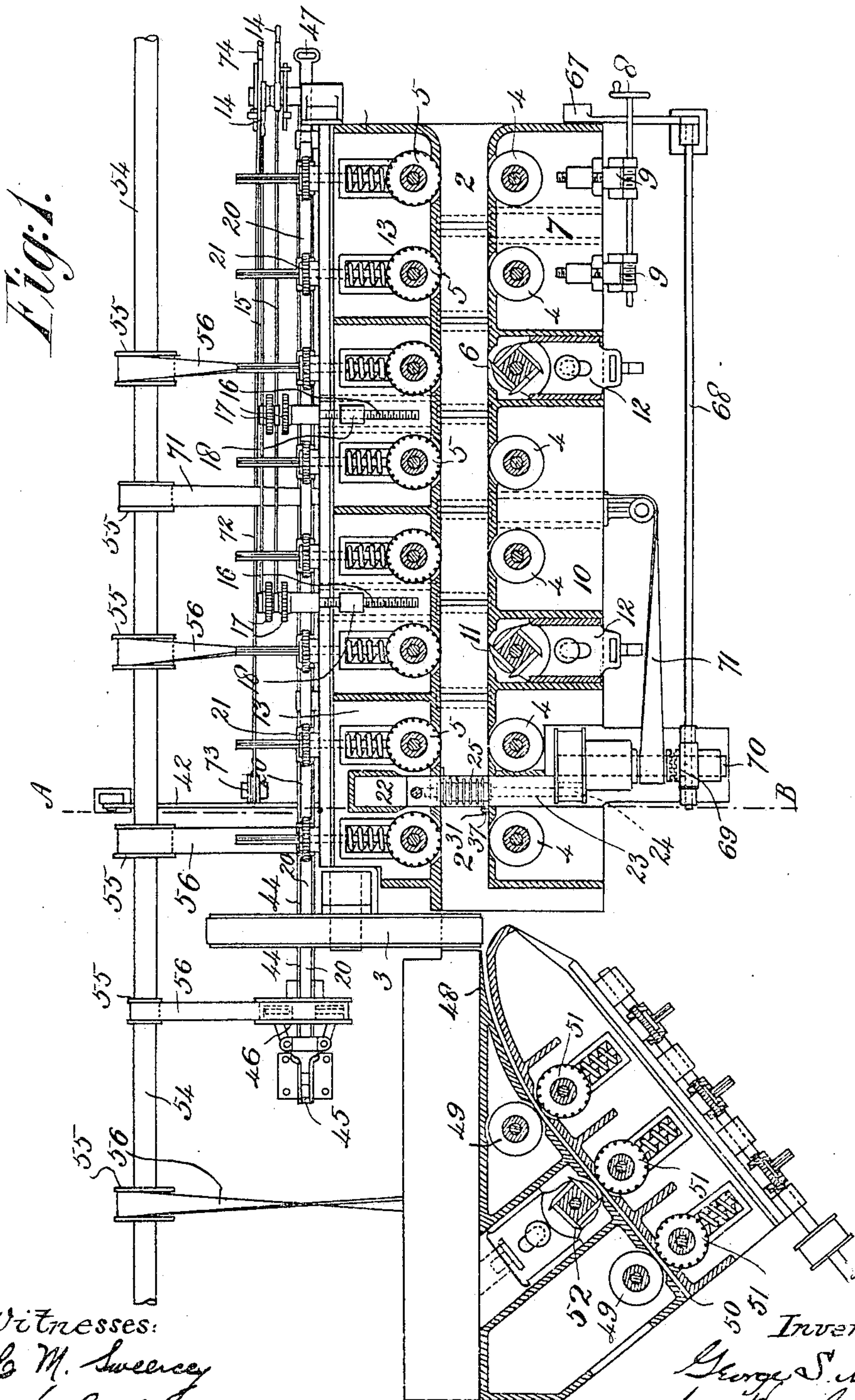


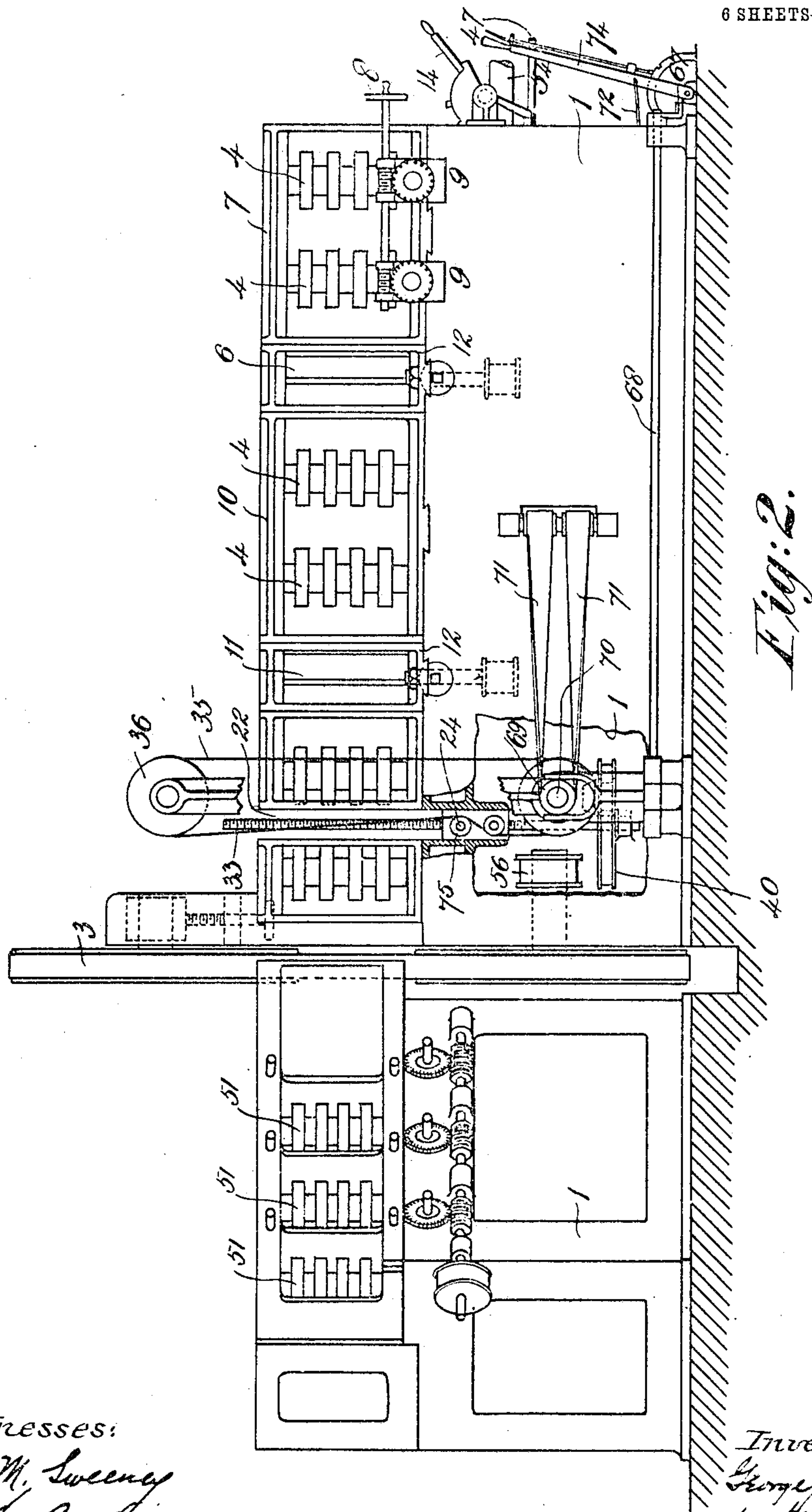
G. S. MAYHEW.
WOOD SLICING MACHINE.
APPLICATION FILED NOV. 23, 1904.

6 SHEETS—SHEET 1.



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WOOD SLICING MACHINE.
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6 SHEETS—SHEET 2.



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6 SHEETS—SHEET 3.

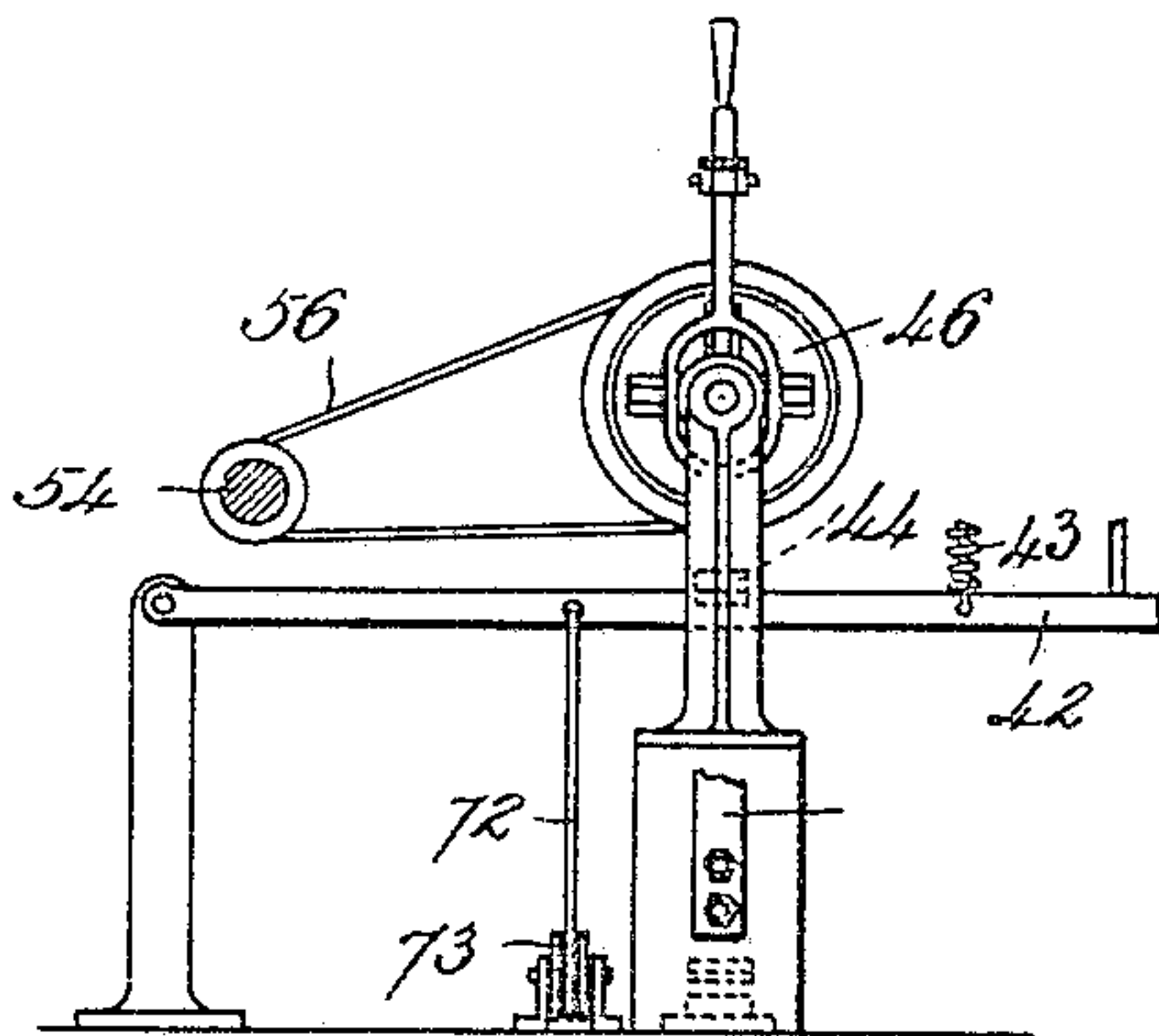


Fig: 7.

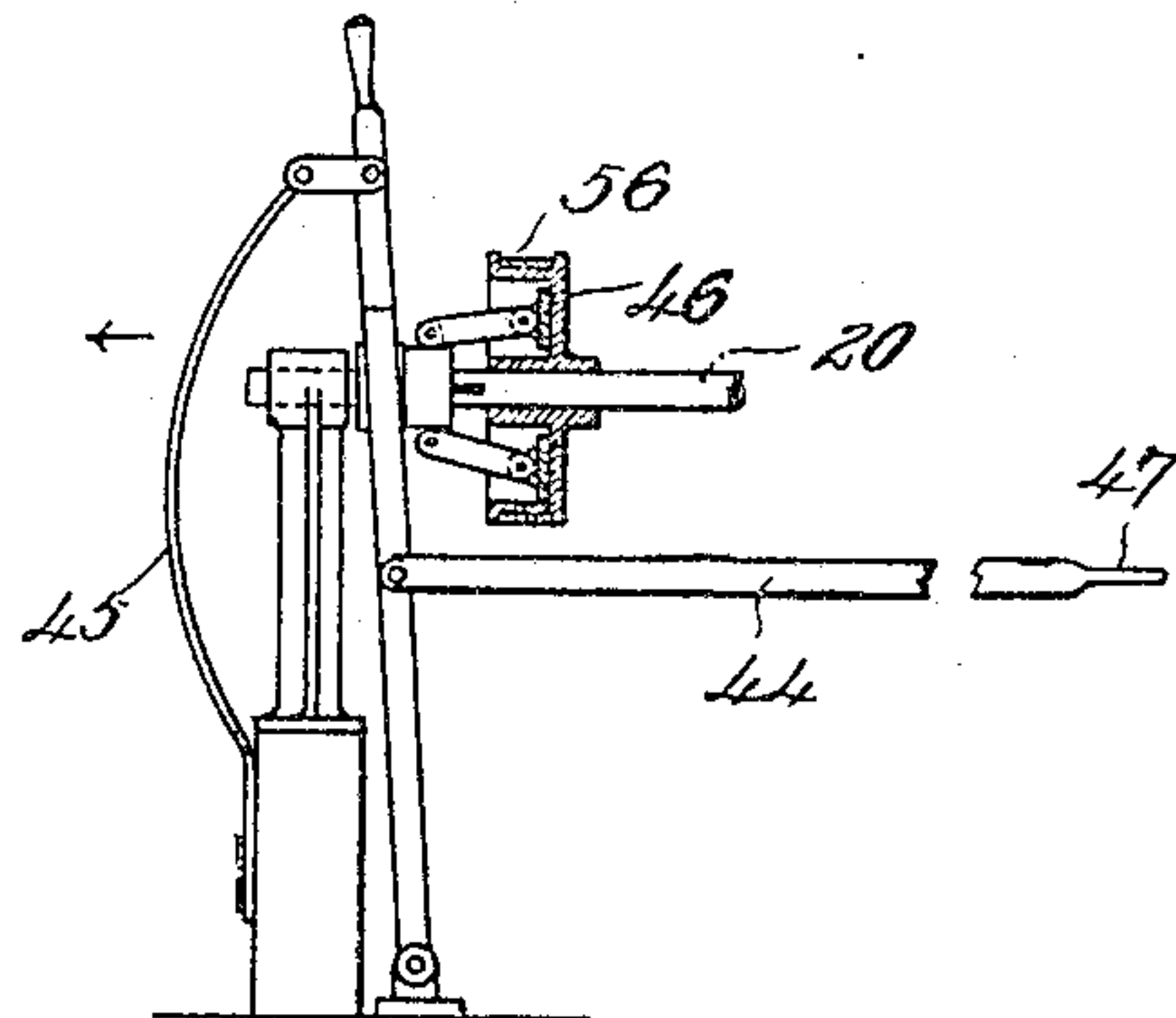


Fig: 8.

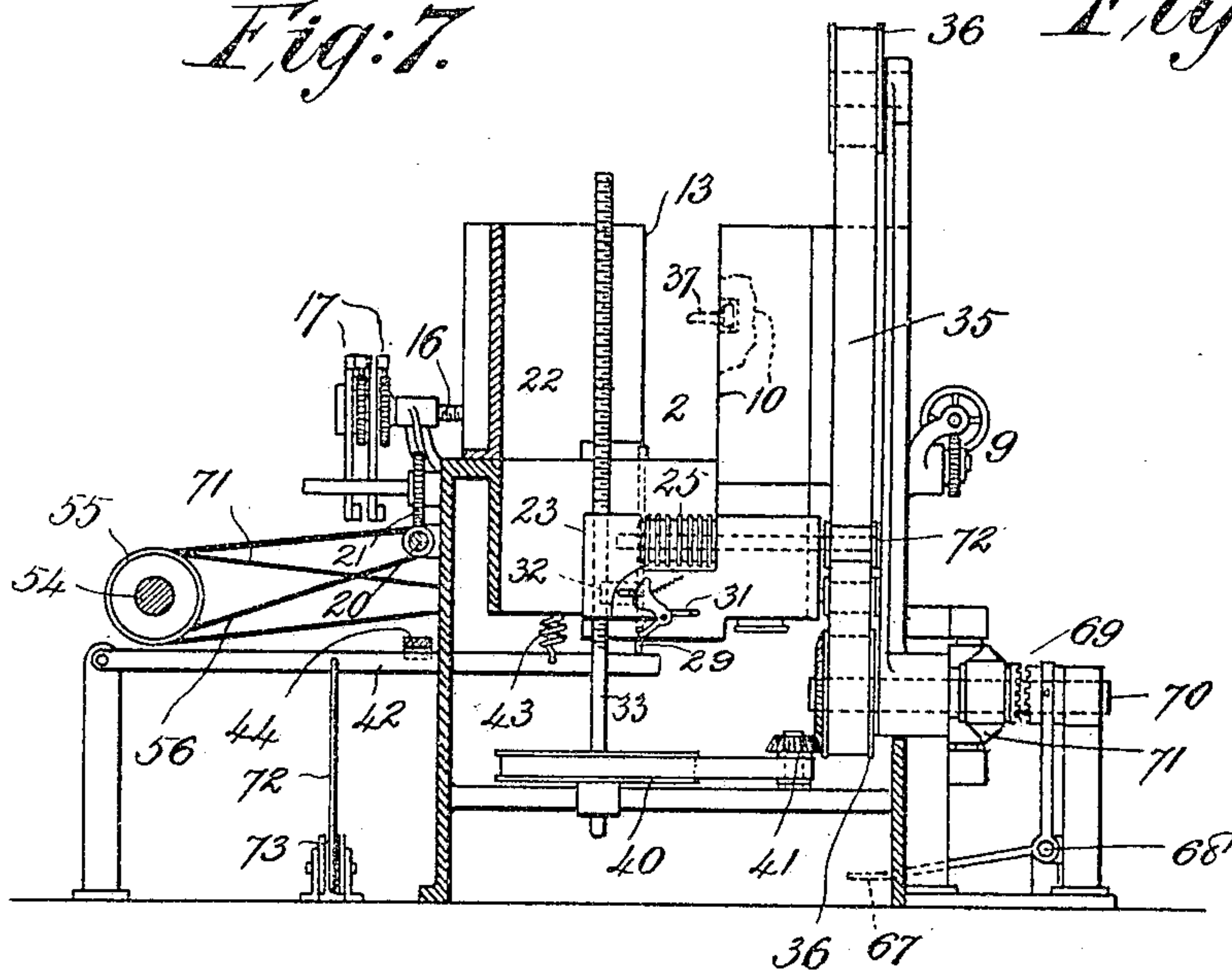


Fig: 3.

Witnesses:

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A. Cushman

Inventor:

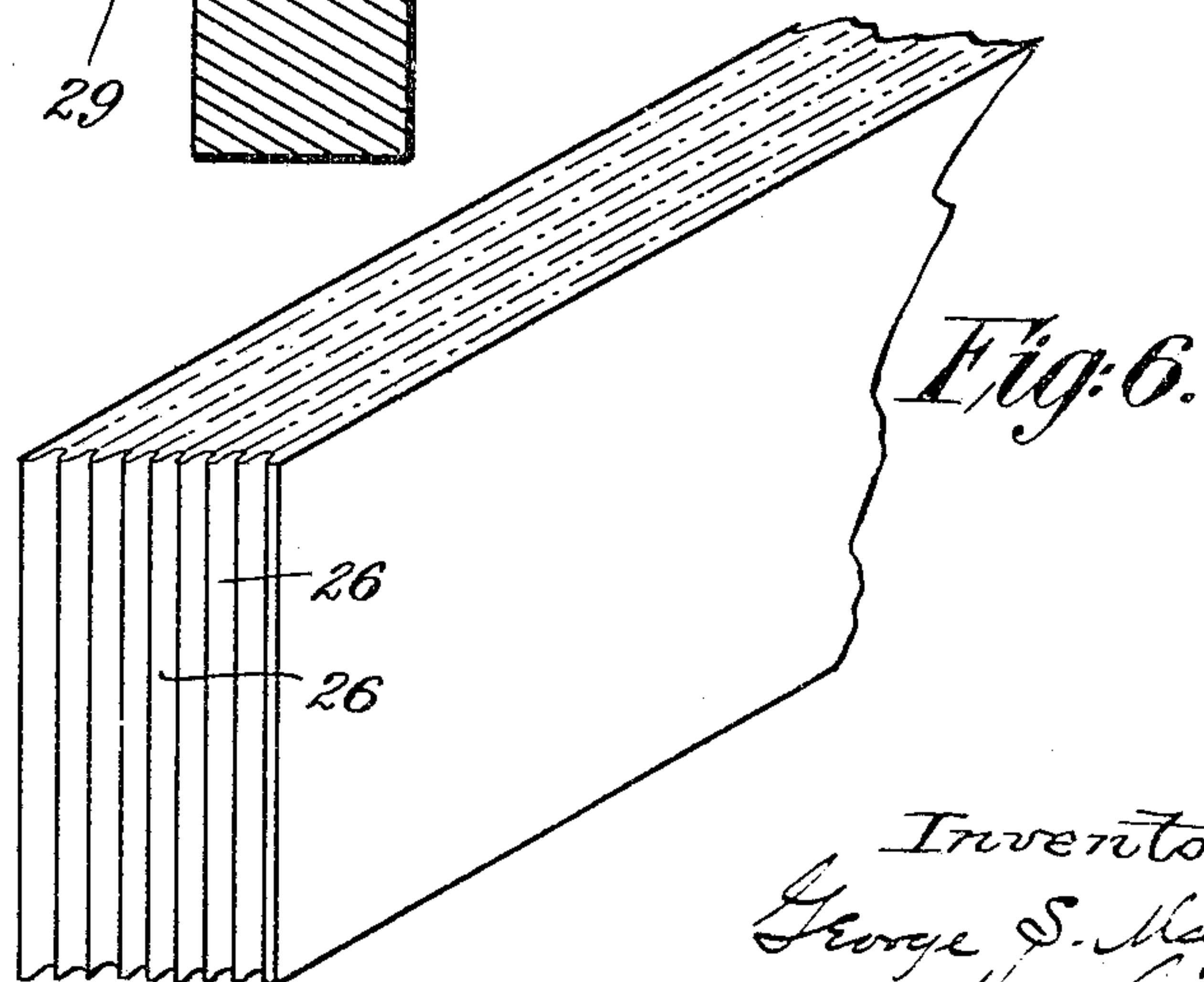
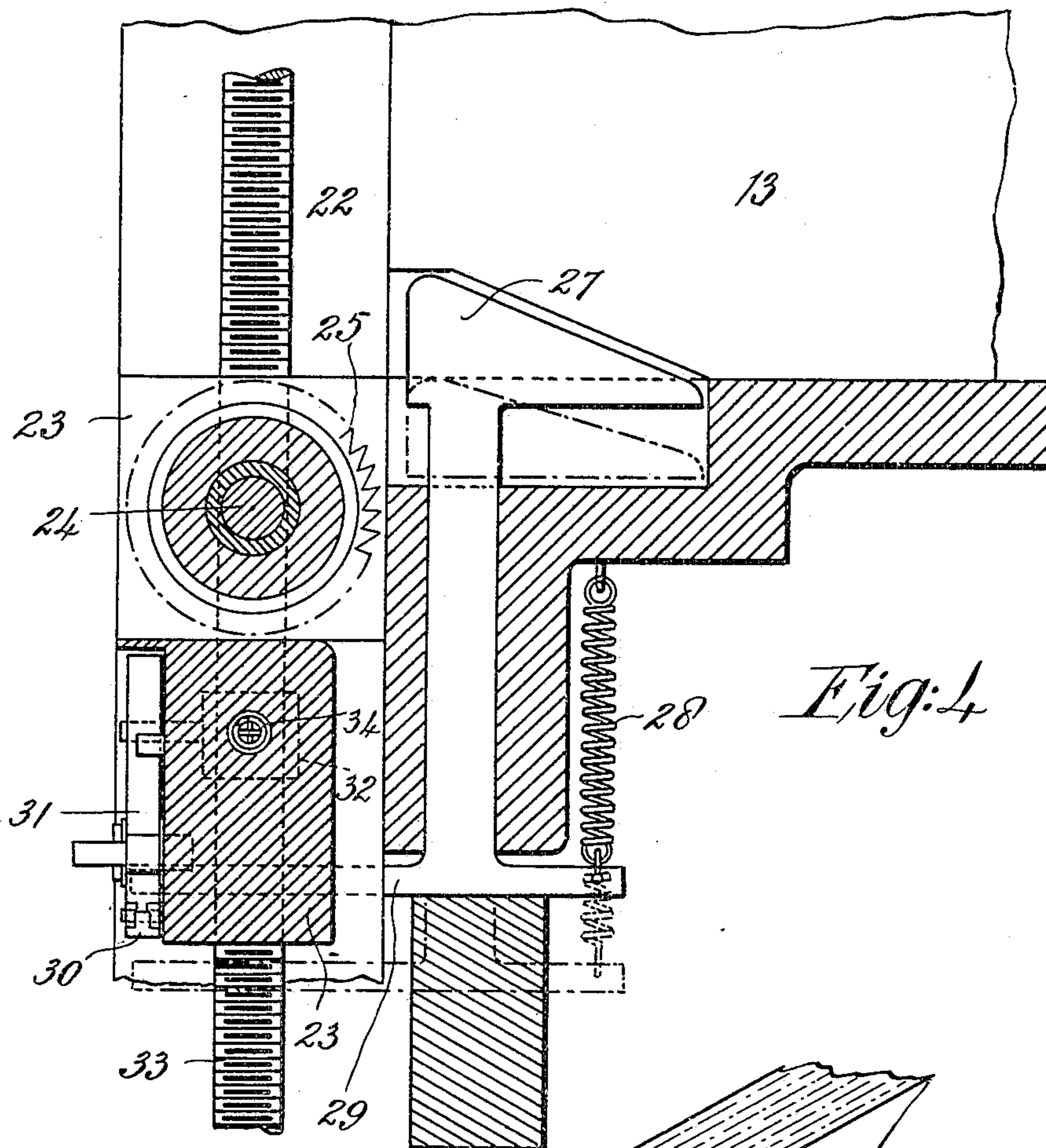
George S. Mayhew
by Henry S. Allen
Att'y.

No. 787,203.

PATENTED APR. 11, 1905.

G. S. MAYHEW.
WOOD SLICING MACHINE.
APPLICATION FILED NOV. 23, 1904.

8 SHEETS—SHEET 4.



Witnesses:

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PATENTED APR. 11, 1905.

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6 SHEETS—SHEET 5.

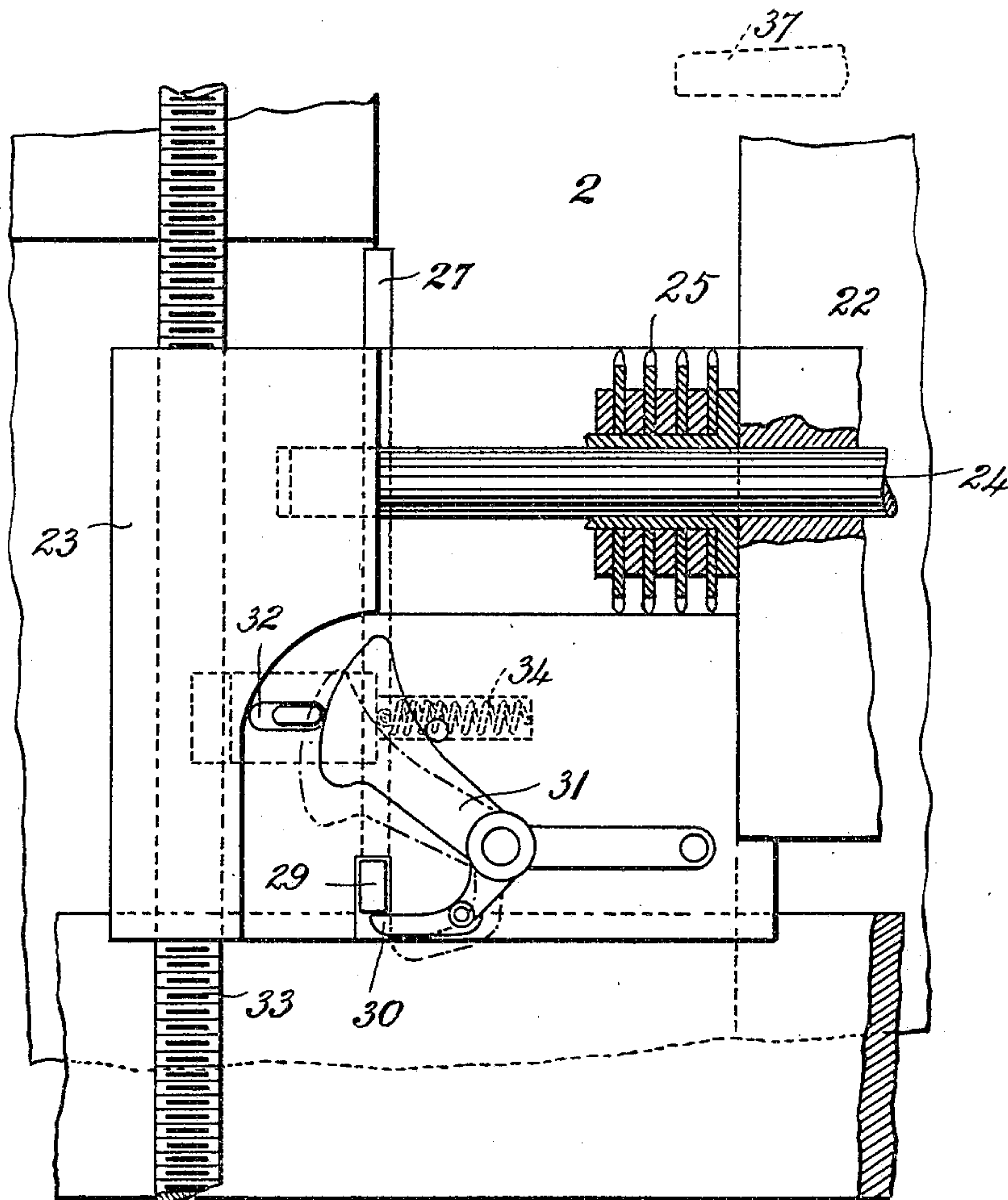


Fig: 5.

Witnesses:
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A. Cushman

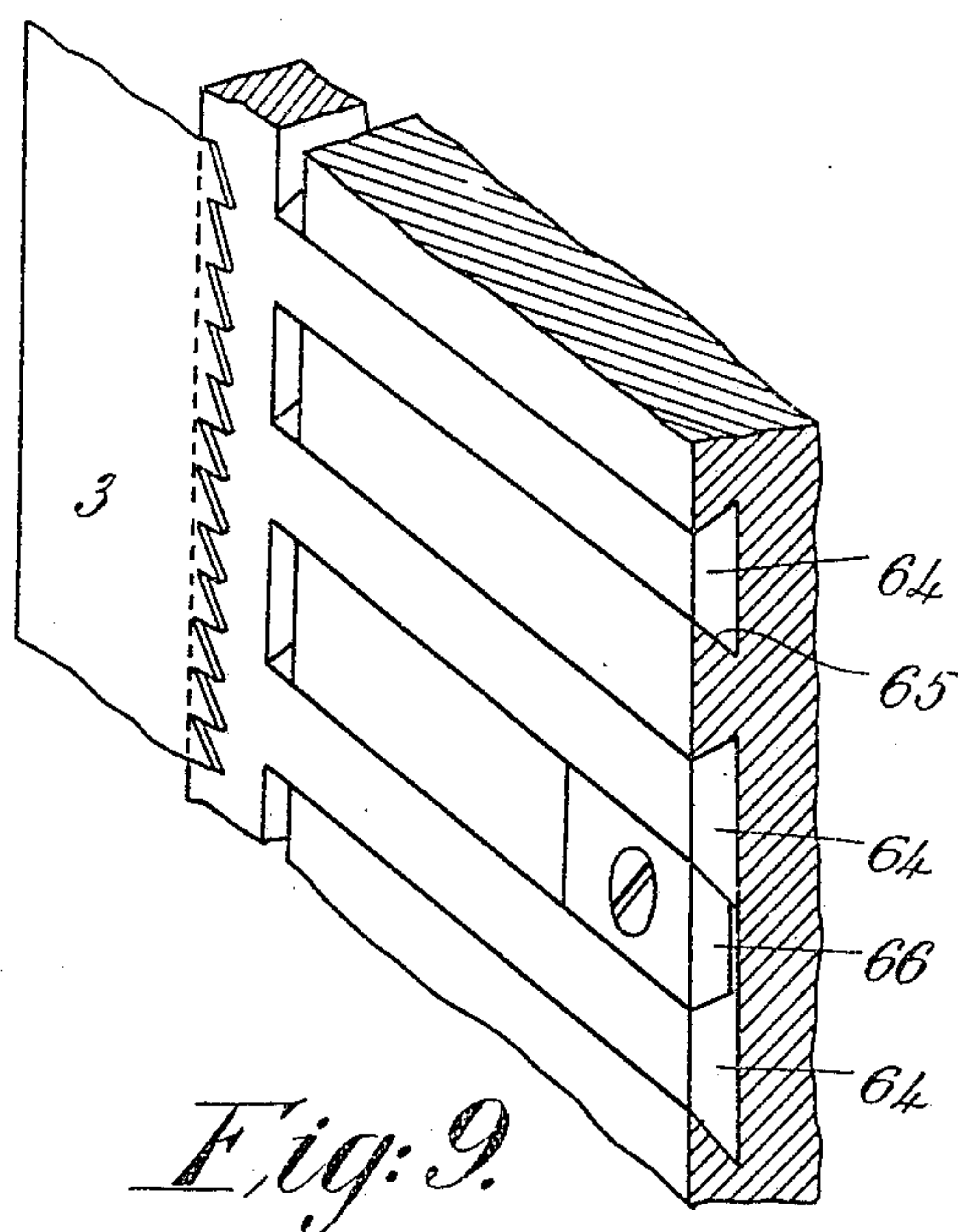
Inventor:
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by *[Signature]* Att'y

No. 787,203.

PATENTED APR. 11, 1905.

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WOOD SLICING MACHINE.
APPLICATION FILED NOV. 23, 1904.

6 SHEETS—SHEET 6.



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Inventor:

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UNITED STATES PATENT OFFICE.

GEORGE SKAATS MAYHEW, OF LONDON, ENGLAND, ASSIGNOR TO
GEORGE WILLIAM MELLOR, OF LONDON, ENGLAND.

WOOD-SLICING MACHINE.

SPECIFICATION forming part of Letters Patent No. 787,203, dated April 11, 1905.

Application filed November 23, 1904. Serial No. 233,978.

To all whom it may concern:

Be it known that I, GEORGE SKAATS MAYHEW, a citizen of the United States of America, residing at 2 Basinghall avenue, in the city and county of London, England, have invented a new and useful Improved Wood-Slicing Machine, of which the following is a specification.

My invention relates to special machinery for sawing and planing especially adapted to be used in the preparation of thin sheets or boards of wood and other similar purposes.

The operation of my apparatus comprises elements commonly known in woodworking machinery, but combined with special apparatus operated in a particular manner to achieve results such as have hitherto not been obtainable by any of the machines or systems of machinery hitherto known in the trade.

By my improved machinery accuracy and rapidity of the work and the economy aimed at of time, labor, and material are attained in practice to the fullest extent of which the material operated on is capable.

In all wood-sawing machinery the accuracy and speed of the work and the economy of the material depend principally on the straightness of the saw-blade, the perfect sharpening and setting of the teeth, and the correctness of the path of the teeth through the wood. A perfectly-running saw-blade properly filed and set should leave only scarcely-perceptible marks upon the surfaces cut and the marks should be in regular relation to one another.

In my judgment the best effect of the machinery hereinafter detailed is attained by the use of a band saw or saws; but I wish it to be understood that I do not exclude the use of a circular saw or saws in combination with the rest of my machinery.

In the first place my aim is to reduce the thickness of the saw-blade, and consequently of the kerf, as much as possible, so that the smallest quantity of material may be wasted in cutting. In order to successfully use a thin blade, the material which is cut must be held perfectly in line and must progress not only in a straight line, but also with absolute regu-

larity of progress without jerking or twisting. The guides which hold the saw-blade in perfect line and perfect position without friction at either side or at the back edge while the blade is running idle would break the saw if the material presented to it twisted the blade or choked it by irregular feeding.

My invention is more particularly described with reference to the accompanying drawings, in which—

Figure 1 is a plan view of my improved machine. Fig. 2 is a side view, partly broken away, to show the mechanism for operating the grooving-cutters. Fig. 3 is a section on the line A B of Fig. 1 looking toward the grooving-cutters. Figs. 4 and 5 are detail views of the mechanism automatically operated by the deal to bring the grooving-cutters into operation. Fig. 6 is a view of the end of a deal grooved. Figs. 7 and 8 are detail views showing the clutch mechanism for automatically stopping the rotation of the deal-roller-driving shaft, and Fig. 9 is a view showing an adjustable guide behind the saw.

Referring now to the drawings, my machine consists of a number of coöperating parts comprising a framework 1, mounted on a suitable bed-plate and provided with a slot 2, the sides of which form the guides for the deal when passing through the machine. The band-saw 3 is arranged at the end of said slot, as shown in Figs. 1 and 2, and lies perpendicularly to the deal, which is arranged to travel through the guide-slot on its edge. The sides of the said slot are provided with a series of friction and feed rollers 4 and 5, which project through the sides, but not sufficiently far to push the smooth face of the deal away from the guide, but only enough to prevent unnecessary friction and to carry the deal forward. On the side of said guide-slot against which the working face of the deal bears evening and smoothing planers 6 and 11 are arranged. This side of the guide is formed in sections, the first section 7 of said guide being preferably two feet in length, and is adapted to be adjusted against the side of the deal by means of the handle 8 and gearing 9. In this section of the guide there are

two friction-rollers 4, one arranged as near as possible to the mouth of the slot and the other arranged as near as possible without interfering with its operation to the evening-planer 6, mounted at the end of said guide-section. This movable guide may be worked backward and forward at right angles to the deal very easily and may be retired to admit of the entrance of a slightly thicker or rougher faced deal. On the same side of the guide-slot I arrange a second section 10, provided with friction-rollers 4 similar to those in the previously-described section of the guide. This section of the guide carries a smoothing-planer 11 and is adjustable, but separately, from the section of the guide previously mentioned. The functions of the smoothing-planer 6, above described, are only to remove the very slight saw-marks which show themselves in the face of the deal after the first slice or sheet of wood has been cut therefrom or for removing the coarser marks of the evening-planer, which operates upon the working face of the deal in its first passage through the machine and before a slice has been sliced off. Both the evening-planer 6 and the smoothing-planer 11 are mounted on sliding supports 12 and are adjustable backward and forward in the same manner and to the same degree by hand or other suitable mechanism in order at the will of the operator to regulate the thickness of the slice to be cut from the face of the deal as it passes through the guides. These planers are adapted to be removed bodily from their supports 12 and are so arranged that they may be removed very quickly and duplicates having knives already in position be slipped in position quickly and the machinery started again. The other side of the guide-slot 2 is formed of a single adjustable guide 13, running the whole length of the slot, adapted to be moved forward or backward by means of a pair of hand-levers 14, operating through links 15, and ratchet-pawls engaging with ratchet-wheels 17, the screws 16 engaging with nuts 18, mounted on said guide, as shown in Fig. 1. As stated above, the guide 13 is immovable except throughout its entire length and is only for the purpose of setting the deal forward as each slice is cut from said deal. A number of feed-rollers 5 are arranged in this guide, as shown in Fig. 1, provided with ridges for engaging the deal. These rollers serve to propel the deal forward in a direct line without variation at the required speed and with perfect regularity and are all driven from a driving-shaft 20, carrying worms engaging with the worm-wheels 21.

Though the above-mentioned side 13 of the guide-slot may be moved forward after each slice is cut from the deal, it will be obvious that in order to avoid wasting time in frequent adjustment of this guide a number of deals of equal thickness may be run through the machinery consecutively, whereby it will only be

necessary to reset this side of the guide-slot occasionally.

As shown in Fig. 9, at the inner or saw end of the guide 13 I arrange a frame 64, flush with the bearing-surface of said guide and adapted to move in grooves 65. When the width of the saw 3 has been decreased by sharpening, the frame 64 can be extended, so as to form a bearing for the back surface of the deal beyond the end of the guide 13. A block 66 is arranged to lock the frame to the guide 13 after it has been set in the position required.

As shown in Figs. 1 and 2, an opening 22 is formed in the framework of the machine at right angles to the above-mentioned guide-slot preferably of about six inches across, adapted to admit of the passage up and down of the frame 23, supporting a shaft 24, carrying a series of revolving cutters 25, adapted to form grooves 26 in the head of the deal, as shown in Fig. 6, for the purpose hereinafter described, so accurately distanced from each other that the slicing-saw 3 commences its cutting exactly in the bottom of each groove.

It is not absolutely necessary for my grooving mechanism to be operated by one and the same mechanism as the saw and planer; but I prefer it in one machine, because I find it to secure a greater accuracy of work if introduced in the position shown in Fig. 1. The cutter-head in its frame is arranged to disappear beneath the table after it has grooved a deal and to rise again when the next full-sized deal is passed through the machine. It is put into operation by the operator pressing upon the pedal 67, thereby operating, through the link 68, the clutch mechanism 69, thereby causing the revolution of the shaft 70, carrying the lower belt-pulley 36 of the cutter-head, by means of the driving-belt 71. As shown in Fig. 2, a belt is arranged between upper and lower pulleys 36, engaging with and revolving the pulley 75, and so rotating the cutter-head as it is moved across the guide-slot to groove the head of the deal, as aforementioned. Mechanism is provided whereby the deal stops automatically at the point where the cutter operates, and in about twenty seconds the whole series of grooves are cut. This mechanism is more particularly described with reference to Figs. 4, 5, 7, and 8. The deal on passing through the machine down the guide-slot comes against a heel 27, arranged to project from the side of the guide just in front of the space in which the said cutter-head works. The said heel is controlled by a spring 28, which is adapted to normally hold it in position beyond the side surface of the guide. When the aforementioned deal bears against it, it is pressed back into the position shown in dotted lines in Fig. 4, and thereby causing an arm 29, projecting therefrom, to engage with a heel 30 of a pivoted cam-arm 31. (Shown in Fig. 5.) Owing to the movement of the

aforementioned heel 27 the said cam-arm 31 is turned into the position shown in dotted lines in Fig. 5 and bears against a projection of a half-nut 32, shown in dotted lines, and causes said half-nut to engage with the screw 33. Said nut is controlled by a spring 34, adapted to hold it normally out of engagement with said screw 33. The screw 33 is rotated from a pulley 40, driven by gearing 41, receiving its motion from the driving-belt pulley 36 of said cutter-head frame, the latter pulley being driven from shafting mounted on the side of the machine. As soon as the half-nut 32 engages with the screw the cutter-head is moved up and rotated by the said belt 35, driven by the pulleys 36, and grooves the head of the deal, as aforementioned. When said cutter has crossed the head of the deal, its frame comes into engagement with a projection 37, (shown in dotted lines in Fig. 5,) adapted to operate the cam-arm 31, so as to bring it out of engagement with the projection of the half-nut 32, thereby allowing said half-nut to spring back under the influence of its spring 34 and out of engagement with the screw 33, and so letting the cutter-head, with its frame, fall back by gravity to its position under the table. It will be obvious that the deal, as above mentioned, must be stopped from moving at the moment when the cutter-head is about to move across the head of the deal, and in order to do this the arm 29 of the heel 27 is arranged at the moment of operating the cam-arm 31 to bear upon the pivoted lever-arm 42, controlled by a spring 43, (shown in Figs. 3 and 7,) and to press this arm down until it releases an arm 44, which is engaging with it, and allows the latter arm to spring back under the influence of the spring 45, and so disengage the clutch 46, coupling the feed-roller driving-shaft 20 with the main driving-shaft, thereby stopping the rotation of the feed-rollers. (See Figs. 1 and 8.) As soon as the head of the deal has been grooved the clutch mechanism 46 is recoupled by the operator pulling on the handle 47 of the arm 44, thereby starting the rotation of the feed-rollers and continuing the feed of the deal through the machine. It will be obvious that it is only necessary to groove the head of the deal once. I therefore arrange that after a slice has been cut from the deal the guide 13 is moved forward over the heel 27, so that the latter cannot be engaged again until the said guide is moved back to allow another uncut deal to be passed through the machine. A cord 72, as shown in Figs. 1, 3, and 7, is attached to the lever-arm 42 and passes over a pulley 73 to the front of the machine. In order to bring the lever-arm 42 out of engagement with the arm 44 to stop the rotation of the shaft 20 and the feed-rollers 5, the operator pulls on the handle 74 of said cord 72. The deal is fed forward, after having been grooved, to the saw-blade,

which is preferably a thin blade with teeth having practically no set in them and runs in guides of friction metal at the sides. I prefer to arrange an upper and lower set of guides as close to the deal as possible in order to leave as little room as possible for the vibration of the portion of the saw between the top guide and the last point of support the blade derives from the upper wheel. It is of course obvious that a saw with such a very light set in it must have eliminated as far as possible the risks attending its operation which come from the possible pinching of the back edge of the saw by a twisting grain as the slice is cut off the deal, and in order to do this I arrange immediately behind the saw an adjustable spreader 48, having a rounded front edge slightly thicker than the edge of the saw and tapering backward, the deal side of it being perfectly in line with the deal and the opposite side being concave from back to front and gradually increasing in thickness until it separates the slice being cut off from the body of the deal by a space sufficient to get in a friction-roller 49, which roller is followed by a guide 50, terminating in a straight guide having mounted on one side feed-rollers 51 and on the other side frictional rollers, and a smoothing-planer 52, adapted to smooth off the saw-marks from the back of the slice. These feed and friction rollers and guide 50 are so arranged as to hold the said slice steadily in an upright position as it comes off the deal. (See Figs. 1 and 2.)

It will be obvious that the above-mentioned adjustable spreader 48 could not enter the cut of a thin saw-blade without the deal being prepared for it beforehand, and in order that this may be insured I arrange the aforementioned mechanism for grooving the head of each deal before a slice is sliced therefrom.

All the above-described mechanism is driven from a main driving-shaft 54 by means of pulleys 55 and belting 56, as will be obvious from Fig. 1.

The operation of my machine is as follows: The deal is inserted at the end of the guide-slot 2 on its edge and is fed forward through said slot by means of the feed-rollers 5. When the face of the deal comes against the evening-planers 6, the latter takes off the outer surface of the deal and cuts it down to one thickness, the deal meanwhile moving on through the guide-slot past the smoothing-planer, which removes the coarser marks of the evening-planer, until it comes to a full stop just in front of the grooving-cutters. As above described, the grooving-cutters pass across its head and groove it, as shown in Fig. 6. The said cutters then fall by gravity below the lower surface of the guide-slot, while the machinery is put in motion again by the operator, and the deal is passed forward until it is brought against the band-saw 3, which

cuts a slice from it, which passes as it comes off the deal through the guide 50 and is smoothed on its inner side by means of the smoothing-planer 52, the deal meanwhile
 5 passing down the machine along the guide 56 and may be run down the guide-slot again in order to have another slice cut therefrom.

What I claim is—

1. In a machine for sawing thin slices from
 10 deals or planks and planing said slices on both sides, a bed-plate, a guide in the form of a slot with adjustable sides mounted on said bed-plate, means for evening and smoothing the
 15 slicing-face of the deal arranged on one side of said adjustable guide, means for feeding the deal forward through the machine arranged on the other side of said guide, a cross-
 20 slot arranged in said bed-plate at right angles to said guide, means for grooving the head of the deal adapted to move in said cross-slot, a saw adapted to slice said deal arranged at the
 25 head of said guide-slot, means for separating the slice from the deal as it is cut by said saw, an adjustable guide adapted to receive said slice as it is separated from said deal,
 means for smoothing the back face of said slice and means for feeding said slice forward mounted in said slice-guide, substantially as described.

30 2. In a machine for sawing thin slices from deals or planks and planing said slices on both sides a bed-plate, a guide in the form of a slot with adjustable sides mounted on said bed-
 35 plate the side of said guide against which the working face of the deal bears formed in two adjustable sections, an evening-planer and friction-rollers mounted in the first of said
 40 sections, a smoothing-planer and friction-rollers mounted in the second of said sections, means for operating said evening and smoothing planes, the other side of said guide formed as a single adjustable guide, an adjustable
 45 frame mounted on the end of said single guide adapted to form a bearing for the back of the deal behind the saw, means for moving said single guide inward or outward according to the thickness of said deal, feeding-rollers
 50 mounted in said single guide adapted to feed said deal forward through the machine, means for operating said feeding-rollers, a cross-slot arranged in said bed-plate at right angles to
 55 said guide-slot, means for grooving the head of the deal adapted to move in said cross-slot, a saw adapted to slice said deal arranged in the head of said guide-slot, means for separating the slice from the deal as it is cut by
 60 said saw, an adjustable guide adapted to receive said slice as it is separated from the deal, means for smoothing the back face of said slice and means for feeding the slice forward through said slice-guide substantially as described.

3. In a machine for sawing thin slices from
 65 deals or planks and planing said slices on both sides a bed-plate, a guide in the form of a slot

with adjustable sides mounted on said bed-plate, means for evening and smoothing the slicing-face of the deal arranged on one side of said adjustable guide, feeding-rollers adapted to feed the deal forward through the machine arranged on the other side of said guide, a cross-slot arranged in said bed-plate at right angles to said guide-slot, a cutter-head adapted to move in said cross-slot to groove the head of said deal, a heel projecting into the slot adapted to be engaged by an uncut deal and caused to operate lever mechanism to release a spring-controlled clutch and stop the rotation of said feeding-rollers and to cause a nut to engage a screw to carry said cutter-head up said cross-slot, automatic means to disengage said nut from said screw when said cutter-head is at the end of its stroke, a saw adapted to slice said deal arranged at the head of said guide-slot, means for separating the slice from the deal as it is cut by said saw, an adjustable guide adapted to receive said slice as it is separated from said deal, means for smoothing the back face of said slice mounted on the guide and means for feeding the slice forward through said guide, substantially as described.

4. In a machine for sawing thin slices from deals or planks and planing said slices on both sides, a bed-plate, a guide in the form of a slot with adjustable sides mounted on said bed-plate, means for evening and smoothing the slicing-face of the deal arranged on one side of said adjustable guide-slot, means for feeding the deal forward through the machine arranged on the other side of said guide-slot, a cross-slot arranged in said bed-plate at right angles to said guide-slot, means for grooving the head of said deal moving in said cross-slot, a band-saw adapted to slice said deal arranged at the head of said guide-slot, an adjustable spreader arranged behind said saw adapted to separate the slice from the deal as it is cut by said saw, an adjustable guide adapted to receive said slice as it is separated from the deal by said spreader, means for smoothing the back face of said slice and means for feeding the slice forward through the said slice-guide, substantially as described.

5. In a machine for sawing thin slices from deals or planks and planing said slices on both sides, a bed-plate, a guide in the form of a slot with adjustable sides mounted on said bed-plate, means for evening and smoothing the slicing-face of the deal arranged on one side of said adjustable guide, means for feeding the deal forward through the machine arranged on the other side of said guide, a cross-slot arranged in said bed-plate at right angles to said guide-slot, means for grooving the head of the deal adapted to move in said cross-slot, a band-saw adapted to slice said deal arranged at the head of said guide-slot, an adjustable spreader arranged behind said saw adapted to separate the slice from the deal as

it is cut by said saw, an adjustable guide adapted to receive the slice as it is separated from the deal by said spreader, smoothing-planes adapted to smooth the back face of said slice
5 mounted on the side of said slice-guide against which the back face of the slice bears, feeding-rollers adapted to move said slice forward through said slice-guide arranged on the other side of said guide, and means for operating

said smoothing-planes and feeding-rollers, 10 substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE SKAATS MAYHEW.

Witnesses:

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LEONARD E. HAYNES.