

(No Model.)

3 Sheets—Sheet 1.

W. M. BARRY.
MULTIPLE SAWING MACHINE.

No. 579,463.

Patented Mar. 23, 1897.

FIG. 1.

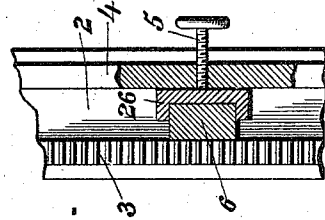
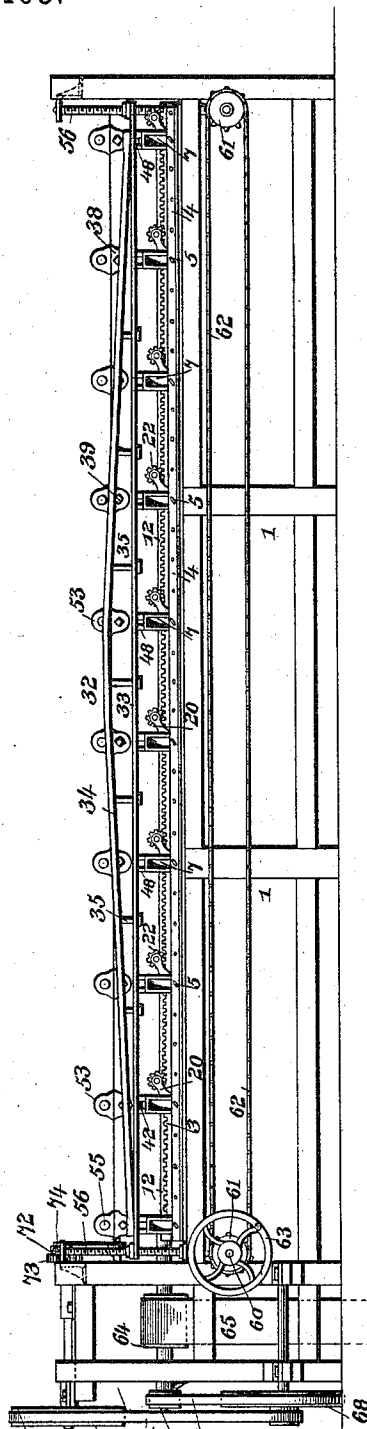


FIG. 8.

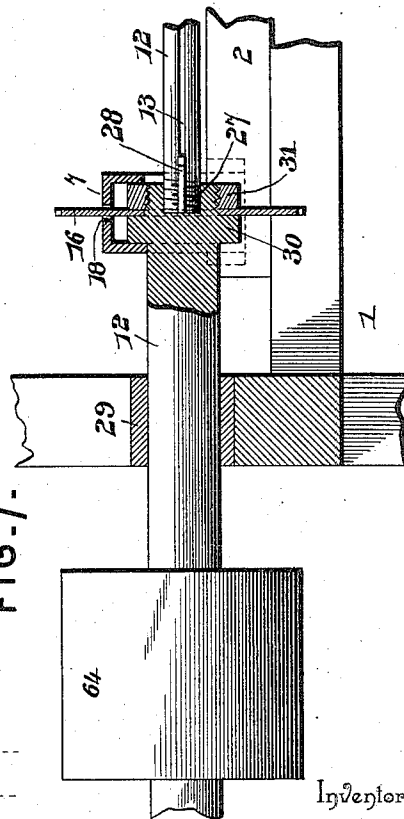


FIG. 7.

Witnesses

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FIG. 3.

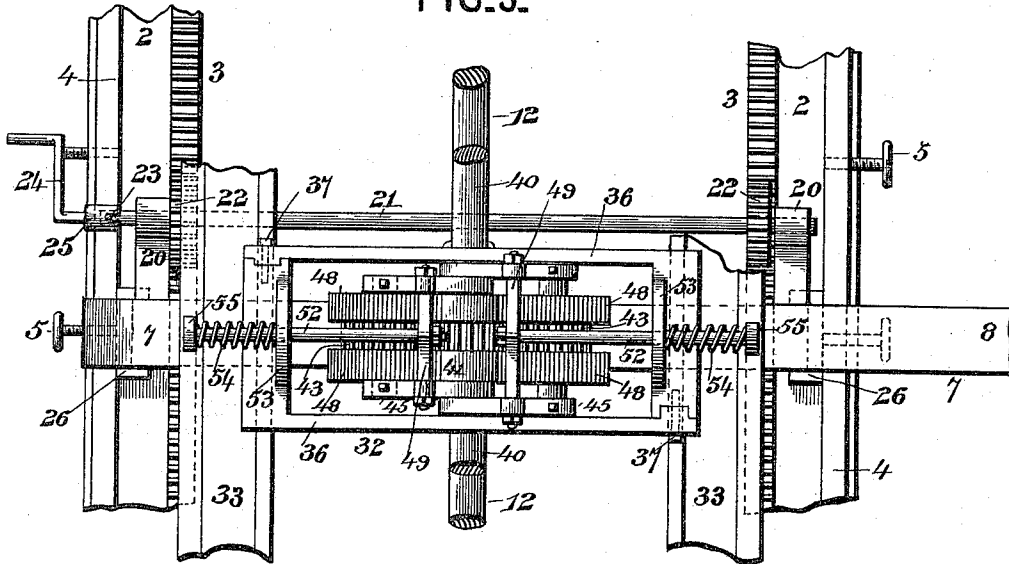


FIG. 2.

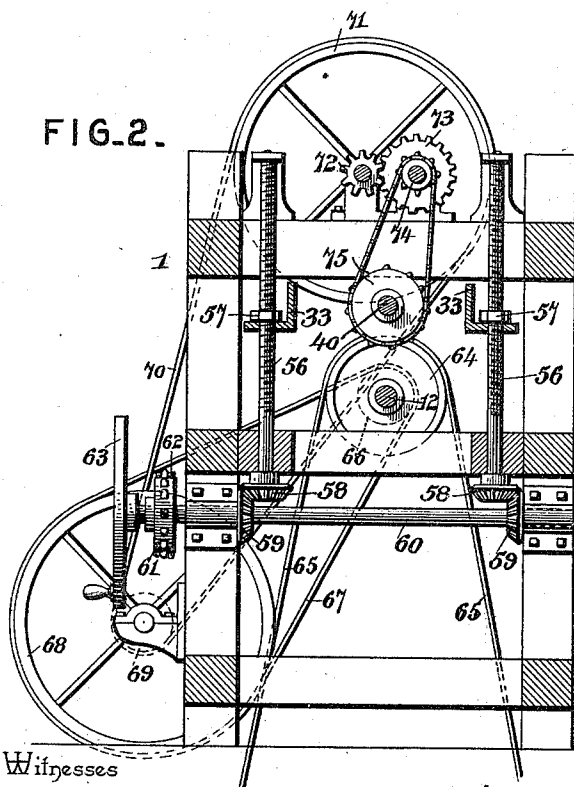


FIG. 9.

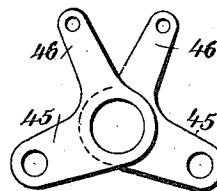
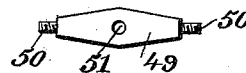


FIG. 10.



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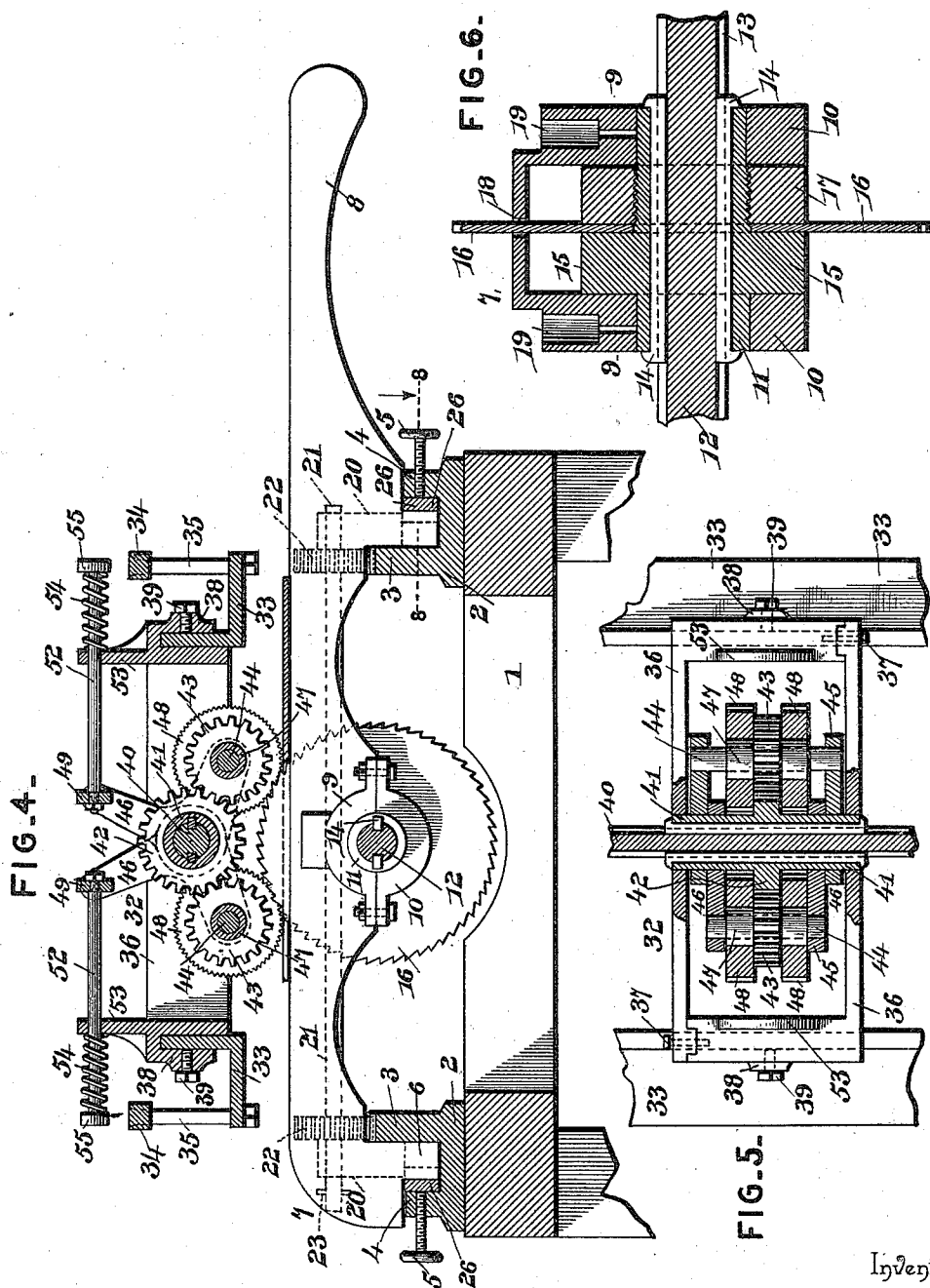
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3 Sheets—Sheet 3.

W. M. BARRY.
MULTIPLE SAWING MACHINE.

No. 579,463.

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UNITED STATES PATENT OFFICE.

WILLIAM M. BARRY, OF MEMPHIS, TENNESSEE, ASSIGNOR TO BEARD,
WILSON & CO., OF SAME PLACE.

MULTIPLE SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 579,463, dated March 23, 1897.

Application filed April 3, 1896. Serial No. 586,075. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. BARRY, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented a new and useful Multiple Sawing-Machine, of which the following is a specification.

This invention relates to multiple sawing-machines; and the general object in view is to provide a machine having a number of saws and a corresponding number of independent feed-rolls, together with the operating mechanism therefor, whereby the stock may be fed laterally and with equal speed throughout to the saws and be thereby cut up into predetermined lengths.

The invention also has for its object to provide means whereby the saws may be adjusted longitudinally of their driving-shaft and means also whereby the feeding mechanism for each saw may be independently adjusted, the different feeding mechanisms being operatively connected to the same driving-shaft and operated synchronously.

Other objects and advantages of the invention will appear in the course of the subjoined description.

The invention consists in an improved multiple sawing-machine embodying certain novel features and details of construction and arrangement of parts hereinafter fully described, illustrated in the drawings, and incorporated in the claims hereto appended.

In the accompanying drawings, Figure 1 is a side elevation of the improved machine. Fig. 2 is a cross-section of the same, taken just inside of the head-frame. Fig. 3 is an enlarged plan view of a portion of the machine, showing the feeding mechanism. Fig. 4 is a transverse section through the machine, taken also through the feeding mechanism. Fig. 5 is a detail horizontal section through the feeding mechanism in line with the driving-shaft of such mechanism. Fig. 6 is a detail longitudinal section through one of the saw-heads and the saw-arm. Fig. 7 is a detail longitudinal section showing the manner in which the long and short sections of the saw-shaft are coupled and the manner of mounting the initial saw. Fig. 8 is a detail horizontal section on the line 8 8 of Fig. 4. Fig.

9 is an enlarged elevation of the elbow-links of the feeding mechanism. Fig. 10 is a similar view of the cross-head connecting the elbow-links in pairs.

Similar numerals of reference designate corresponding parts in the several figures of the drawings.

Referring to the accompanying drawings, 1 designates the frame of the machine, which may be of any suitable construction, and upon which the operative parts of the machine are mounted.

2 represents a pair of metal slides or tracks which extend longitudinally of the frame and are supported thereon. These tracks are spaced apart, as shown in Fig. 4, and are arranged exactly parallel, and each comprises a rack-rail 3, arranged near its inner edge and having its upper surface toothed for a purpose that will hereinafter appear. Each track is provided near its outer edge with a vertical longitudinal flange 4, which is provided at numerous intervals with threaded horizontal openings, through which pass binding-screws 5. The spaces or grooves formed between the rack-rails 3 and flanges 4 are adapted to receive slidingly the depending feet 6 of a number of saw-arms 7.

Any number of saw-arms 7 may be employed, and each extends transversely of the machine, as shown in Figs. 3 and 4, and is provided at its receiving end with an extension 8, upon which the board is placed preparatory to sawing. The saw-arms 7 are arranged at distances apart corresponding to the lengths of material to be cut, and they all contribute to form the saw-table. At a medial point between the tracks 2 each saw-arm is hollowed out beneath or made substantially in the form of an inverted U in cross-section, and at such point the arm is provided at each side with half-journal boxes 9 for the saw-head, complementary half-boxes 10 being detachably connected to the integral half-boxes 9 for completing the bearings. The saw-head (shown at 11) is in the form of a sleeve, which is mounted to slide longitudinally upon the saw-shaft 12. The saw-shaft 12 is provided with diametrically-opposite longitudinal grooves 13 and the saw-head is provided with inwardly-projecting feathers 14, which rest

loosely in said grooves, thus enabling the saw-head to be adjusted longitudinally of the shaft, while the head is caused to revolve therewith. The saw-head has an annular flange 15, forming a shoulder against which the circular saw 16 is seated, and is also threaded to receive a clamping-nut 17 for the saw, all as clearly illustrated in Fig. 6. The saw-arm 7 is provided in its upper wall with a slot 18, through which the saw operates, and is provided at either side with oil-pockets 19, communicating with the saw-head and adapted to receive and contain a quantity of lubricant.

Each of the saw-arms 7 is provided at front and rear with laterally-projecting bearing-brackets 20, in which is journaled a transverse shaft 21, extending parallel to the arm 7 and having near each end a pinion 22, said pinions being fast on the shaft 21 and meshing with the teeth of the rack-rails 3. One end of the shaft 21 is extended and provided with a transverse pin 23, enabling the shaft to be turned by means of a crank-handle 24, having a slotted head 25, which is adapted to embrace such end of the shaft and to engage the projecting ends of the pin 23, as shown in Fig. 3. In this manner the shaft 21 may be turned, causing the pinions 22 to feed along the rack-rails 3, thereby moving the saw-arm and saw-head longitudinally of the saw-shaft. When the desired position is reached, the saw-arm is clamped by means of the binding-screws 5, which are brought to bear at their inner ends against gibs 26, embracing the feet 6 of the saw-arm. These gibs are made in the U shape shown in Fig. 8, so that they will engage and slide with the feet 6, and their object is to prevent wear on the feet 6 by the binding-screws 5. The several features above described with relation to one saw-arm are present in each and all of the saw-arms, and it will also be noted that the saw arms and heads may be entirely removed from the machine, the arms being lifted out of engagement with their tracks and the saw-heads being capable of being moved endwise off the end of the saw-shaft.

The saw-shaft 12 is made in two sections, which are coupled together by a screw-threaded connection, (shown at 27 in Fig. 7,) the larger portion, or that portion having the largest diameter, being formed with a threaded socket, in which the threaded end of the other section is screwed. When in place, keys 28 are inserted in the grooves 13 of the saw-shaft, the same fitting corresponding grooves in the end of the other section of the shaft and preventing relative rotation of said sections and consequent jamming. The initial saw-arm 7 being located so near one of the bearings 29 of the shaft 12, it is unnecessary to provide such arm with the boxes 9 and 10, above referred to, and it is also unnecessary to employ an adjustable saw-head. Therefore as the initial saw always remains at the same point a stationary flange 30 is provided and the saw 16 is secured against

the same by means of the clamping-nut 31. By uncoupling the sections of the saw-shaft 12 one or more of the saws may be readily removed for the purpose of sharpening, and by this construction the number of saws may readily be changed at will.

32 designates the feed-bridge, which is superposed above the saw-arms 7, said bridge comprising a pair of parallel longitudinal angle-beams 33, having their vertical portions arranged innermost and opposing each other, the said beams being braced by means of a pair of trusses 34, arranged over the horizontal portions of the beams and connected thereto by means of strut-bolts 35. The inner vertical portions of the beams 33 form tracks or ways, upon which are mounted a number of sliding frames 36, carrying the feed mechanism. The number of these sliding frames is governed by the number of saws employed. Each of said frames is constructed, preferably, as shown in plan in Figs. 3 and 5, being formed of two L-shaped frames having a tongue-and-groove connection at diagonally opposite corners and fastened at such points by means of screws or bolts 37. Each frame fits snugly between and abuts squarely against the inner adjacent surfaces of the vertical portions of the beams 33 and is also provided at front and rear with overhanging lips 38, which bear against the outer surfaces of such portions of the beams and carry binding-screws 39, by which the frame 36 may be held stationary.

40 designates the feed-shaft, which, like the saw-shaft, is provided with longitudinal grooves arranged diametrically opposite, said shaft having its bearings in and passing through the side bars of each and all of the frames 36. Within each frame 36 is journaled a sleeve 41, provided at its center with a fixed spur-wheel 42, the same meshing with and driving spur-pinions 43, mounted on short axles 44, carried by the lower arms 45 of elbow-shaped links 46. These links are journaled at their elbows on the end portions of the sleeve 41 and upon opposite sides of the central spur-gear 42, and are connected in opposing pairs by the axles 44. The pinions 43 are formed or secured fast upon sleeves 47, which are journaled upon the axles 44, the ends of said sleeves being extended beyond the sides of the pinions 43 and having fast thereon feed-rolls 48, provided with toothed peripheries, whereby they are adapted to obtain the necessary hold upon the board being cut. By reason of the elbow-links being fulcrumed on the feed-shaft 40 the spur-pinions 43 will always remain in gear with the driving spur-gear 42 as the links swing. The upper arms of the links 46 are connected in opposing pairs by means of cross-heads 49, one of which is shown in detail in Fig. 10, said cross-heads having their ends reduced to form journals 50, which enter eye-bearings in the links. Each of said cross-heads 49 also has a central opening 51, through which is re-

ceived the inner end of a tension-rod 52, said rod passing through a perforated vertical ear or extension 53 on the frame 36 and having disposed around its projecting end a spiral tension-spring 54, the said rod also having a nut 55 for adjusting the tension of the spring. The springs 54 exert their tension upon the elbow-links 46, so as to force the feed-rolls 48 into operative engagement with the stock, and at the same time the said springs will yield for enabling the feed-rolls to rise and fall to accommodate any unevenness or inequalities in the stock.

By the construction described it will be seen that whenever the saws are adjusted the feeding mechanism for that saw may be correspondingly adjusted, the idea being to have the feed-rolls 48 straddle the saw, both at its cutting-point and at its rear edge, so as to exert equal force on the board upon each side of the saw. It will also be seen that by making the several gears and feed-rolls of the several feeding mechanisms the same size throughout and driving them all by means of the one shaft 40 the stock must necessarily be fed with equal speed at all points throughout its length, thus preventing the board from canting or twisting and wedging or binding the saws.

The feed-bridge may be adjusted up or down by means of the vertical screws 56, located one at each corner of the bridge, as shown in Figs. 1 and 2. These screws pass through the angle-beams 33 at their ends and have a threaded connection therewith, and when the feed-bridge has attained the desired elevation it is clamped by means of jam-nuts 57. Screws 56 have at their lower ends miter-gears 58, which mesh with complementary gears 59 on transverse shafts 60, journaled in the machine-frame at each end thereof, as shown in Fig. 1. Both of said shafts are provided with sprocket-wheels 61, which are operatively connected by a drive-chain 62, and one of the shafts 60 is provided with a hand-wheel or crank 63, by the rotation of which all of the screws 56 may be simultaneously operated, thus lifting the feed-brakes equally at all points and correspondingly elevating the several feed mechanisms carried by the bridge.

The saw-shaft is provided with a pulley 64, to which motion is communicated directly by a belt 65. The saw-shaft also has a smaller pulley 66, from which a belt 67 extends around a large pulley 68. The shaft of this pulley has a small pulley 69, from which a belt 70 extends to a large pulley 71 on a short horizontal shaft at the top of the machine, and this shaft has a spur-pinion 72, which meshes with a spur-wheel 73, upon the shaft of which is arranged a small sprocket-wheel 74, from which a chain extends around another larger sprocket-wheel 75 on the feed-shaft. By means of this arrangement of belts and pulleys the speed of the feeding mechanism is reduced to the desired point, the material to

be sawed being thus fed at a speed proportionate to that of the saws.

The multiple sawing-machine hereinabove described is especially designed for use in the manufacture of boxes and packing-cases, the said saw being capable of making at one cut the sides, top, and bottom of a box, and as the lengths sawed are always equal the completed boxes or cases will be similar in every respect. It will be apparent, however, that the machine is susceptible of various other uses, which will readily suggest themselves. It will be understood that the number of saws may be increased or diminished at will and that the several saws may be adjusted to any desired distances apart. Owing to the particular construction of the feed-operating mechanism the feed-rolls are all driven synchronously, thereby rendering it impossible for the stock to cant or become twisted between the saws, and thus to bind or stop the same. By the construction described the saws may be removed from either end of the saw-shaft for sharpening, &c. Where only one or two saws become dull, the feed-bridge may be elevated by the mechanism described sufficiently to enable an attendant to sharpen the said saw or saws without the necessity of removing the same from the shaft. The invention is also susceptible of various changes in the form, proportion, and minor details of construction, which may accordingly be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new is—

1. In a sawing-machine, the combination with the machine-frame, and the saw mounted thereon, of a superposed feed-bridge, the feed-rolls and their operating mechanism mounted thereon, the screws located at different points and interposed between the machine-frame and the feed-bridge, and means for simultaneously operating said screws for adjusting the height of the bridge, substantially as described.

2. In a sawing-machine, the combination with the machine-frame, the saw, and the feed-bridge, of a frame having a sliding engagement with the feed-bridge and having provision whereby it may be clamped at any point, a pair of spaced feed-rolls mounted in said frame and adapted to straddle the saw, and means for operating said feed-rolls and allowing the same to yield, substantially in the manner and for the purpose described.

3. In a sawing-machine, the combination with the machine-frame, the saw, and a frame superposed above the machine-frame, of the feed mechanism on said superposed frame, comprising two sets of feed-rolls arranged in opposing pairs which straddle the saw at front and rear, the pinions on the feed-roll shafts, the intermediate actuating-gear meshing with said pinions, the feed-shaft on which the in-

intermediate gear is mounted, and provision for holding the feed-rolls in yielding engagement with the work, substantially as described.

- 5 4. In a sawing-machine, the combination
with the saw-table and the shaft of the feed
mechanism arranged above the same, of an
actuating-gear mounted on said shaft, an elbow-link journaled on the shaft, a feed-roll
10 journaled in one arm of said link and having
a pinion intermeshing with the actuating-gear, and a tension device connected with
the other arm of the link, and arranged
wholly above the saw-table so as to leave an
15 unobstructed way for the boards to be fed
laterally to the saws, substantially as described.

5. In a sawing-machine, the combination
with the saw-table and the shaft of the feed
20 mechanism arranged over said table, of an
actuating-gear on said shaft, an elbow-link
journaled on said shaft, a feed-roll journaled
on one arm of said link and operatively engaged
by the actuating-gear, a substantially
25 horizontal tension-rod connected to the other
arm of said link and passing through the
frame of the feed mechanism and arranged
wholly above the saw-table so as to leave the
latter unobstructed, and the tension-spring on
30 said rod, all arranged for joint operation, substantially
as described.

6. In a sawing-machine, the combination
with the saw-table and the shaft of the feed
mechanism arranged over said table, of an
35 actuating-gear on said shaft, a pair of elbow-
links journaled on the shaft at each side of
said gear, a feed-roll mounted on an axle connecting
said links, said feed-roll being operatively
engaged with and rotated by the
40 actuating-gear, the cross-head connecting the
remaining arms of said links, and the tension-
rod connected to said cross-head, the entire
feed mechanism being located wholly above
the saw-table so as to allow the lateral feeding
45 of the boards through the saws, substantially
as described.

7. In a sawing-machine, the combination
with the shaft of the feed mechanism, of an
actuating-gear mounted on a sleeve having a

feather-and-spline connection with the shaft 50
whereby the said gear may be adjusted
lengthwise of the shaft, a link fulcrumed on
said sleeve, the feed-roll journaled on said
link and geared to the actuating-gear, and
means for holding the feed-roll to its work, 55
all of said mechanism being adjustable
lengthwise of the shaft, substantially as and
for the purpose described.

8. In a sawing-machine, the combination
with the machine-frame, the saw-shaft, and 60
the saws adjustable longitudinally thereof,
of an independent feed mechanism for each
saw, the feed mechanism being adjustable
longitudinally of its shaft whereby the proper
relation may be maintained between each saw 65
and its feed mechanism, substantially as described.

9. In a sawing-machine, the combination
with the machine-frame, the saw-shaft, and 70
a series of saws mounted on said shaft and
made independently adjustable, of the shaft
of the feed mechanism, extending parallel
to the saw-shaft, and a series of independent
feed mechanisms mounted on said shaft and
made independently adjustable thereon, 75
whereby the saws and the several feeding
mechanisms may be adjusted and the proper
relation maintained between the saws and
their respective feed mechanisms, substantially
as described. 80

10. In a sawing-machine, the combination
with the machine-frame, a sliding frame superposed
above the machine-frame and having provision
whereby it may be clamped at
any point and the sliding saw arranged to 85
move with the sliding frame, of spaced feed-
rolls mounted in said sliding frame and
adapted to straddle the saw, and means for
operating said feed-rolls, substantially as described. 90

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

WILLIAM M. BARRY.

Witnesses:

JOHN H. SIGGERS,
THEODORE DALTON.