

No. 762,312.

PATENTED JUNE 14, 1904.

B. G. JAYNE.
STAVE JOINTING AND SHAPING MACHINE.

APPLICATION FILED JAN. 22, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

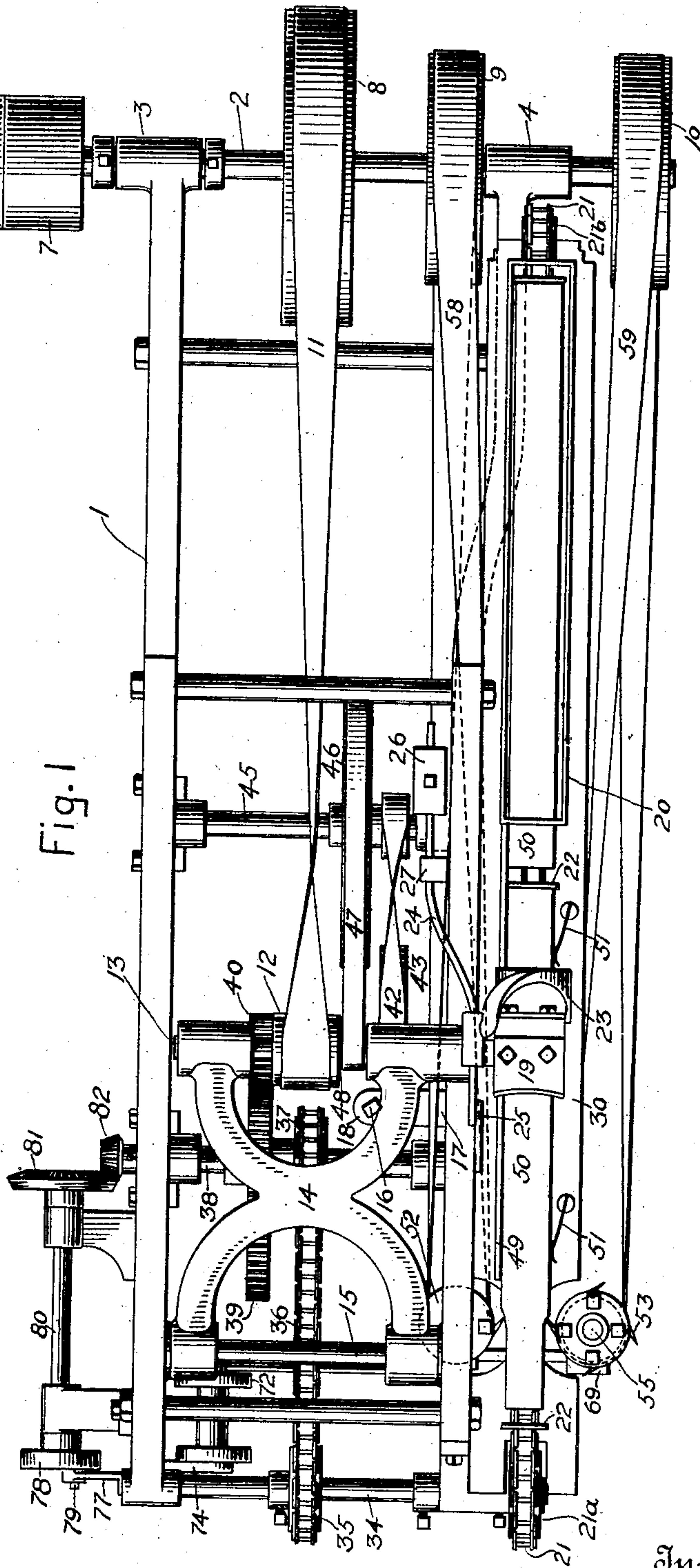


Fig. 1

Witnesses

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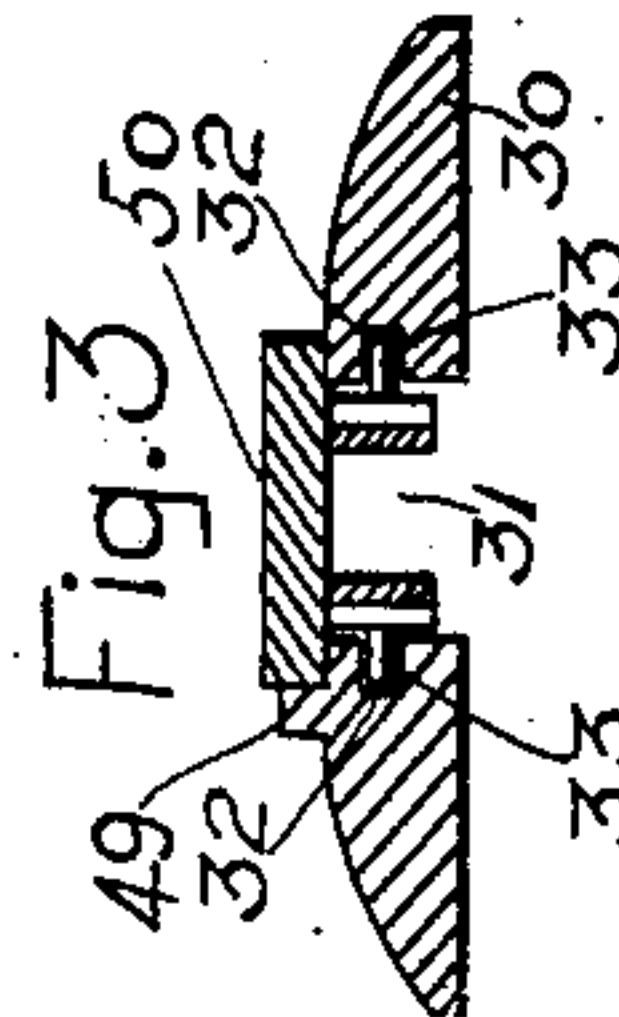
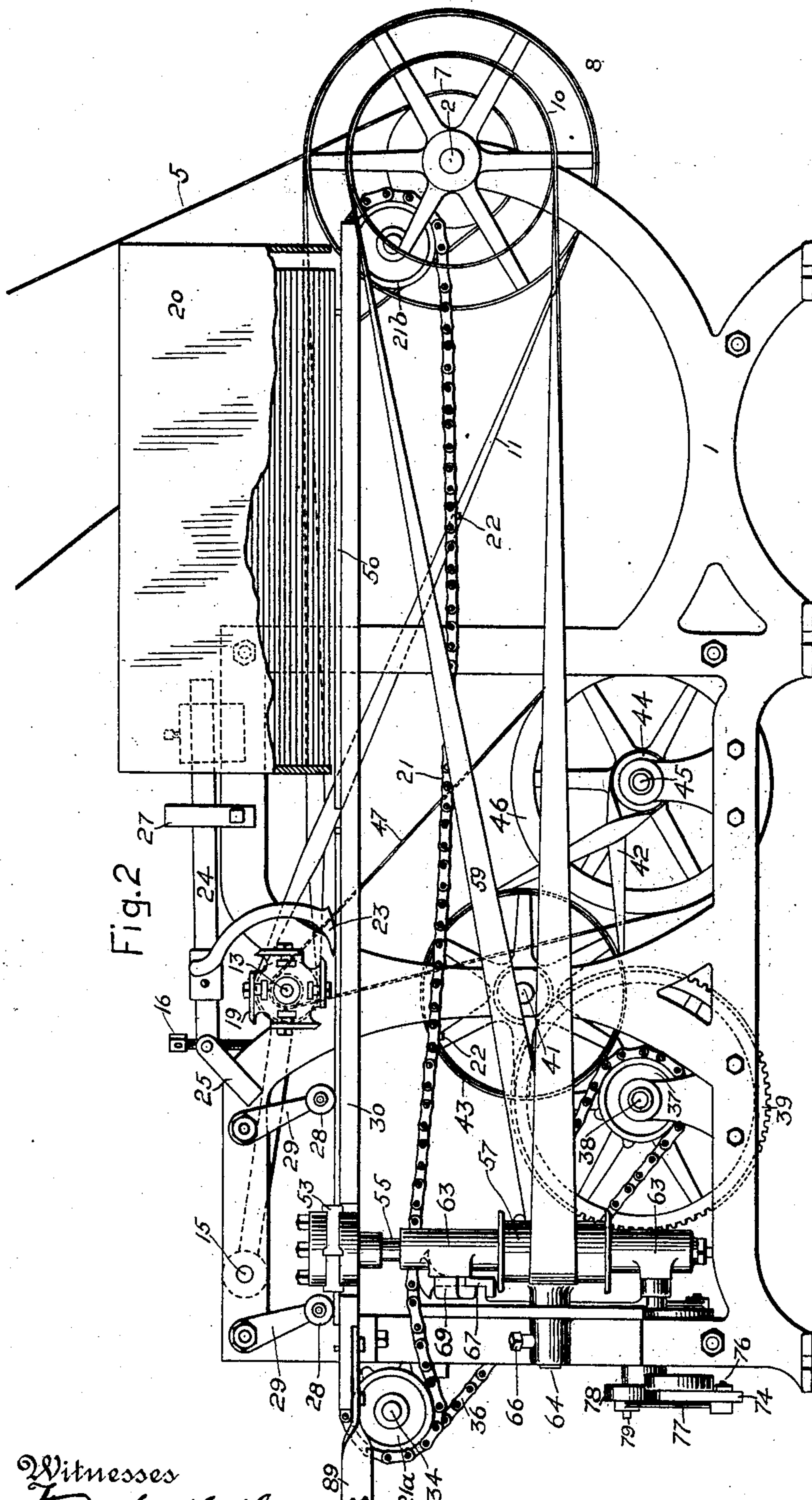
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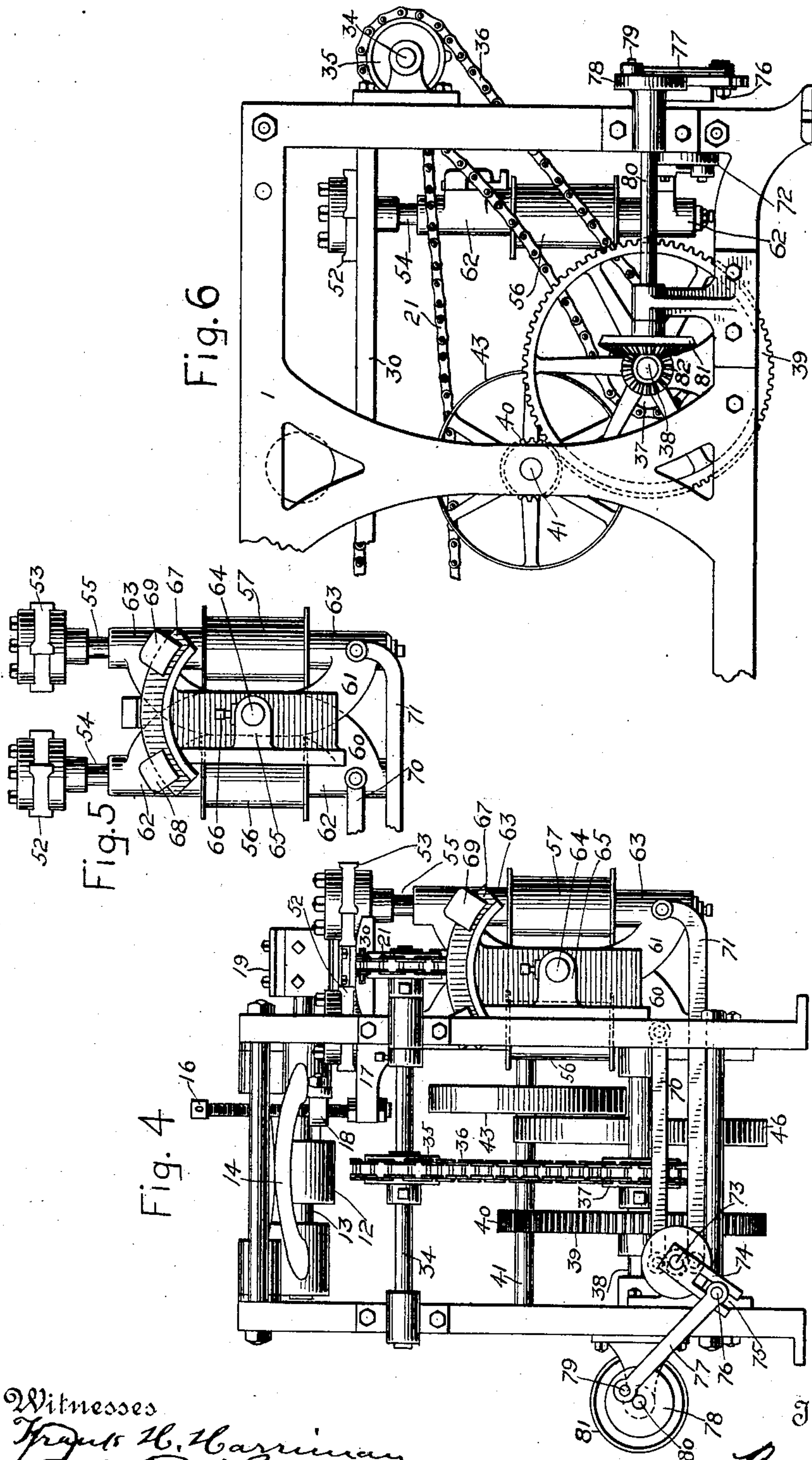
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4 SHEETS—SHEET 3.



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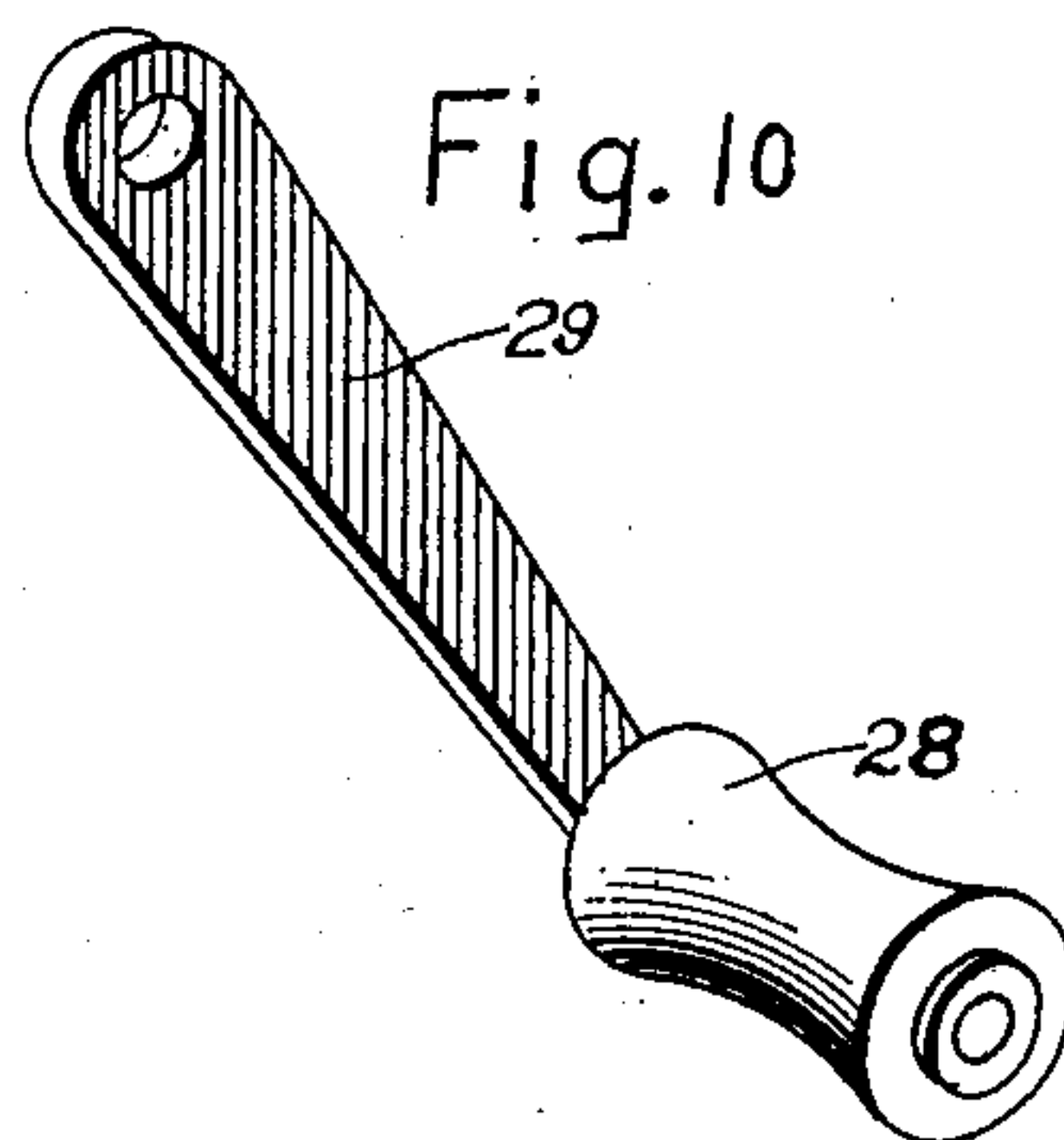
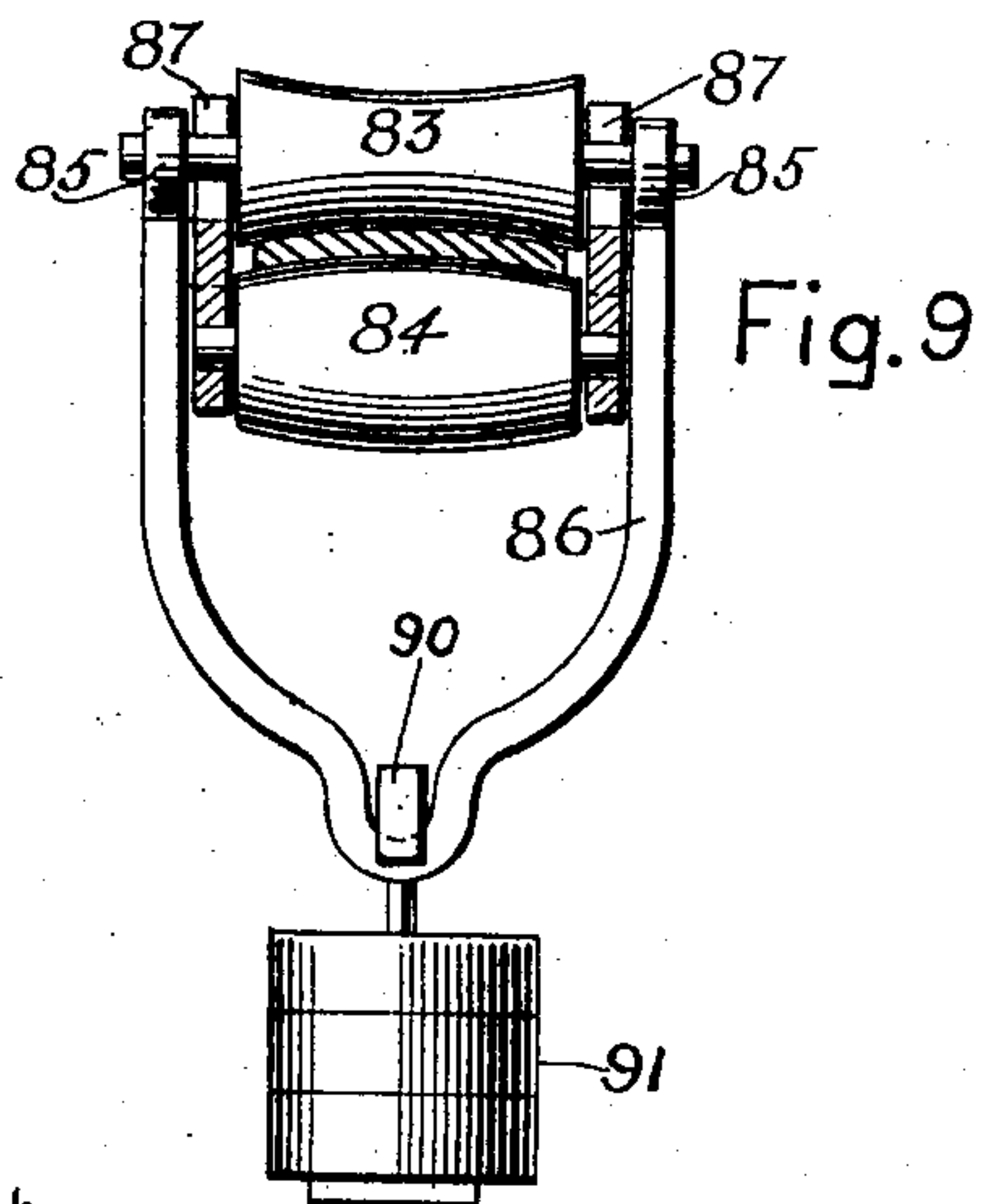
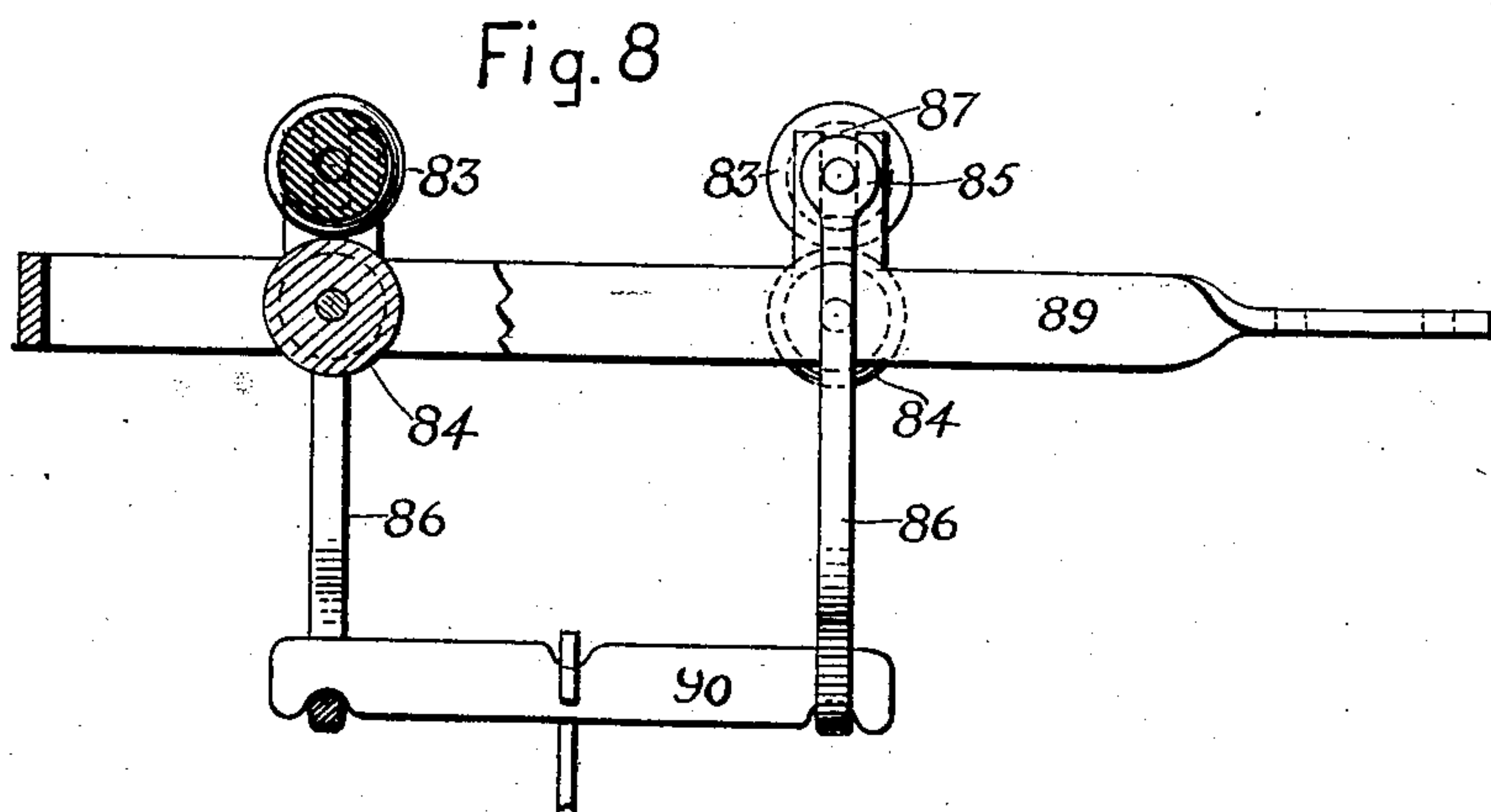
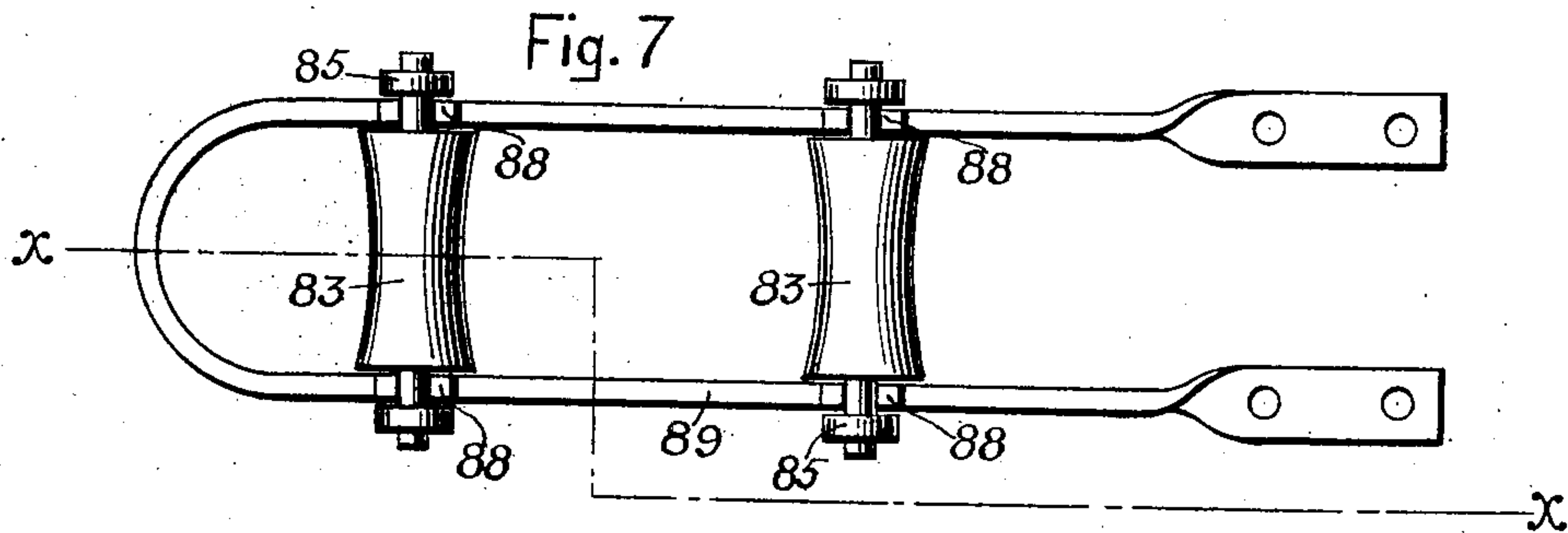
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4 SHEETS—SHEET 4.



Witnesses

John P. Craighead

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UNITED STATES PATENT OFFICE.

BENAIHAH GUSTIN JAYNE, OF NEW YORK, N. Y.

STAVE JOINTING AND SHAPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 762,312, dated June 14, 1904.

Application filed January 22, 1903. Serial No. 140,160. (No model.)

To all whom it may concern:

Be it known that I, BENAIHAH GUSTIN JAYNE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Stave Jointing and Shaping Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to stave jointing and shaping machines, and has for its object the production of a machine possessing elements of special form and arrangement and belonging to that class of apparatus designed for the purpose of fashioning the surface and edges of barrel-staves by means of suitably driven and adjustable cutters and their supports. From such machines and for a given adjustment each stave turned out is in all respects identical with its fellows, thus insuring a true fit of all the meeting edges when the staves are assembled into a complete barrel.

In my invention the elements of special forms and arrangement include the driving-pulleys, gearing and connections, the support and means of adjustment for the surface-cutter, the devices for holding the staves in place upon the conveyer, and the parts concerned in the pivotal support and rocking operation of the edge-cutters. Those special elements and their particular arrangement are illustrated in the accompanying drawings, of which—

Figure 1 is a top plan view of the entire machine excepting the U-frame and gravity-rollers. Fig. 2 represents a side view, the hopper or stave blank feed-box being partly in section. Fig. 3 is a cross-section of the conveyer-chain and stave-bed detached. Fig. 4 is an end view from the left of the machine as shown in the first two figures. Fig. 5 is a detached detail front view of the vertical shafts holding the edge-cutters, showing the rocking supports and bearings for those shafts and means for guiding the rocking

parts. Fig. 6 is a side view of a portion of the machine near the end illustrated in the fourth figure and from the opposite side to that shown in the second figure. Figs. 7, 8, and 9 are respectively plan views, side and cross-sectional views of the U-bracket secured to the left-hand end of the frame and of the gravity grip-rollers arranged to take the finished stave from the cutters and chain. Fig. 10 is a perspective view of one of several like pivoted arms and rollers which rest upon and help to keep the stave in position on the carrier-chain.

Like numbers refer to like parts in all the views.

The frame of the machine is marked 1 and may be of any suitable form and weight. At one end the transverse shaft 2 is revoluble in bearings 3 and 4. A driving-belt 5 serves power to the band-pulleys 6 and 7, one of which is loose on the shaft in order that the machine may be stopped by shifting the belt in the ordinary manner. On shaft 2 three other pulleys 8, 9, and 10 are fixed. (Best shown in Fig. 1.) From the pulley 8 a belt 11 rotates pulley 12, proportioned for a desired speed of rotation and fixed on the independent cross-shaft 13, journaled in the X-frame 14, which is pivotally movable on the stationary shaft 15, upheld in the frame 1 of the machine. As best shown in Fig. 4, a screw 16, having a smooth end rotatively held at the end of a bracket 17, engages a threaded block 18, secured to a leg of the X-frame, (see also Fig. 2,) and the office of the screw is to raise and lower the X-frame with independent shaft 13 and stave-surface cutter 19, borne by the end of the shaft. This surface-cutter is curved in accordance with the greatest circle of the barrel and gives approximately the proper exterior curvature to the surface of the stave from end to end. To this cutter staves are served from a box 20, wherein they are placed in the rough one upon another by the conveyer-chain 21, having lugs 22 projecting at intervals and of such extent as to make contact with the end of the underlying stave in the box and push it forward. Another stave takes the place of that removed, and the next following lug 22 pushes it for-

ward from beneath the pile in the usual way. As the end of the stave advances it passes under the presser-foot 23, adjustably secured to an arm 24, pivoted to an upwardly-extended bracket 25, attached to frame 1. A weight 26, sliding on the arm, varies the pressure desired to be exerted by foot 23. It is usual in practice to prevent lateral vibration of arm 24 by means of a restraining-guide 27, attached to the top of frame 1 and through which the arm 24 is inserted. After the stave leaves the surface-cutter it is downwardly pressed by the roller-weights 28, rotatively held at the end of arms 29, pivotally connected with frame 1. There may be any number of roller-weights 28. The normal position of the arms 29 is inclined in the direction of the approaching stave, as illustrated in Fig. 2. The staves travel a bed 30, ordinarily curved, (see Fig. 3,) impelled by the conveyer-chain, and the walls of the longitudinal slot 31 of the bed are provided with recesses 32 lengthwise, and these recesses engage laterally-projecting pins 33 on each side of the conveyer-chain, which is thus held up to the level of the bed as long as a stave is carried.

Conveyer-chain 21 is driven immediately by transverse shaft 34 at the end of frame 1, opposite to the location of shaft 2 and the belt-pulleys mentioned. Shaft 34 is turned by sprocket-wheel 35 and chain 36 from sprocket-wheel 37 on cross-shaft 38, which in its turn is rotated by gear 39, meshing with pinion 40 on cross-shaft 41. Shaft 41 is driven by belt 42 on pulley 43, fixed on that shaft, the belt leading to pulley 44 on counter-shaft 45, which shaft also carries the pulley 46, and the belt 47 leads therefrom to pulley 48 on independent shaft 13 in the X-frame already described and from which all the mechanism set out hereinabove receives its power. The conveyer-chain sprocket-wheels are marked 21^a 21^b.

In Figs. 1 and 3 it will be noted that near the inner side of slot 31 the stave-bed is slightly raised into a flange 49, running lengthwise, and that one edge of the stave-blank 50 lies against this guiding-flange, while spring-fingers 51 press against the opposite edge of the stave-blank, which is in this manner yieldingly and movably held against displacement sidewise.

I do not limit myself to a stave-surface cutter curved to fashion the outside of staves convexly, and it is believed to be but an obvious modification of my invention to provide cutters to hollow the inside of staves and correspondingly-formed roller-weights to direct their movement.

To finish the edges of staves, the edge-cutters 52 and 53 are employed. (See Fig. 5 particularly.) Those cutters are fixed on the upper extremities of twin vertical shafts 54 and 55, and each shaft has a flanged band-pulley. These pulleys are marked 56 and 57,

and belts 58 and 59 from pulleys 9 and 10 on shaft 2 drive them. Vertical shafts 54 and 55 are held in bearings at the ends of C-shaped rocking hangers 60 and 61. Bearings for shaft 54 are referred to by number 62 and those for shaft 55 by number 63. The two hangers are pivotally supported at their middle points on a stationary shaft 64, held in a bracket 65 (see Fig. 4) by a set-screw 66. In order that they may move truly in the same vertical plane, a guiding-arc 67 is provided, and grooved blocks 68 and 69, attached to the upper portions of the hangers or shaft-supports 60 and 61, engage the arc-shaped rim of the guide. The shafts and related parts are rocked in unison, but in opposite directions, by pitman-rods 70 and 71, pivotally connected with the lower portions of the hangers and with rocking disk 72 on fixed shaft 73. (See Figs. 1 and 6.) The disk is rocked by the attached crank 74, which has a slot 75 running lengthwise of it. In the slot an adjustable crank-pin 76 is clamped. It may be clamped nearer or farther from the center of the rocking disk, and thus give less or more swing to the shaft-hangers 60 and 61, according as the width of the middle of a stave differs from that of its ends. Engaging crank-pin 76 is the pitman 77, having its remaining extremity pivotally secured to rotating disk 78 by means of pintle 79. Disk 78 turns on the end of longitudinal shaft 80, suitably journaled and driven by bevel-gear 81, meshing with bevel-gear 82, fixed upon the outer end of cross-shaft 38, already mentioned. It will now be noted that while the cutters are belt-driven at speeds set for them as best the serving of the staves by the chain conveyer and the rocking or opening and closing movements of the edge-cutter shafts with respect to each other are gear-driven positively and in unvarying relation to one another. Thus the edge-cutters are nearest each other as the edging of each stave-blank begins, and they recede and close again during the passage of the blank between them.

After leaving the edge-cutters and the roller-weight pivoted arms 29 the staves pass between gravity grip-rollers 83 and 84. The spindle of rollers 83 is held in the end eyes 85 of yokes 86, and the spindle also passes through recesses 87 in the top of standards 88, erected on the upper edges of the U-shaped bracket 89, which is secured to the end of frame 1. (See Fig. 2.) The spindles of rollers 84, the lower rollers of each pair, are journaled in the sides of the bracket 89. I customarily employ two yokes 86 and two pairs of rollers. The yokes are coupled and spaced apart by the notched coupling-bar 90, and from the middle of the bar a weight 91 of any amount is suspended. It is clear that the weight draws the upper rollers of each pair down upon a stave passing between them, and the stave is delivered beyond the end of the

machine, being forced along by a stave behind it that is itself pushed by the stave-blank for the moment on the conveyer-chain and in contact with one of lugs 22. The completed
 5 staves either fall from or are taken by hand as they leave the gravity-grip pairs of rollers. Rollers 83 84 and appurtenances appear in Figs. 7, 8, 9.

I am aware that stave jointing and shaping
 10 machines have been constructed having chain conveyers and rocking edge-cutters, and I do not claim those features broadly.

What I claim, and desire to secure by Letters Patent of the United States, is—

15 1. In a stave jointing and shaping machine, the combination of a slotted bed, a chain conveyer traveling the slot in said bed, a main driving-shaft, a surface-cutter and surface-cutter shaft, a pivoted frame provided with
 20 bearings for the surface-cutter shaft, adjusting devices whereby the pivoted frame is raised or lowered with relation to the bed, pulleys and belting adapted to transmit power from the main driving-shaft to said surface-
 25 cutter shaft, edge-cutters and edge-cutter shafts, rocking supports for said edge-cutter shafts, mechanism constructed to swing said rocking supports thereby moving the edge-cutters toward and from said chain, and
 30 power-transmitting contrivances actuated by rotation of said surface-cutter shaft and arranged to draw said chain a predetermined distance during each rocking movement of the
 35 edge-cutter shaft's supports.

2. In a stave jointing and shaping machine, the combination of stave-blank-feeding devices, a surface-cutter and surface-cutter shaft, a pivoted frame provided with bearings
 40 for said surface-cutter shaft, adjusting means to raise and lower the said pivoted frame, edge-cutters and edge-cutter shafts, rocking supports for said edge-cutter shafts, mechanism constructed and arranged to swing said
 45 rocking supports thereby moving the edge-cutters toward and from each other, power-transmitting contrivances actuated by rotation of said surface-cutter shaft and arranged to drive the said mechanism and adapted to
 50 operate said blank-feeding devices to a predetermined extent during each rocking movement of said edge-cutter shaft's supports, and suitable driving connections for said surface-cutter shaft.

55 3. In a stave jointing and shaping machine, the combination with a slotted bed, of a chain conveyer traveling the slot and provided with means for engaging a stave-blank and compelling it to move with the chain, a main driving-shaft, a surface-cutter and surface-cutter shaft, a pivoted frame having bearings for
 60 said surface-cutter shaft, means for adjusting said frame toward or from the bed, pulleys and belting connecting the surface-cutter shaft and driving-shaft, edge-cutters and edge-

cutter shafts, rocking supports for said edge-cutter shafts, means for driving said edge-cutter shafts from the driving-shaft, mechanism constructed and arranged to swing said
 70 rocking supports thereby moving the edge-cutters toward or from the chain and to draw the chain a predetermined distance during each rocking movement of the supports, means whereby power is transmitted from the
 75 said surface-cutter shaft to said mechanism, a pivoted lever, a weight adjustable on the lever, a presser-foot attached to the lever and arranged to press upon a stave-blank, a flange formed on said bed to guide the blanks, and
 80 means adapted to hold a moving stave-blank against said guiding-flange.

4. In a stave jointing and shaping machine, the combination with a bed, of stave-blank-feeding devices, a surface-cutter and surface-cutter shaft, a pivoted frame having bearings
 85 for said surface-cutter shaft, adjusting means acting upon the said frame thereby moving the surface-cutter toward or from the bed, edge-cutting means for forming the bilge of the staves and mechanism constructed to actuate the edge-cutting means regularly in accordance with the movement of said blank-feeding devices, power-transmitting contrivances actuated by rotation of said surface-cutter shaft and arranged to drive the said
 90 mechanism and adapted to operate said blank-feeding devices to a predetermined extent during each movement of said edge-cutting means, and suitable driving connections for said surface-cutter shaft.
 100

5. In a stave jointing and shaping machine, the combination with a bed, of stave-blank-feeding devices, a surface-cutter and surface-cutter shaft, a pivoted frame having bearings
 105 for said surface-cutter shaft, adjusting means acting upon said frame thereby moving the surface-cutter toward or from said bed, a main driving-shaft, pulleys and belting connecting said driving-shaft and surface-cutter shaft and arranged to allow the said adjustment of said
 110 pivoted frame, edge-cutters located on each side of the bed and mechanism constructed to move the edge-cutters bodily toward and from said bed, said mechanism including as a part thereof adjusting devices whereby said bodily
 115 movement of the edge-cutters can be amplified or diminished, and power-transmitting contrivances actuated by rotation of said surface-cutter shaft and arranged to drive said mechanism and adapted to operate said blank-feeding devices proportionately to the said
 120 bodily movement of the edge-cutters.

6. In a stave jointing and shaping machine, the combination with stave-blank-feeding devices, of edge-cutters and edge-cutter shafts,
 125 rocking supports for the said shafts, an arc-shaped guide, grooved blocks attached to the said rocking supports, the grooves in said blocks engaging the arc-shaped guide whereby the cutter-shafts and supports are con-
 130

strained to rock in the same plane, a rocking
disk, pitman-rods pivotally connected with
said rocking supports and with points on op-
posite sides of the center of said rocking disk,
5 a crank secured upon the same shaft with the
rocking disk and having a recess extending
lengthwise, a crank-pin adjustable in said
crank-recess toward or from the center, a rev-
oluble shaft and crank-disk thereon, a con-
10 necting-rod pivotally attached to said crank-
disk and to said adjustable crank-pin whereby
the movement of said rocking supports may
be amplified or diminished, mechanism con-

structed to turn said revoluble shaft, and
power-transmitting contrivances arranged to 15
drive the said mechanism and adapted to op-
erate said blank-feeding devices in regular
proportion to the movement of said edge-
cutters.

In testimony whereof I affix my signature in 20
presence of two witnesses.

BENAI AH GUSTIN JAYNE.

Witnesses:

SAMUEL GOLDSMITH,
JOHN P. CRAIGHEAD.