and a rearwardly-extending rack, of a bar pivoted to the pivot
115 of the dogging-lever, lying above the same in position to engage the rack and be engaged by the projection, and adjunctive mechanism, substantially as described, whereby the position of the bar with relation to the rack is
120 determined, substantially as described.

14. The combination of the dogging-lever, a rack thereon, a swinging bar on the same pivot with said lever in position to engage
125 the rack, an arm projecting from said bar, and a link connecting said arm to the pivot, whereby the bar will be held in rigid relation to the arm and compelled to swing as the arm is actuated, substantially as described.

15. The combination of the reciprocating
130 carriage and the movable dogging mechanism thereon, substantially as described, and the frame having bracket 28 extending above said carriage, and set-screw 29 in said bracket

in position to act as a stop for the bar of the dogging mechanism as the carriage completes its movement toward the saw.

16. The combination of the reciprocating carriage, the movable dog and connections carried thereby, a movable arm, as 26, on the frame, and the rock-shaft and train of levers by which said arm 26 may be shifted to serve as an operating-abutment to the dog, substantially as described.

17. The combination, with the reciprocating carriage, of a pivoted table under the outer position of said carriage, a rock-shaft under the table, and a toggle-lever from the rock-shaft supporting the free end of the table, substantially as described.

18. The pivoted spalt-table, a rock-shaft having a toggle-lever connected to the edge of the table away from the pivot, and a movable stop on one link of said toggle-lever to determine the flexure of the toggle, in combination, as set forth.

19. The combination, with the main frame, of the adjustable risers thereon, the table pivoted to said risers, the rock-shaft and toggle-lever connected to the end of the table away from the pivot, and the movable stop by which the flexure of said toggle may be regulated, substantially as described.

20. The combination, with the carriage having a fixed dog, of a supplementary pivoted arm or dog-support, a sliding spindle in said support, and a retaining-spud on said spindle, substantially as described.

21. The combination, with the reciprocating carriage, of a fixed dog thereon, a pivoted arm near said dog, a sliding spindle in said arm, and a spud on the spindle, adapted to enter the surface of the block and hold it away from the saw a distance equal to the thickness of the piece to be cut.

22. The combination, with the bridge-pot, of a divided box, one of the members of said box having a horizontal bridge or step on which the arbor finds a bearing, substantially as described.

23. The combination, with the controlling-lever, of a slide, a pivoted lever engaging the driving-clutch, on which said slide has longitudinal movement, and an incline on said slide engaging a catch on the frame to raise said catch and permit it to engage and hold the slide, and thus hold the clutch disengaged, substantially as described.

24. The combination, with the slide on the clutch-lever, of a catch on the frame engaging said slide and a clutch on the shaft engaging said clutch-lever, substantially as stated.

25. The combination, with the reciprocating saw-carriage and a horizontal saw, of guard-fingers F, extending from the carriage over the saw, substantially as described.

26. The combination, with the frame and horizontal saw, of two carriages having guards extending over the saw, the guards being offset to extend past each other, substantially as described.

27. In a sawing-machine, a saw, a plurality of reciprocating carriages moving independently of each other in ways and moving toward and away from opposite sides of the saw, so as at times to approach each other, and a saw-guard interposed between the carriages and in position to prevent blocks, &c., from falling between the carriages, in combination, substantially as described.

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

WILLIS J. PERKINS.

Witnesses:

W. A. BARTLETT,
T. W. JOHNSON.