W. F. BARNES.

BASKET MAKING MACHINE.

APPLICATION FILED JULY 20, 1908.

952,406.

Patented Mar. 15, 1910.

4 SHEETS—SHEET 1.

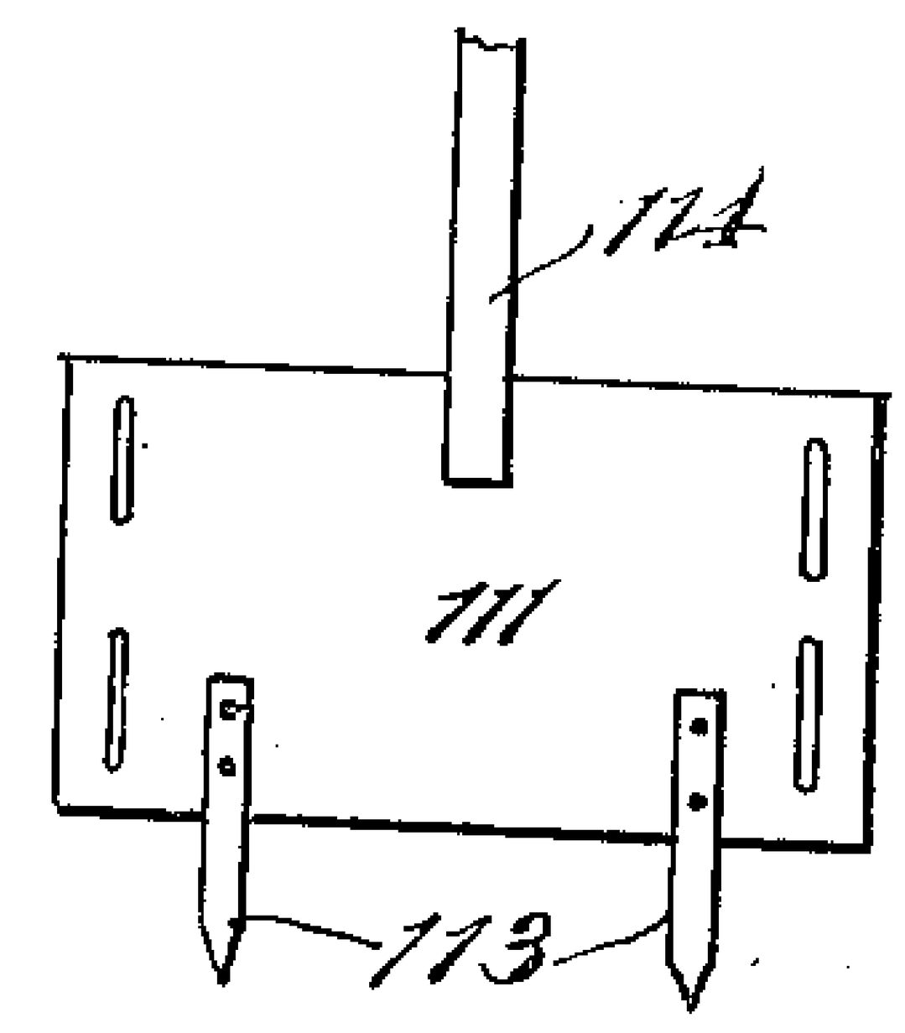

Fig. 12.

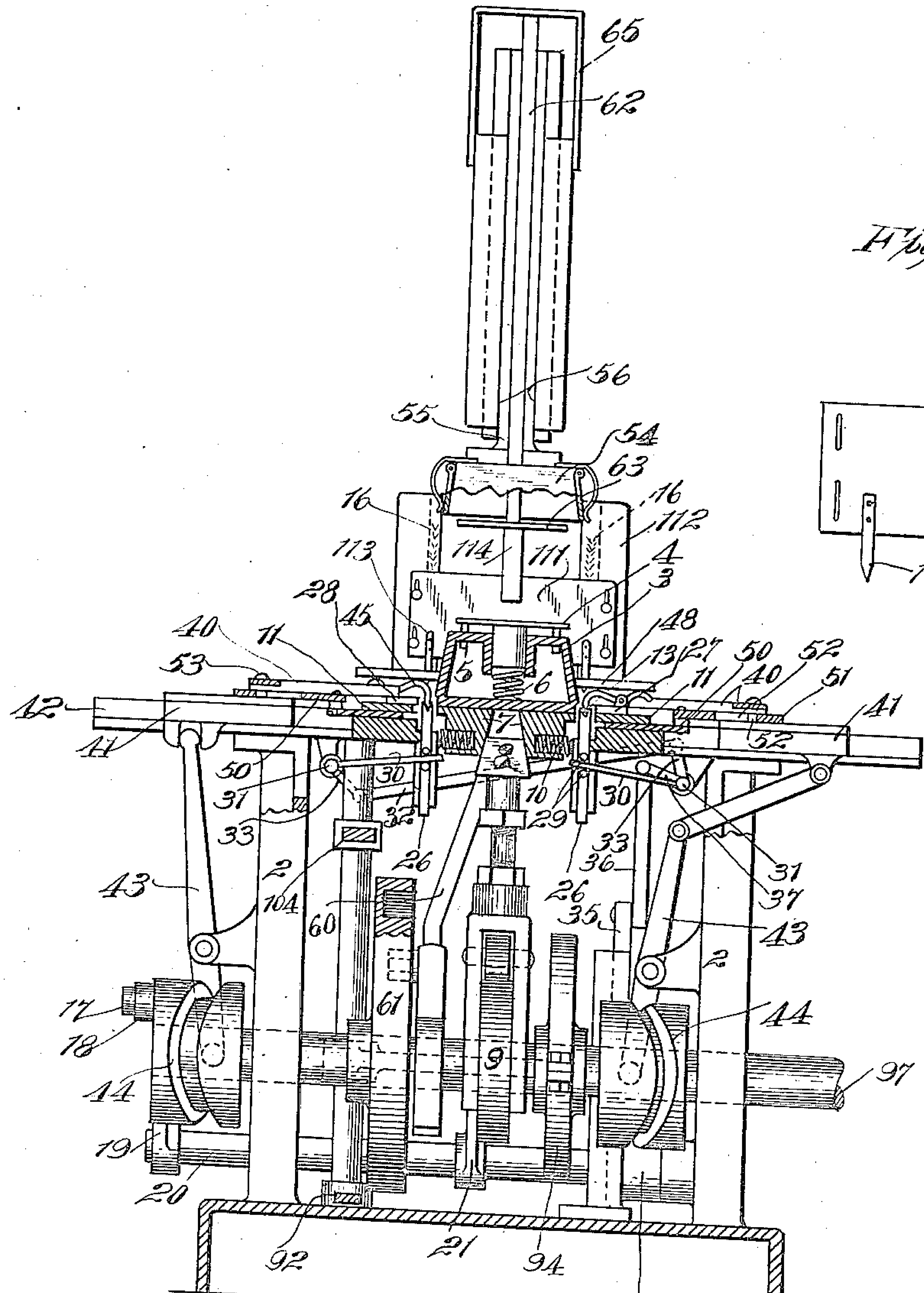

Fig. 1.

WITNESSES

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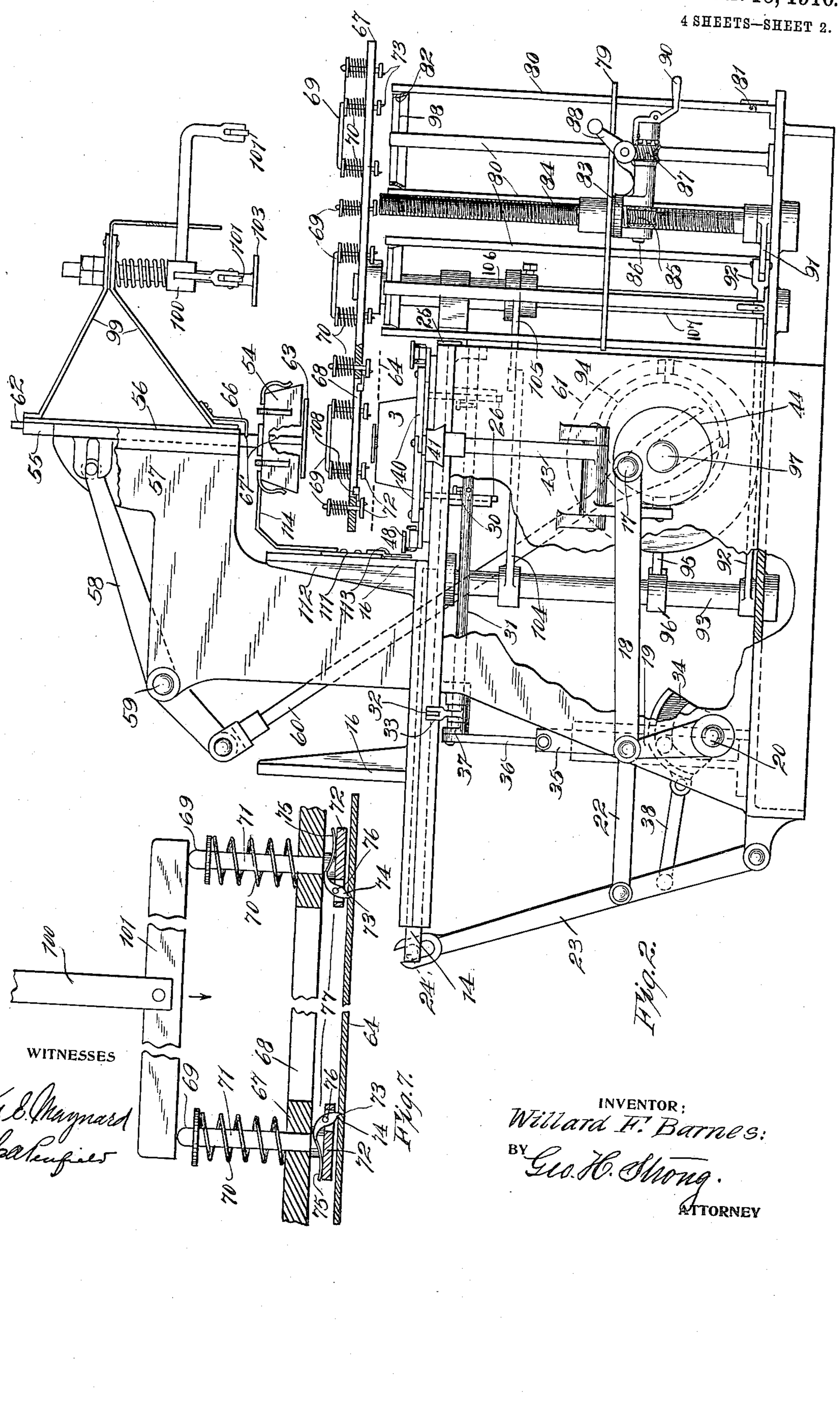

Fig. 2.

Fig. 7.

WITNESSES

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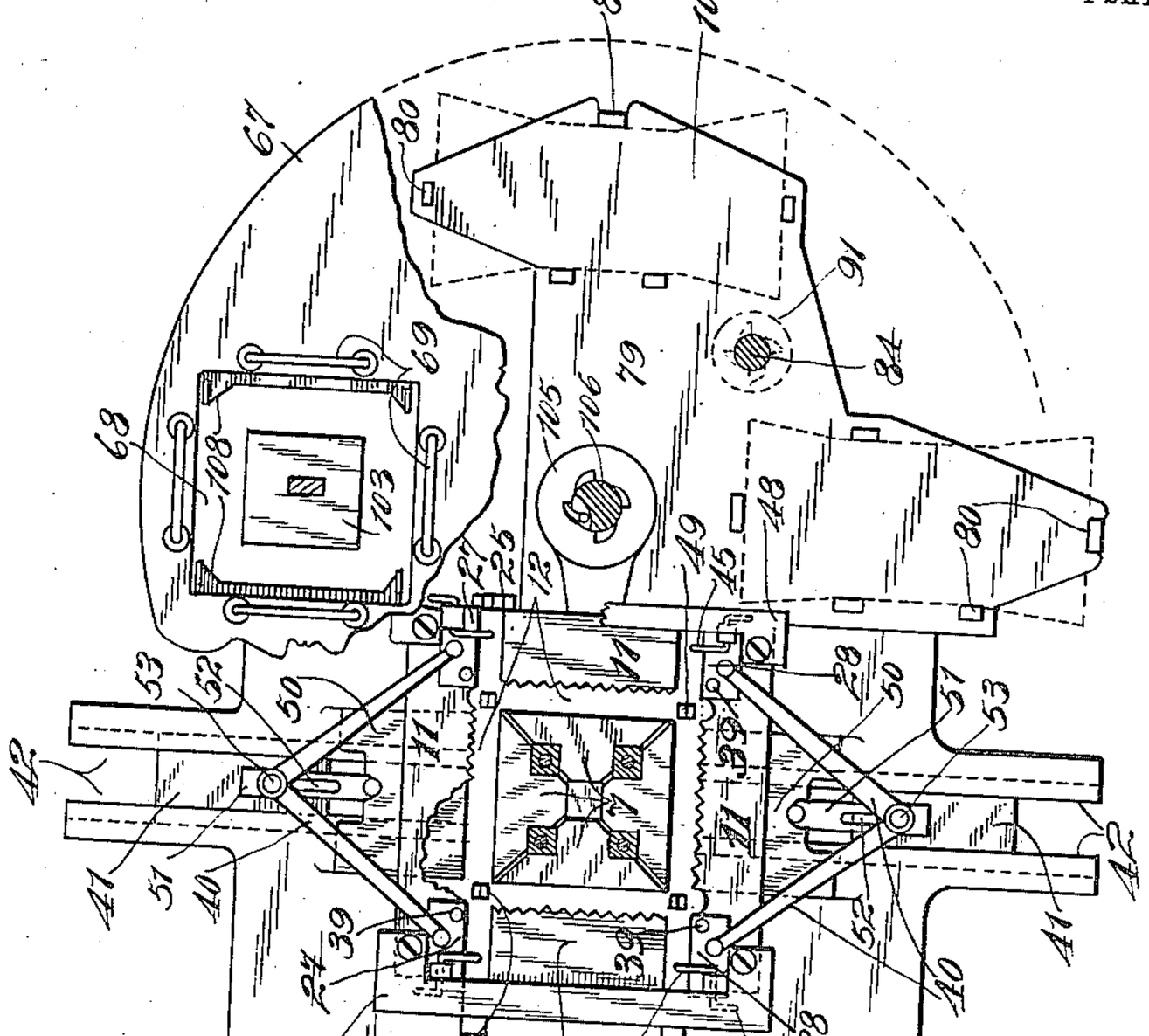

Fig. 3.

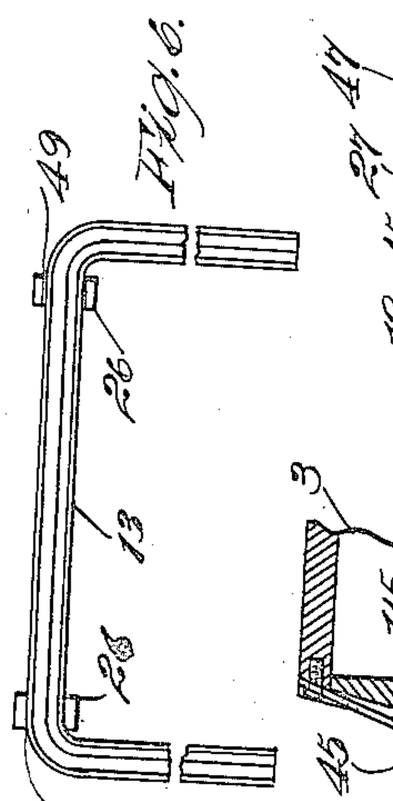

Fig. 6.

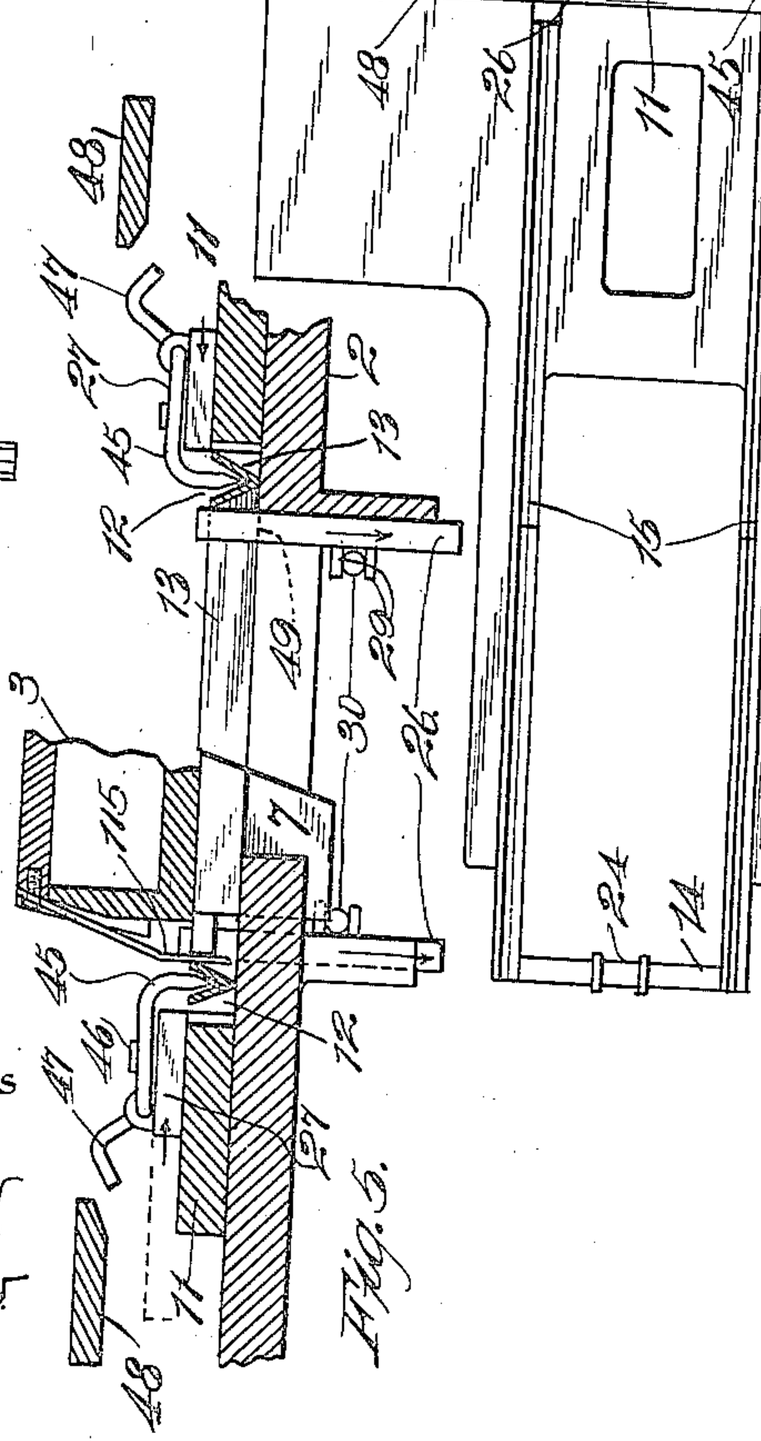

Fig. 5.

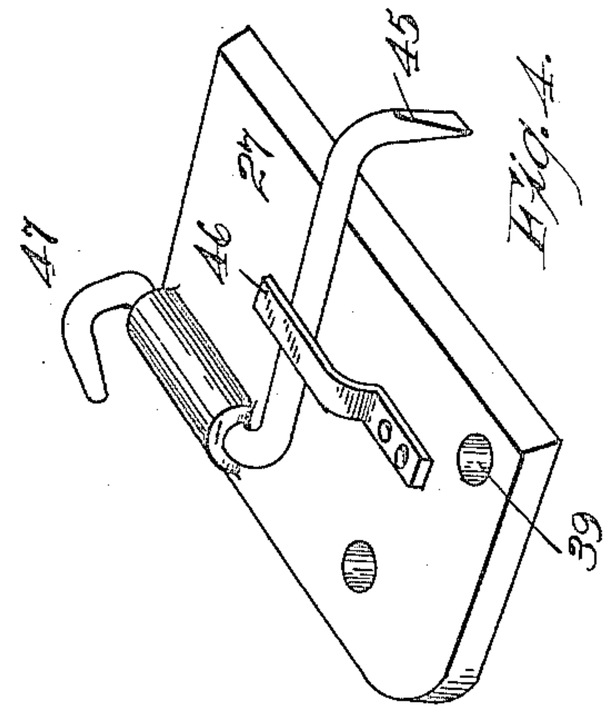

Fig. 4.

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4 SHEETS—SHEET 4.

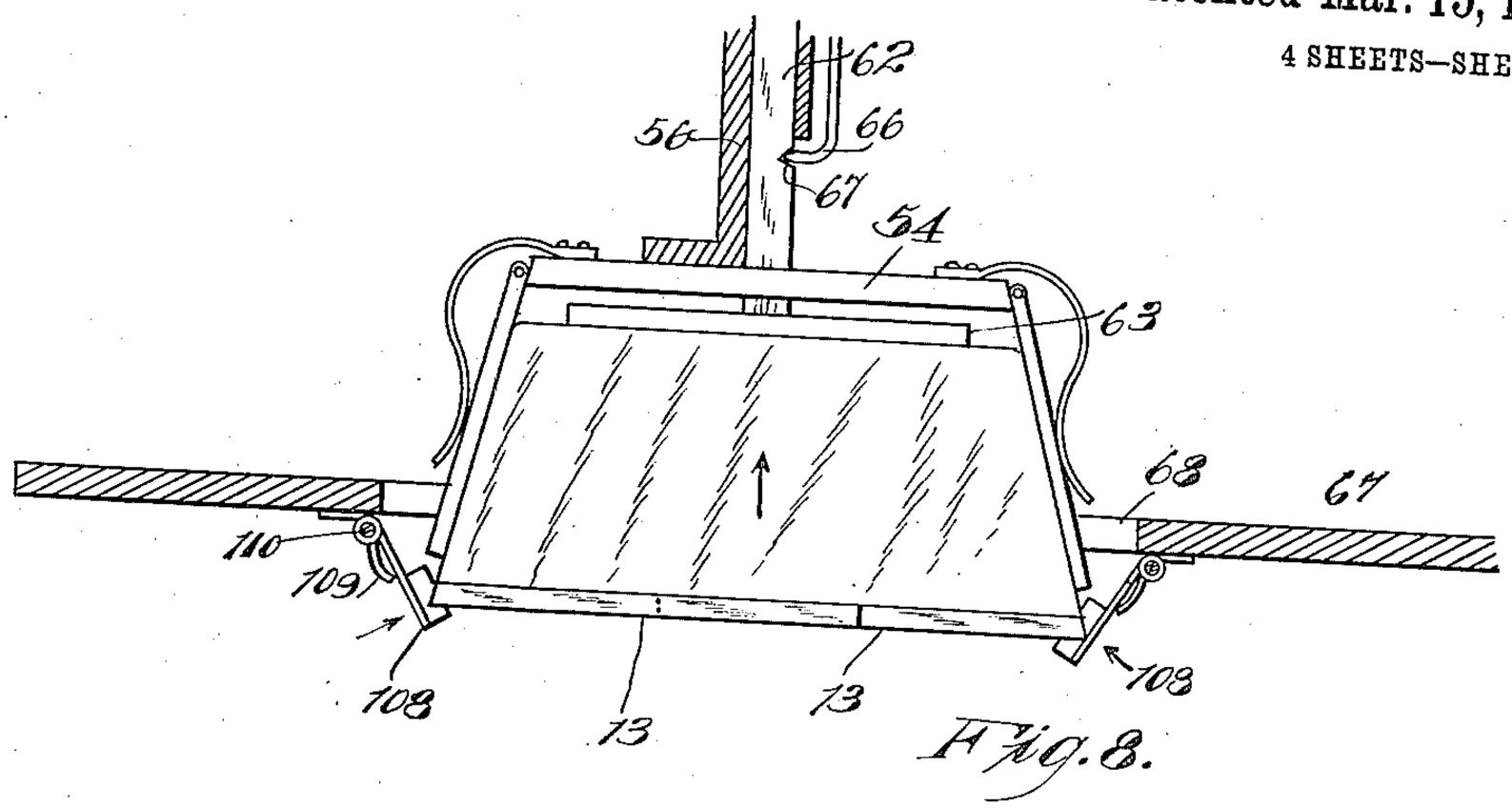

Fig. 8.

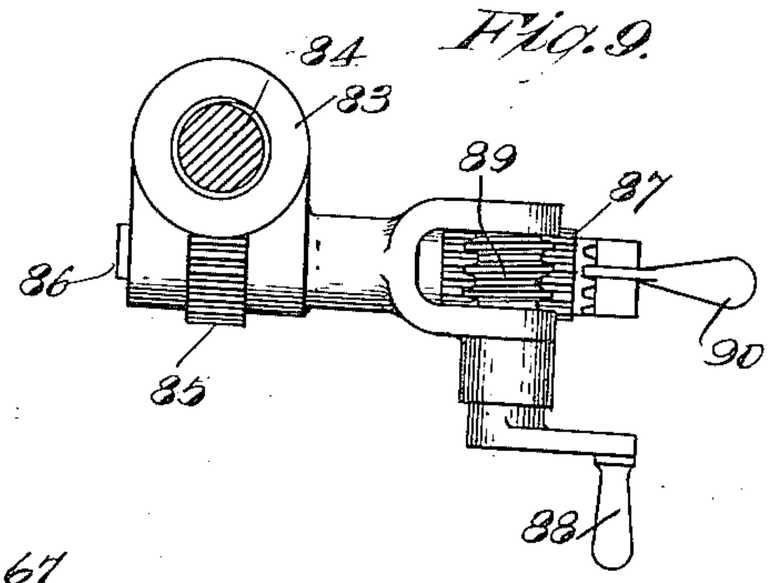

Fig. 9.

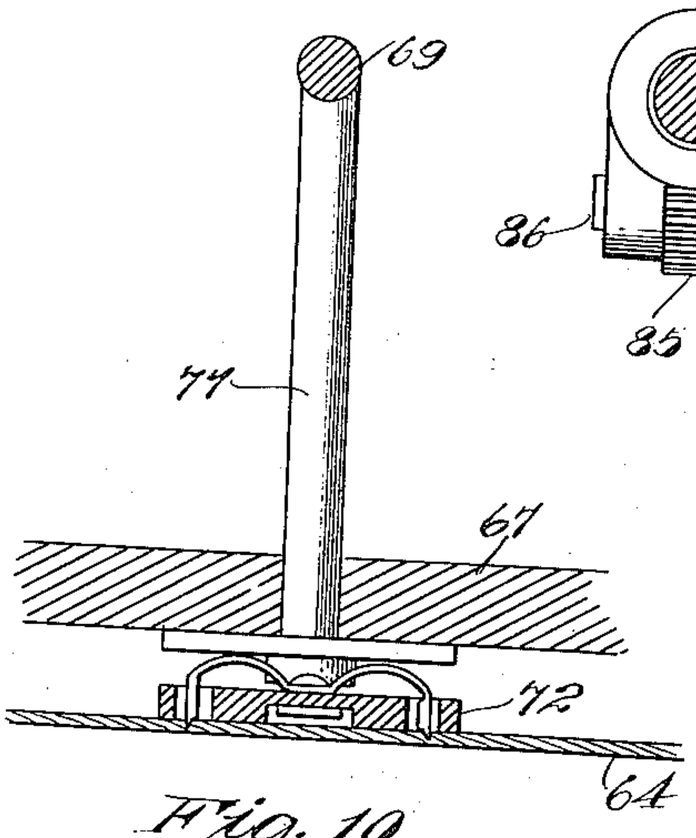

Fig. 10.

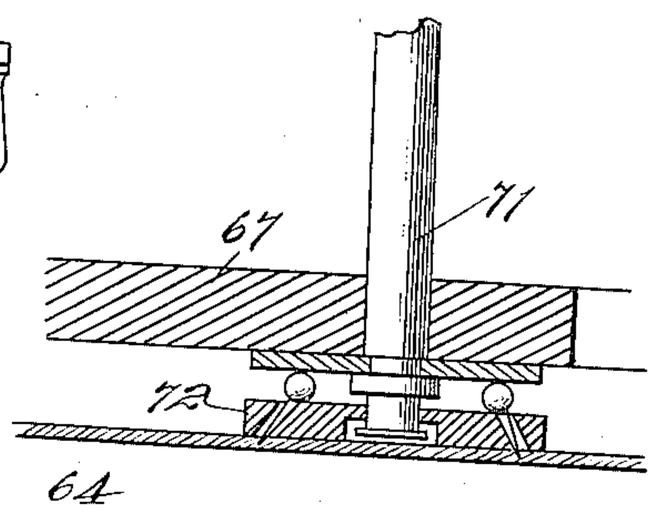

Fig. 11.

WITNESSES

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UNITED STATES PATENT OFFICE.

WILLARD F. BARNES, OF SAN FRANCISCO, CALIFORNIA.

BASKET-MAKING MACHINE.

952,406. Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed July 20, 1908. Serial No. 444,400.

To all whom it may concern:

Be it known that I, WILLARD F. BARNES, citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Basket-Making Machines, of which the following is a specification.

This invention pertains to automatic machines of the class used to manufacture baskets made of very thin sheets of wood, or other suitable material, and bound or reinforced by a metallic strip or strips.

An important object of my invention is the provision of a machine, simple in construction, that will greatly reduce the amount of waste material, caused by deformation of the baskets, so frequently occurring in machines as at present constructed.

Another object is to provide a machine that will attain a maximum productive efficiency per hour and be economical in power consumption.

Other objects will become manifest.

It is desired to provide a machine that will form a basket of two pieces of wood (which will be referred to hereinafter as slices), that have been previously shaped and sized in blank, by automatically placing one across the other, bending the projecting portions to form sides and then binding the edges to form the permanent basket and ejecting the same from the machine.

My invention comprises details of construction, the elements and the combination of elements, and will be clearly explained by reference to the drawings, in which—

Figure 1 is an end elevation, and section through the mold. Fig. 2 is a side elevation and partial section. Fig. 3 is a plan view and partial section. Fig. 4 is a perspective view of the binding-strip holder. Fig. 5 is a detail of the same and associated parts. Fig. 6 is a plan of a bent binding-strip. Fig. 7 is a detail view of the slice-lifters. Fig. 8 is a detail showing the basket being lifted after being formed. Fig. 9 is a detail of the hand-feed for the table. Figs. 10 and 11 are modified forms of the slice lifters. Fig. 12 is a detail of the binding-strip holder.

The embodiment of my invention as shown in Fig. 1 comprises a bed-frame 2, centrally mounted, upon which is a mold block 3 having a buffer 4 cushioned by a spring 6, proximate its top surface and provided with guide pins 5 to preserve alinement. The sides of the mold are, in this instance, converged toward the top and a finished basket is readily lifted therefrom by the buffer 4.

Just below the mold 3 are squeezer-jaws 7 adapted to be actuated by any suitable device, here illustrated as a wedge 8, operably mounted to be acted on by cam 9. Springs 10 serve to retract the jaws 7. Fixed dies 11 surround the squeezers forming a channel 12 for the reception of the V-shaped strips 13, which are fed into position on two sides of the mold 3 by a feeder frame 14 having recessed arms 15 for the purpose of receiving, from supply chutes 16, a charge of the strips. The frame 14 is reciprocated by means of a crank 17 which oscillates, through connecting rod 18 and lever-arm 19, a rocker shaft 20. A crank-arm 21, secured on shaft 20, connects through link 22, with a lever 23 fulcrumed at its lower end and the upper end engages a roller 24 mounted on frame 14. Thus a pair of V strips, of suitable length, are carried forward by the arms 15 and deposited in the channels 12, the outer ends of the strips being supported by centering plates 25, as the arms recede, until lifters 26, located at corners of the mold, come up under the strips and carry them into the same plane of two sets of bending dies 27—27 and 28—28. The lifters 26 are slotted at their upper ends so that the strips seat themselves firmly therein and when the dies 27—27 and 28—28 engage the strip, held by the lifters immediately near the die, it is bent at right angles to itself. Suitable means may be employed to actuate the lifters and I show them as provided with pins 29, engaging levers 30 secured in pairs to two rocker-shafts 31, linked for simultaneous operation by link 32 and cranks 33, and rocked by cam 34, loosely supported on the rocker-shaft 20, through cam-roller-bearing slide 35, link 36 and crank 37. The cam 34 is actuated in unison with the feed arms by virtue of its connection with lever 23 through the link 38. Obviously the lifters are raised and engage the strip immediately following the recession of the feed arms 15.

While the strip is still in the elevated position the bending dies are turned about their several pivots 39 through the instrumentality of toggle-links 40, mounted on slides 41 slidable in ways 42 in the bed 2; the slides are operated by any desirable mechanism and may consist of simple levers 43 and suitably timed cams 44.

In this particular machine I employ metallic strips, for binding the basket. These strips are of such length that when they have been folded, they overlap at their inturned ends and these ends are firmly crimped or squeezed together, producing the effect of a continuous unitary binder.

As above stated, the strips 13 are lifted into the plane of the bending dies 27—28. In order that the strips may properly overlap it is necessary to have one set of dies, for instance dies 27—27, advance upon and bend the respective strip 13 sufficiently ahead of the other strip to avoid their interference, and this result is readily accomplished by simply setting one of the actuating cams 44 slightly in advance of the other.

An important feature of this machine is the provision of means for preventing the V-shaped strip becoming distorted during the bending operation. I overcome this destructive and wasteful action by the use of automatic fingers 45, pivotally mounted upon the several dies 27—28 and normally depressed by suitable flexible elements or springs 46. When the dies are in the open position, these fingers 45 are then in a line vertically over the center of the V strips and as these are raised the fingers register with and seat firmly in the channel of the strip, as shown in Fig. 1. By reason of the engagement of a crank extension or cam-arm 47, of the fingers 45, with bridge-plates 48, secured to the fixed dies 11 and extending transversely across the bed 2, the plates are effective to raise the finger 45 on opposite pairs 27—28 and 27—28 of the dies when these are opened.

The operation of this portion of the machine is as follows:—A strip of metal having been fed in, it is raised by the lifters 26, held in the slots 49 therein and the bending dies 27—28, carrying the fingers 45, now engaging the portions of the strip projecting beyond the lifters, advance and bend the ends of the strips about the lifters and as soon as the cam-arms 47 of the fingers 45 pass from under the bridge plates 48, the springs 46 depress the fingers into the channel 12, the lifters descend, carrying the strip, now bent into the form of a broad U, until it rests upon sliding plates 50 forming a movable support to hold the strips after they are bent and while the basket is being bound and the metal squeezed. These plates 50, slidably mounted upon the bed 2, have a rearwardly projecting arm 51, slotted as at 52, and within this slot works a pin 53 secured in the slide 41. As the slides, which operate the bending jaws, advance, the pins 53 run forward in the slots 52 until they reach its end and further forward motion of the slide will then project the plate 50 out into the channel 12 for the purpose above stated. The plates remain in this position until slides 41, when nearing their rearward position, retract them, through pins 53. Simultaneously with the bending of the tin strip 13 a former 54 descends, releasing from a suitable carrier 67 a pair of veneers or slices, preferably of wood, which are then deposited upon the mold 3 (referring to Fig. 2). This former may be of any suitable variety, the one shown being sufficient for the purpose and comprises a set of yielding sides 54 arranged to conform to the sides of its coöperating mold 3. From the top of the former extends a stem 55, reciprocable, in ways 56 in the frame 57, by a suitable mechanism here consisting of a lever 58 fulcrumed at 59 and rocked through the link 60 by a cam 61. Extending downward through the stem 55, of the former, is a slidable shank 62 having fixed to its lower end a presser-foot 63 in a plane just below the bottom of the former and as the former 54 descends, releasing the veneers from a carrier, they are then firmly held on top of the mold 3 by the presser-foot, while the former abuts the projecting ends, shown in dotted lines Fig. 2, of the veneers 64, bending them downward to form the sides of a box, the inverted top edges of which are inserted into the now formed rectangular binding V-strip. As soon as the strip has been folded, as seen in Fig. 5, the bending dies 27—28 are withdrawn, the fingers 45 uplifted by engagement with the bridge-plate 48 of the cam-arm 47. Immediately following this action the edges of a box enter the channel in the V-strip and the squeezer-jaws 7 are expanded forcing the strip against the fixed dies 11 and crimping it securely upon the basket edges. The basket being thus completed, former 54 is raised carrying it upward, held by the spring-pressed sides, until just above a carrier (to be described fully hereinafter) when it is ejected from the former 54 by presser-foot 63, the upper end of the shank 62 of which is stopped against further upward movement by a yoke 65 fastened to the frame 57. For the purpose of maintaining the presser-foot in the two different positions it attains relative to the former, though carried by it, a spring or suitable detent 66 is secured to the stem 55 and registers with keepers 67′ in the shank 62.

Any suitable form of endless, movable

carrier, such as a belt, table or equivalent device, may be employed to bring the veneer blanks into position under the former 54. I accomplish this by means, in this case comprising a continuous carrier 67, having rectangular perforations 68 contiguous to the sides of which are arranged slidable inverted U-shaped elements or bars 69, supported upon springs 70 resting on top of the carrier and surrounding the legs 71, which project through the carrier. At the extremity of these legs are foot-plates 72 carrying any desirable form of prick-pins 73. Fig. 7 shows a very efficient design of pins, in that they are provided with shoulders 74 to prevent too deep a penetration of the slices or veneers, and are formed with spring arms 75 and when the pins 73 have been driven into a thin veneer-like slice 64, the spring-arms 75, fulcrumed at 76 in the foot plate 72 and being arranged in opposing, alined pairs, as at 77, act to rotate the pins 73 about their pivots 76, hooking the pins into the slices. It will be apparent that this construction enables the pins to pick up the slices and hold them with tension-like action.

In Figs. 2 and 3 is shown a table 79 upon which is placed a stock of slices 64 in parallel tiers between guide bars 80, fastened in the base of the frame 3, some of which are pivotally jointed as at 81 so that they may be tilted out of the way while the stock is being replenished. Fixed between the top of bars 80, which are arranged in groups, are centering collars 82 for the purpose of centralizing the slices, the stock of which is kept at this level by the automatic elevation of the table 79 through any desirable means, comprising here, a ring 83, bearing the table, through which slides a worm shaft 84, meshing with pinion 85 fixed on shaft 86. Loosely running on this shaft is a pinion 87 adapted to be rotated by crank 88 and worm 89 fixed thereto. Secured to the end of shaft 86 is a pivoted dogging crank 90 designed to interlock with notches formed on the end of pinion 87, (Fig. 9). Worm shaft 84 is given an intermittent rotary motion by a ratchet-lever 91, through pin connection with a lever arm 92 fastened on a stud shaft 93 which is rocked by eccentric 94, eccentric-rod 95 and crank-arm 96. Since the threads on worm-shaft 84 mesh with pinion 85, when the shaft is partially revolved the table-bearing ring 83 is raised an amount proportional to the average thickness of the slices at each revolution of the main shaft 97, which carries the several cams, 44 44, 91, 9 and eccentric 94. As it is impossible to obtain slices of perfectly uniform thickness, provision must be made for manually raising or lowering the table 79 at intervals to compensate for this varying thickness of material resulting as it does in varying the level of the stock tiers. To explain: Assume that the stock has a normal level indicated at 98 (Fig. 2) and that the ordinary thickness of a slice would be .03 of an inch, then the automatic feed mechanism relating to worm-shaft 84 would be designed to feed the table, at each part rotation of this shaft, an equal distance upward. Perhaps hundreds of slices might be of equal thickness and rise successively to the proper level but the lower slices may be of only .025 of an inch thickness so that by the time one hundred had been picked off by the pins 73, the level would be one-half inch below the normal level 98. To remedy this the operator has only to turn the crank 88 and worm 89, thereby revolving pinion 87, shaft 86 and pinion 85, thus raising the ring 83 and table 79 supported thereon. In order to allow the table 79 to be quickly dropped the full distance, the operator depresses the dogging lever 90, which unlocks the shaft 86 from pinion 87, and revolves the lever 90, its shaft 86 and the pinion 85, meshing with worm shaft 84.

Centrally supported, by brackets 99 fastened to the stem 55 of the former 54 and reciprocable in unison therewith, over the carrier 67, is a spider 100, two of the depending legs of which carry cross-bars 101 each adapted to encounter, when descending, a pair of the pin-carrying bars 69, forcing the pins into the slices.

As stated, two slices are placed across each other over the mold 3; to produce this the pin-bars 69 are located on the sides of the perforation 68 and one of the descending cross-bars 101 operate on one pair when the carrier is in position, as indicated at 102, and pins will lift a slice, upon the upward stroke of the spider; the table is then given a part (in this instance one quarter) rotation, bringing this slice in a transverse position over the second tier of slices, when the spider again descends, the cross-bar 101 forcing down the pair of pin-bars 69 disposed in its path, these bars being at right angles to those which already carry a slice. One leg of the spider is provided with an ejector-plate 103 for the purpose of discharging a finished basket from the carrier. The carrier may be rotated by any suitable form of drive mechanism. I have shown a crank-arm 104, secured on shaft 93, linked to a ratchet-lever 105, engaging sleeve 106, to which the carrier is secured. A post 107 supports the sleeve and carrier.

In Fig. 8 is clearly shown one of any suitable means for supporting the finished basket on the carrier, until it is brought around under the ejector 103, consisting of plate-pawls 108 normally held in horizontal position by springs 109. These pawls are adapted to swing down about pivot 110 as

the former 54 passes downward through the opening 68. When the basket has been folded and is being brought up by the folder the pawls spring in under it and the springs support its weight.

Figs. 1 and 12 show a plate 111 suitably slotted and slidably mounted upon frames 112, to which plate are secured friction points 113 adapted to descend upon the strips 13 and hold them while the frame 14 is receding. The plate 111 is lifted by means of an arm 114 which it carries contacting with the top of former 54 during its upward stroke.

In Fig. 5 will be seen a spring 115, the purpose of which is to force the strips 13 against the fixed dies 11. As many of these springs 115 as may be desired, are secured to the sides of the mold 3.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a basket-forming machine of the character described, a mold-block or form, a carrier for delivering veneers, and receiving a finished basket, means for folding veneers or slices over said form, and means for retaining the slices upon the form, said means including clamps substantially as herein described.

2. In a basket-forming machine of the character described, a mold, means including a carrier for placing slices at right angles upon the mold, means for folding the slices against the sides of the mold, means for applying binding strips to the edges of the baskets, and means for retaining the finished basket on the carrier, said means including spring-pressed pawls adapted to grip and support the edges of the basket.

3. A basket-forming machine of the character described, having a mold-block, means for placing slices at right angles with each other upon said block, with their ends projecting over the sides, said means including pins and carrying bars, pressure plates, reciprocating cross bars by which the plates are carried, and means to depress said plates whereby the pins are forced into the slices so that the return movement will lift a single slice.

4. In a basket-forming machine of the character described, a mold or form over which the basket is shaped, a table upon which a stock of basket-forming slices is placed in parallel tiers, means for lifting said slices from the table one at a time, said means including fulcrumed lever arms, pressure bars by which the lever arms are carried, said lever arms having projecting points, a reciprocating spider, arms carried thereby adapted to engage said pressure bars by which the levers are depressed to force the points into the uppermost of the slices, and means to lift them in position to be placed upon the mold.

5. In a basket-forming apparatus, a mold adapted to receive the material from which the basket is formed, a vertically reciprocating former co-acting with the mold, a table upon which the basket-forming slices are placed, a carrier located above the mold and the table, spring-pressed rods guided and vertically movable with relation to the carrier, pointed levers fulcrumed thereto, a pressure bar adapted to force the levers down, and insert the points into the uppermost of the slices whereby it will be lifted and held beneath the carrier while said carrier transfers the slice to a point above the mold, a reciprocating folding device, and mechanism by which it is moved to bend the slices over the mold.

6. In a basket-forming machine, a mold over which a pair of strips or slices may be bent to form a basket, a table adapted to receive a quantity of said slices superposed upon each other, a carrier movable above the table and the mold, said carrier having an opening therethrough of larger size than that of the mold and basket, vertically reciprocating spring-pressed rods mounted on the carrier, pointed levers fulcrumed upon said rods below the carrier, a reciprocating spider carrying arms whereby the rods are depressed to force the points into the uppermost slices whereby said slices are lifted when the spring-pressed rods are released from pressure and retained beneath the carrier by which they are transferred and placed across the mold-block, a vertically reciprocating former co-acting with the mold-block to fold the slices and form them into a basket, means for applying binding strips around the edges of the basket, and gripping devices upon the carrier adapted to support the basket when lifted from the mold-block and retain it until it reaches the discharge position, and an ejector.

7. In a basket-forming machine, a mold, a carrier movable above said mold, a former reciprocable above and co-acting with the mold, the carrier having openings adapted to register with the mold and former, a table upon which veneers or slices from which the baskets are to be formed, are superposed, spring-pressed rods vertically reciprocable with relation to and on the carrier, pointed lever arms fulcrumed to said rods, means by which said rods are depressed and the points forced into the uppermost of the slices, means for folding binding strips about the lower edges of the baskets, and compressing them thereon, means for retaining the finished baskets in the carrier after being lifted from the mold, and means for ejecting the baskets therefrom.

8. In a basket-forming apparatus, a mold, a former co-acting with the mold and having a stem, means by which the former is reciprocated, a carrier having openings adapted to register with the mold and former, a table upon which basket-forming slices are piled, points connected with the carrier, means by which said points are depressed to pick two single slices and transfer them to the mold, a spider supported from the stem of the former and movable in unison therewith, arms carried by the spider whereby the pin points are periodically depressed to engage with the slices, means for actuating the carrier so as to present the crossed slices over the mold, and means for applying metallic strips to the edges of the folded basket, said last-named means including reciprocating carriers by which a pair of strips is moved upon two opposite sides of the mold about which the slices are formed.

9. In a basket-forming machine, a mold, a former co-acting with the mold to fold the slices into basket-shape, means by which said former is reciprocated, a carrier having openings adapted to register with the mold and former, means for picking up veneers or slices and placing them transverse upon the mold, a table upon which the slices are superposed and means for automatically elevating the table a distance approximately equal to the thickness of each slice as it is removed but maintaining the upper surface in constant proximity with the carrier, and means for applying binding strips to the edges of the folded basket, said last named means including reciprocating carriers by which a pair of strips is moved upon two opposite sides of the mold about which the slices are folded.

10. In a basket-forming machine, a mold, a vertically reciprocating former co-acting therewith, a carrier having openings adapted to register with the mold and former, means by which the slices are taken from superposed piles and transferred to the former, a table upon which the slices are superposed, a worm and screw and mechanism by which it is intermittently moved to raise the table after the removal of each slice, independent mechanism whereby the table may be moved to correct variations in the thickness of the slices, and means for applying binding strips to the edges of the folded basket, the said last named means including reciprocating carriers by which a pair of strips is moved upon two opposite sides of the mold about which the slices are folded.

11. In a basket-forming machine, a mold, a vertically reciprocating former co-acting with the mold to fold slices into basket form, means for applying metallic strips to the edges of the basket, said means including reciprocating carriers by which a pair of strips is moved upon two opposite sides of the mold about which the slices are folded, channels in which said strips are received, lifters by which the strips are raised, means for bending the strips, and squeezing jaws by which the strips are compressed in place.

12. In a basket-forming machine, a mold, a former, mechanism by which it is reciprocated to co-act with the mold, means for placing slices upon the mold to be folded there-over by the former, means for applying metallic V-shaped binding strips to the edges of the basket, said means including carriers by which strips are advanced upon opposite sides of the former, means by which said strips are bent to register with the edges of the basket, lifters by which the strips are raised and fitted upon the basket edges, and squeezers or compressors, and mechanism by which they are actuated to compress the strips in place.

13. In a basket-forming machine of the character described, the combination with means for folding slices into basket form, lifters whereby V-shaped metallic strips are raised to fit the edges of the basket, said lifters having their upper edges slotted to receive the folded edges of the strips.

14. In a basket-forming machine of the character described, means for folding slices into basket form, means for advancing metallic V-shaped strips upon opposite sides beneath the edges of the baskets, with their ends extending beyond said sides, means for folding the extended ends, said means including dies, and mechanism by which they are moved to fold and overlap the ends of the strips, lifters having V-shaped upper edges into which the folds of the strips are received, means by which the lifters are raised to fit the strips upon the edges of the basket, and means by which the strips are compressed transversely and locked in position.

15. In a basket-forming machine of the character described, means for folding the slices into basket-form, means for advancing metallic V-shaped strips beneath opposite edges of the basket with their ends projecting, dies by which said projecting ends are folded and overlapped across the remaining edges of the basket, one pair of said dies being operated in advance of the other pair so that the ends are positioned successively, lifters having V-shaped upper edges, mechanism by which they are actuated to interlock the overlapping ends of the strips, and to force them upon the edges of the basket, and compressing devices whereby the strips are closed and locked upon the basket edges.

16. The combination in a basket-making

machine, of strip-containing chutes, means for carrying said strips into position beside a mold, means for lifting and holding the strips into the plane of bending elements, and means coöperative with said bending elements to support and depress the strips while being bent, said means comprising a suitable detent insertible into the V strip.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLARD F. BARNES.

Witnesses:
GEO. H. STRONG,
CHARLES A. RUFERTS.