W. H. COLLIER.

VENEER CUTTING MACHINE.

APPLICATION FILED JAN. 29, 1921.

1,438,810.

Patented Dec. 12, 1922.

5 SHEETS—SHEET 1.

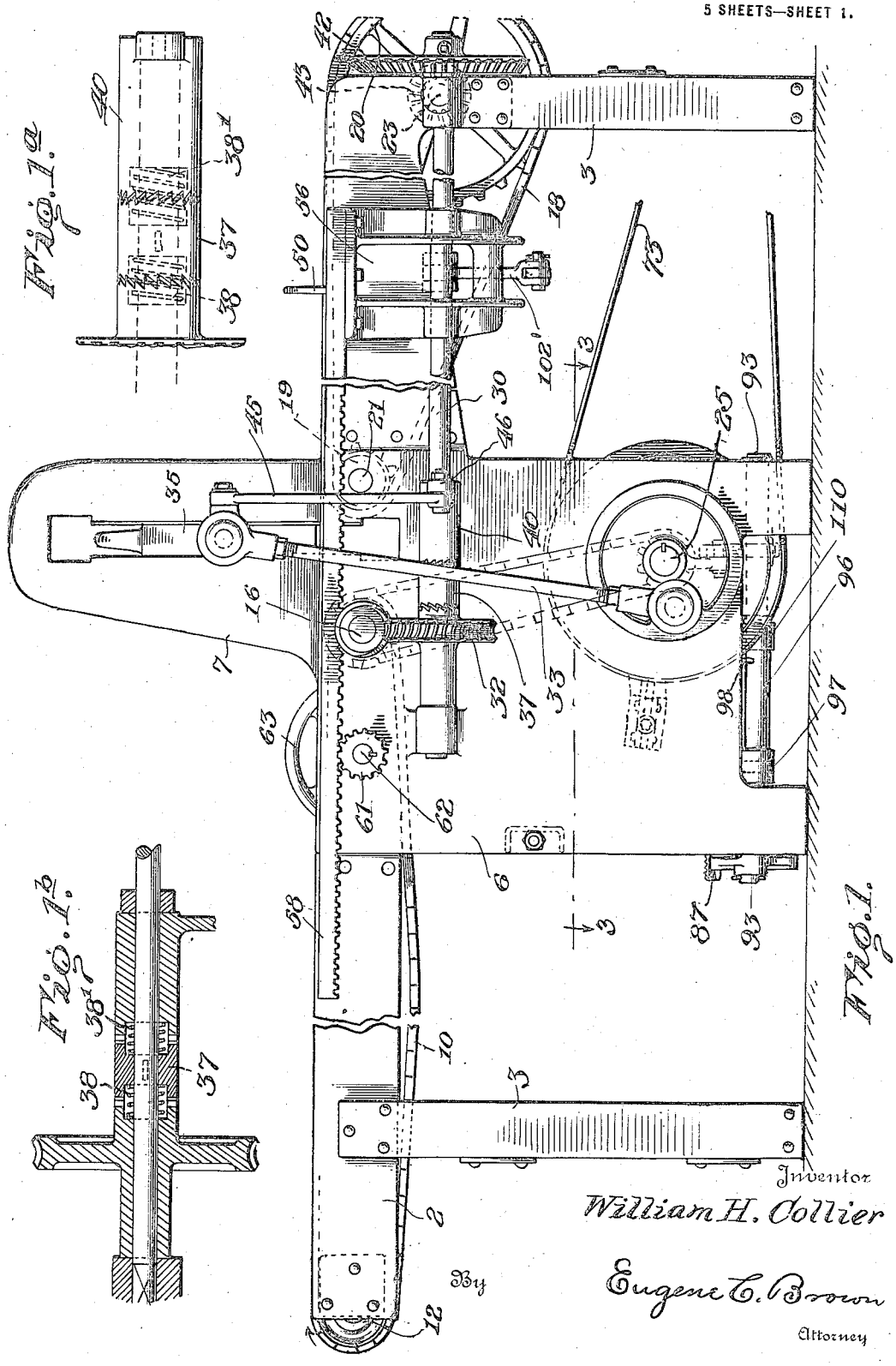


Fig. 1a.

Fig. 1b.

Fig. 1.

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5 SHEETS—SHEET 2.

Fig. 2.

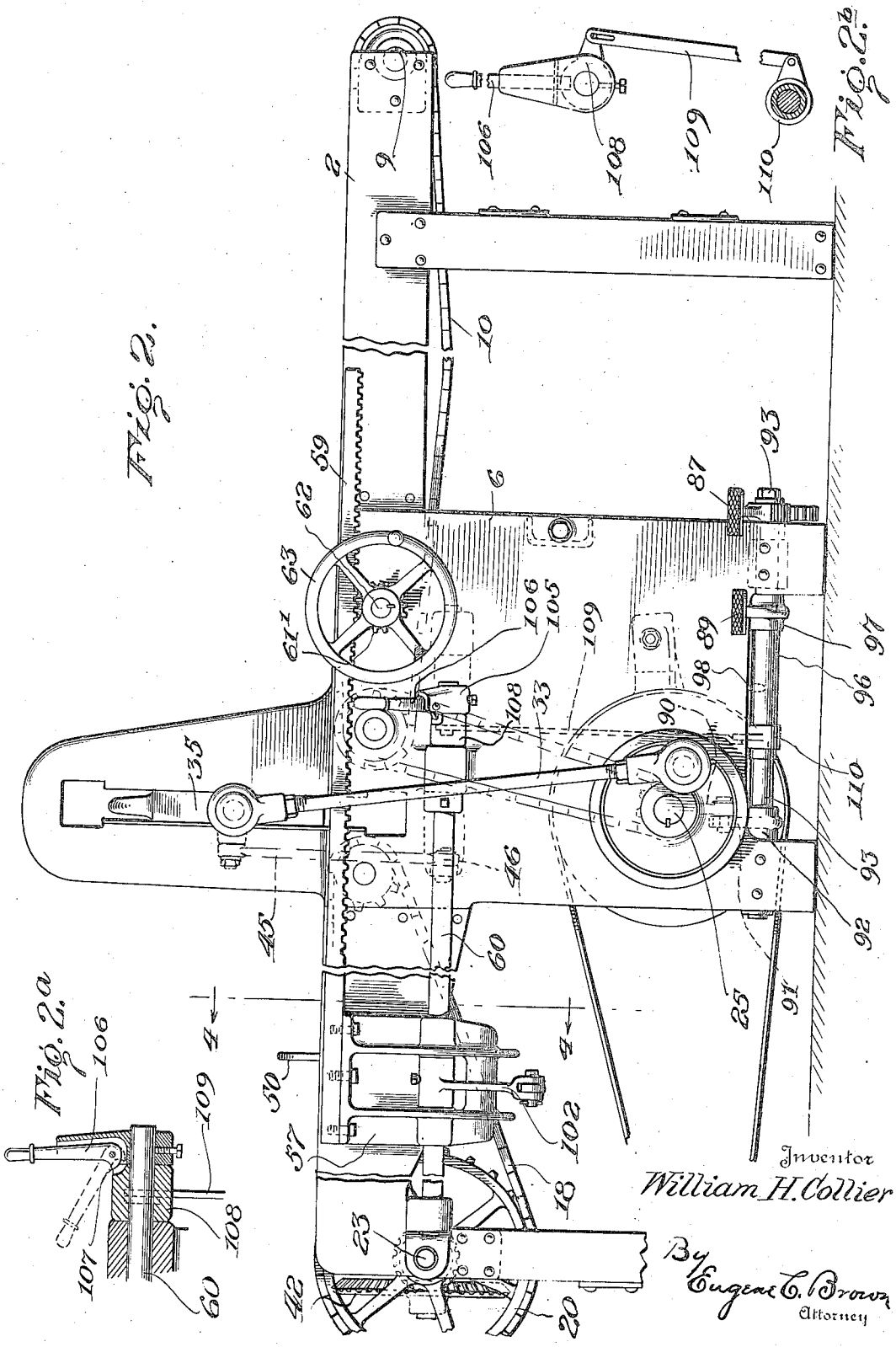


Fig. 2a.

Fig. 2b.

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5 SHEETS—SHEET 3.

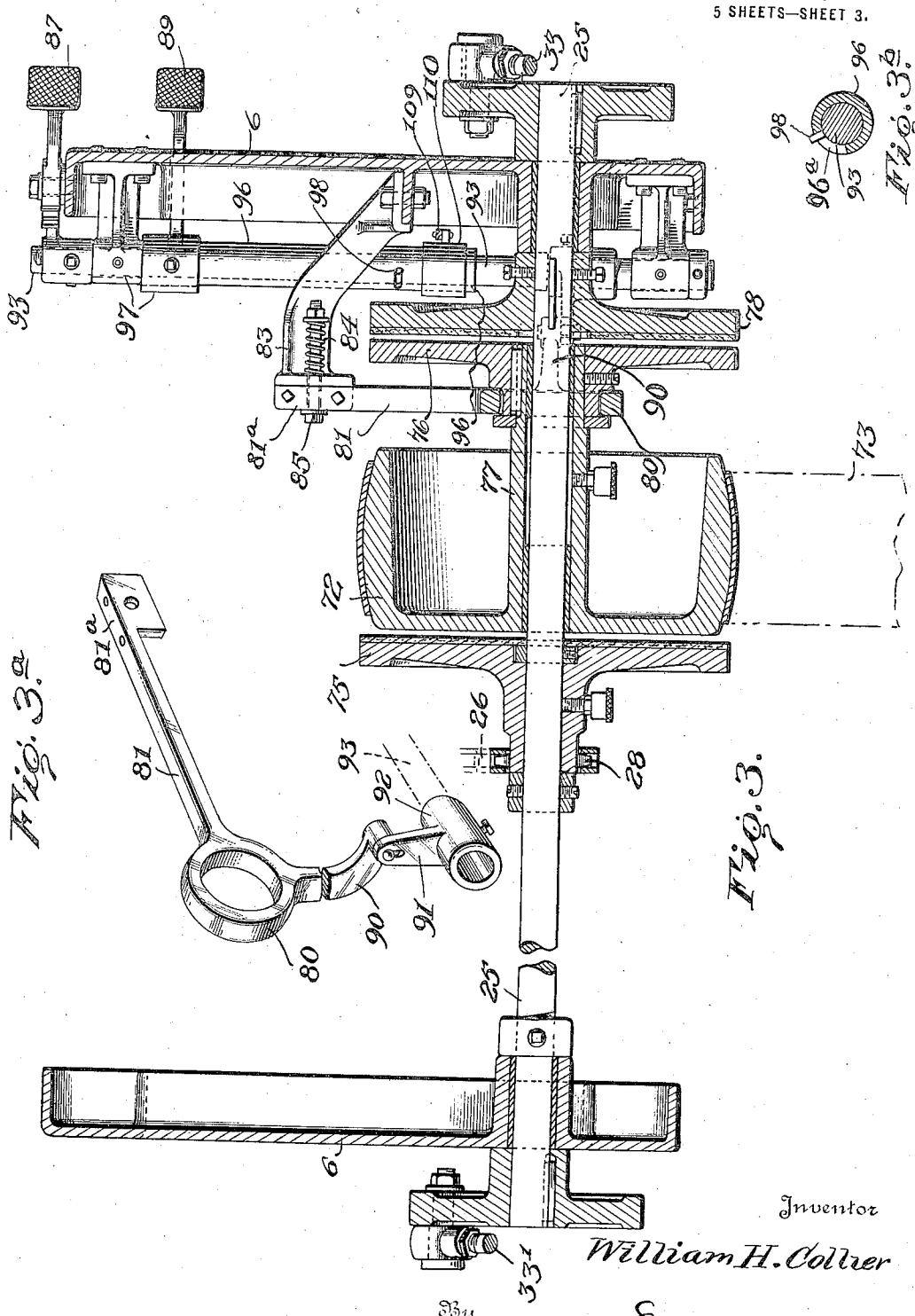


Fig. 3a.

Fig. 3.

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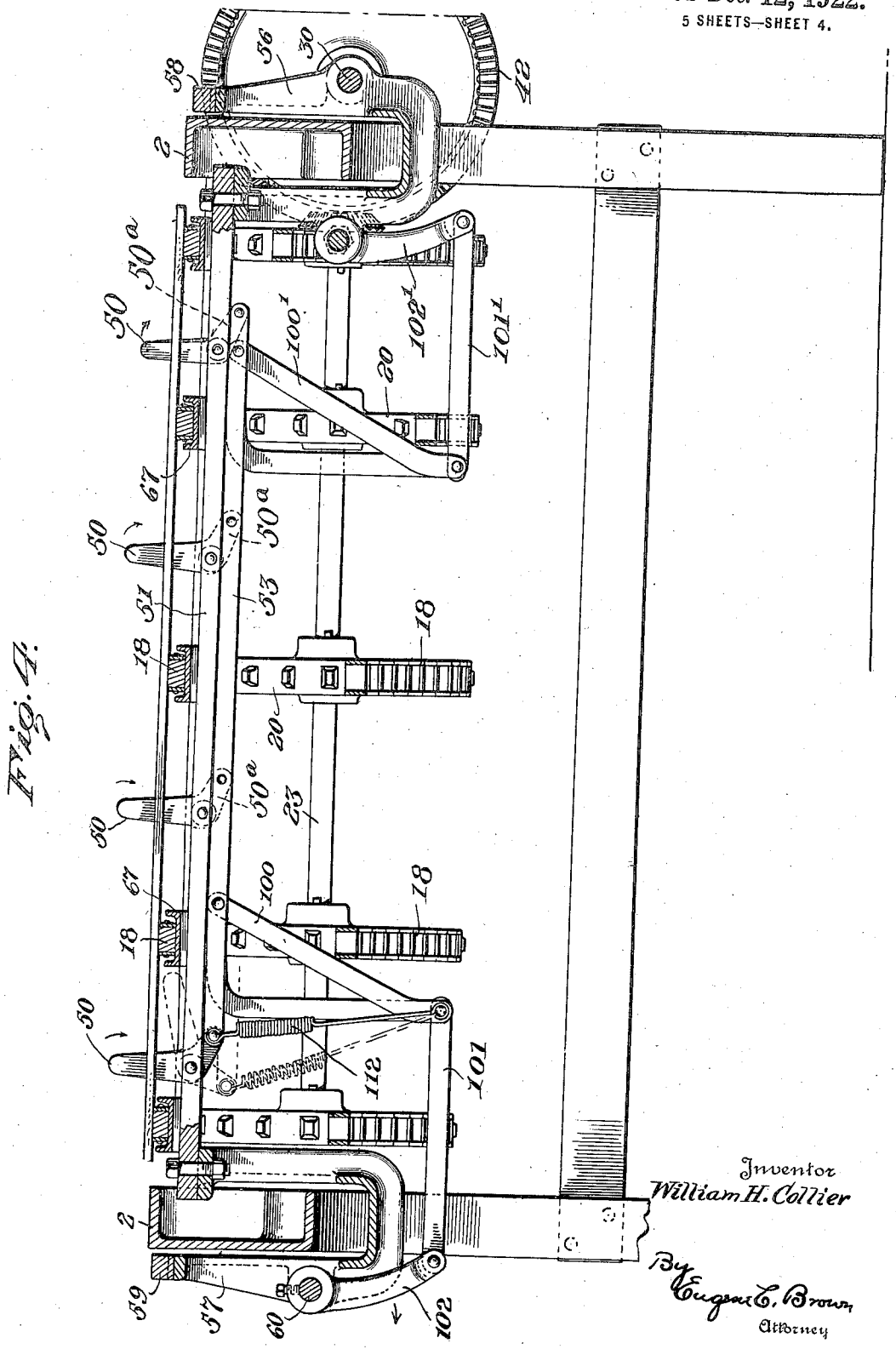
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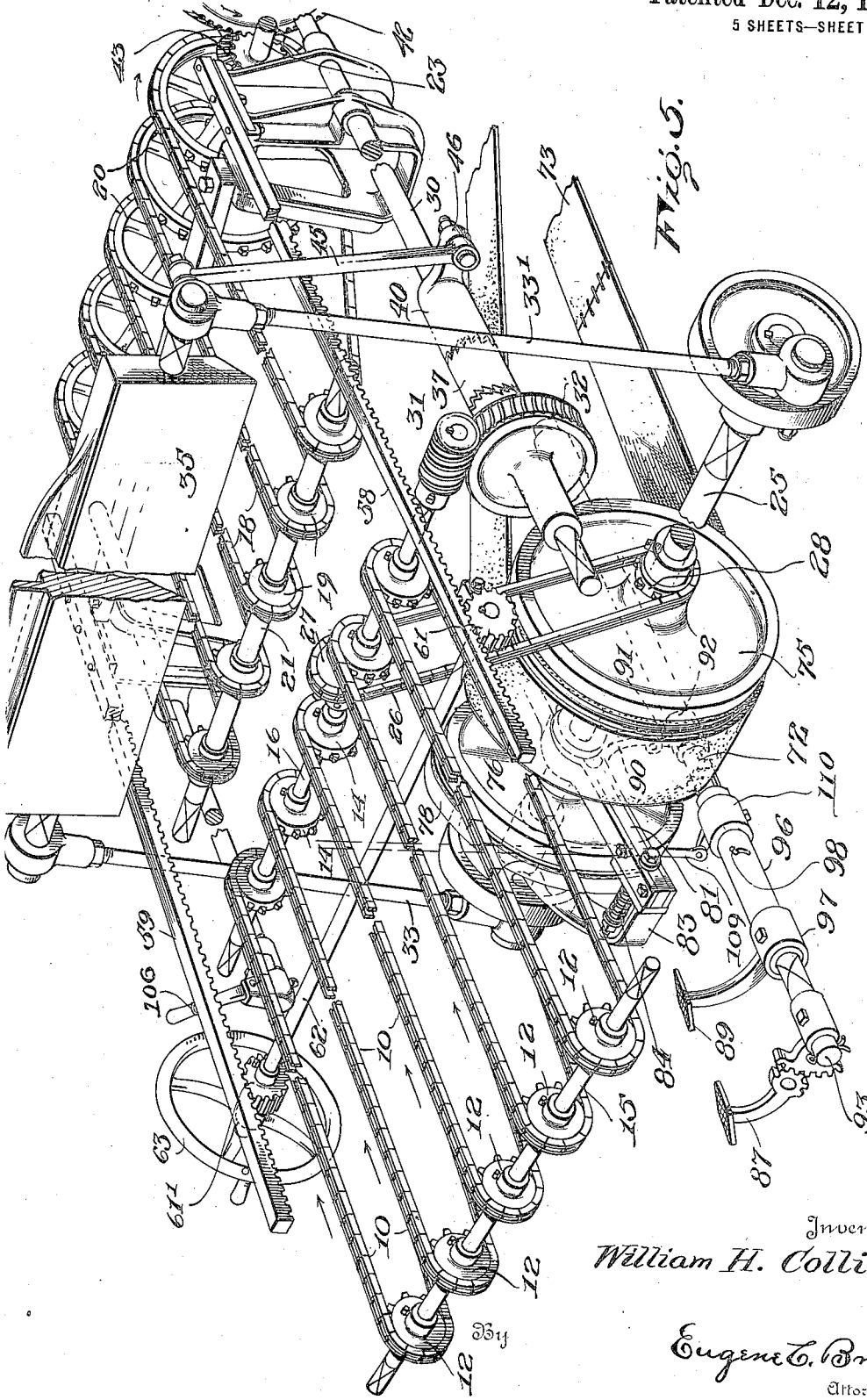
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5 SHEETS—SHEET 5.

Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM H. COLLIER, OF PAINESVILLE, OHIO.

VENEER-CUTTING MACHINE.

Application filed January 29, 1921. Serial No. 440,916.

To all whom it may concern:

Be it known that I, WILLIAM H. COLLIER, a citizen of the United States, residing at Painesville, in the county of Lake and State of Ohio, have invented certain new and useful Improvements in Veneer-Cutting Machines, of which the following is a specification.

This invention relates to machines for cutting a continuous sheet or web into lengths or panels of any desired size. While it is especially adapted for cutting veneer it may be used for cutting sheets of other materials.

When the sheet or web of veneer is fed to the cutter or clipper direct from the lathe, it frequently contains defective portions which should be eliminated or discarded. One object of my invention is to provide a machine having stops for determining the size of the length to be cut which may be quickly shifted toward or from the cutting blade, as the operator determines at a glance the length that may be cut without running into a defective portion. Another object is to provide means for operating at will the feed conveyor mechanism of the table or the cutter, and to control the operation by means of foot levers. I further provide means for removing the cut lengths at a more rapid rate than the sheet or web is fed upon the table.

Figure 1 is a side elevation of a machine embodying my invention; Figure 1^a is an enlarged detail view of the clutch mechanism used in connection with the conveyor chains on the discharge side of the table; Figure 1^b is a longitudinal sectional view of the clutch mechanism shown in Fig. 1^a;

Figure 2 is a side elevation of my machine, as seen from the side opposite to that shown in Figure 1; Figure 2^a is a sectional detail view of the manually operated stop retracting lever and coupling; Figure 2^b is a detail view showing the connection between the stop retracting shaft and the foot pedal shaft;

Figure 3 is a horizontal sectional view taken through the clutch mechanism for operating the feeding and the cutter mechanism; Figure 3^a is a fragmentary perspective view of a portion of the clutch controlling shaft and the yoke connection with the clutch mechanism; Figure 3^b is a detail sectional view of the clutch controlling shafts;

Figure 4 is a transverse vertical section on the line 4—4 of Figure 2;

Figure 5 is a top perspective view of the operating mechanism of the machine, the upper portion being slightly distorted or transversely extended to permit of greater clearness of disclosure.

The machine frame may be formed of side bars 2 supported at either end by legs 3, and at the center by side plates 6 in which the main shaft bearings are journaled, the plates being extended upwardly to form guide frames 7 for the cutter.

The cutting table comprises a feed portion consisting of a series of parallel conveyor chains 10 located in front of the cutter and carried by sprockets 12 and 14 mounted on shafts 15 and 16, and a discharge portion consisting of a series of chains 18 in the rear of the cutter carried by sprockets 19 and 20, mounted on shafts 21 and 23, said shafts being journaled in the side frame bars. The front series of chains 10 of the feeding table is connected with the main drive shaft 25 by means of the sprocket chain 26 and sprockets 27 and 28, the rear conveyor chains 18 of the discharge table being actuated simultaneously during the feeding operation through the countershaft 30, which is driven from shaft 16 by worm 31 and worm gear 32.

The table conveyor chains are stopped while the cutter blade or shear mechanism 35 descends. During the upstroke of the cutter the conveyor chains at the discharge end of the table are momentarily actuated to remove the severed length of veneer from the table. For the purpose of effecting these operations of the rear or discharge chains, the shaft 30 is driven through the clutch mechanism shown in Figs. 1, 1^a, 1^b and 5. The central clutch member 37 is splined to the shaft 30 and is normally held in mid-position by opposed springs 38, 38′, so that the ratchet teeth upon opposite ends overlap both the cooperating teeth on the hub of the worm gear 32 and those on the sleeve 40, substantially the depth of one-half tooth, said gear and sleeve being loose on the shaft but prevented from endwise movement.

When the gear 32 is driven by the worm 31, the shaft 30 is operated through the clutch member 37, the ratchet teeth being brought into complete engagement when the member 37 is moved laterally along the shaft by the action of the teeth on the sleeve 40

as it rides thereover. The ratios of the worm 31 to the worm gear 32 and of the bevel gear 42 to the bevel pinion 43, are proportioned to cause the rear discharge chains 18 to move with the same speed as the front feed chains 10, so that they may cooperate in feeding the veneer sheet beneath the cutter.

It is desirable that the severed length of veneer or other sheet material should be removed from the table during the upstroke of the cutter. For this purpose the upper end of the connecting rod 33 which actuates the cutter blade is pivotally connected by a link 45 with an arm or lug 46 projecting from the sleeve 40. On the down stroke of the cutter the link 45 rotates the sleeve through an angle of about 60°, the ratchet teeth riding over those on the clutch member 37, while upon the upstroke the teeth will lock and the shaft will be rotated through an angle of 60°, the ratio of the gear 42 to the pinion 43 causing a complete revolution of the sprockets 20, the diameter of which is sufficient to cause the chains 18 to move a distance equal to their length over the table, thereby, removing the cut length of veneer from the table. As this discharge movement takes place during the short interval of the upstroke of the cutter, the chains 18 must travel considerably faster than during the feeding periods. This rapid movement is effected by the direct connection of the countershaft 30 with the link 45 through the clutch members 37, 40, whereas during the feeding operation the countershaft is actuated by the worm 31 and worm wheel 32.

The stops which gage the width of the veneer strips or blanks cut off by the cutter consist of angle members 50 pivoted to the bar 51, the lower arms 50^a being pivotally connected to a laterally swinging bar 53. The bar 51 is bolted at either end to yoke members 56, 57 which are slidably supported upon shafts 30 and 60 respectively. To the upper ends of the outer arms of the yoke members are secured rack bars 58, 59 which are engaged by pinions 61, 61′ on the shaft 62. By turning the hand wheel 63 on the shaft 62 in one direction or the other, the yoke members may be moved to adjust the stops 50 toward or from the cutter. As indicated in Fig. 4, the chain carriers are supported in their travel over the table by channel bars 67, the stops 50 being so positioned that they may be swung between the bars below the level of the chains.

The clutch mechanism which connects the conveyor chains and the cutter with the power is controlled by foot pedals 87 and 89 in the manner illustrated in Fig. 3. The pulley 72 is loosely mounted on the shaft 25 and is continuously driven from an engine or other source of power indicated by the engine belt 73. When the pulley is slid along the shaft 25 to the left, it engages the friction clutch member 75, loose on the shaft 25 and which carries the sprocket 28, the latter driving the conveyor chains 10 through the chain 26 and sprocket 27. When the belt pulley 72 is slid to the right, the disk 76, fast on the hub 77 of the pulley, engages the friction clutch member 78, which is splined to the shaft 25. Accordingly, when the pulley is shifted to the left, both sets of conveyor chains will be operated to feed the sheet of veneer onto the table and when the pulley is shifted to the right the chains will be disengaged and the cutter knife will be operated, the discharge chains 18 being actuated during the upstroke in the manner previously described to remove the cut length or strip of veneer from the table.

The drive pulley 72 is normally maintained in intermediate or neutral position by the yoke 80 which surrounds the hub 77 and is carried by an arm 81 having an enlarged head 81^a which is yieldingly held against the flattened end of the bracket 83 by the spring 84 surrounding the bolt 85 which passes loosely through registering apertures in the head and bracket, the yoke arm being thus permitted to rock in either direction against the tension of the spring.

The yoke ring 80 is moved to the left by depressing the foot lever or pedal 87 and is moved to the right by depressing the pedal 89. The yoke ring 80 is provided with a lever arm 90, pivoted at its outer end to the lug 91 projecting from the collar 92, fast on the rock-shaft 93. A collar 94 secured to the outer end of this shaft, carries a gear segment 95 which meshes with a segmental rack 96 carried by the hub of pedal 87. By this arrangement, upon depressing the pedal 87, the shaft 93 is rocked in the opposite direction, thereby pushing the yoke 80 to the left and causing the pulley to engage the friction clutch member 75.

For the purpose of shifting the yoke ring and pulley to the right I provide a tubular shaft 96 which is sleeved about the rock-shaft 93 and carries at its outer end the collar 97 to which the pedal 89 is attached. At an intermediate point the sleeve shaft 96 is provided with a transverse slot 96^a, through which protrudes the pin 98 carried by the rock-shaft 93. The pin is normally positioned at one end of the slot, as indicated in Figs. 3 and 3^b to permit the shaft 93 to rock in an anti-clockwise direction through an angle sufficient to cause the pulley 72 to move into engagement with the clutch member 75. When the pedal 89 is depressed, the tubular shaft 96 is rocked in a clock-wise direction until the edge of the slot engages the pin 98, whereby the further movement of the shaft 96 causes the shaft 93 to rock in a clock-wise direction and shifts

the pulley 72 to the right until the disk 76 engages the friction clutch member 78.

It is necessary to depress the stops 50 before the discharge chains are actuated to remove the cut length of veneer from the table. I accomplish this purpose by suitable connection with the pedal 89 which controls the operation of the cutter. The rock bar 53, to which the short arms 50[a] of the stops are pivoted, is connected at one end by links 100 and 101 with a rock-arm 102 secured to the rock-shaft 60, as shown in Figs. 2 and 4; and at its opposite end said bar 53 is connected by links 100′ and 101′ with a rocking arm 102′. The outer end of the rock-shaft 60 is provided with a collar 105 fast thereon, which carries a pivoted latch dog 106, having a toe 107, which normally enters a notch in a sleeve 108 loose on the shaft 60, but which may be disengaged from said notch by swinging the handle of the dog into the dotted line position shown in Fig. 2[a]. The sleeve 108 is connected by a link 109 with a collar 110 secured to the tubular rock-shaft 96. It will be evident, therefore, that as the pedal 89 is depressed to connect the clutch which actuates the cutter 35, the link connection 109, operating through the sleeve 108 and collar 106, will rock the shaft 60 and thereby depress the stops 50 below the level of the table conveyor chains, as indicated in dotted lines at the left of Fig. 4. When the pedal is released the stops will be restored to their normal position by the spring 112.

The operation of the machine will be understood from the previous detailed description of the various parts of the mechanism. When the sheet veneer or other stock sheet, is delivered to the table the operator first determines at a glance the length which may be cut without imperfections and sets the stops 50 the proper distance from the cutter by turning the wheel 63 until the corresponding guage or scale mark on the rack-bar 59 is brought opposite an indicator point on the frame. He then depresses the pedal 87 to shift the belt pulley 72 into engagement with the clutch 75 and thereby actuate the conveyor chains 10 and 18 until the sheet is arrested by the stops. The operator then releases the foot lever pedal 87 to stop the chains and depresses pedal 89 to throw in the clutch 78 and actuate the cutter 35. Upon the upstroke of the cutter the link 45 rotates the clutch sleeve 40 which engages the clutch member 37 fixed to the shaft 30 and rotates the latter through an angle of about 60°, sufficient to cause the meshing gears 42 and 43 to turn the sprockets 20 through a complete revolution, thereby moving the conveyor chains 18 a distance sufficient to discharge the cut length of veneer from the table. It will be remembered that the link 109 is simultaneously operated by the pedal 89 to cause the stops 50 to drop below the level of the chains as the cutter descends so that they are out of the way of the material as it is discharged.

It sometimes happens that the stock veneer may be defective for a certain distance and it is desirable to allow this defective portion to pass across the table without operating the cutter. Under these circumstances the operator tilts the handle of the latch dog 106 until it is disengaged from the sleeve 108, and then rocks the shaft 60 until the stops 50 are depressed. He may then depress the pedal 87 to throw in the clutch which actuates the conveyor chains, holding his foot on the pedal until all of the defective portion has passed across the table. The operator may thus eliminate all defective portions of the veneer stock, so that only perfect panels are cut.

I have described in detail the particular construction illustrated in the accompanying drawings, but it will be evident to engineers that various changes and modifications may be made without departing from the invention.

I claim:—

1. A web or sheet shearing machine, comprising a cutting table, sets of conveyor bands operating at opposite ends of said table, a cutter reciprocable between the inner ends of said sets of conveyor bands, means for operating said conveyor bands simultaneously, and means for causing the actuation of one set independently of the other set.

2. A web or sheet shearing machine, comprising a cutting table, sets of conveyor bands operating at opposite ends of said table, a cutter reciprocable between the inner ends of said sets of conveyor bands, means for operating said conveyor bands simultaneously, at the same speed for feeding the stock sheet under the cutter, and means for operating the set at the discharge end independently of the other set and at a greater speed to quickly remove the cut length from the table.

3. In a machine as set forth in claim 1, clutch mechanism for connecting either the cutter or the conveyor bands with a power shaft, stops adjustable along the discharge side of said table, and clutch controlling mechanism having a connection with said stops for causing the latter to drop below the conveyor bands when the cutter is actuated.

4. In a machine as set forth in claim 1, clutch mechanism for connecting either the cutter or the conveyor bands with a power shaft, stops adjustable along the discharge side of said table, clutch controlling mechanism having a connection with said stops for causing the latter to drop below the conveyor bands when the cutter is actuated, and means

for manually lowering the stops independent of the cutter.

5. A web or sheet shearing machine, comprising a cutting table, a cutter reciprocable thereover, separate sets of endless conveyors upon opposite sides of said cutter, clutch controlling mechanism for causing either said sets of chains to operate simultaneously or said cutter to reciprocate, and means connected with the cutter for causing the conveyor upon the discharge side to operate independently of the other set during the upstroke of the cutter.

6. A web or sheet shearing machine, comprising a cutting table, a cutter reciprocable thereover, separate sets of endless conveyors upon opposite sides of said cutter, clutch controlling mechanism for causing either said sets of chains to operate simultaneously or said cutter to reciprocate, means connected with the cutter for causing the conveyor upon the discharge side to operate independently during the upstroke of the cutter, stops adjustable along the discharge side of the table, and means connected with said clutch controlling mechanism for lowering the stops during the reciprocation of the cutter.

7. In a machine of the kind described for operating upon a web or sheet of material, the combination of a table having endless feed chains adapted to feed the web to the machine, means to operate said chains at a predetermined speed, shear mechanism to cut the web transversely into lengths or blanks, endless chains to discharge said cut lengths or blanks, and means to actuate said discharge chains independently of the feed chains and at a greater speed than the speed at which the web is fed to the machine.

In testimony whereof I affix my signature.

WILLIAM H. COLLIER.