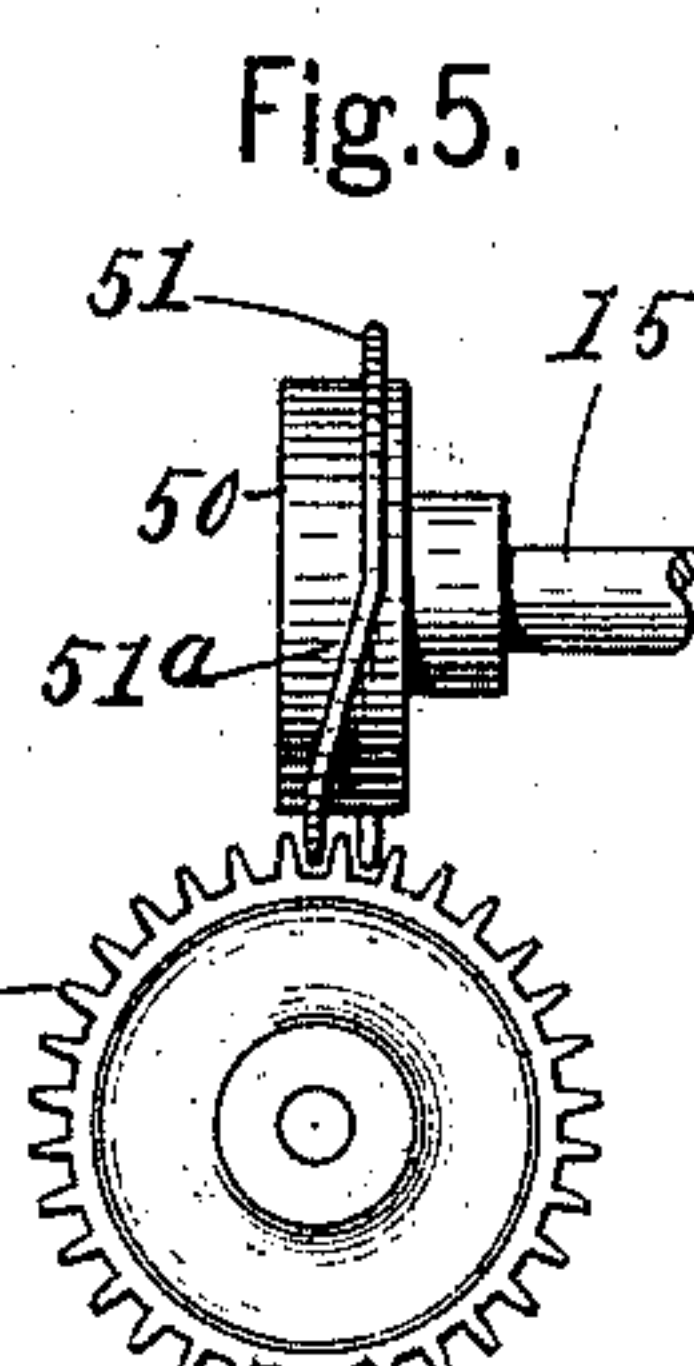
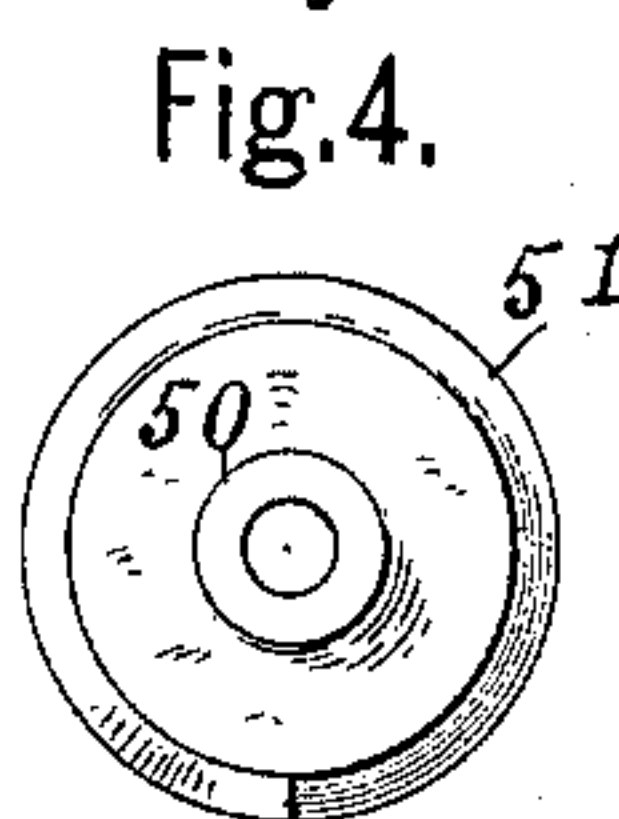
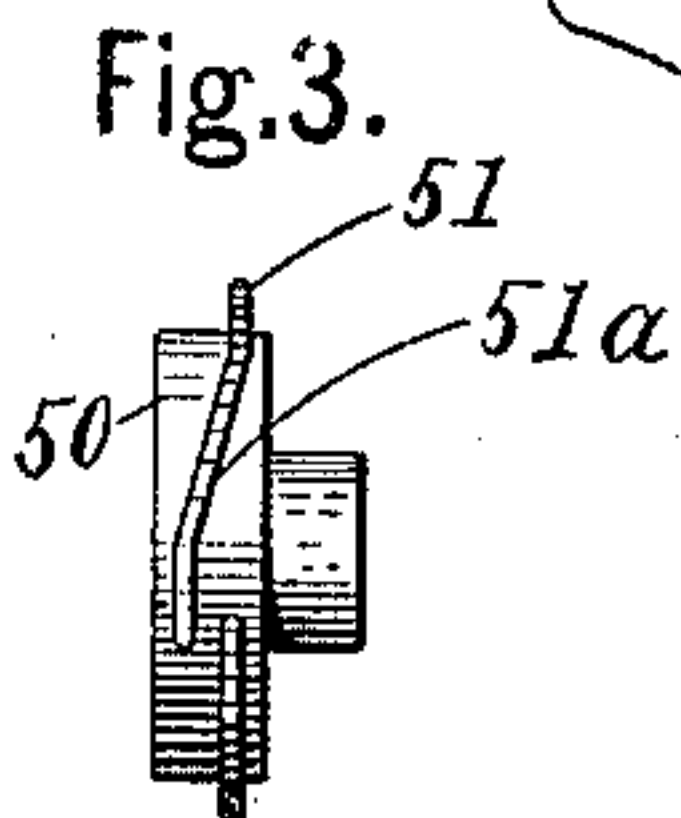
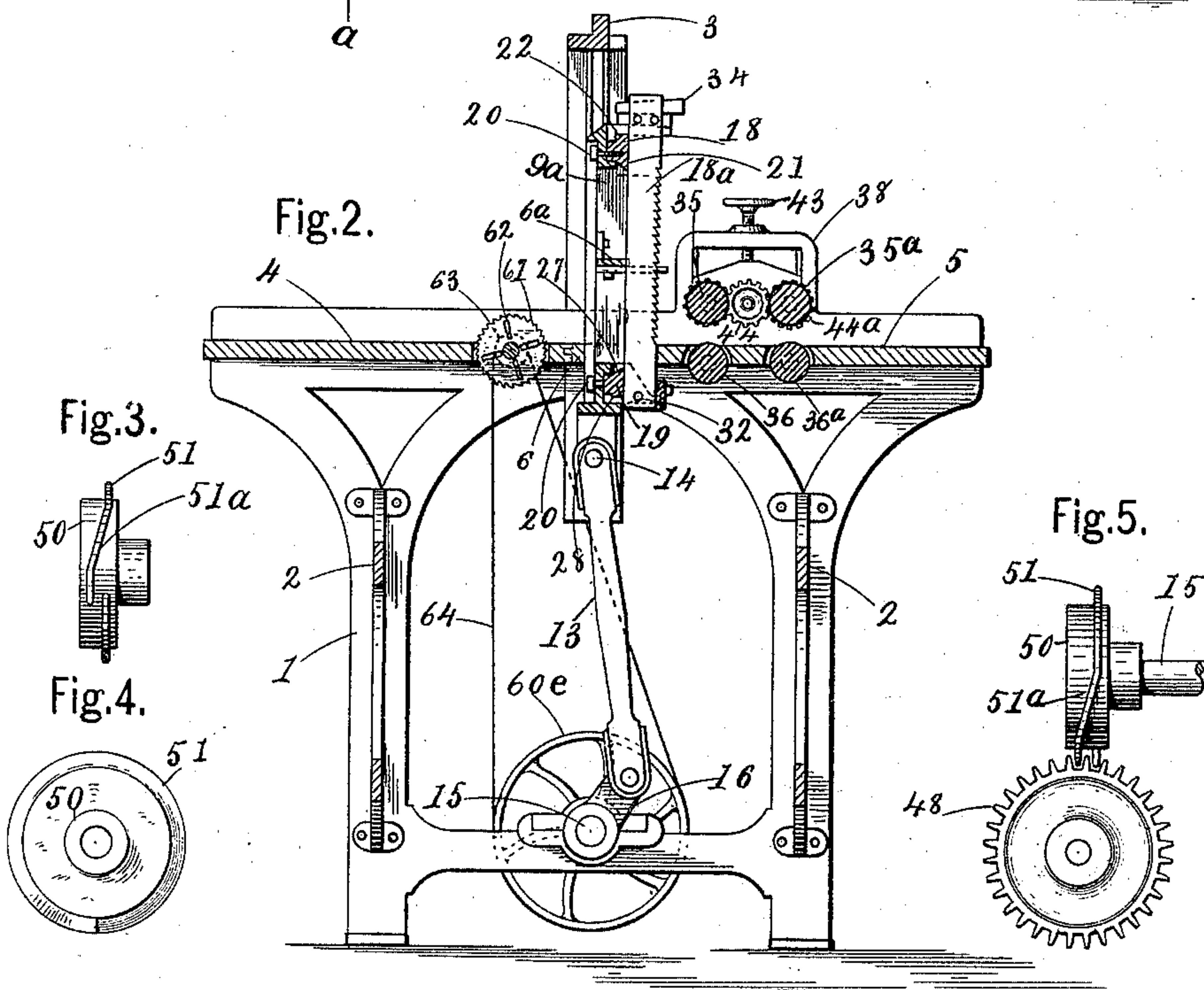
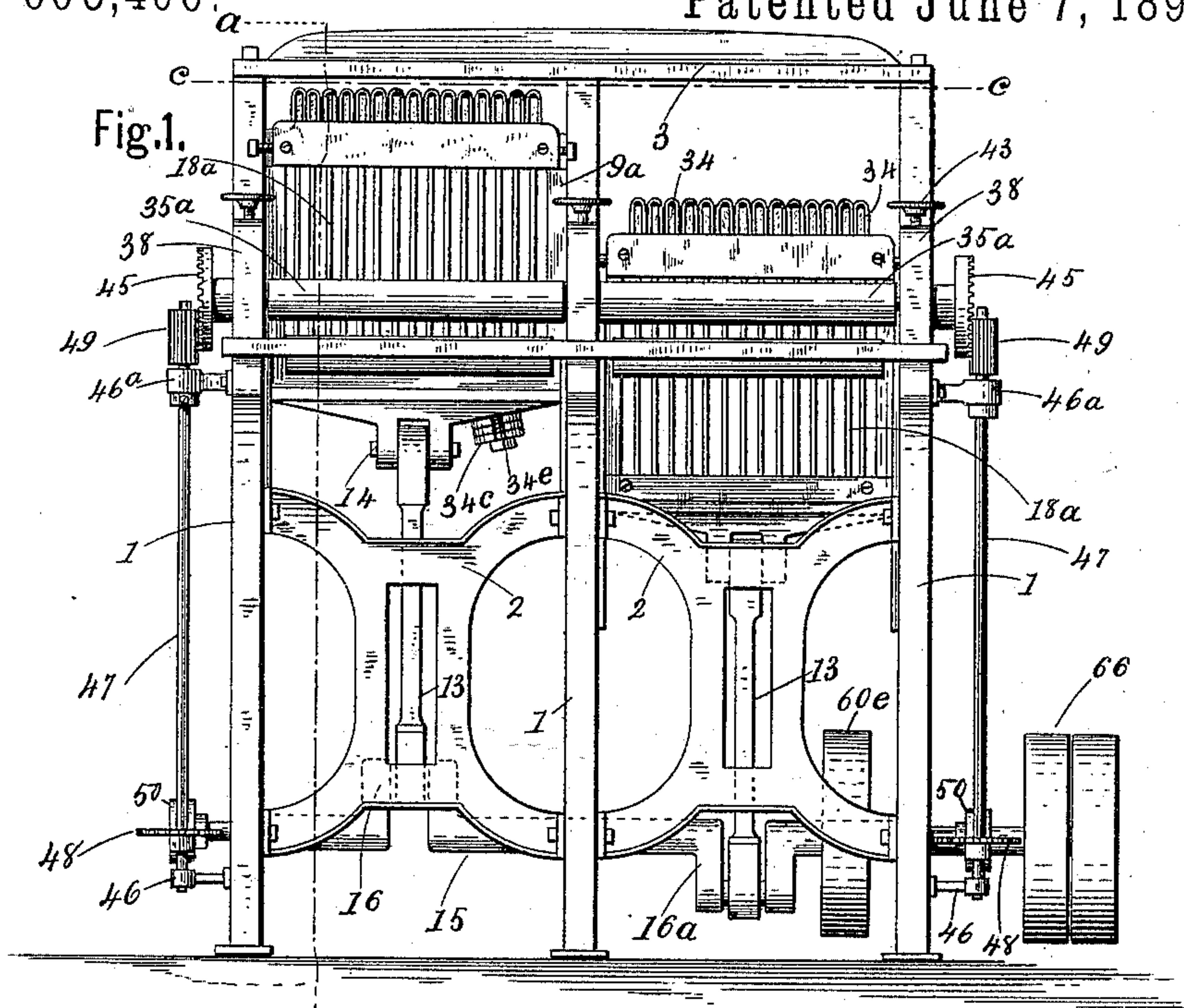


L. A. DEUTHER.
SAWING MACHINE.

No. 605,406.

Patented June 7, 1898.



Witnesses,
J. A. Neubauer
Geo. C. Bates

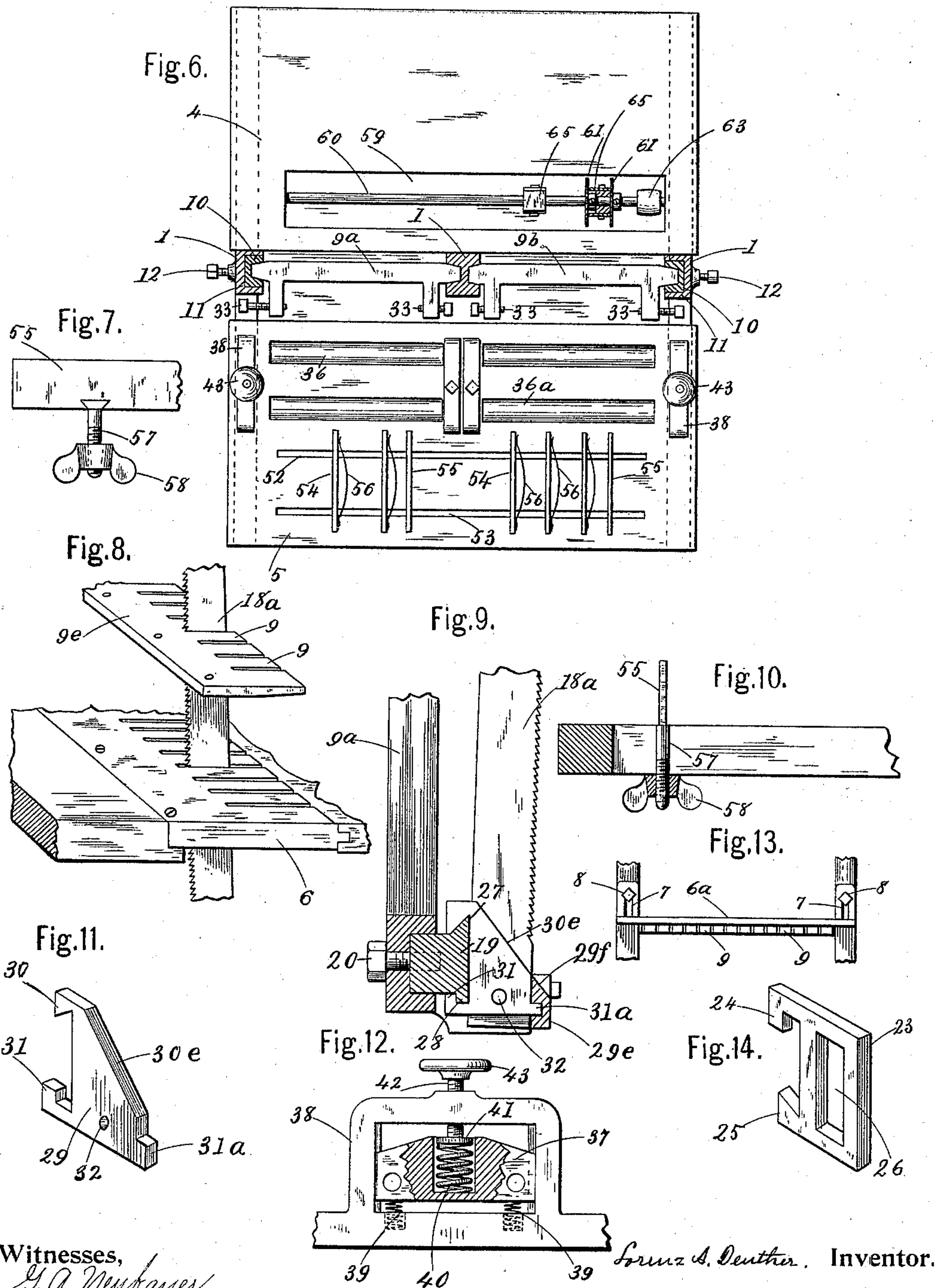
Lorenz A. Deuther Inventor.

By James Sangster Attorney.

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UNITED STATES PATENT OFFICE.

LORENZ A. DEUTHER, OF BUFFALO, NEW YORK.

SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 605,406, dated June 7, 1898.

Application filed June 28, 1897. Serial No. 642,575. (No model.)

To all whom it may concern:

Be it known that I, LORENZ A. DEUTHER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Sawing-Machines, of which the following is a specification.

This invention relates to that class of sawing-machines in which a gang of reciprocating-saws are employed for sawing more than one strip of material at the same time, and is designed as an improvement over Letters Patent No. 510,962, granted to me December 19, 1893, and will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 represents a front elevation of the machine complete. Fig. 2 represents a vertical longitudinal section through the machine on or about line *a a*, Fig. 1. Fig. 3 represents a detached enlarged side elevation of one of the cam-wheels for giving an intermittent feed motion to the material being sawed, showing a peripheral face view of the cam thereon. Fig. 4 represents a front elevation of said cam-wheel, showing a side elevation of the cam thereon. Fig. 5 is a plan view showing the said cam-wheel and cam in engagement with the feeding gear-wheel. Fig. 6 represents a plan view of the table-top, showing a horizontal section on or about line *c c*, Fig. 1, the upper feed-rollers and some portions of the mechanism being omitted, showing also a slight modification in the mechanism for adjusting the upper feed-rollers, as will appear farther on. Fig. 7 represents an enlarged side elevation of a portion of one of the adjustable plates for guiding the strips of wood as they are being fed into the machine. Fig. 8 represents a perspective view showing a portion of the upper and lower holding-fingers between which the saws operate. Fig. 9 represents an enlarged portion of one of the saws and a portion of the gate to which it is attached, showing also one of the saw-separating plates and the manner of attachment. Fig. 10 represents a section through a portion of the table-top, showing an end view of one of the adjustable guiding-plates and the means for adjusting and securing it. Fig. 11 represents a detached per-

spective view of one of the lower saw-separating plates. Fig. 12 represents a side elevation of one of the frames for carrying the feed-roller, a portion being broken away to show the adjusting-spring. Fig. 13 represents a front elevation of a portion of the machine-frame, showing one of the cross-bars to which the forked saw-guide bars are attached. Fig. 14 represents a detached perspective view of one of the upper saw-separating plates.

Referring to the drawings for the details of construction, in which like numerals indicate like parts, 1 represents the three side supporting-frame pieces of the machine, which are preferably constructed of iron. They are held together below the table by the braces 2 and at the top by the cross-head 3, all of which are rigidly secured together and to each other by screw-bolts in the usual way. The table is constructed in two parts 4 and 5, and the rear portion thereof is preferably made removable.

A saw-guide 6 is placed between the front and rear table portions, which is preferably constructed of wood; but, if desired, it may be made of any suitable metal or metal and wood combined, the wood being arranged to prevent contact between the metal portion and the saws.

Above the table is located another saw-guide consisting of a vertically-adjustable supporting cross-bar 6^a, having brackets provided with slots 7, through which the screw-bolts 8 pass to secure it to the frame. (See Fig. 13.) The slots 7 also allow for a vertical adjustment. To this cross-bar is bolted a series of wooden fingers 9 9^a. (See Figs. 8 and 13, where these fingers are shown.) The object of these guides and fingers is to prevent the saws from being sprung.

The means for holding the saws consist of two saw gates or frames 9^a and 9^b. They are adapted to slide vertically up and down in the supporting-frames (see Figs. 1, 2, and 6) in slideways 10. (Shown in section in Fig. 6.) These grooved slideways 10 are fitted in the sides 11 of the machine-frames 1 and when worn loose can be tightened by the screw-bolts 12. (Shown in Fig. 6.) The saw-gates receive their vertical up-and-down movements by means of connecting-rods 13, pivoted to the lower portions of the saw-gates by pins 14,

the lower ends of the connecting-rods 13 being pivoted to the main crank-shaft 15. (See Figs. 1 and 2.) The cranks on the crank-shaft are located so that one pair of cranks, 16, will extend upward and the other pair, 16^a, will extend downward. (See Fig. 1.) This construction tends to balance the action of the saw-gates and their connecting parts and thereby render the operation of the machine more easy.

A transverse bar 18 is secured by screw-bolts 20 at the top of the front portion of each saw-gate, and at the lower side of each saw-gate is fastened a cross-bar 19, also secured in place by similar screw-bolts 20. (See Fig. 2, where these bars are shown in cross-section.)

The upper bar 18 is provided on its under side with a beveled rib 21, extending lengthwise, and at its top side is a rib 22. (See Fig. 2.) Over these ribs the upper saw-spacing plates 23, that are placed between the saws to limit their distance apart, are hung and are thereby secured to the bar, (see Fig. 14, where a detached view of one of these upper spacing-plates is shown,) the part 24 on the plate 23 fitting over the top rib 22 and the part 25 fitting over the bevel or lower rib 21. These spacing-plates are provided with an opening 26 to lighten them, and one is placed between each adjacent pair of saws, as indicated in Fig. 1.

The lower bar 19 is provided at its upper side with a beveled rib 27 (see Fig. 2, also Fig. 9) and with a rib 28 at its under side. The lower saw-spacing plates 29, (see Fig. 11, where an enlarged detached perspective view of one of the plates 29 is shown.) The part 30 is adapted to fit over the beveled rib 27, and the part 31 fits over the lower rib 28 and is thereby securely held to the bar 19. A projecting finger or nose 31^a extends from the lower right-hand corner of each plate, and the cross-bar 29^e is provided with a longitudinal groove which fits over the said noses 31^a. (See Fig. 9.) Each of these plates 29 is provided on one side with a beveled edge 30^e, the object of which is to afford an inclined slideway down which the sawdust collected between the saws readily travels. This prevents the sawdust from getting between the sides of the spacing-plates and the sides of the saws and thus changing the alinement and relative position of the saws. The cross-bar 29^e is provided with a beveled edge 29^f to correspond with the beveled face 30^e. A series of these spacing-plates are used corresponding with the number of saws and alternate between them.

After the saws are all in place, as in Fig. 1, and the space-plates in exact position a rod is put through the whole lower series of space-plates, which passes through the holes 32 (see Figs. 2, 9, and 11) and is then rigidly fastened by a screw-nut at each end, or a head at one end and a nut at the other end, in the well-known way for such purposes.

At the top the saws 18^a are secured, with the plates 23 between them, to the bar 18, after which they are all rigidly fastened together by means of the screw-bolts 33. (Shown in Fig. 6.) The saws are then drawn tight by means of wedges 34 in the usual way. (See Figs. 1 and 2.)

The saws 18^a are set at a slight angle from the perpendicular—that is, the top end inclines slightly forward, substantially as shown in Figs. 2, 8, and 9.

It is well known that a continuous forward feed of the material to be sawed will move it just as fast against the saw while it is moving upward and not cutting as it does while it is moving downward and cutting. This operation is exceedingly objectionable, as it is liable to crowd and injure the saws and necessitates a comparatively slow feed. The object of this part of my invention is to avoid the serious objection above mentioned by so inclining the saw that its teeth gradually move back from the material to be sawed as the saw moves upward and employing an intermittent feed which carries the material forward either as the saw is moving upward or has nearly completed its upward movement and its teeth receding from the material and then holding said material stationary until the saw has made its downward movement and completed a cut the length of the feed. In this way I get a quicker feed and cut with ease a larger amount in a given time without crowding the saws, because each tooth as the saw moves downward cuts but a small portion and the whole combined provides the means for a much longer cut during a down movement of the saw than could otherwise be given.

To bring both saw-gates, their saws, and several operating parts to a balance, I attach one or more weights 34^e to the saw-gate at any convenient point—for instance, at the point shown in Fig. 1. In some instances a less number of saws may be required in one gate than in the other and the saws in one gate arranged at a greater distance from each other than the saws in the other. Under these circumstances the balancing-weights are absolutely necessary to balance the gates with each other. These weights are secured by a bolt 34^e, and a sufficient quantity only are put on to balance the gates. The upper feed-rollers 35 and 35^a are shown in Figs. 1 and 2, and the lower feed-rollers are shown in Figs. 1, 2, and 6. The lower feed-rollers 36 and 36^a are mounted in bearings in the table, so that their upper sides will be slightly above its surface, and the upper pairs of rollers 35 and 35^a are each mounted in a vertically-movable box 37, (see Fig. 2,) adapted to slide up or down in the frame portion 38. (See Figs. 1, 2, 6, and 12, particularly Fig. 12, where a larger view of this portion is shown.) Below the box 37 are two springs 39 to hold the box and feed-rollers upward. Centrally within each box 37 a strong spiral spring 40, which may be a

rubber spring, if desired, is placed, as shown in said Fig. 12, a portion being in section to expose the spring. On the top of the spring is placed a disk 41, and at the top of the frame 5 38 is a screw 42, extending down to said disk and provided with a hand-wheel 43 for operating it and giving the required pressure to the feed-rollers upon the material to be sawed. It will be noticed by reference to Fig. 2 that 10 the feed-rollers 35 and 35^a are geared together by an intermediate gear-wheel 44, which engages with the gear-wheels 44^a. The rollers 35^a are each provided with a journal that extends out and carries a crown-wheel 45—one 15 at each side of the machine. (See Fig. 1.)

At each side of the machine is secured by bolts in the usual way an upper and lower bracket 46 and 46^a, in which is mounted a vertical shaft 47. (Shown in Fig. 1.) Near 20 the lower end of each shaft 47 is rigidly secured a small spur-wheel 48, and at the top of said shaft is secured an elongated pinion 49, adapted to engage with the teeth in the crown-wheels 45. (Shown in Fig. 1.) The 25 elongated pinions 49 allow the feed-rollers 35 and 35^a to be adjusted sufficiently up or down without coming out of engagement with the crown-wheels 45.

To each end of the crank-shaft 15 is rigidly 30 secured a cam-wheel 50, provided with a cam 51. This cam 51 extends nearly around the wheel 50 and at 51^a inclines the width of a tooth to one side, the construction being such that every time the cam-wheel turns once the 35 wheel 48 is moved one tooth forward and the feed-rollers 35 and 35^a are moved one feeding step by means of the shaft 47 and connecting-gearing 45 and 49. The cam-wheel 50 is so timed or secured to the crank-shaft that it 40 gives the proper feed movement at the exact time required or at the time the saws have completed or nearly completed their upward movement.

The saw-table is provided with two longitudinal grooves 52 and 53 (see Fig. 6) and 45 with a series of guide-plates 54 and 55. The plates 54 are each provided with a side spring 56 and are adjustably and removably secured to the table by means of a screw portion 57 and a thumb-nut 58. (See Figs. 7 50 and 10.)

The object of the side springs 56 on the guide-plates is to hold the strips or portions of material being sawed to one side and 55 against the opposite or companion guide-plate when required.

In order to remove the sawdust which collects between the side edges of the slats during the operation of sawing, I provide the 60 saw-table with an opening 59 (see Fig. 6) and mount a shaft 60, which adjustably supports two or more circular saws 61, in bearings on said table, so that it passes centrally and longitudinally through said opening. These 65 saws are each provided with a series of elongated slots 62, which preferably radiate from the center, substantially as shown in Fig. 2.

The side edges of these slots are slightly bent or offset alternately to each side of the circular saws, and thus afford an additional 70 means for removing the sawdust and also smoothing the side edges of the slats after they come from the reciprocating saws. Under some conditions the sawdust becomes packed and partially caked and the teeth on 75 the circular saws serve to cut and disintegrate the dust when in this partly-caked condition. A pulley 63, mounted on the shaft 60, is connected by a belt 64 with the driving-pulley 60^e to operate the shaft 60. 80

It has been found by experience that the reciprocating saws, owing to the fact that the cutting is done in a downward direction, leave small splinters and roughen the lower 85 edges of the slats. To remove the roughness and these splinters, a planing or smoothing device, which is preferably an ordinary planer-cutter 65, is mounted on the shaft 60 between the circular saws. (See Fig. 6.) If 90 desired, a file-surface or sandpaper attached in any convenient manner to the machine may be used in lieu thereof.

The main driving-pulley 66 (shown in Fig. 1) is attached or connected by a belt or any other suitable means to the source of power 95 to drive the machine.

The operation of the machine will be easily understood from the foregoing description and drawings.

I claim as my invention— 100

1. In a sawing-machine, the combination with the supporting-frame and the reciprocating saws, of a supplementary circular saw located behind the reciprocating saws for removing the sawdust between the side edges 105 of the slats as they come from the reciprocating saws, as set forth.

2. In a sawing-machine, the combination with the frame, the reciprocating saws and the saw-table, provided with an opening located at the rear of the reciprocating saws, 110 of a shaft mounted in said table and passing through said opening, and one or more circular saws adjustably supported on said shaft to remove the caked sawdust from between 115 the slats as they come from the reciprocating saws, as set forth.

3. In a sawing-machine, the combination with the frame, the reciprocating saws and the saw-table, provided with an opening at 120 the rear of the reciprocating saws, of a shaft mounted in the opening in said table and passing through said opening and one or more circular saws, adjustably supported on said shaft, said saws being provided with a series 125 of slots or openings and having the side edges of said slots slightly offset or bent alternately to each side to afford means to remove the sawdust and smooth the side edges of the slats as they come from the reciprocating 130 saws, as set forth.

4. In a sawing-machine, the combination with the reciprocating saws and the supporting saw-gates, of a series of spacing-plates

- placed between the saws, each provided with a top edge inclining diagonally downwardly toward the front and terminating in a projecting nose, and a rear depression or dovetail, a supporting portion fitting in said depression or dovetail, a cross-bar provided with a groove fitting over said nose and a screw device for rigidly securing said portion and cross-bar to the saw-gates, as set forth.
- 10 5. In a sawing-machine, the combination with the supporting-frame, provided with a slideway portion and table, of a saw-gate, mounted in said slideway and supporting a gang of reciprocating saws, a circular saw
15 mounted in the table at the rear of the reciprocating saws, to remove the sawdust from between the slats as they come from the reciprocating saws, and an operating-shaft in connection with the saw-gate and the circular saw, as set forth.
- 20 6. In a sawing-machine, the combination with the reciprocating saws and the supporting saw-gates, of a series of spacing-plates placed between the saws, each provided with
25 a depression and a projecting nose, a sup-

porting portion fitting in said depression, a cross-bar provided with a groove fitting over said nose and screw means for rigidly securing said portion and cross-bar to the saw-gates, as set forth.

7. In a double sawing-machine, the combination of the double frame, two saw-gates mounted in slideways in said frame, a series of reciprocating saws supported in each gate, a driving-shaft, a cam at each end thereof, two cranks extending at diametrically opposite directions from said shaft, two rods each pivotally connected at its lower end to one of the cranks and at its upper end to one of the saw-gates, feed-rollers provided with crown-wheels, and rods having their lower ends provided with gear-wheels engaging with the cams on the driving-shaft, and their upper ends with pinions engaging with the crown-wheels on the feed-rollers, as set forth.

LORENZ A. DEUTHER.

Witnesses:

JAMES SANGSTER,
G. A. NEUBAUER.