

No. 658,523.

Patented Sept. 25, 1900.

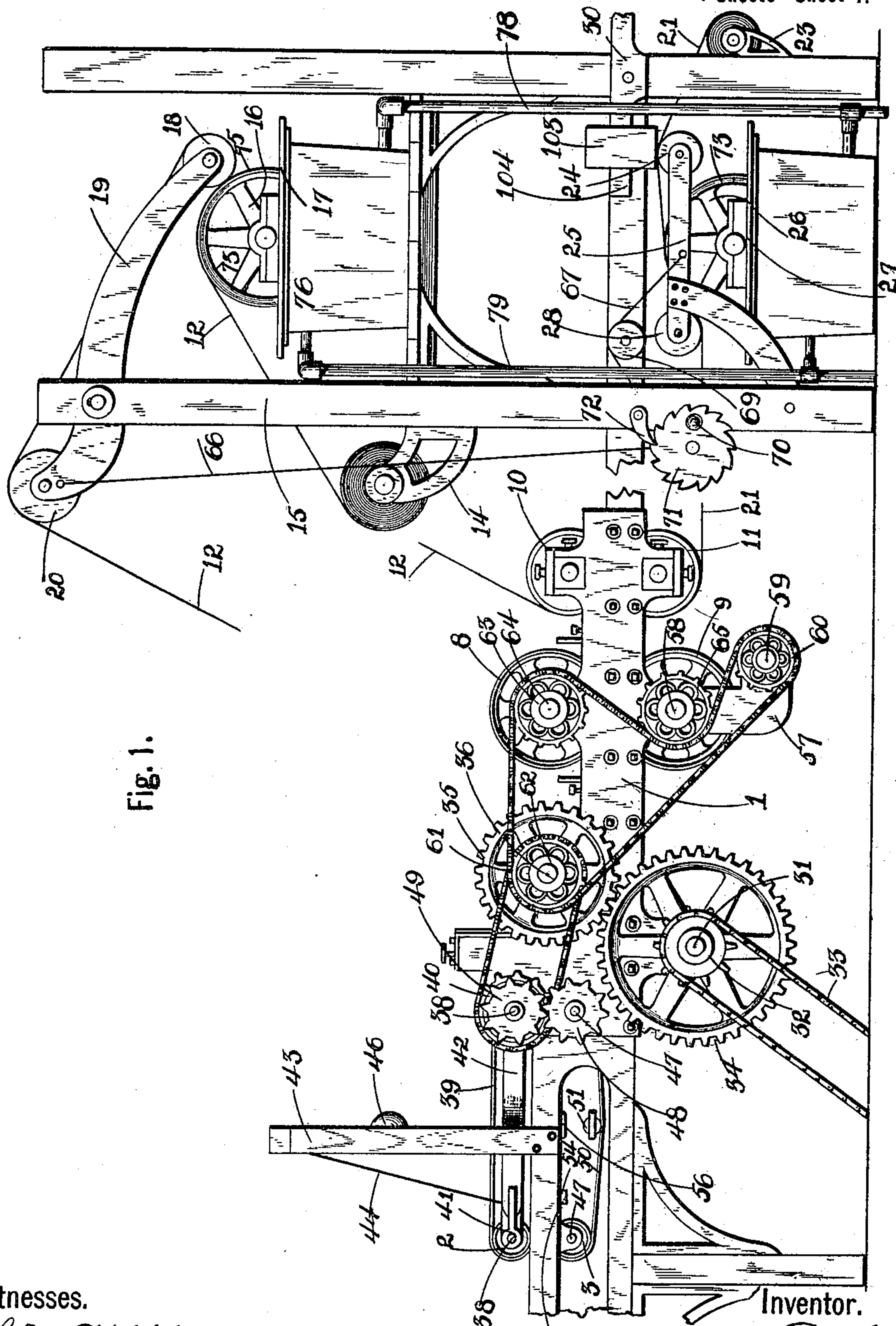
L. A. DEUTHER.

MACHINE FOR MAKING PICTURE BACK BOARDS.

(Application filed Dec. 21, 1899.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses.

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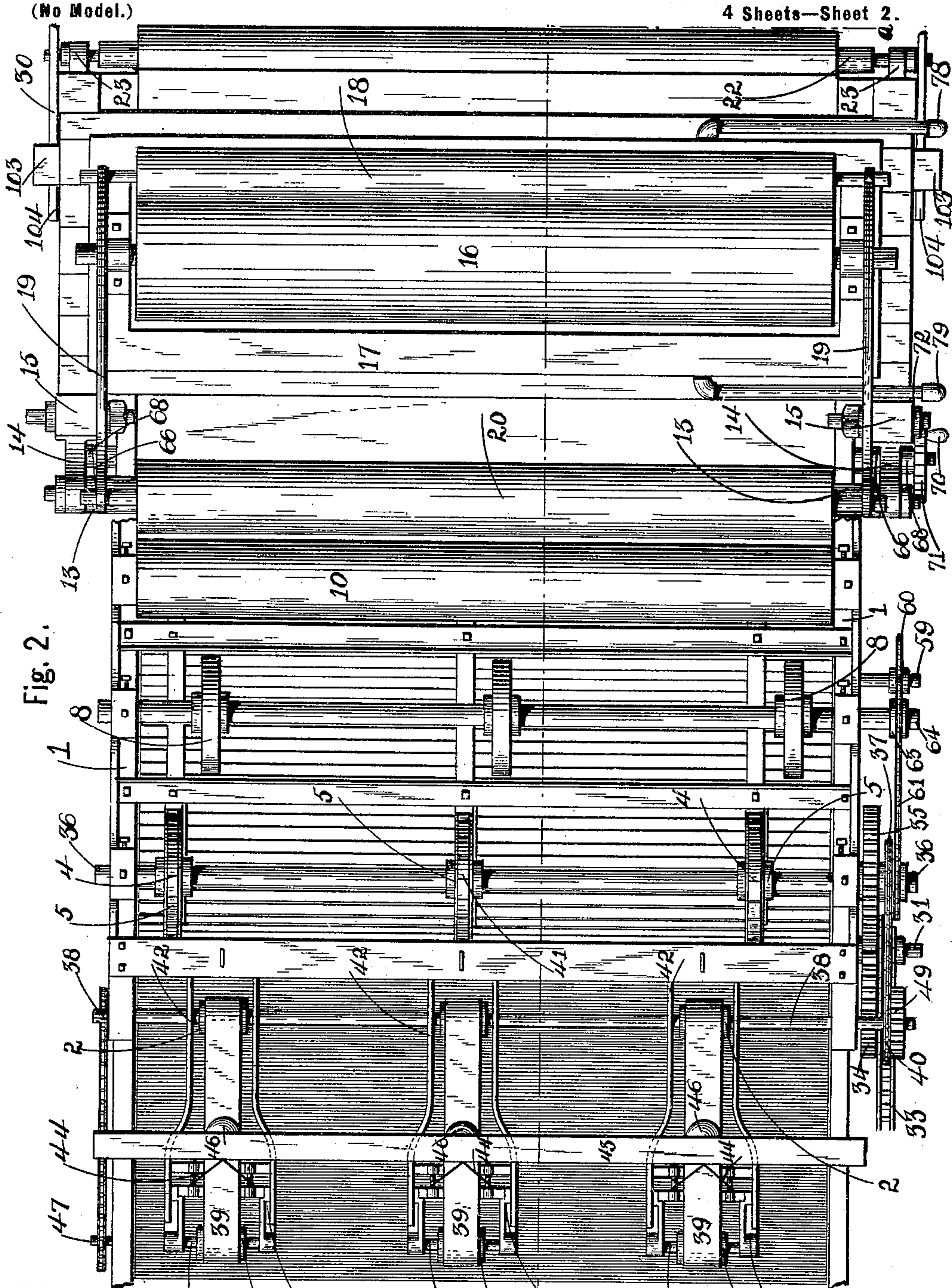


Fig. 2.

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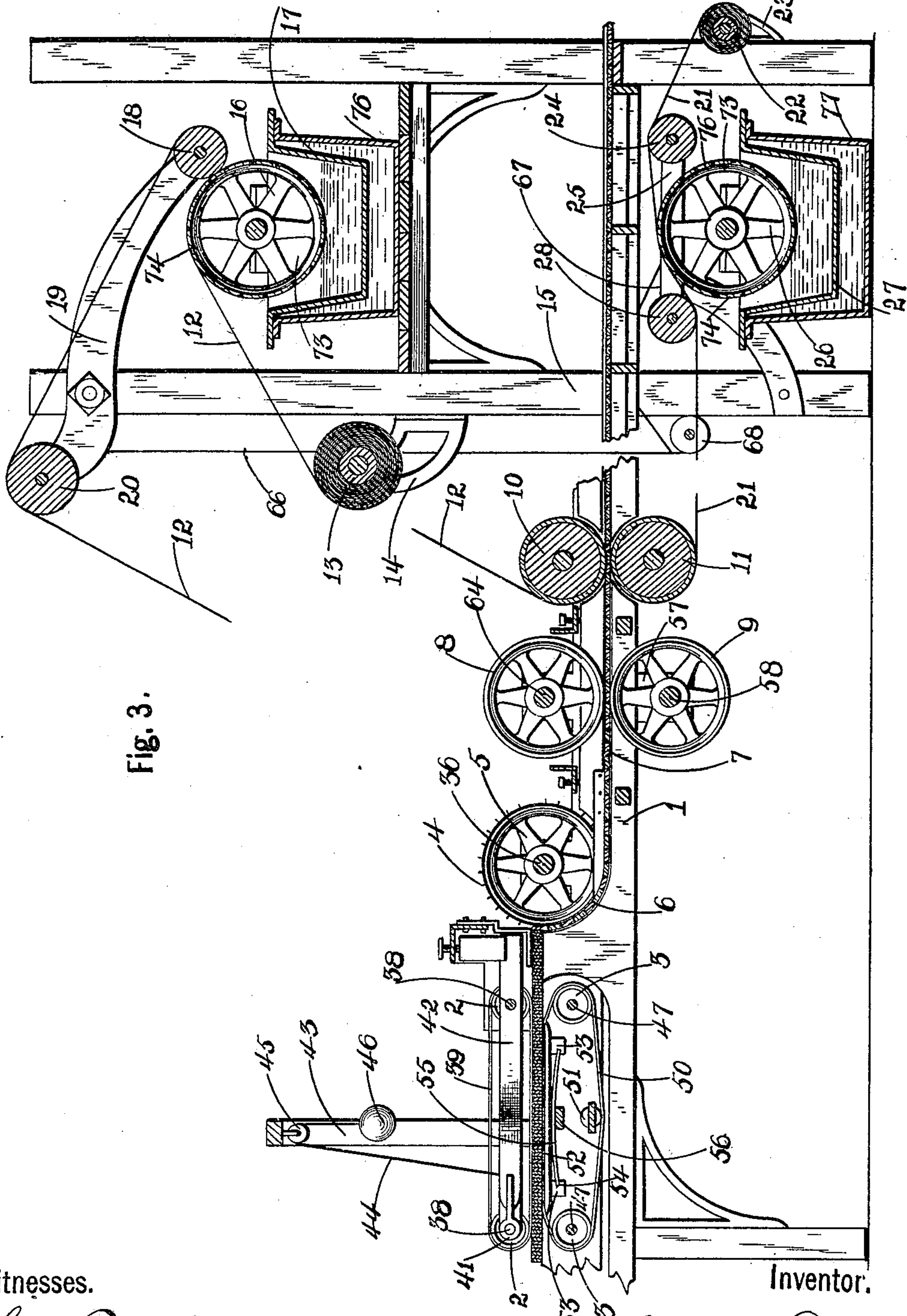


Fig. 3.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING PICTURE-BACK BOARDS.

SPECIFICATION forming part of Letters Patent No. 658,523, dated September 25, 1900.

Application filed December 21, 1899. Serial No. 741,080. (No model.)

To all whom it may concern:

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

My invention relates to an improved machine for making picture-back boards and the like in which a plurality of slats of wood or other suitable material are automatically fed between two sheets of flexible material, such as paper, and the whole rigidly secured together by cement or similar means, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, illustrating a preferred adaptation of my invention, in which—

Figure 1 represents a side elevation of my improved mechanism, the cutting device or knife being omitted. Fig. 2 is a top plan view of the same with the upper sheet of flexible material removed to expose one of the cement-tanks, the cutting device or knife also being omitted. Fig. 3 is a longitudinal section on or about line *a a*, Fig. 2. Fig. 4 represents a detached side elevation of the cutting device or knife and its operating mechanism. Fig. 5 is an end elevation of the cutting device, the locking mechanism being shown in section to illustrate its operation. Fig. 6 is an enlarged section through the upper and lower pairs of forward rollers and their belts and connecting mechanism. Fig. 7 is a fragmentary section through a portion of the toothed feed-roller to show its construction. Fig. 8 is a fragmentary section through a portion of one of the cement-carrying rollers. Fig. 9 is a detached view of the locking-ring. Fig. 10 is a detached view of the beveled arm. Fig. 11 is a section on line *b b*, Fig. 5, through the knife-operating shaft.

In referring to the drawings for the details of construction like numerals designate like parts.

In describing the machine the part into which the slats are fed will be termed the "front" portion and the part from which the completed board comes will be termed the "rear" portion.

The feeding mechanism comprises a series of rollers, which are mounted in the machine-frame 1 and between which the different parts 55 of the board pass. In the drawings the simplest form of machine is shown; but a greater number of rollers may be employed, if desired, to increase the capacity of the machine. 60

The slats are first fed in an upright position between the upper and lower forward pairs of rollers 2 and 3, which are arranged at the forward end of the machine, and are taken one by one between two of the teeth 4 of the feed-wheel 5 and carried downward upon a curved track 6 and then forward upon the horizontal continuation 7 of said track 6, the feed-wheel not only serving to feed them, but also to arrange the slats edgewise to each other. The slats now pass between upper and lower rollers 8 and 9, which I term "push-rollers," and are forced toward and between the rubber-covered rollers 10 and 11, the pressure of the slats between the rollers 8 and 9 75 upon the slats immediately preceding moving the opposed edges of adjacent slats into close contact immediately after they pass between the push-rollers 8 and 9.

The upper sheet of flexible material 12, 80 such as paper, is preferably arranged in roll form upon a roller 13, mounted upon a bracket 14, attached to an upright standard 15 on the machine-frame, and passes over a wheel 16, journaled over a tank 17, containing glue or other cement, so that the lower portion of the wheel will be in contact with the glue. From that wheel the sheet 12 passes over a roller 18, journaled in the rear end of a swinging frame 19, pivoted to the upright standard 15, 90 then over the roller 20, journaled at the opposite or forward end of the frame, and then downward over the upper rubber-covered roller 10, which forces its bottom glue-covered surface firmly upon the top faces of the 95 slats. The lower sheet of flexible material 21 is preferably arranged in roll form upon a roller 22, journaled in the bracket 23, attached to the machine-frame 1, and extends over the roller 24, journaled in the rear portion of a movable frame 25, into contact with the lower wheel 26, for carrying glue or other cement, which is journaled over a lower tank 27, containing glue or other cement, then un- 100

der the roller 28, journaled in the forward portion of the movable frame 25, and thence around the lower rubber-covered roller 11, which forces its top glue-covered surface rigidly in contact with the bottom surface of the slats. The completed board now moves upon the movable table 30, and when the desired length is upon the table a cutting device or knife is automatically operated, which severs that part of the board from the following portion. This cutting device or knife will be more specifically described farther on.

In the preferred adaptation of the machine, as shown in the drawings, 31 designates the driving - shaft, which is provided with a sprocket-wheel 32, over which a chain 33, having connection with a source of power, passes. A gear-wheel 34 is mounted on the shaft 31 and meshes with a gear-wheel 35 on the shaft 36. The feed-wheel 5 is mounted upon the shaft 36, and a smaller sprocket 37 is also mounted on said shaft 36. The upper forward pair of feed-rollers 2 are mounted upon shafts 38, which are journaled in a movable frame and are connected by a belt 39. A sprocket-wheel 40 is mounted upon the rear shaft 38, and a chain connects said sprocket 40 with the sprocket 37.

The movable frame is formed of two pieces 41 and 42, which are adjustable relatively to each other to provide means for tightening the belt 39, and as the frame is of metal and heavy a counterbalance is employed to lighten the downward pressure against the slats. An upright standard 43 extends from the forward end of the machine-frame, and a rope, chain, or the equivalent 44 is fastened at one end to the movable frame, passes over a pulley 45, hung from the standard, and has a weight 46 at its opposite end. (See Fig. 3.) The amount of the weight may be varied to adjust the downward pressure.

The lower pair of forward rollers 3 are mounted upon the shafts 47, journaled in the forward end of the machine-frame 1, and a gear-wheel 48 is mounted upon the rear shaft 47, which meshes with a similar-sized gear-wheel 49, mounted upon the rear upper shaft 38, so that the two pairs of forward rollers rotate in unison and at the same rate of speed. The lower rollers 3 are connected by a belt 50, which is tensioned by the small idler-wheel 51, and that portion of the belt over which the slats pass is supported in a flat horizontal position by the platform 52, which is provided with downwardly-extending lugs 53, having notches or depressions 54, into which the ends of a board 55 are sprung, the middle of the board 55 passing over the beam 56 of the frame, and thus supporting the platform 52 upon a spring foundation to allow for the variation of size and shape in the slats.

The frame 1 is provided with a downward extension 57, in the upper portion of which the shaft 58 is journaled, upon which the lower push-roller 9 is mounted, and a shaft 59,

having a sprocket-wheel 60, is journaled in the lower end of the extension. A chain 61 passes over and partially encircles a small sprocket 62, mounted upon the shaft 36, over a sprocket 63, mounted upon the shaft 64, upon which the upper feed-roller 8 is mounted, under a sprocket 65, mounted upon the shaft 58, and partially around the sprocket 60. The reason for arranging these sprockets and the chain 61 is to provide means for rotating the push-rollers, the feeding-rollers, and feed-wheel in the same direction.

The rollers 10 and 11 are rotated by the passage of the interposed slats, and they therefore travel at exactly the same rate of speed as the slats. These rollers 10 and 11 are preferably covered with rubber; but any other material suitable for the purpose may be employed.

The rear end of the swinging frame 19 and the movable frame 25 are raised by means of the ropes, chains, or their equivalents 66 and 67. The rope or chain 66 is connected at one end to the swinging frame and at the opposite end to a drum or windlass 68, and the rope or chain 67 connects at one end to the movable frame 25, passes up over a pulley 69, and connects at its opposite end to the drum or windlass 68. To elevate these frames 19 and 25, the drum or windlass 68 is rotated by means of the handle 70, thereby winding the rope thereon and lifting the frames and the upper and lower sheets of material out of contact with the rollers 16 and 26. The object of this is to prevent the sheets of material from becoming rigidly cemented to the cement-rollers 16 and 26 when the machine is not in operation.

The drum or windlass is provided with a ratchet-wheel 71, and a pawl 72 is adapted to engage with said ratchet-wheel to prevent the involuntary unwinding of the drum or windlass.

The rollers 16 and 26 may be formed of any material, but are preferably constructed of an inner metallic shell or wheel 73, having a plurality of wooden strips 74, dovetailed to each other around the periphery of the shell, and an outer covering of canvas 75 or other textile absorbent material, which is wrapped two or three times around the wooden strips and then fastened in any well-known way. This form of wheel carries the glue or other liquid cement more readily and places a more even coating upon the sheets of material.

The tanks 17 and 27, which contain the glue or other cement, are inclosed within outer tanks 76 and 77, and a steam pipe 78 has connection with said outer tanks for the purpose of maintaining the glue or other cement in the proper heated condition. Each of these tanks 76 and 77 is provided with an overflow-pipe 79.

The automatically-operated cutting device or knife used to sever the completed board into proper lengths is shown in Figs. 4, 5, 9, and 10. A knife 80 is hung upon the lower

ends of the rods 81, the upper ends of which are provided with collars 82, that loosely encircle eccentrics or cams 83, mounted upon a shaft 84. This shaft 84 is journaled in the boxes 85 on the machine-frame and has a disk 86 rigidly mounted thereon at one end. The disk 86 has a depression 87, in which a pin 88 is seated against the tension of a spring 89. An elongated aperture 90 extends from the depression 87 through the periphery of the disk 86, and a small projection 91 extends at right angles from the pin and travels in the aperture 90. A pulley 92 is loosely mounted on the shaft 84 and has one or more depressions on its inner surface (shown in dotted lines in Figs. 4 and 5) into which the pin 88 springs to lock the pulley to the shaft. An angular beveled arm 93 is pivoted at its upper end to a vertical standard 94, extending from the machine-frame, and is normally held in the position shown in Fig. 5 to maintain the pin in its depressed position. The pin is released by a trigger device which consists of a trigger-arm 95, hung from a shaft 96, which in turn is journaled in the collars 97, at the upper ends of the short rods 98, that are adjustably mounted on the rods 99, supported between the standards 94 and 94^a, and one end of the shaft has a crank-arm which is connected to the rod 98^a, which is rigidly connected to the beveled arm 93. The knife is automatically operated by the completed board pushing against the arm 95 and moving it to partially rotate the shaft 96, which in turn moves the rod 98^a and the beveled arm 93 sufficiently to permit the pin 88 to seat in any one of the depressions in the pulley 92, and thereby lock the pulley to the shaft. When the shaft has completed one revolution, the pin is automatically withdrawn from the depression in the pulley, and the pulley is released. The preferred construction of this portion of the invention is as follows: A movable platform 30 is pivoted to the standard 94 by the pin 100, so that its forward end can drop a short distance when released by the hook 101, which is pivoted to the standard 97 by the pin 102. A counterbalance-weight 103 is placed on the arm 104 and is arranged to restore the movable platform to its original position when the cut board is removed. A spring 105 is employed to maintain the hook in locking position with a spring force, and a stop 106 serves to limit the upward movement of the forward end of the platform. The platform is automatically released from the hook by the downward movement of the knife by means of the rod 107, which is pivoted at one end to the upper end of the hook and operatively connected at its opposite end to a crank device, which in turn is connected to the knife. The object in dropping the platform is to lower the rear end of the board below the trigger-arm, and thus release the trigger-arm and permit it to resume its ver-

tical position, the angular arm 93 under the pressure of the spring 108 returning to its original position and bringing its beveled face in contact with the projection 91 of the pin. The shaft 84 in rotating carries the angular arm with it, and the beveled outer face of said arm presses against the projection 91 and gradually withdraws the pin from the depression in the pulley, thereby releasing the pulley and permitting it to again freely revolve upon the shaft. The cut portion of board is immediately removed from the platform by a workman, the counterbalance returns the platform to its elevated position, and the automatic cutting device is again in position for cutting. Owing to the continuous feed, the completed portion of board in front of the knife bends or curves upward at or near its center when the knife is down and the rear end of the board from which a portion has just been cut is pressing against the front of the knife.

I claim as my invention—

1. A machine for making picture-back boards and the like, into which slats are fed in vertical position, having forward feeding mechanism by which the slats are fed rearward in vertical position, a toothed wheel in the rear of the forward feeding mechanism for taking the slats as they come from said feeding mechanism and arranging them edge to edge, intermediate push-rollers in the rear of the toothed wheel, means for coating the surface of sheets of material with cement, and tension-rollers in the rear of the push-rollers for pressing and cementing the slats between interposed cement-coated sheets of material.

2. A machine for making picture-back boards and the like, into which slats are fed in vertical position, having forward upper and lower feed-belts between which the slats are arranged in vertical position and fed horizontally rearward, a toothed wheel in the rear of the forward feed-belts for taking the slats as they come from the forward feed-belts and arranging them edge to edge, intermediate push-rollers in the rear of the toothed wheel, means for coating the surface of sheets of material with cement, and tension-rollers in the rear of the push-rollers for pressing and cementing the slats between interposed cement-coated sheets of material.

3. A machine for making picture-back boards and the like, into which slats are fed in vertical position, having forward upper and lower feed-belts between which the slats are arranged in vertical position and fed horizontally rearward, a toothed wheel in the rear of the forward feed-belts for taking the slats as they come from the forward feed-belts, carrying them in an arc of a circle and arranging them edge to edge, intermediate push-rollers in the rear of the toothed wheel, means for coating the surface of sheets of material with cement and tension-rollers in the rear of

the push-rollers for pressing and cementing the slats between interposed cement-coated sheets of material.

4. A machine for making picture-back boards and the like, into which slats are fed in vertical position, having forward upper and lower feed-belts between which slats are arranged in vertical position and fed horizontally rearward; a toothed wheel in the rear of the forward feed-belts for taking the slats as they come from the forward feed-belts, carrying them in an arc of a circle and arranging them edge to edge, intermediate push-rollers in the rear of the toothed wheel, means for coating the surface of sheets of material with cement, tension-rollers in the rear of the push-rollers for pressing and cementing the slats between interposed cement-coated sheets of material, and an automatic cutting device.

5. A machine for making picture-back boards and the like, in which sheets of material are cemented upon the opposite faces of a series of slats, having upper and lower tanks containing cement, cement-carrying rollers, a swinging arm having a guiding-roller at one end arranged to guide the upper sheet of material into contact with the upper cement-roller, a movable frame carrying rollers for guiding the lower sheet of material into contact with the lower cement-carrying roller and a single operating means for swinging the arm and raising the movable frame to move the sheets of material out of contact with the cement-carrying rollers.

6. A machine for making picture-back boards and the like, in which sheets of material are cemented upon the opposite faces of a series of slats having two tanks containing cement arranged one above the other, cement-carrying rollers arranged above said tanks, a swinging arm carrying rollers for guiding the upper sheet of material into contact with the upper cement-roller, and a movable frame carrying rollers for guiding the lower sheet of material into contact with the lower cement-carrying roller, and means for jointly and coincidentally raising said swinging arm and movable frame to move the sheets of material out of contact with the cement-carrying rollers.

7. A machine for making picture-back boards and the like, into which slats are fed in vertical position, having forward feeding mechanism by which the slats are fed rearward in vertical position, a toothed wheel in the rear of the forward feeding mechanism for taking the slats as they come from said feeding mechanism and turning them from a vertical to a horizontal position, and means for pressing and cementing the slats between interposed cement-coated sheets of material.

8. A machine for making picture-back boards and the like, in which slats are cemented between interposed sheets of material comprising forward upper and lower pairs of

feed-rollers connected by belts between which the slats are arranged in vertical position and fed horizontally rearward, a toothed wheel in the rear of the forward feed-belts for taking the slats as they come from the forward feed-belts and arranging them loosely edge to edge, intermediate push-rollers in the rear of the toothed wheel for pressing the edges of the slats into close contact, cement-rollers for coating the surface of the sheets of material, and tension-rollers in the rear of the push-rollers for pressing and cementing the slats between interposed sheets of material.

9. A machine for making picture-back boards and the like, comprising a frame, forward upper and lower feed-belts, a toothed wheel mounted on a shaft journaled in the frame in the rear of the forward feed-belts for taking the slats as they come from said feed-belts and arranging them loosely edge to edge, intermediate push-rollers mounted on shafts journaled in the frame in the rear of the toothed wheel for pressing the edges of the slats into close contact, means for coating the surface of the sheets of material with cement, tension-rollers mounted on shafts journaled in the frame in the rear of the push-rollers for pressing and cementing the slats between interposed sheets of material; said tension-rollers being rotated by the passage of the interposed slats, a driving-shaft having a gear-wheel, a pinion on the supporting-shaft of the toothed wheel meshing with said gear-wheel, a chain engaging with sprockets on the shaft of the intermediate push-rollers and a connection between the driving-shaft and the forward feed-belts.

10. A machine for making picture-back boards and the like, having upper and lower pairs of rollers connected by belts, a platform beneath the upper portion of the lower belt to support it in horizontal position, lugs upon said platform, a spring-board having connection with said lugs and a support beneath the middle portion of the spring-board.

11. A machine for making picture-back boards and the like, in which sheets of material are cemented upon opposite faces of a series of slats, comprising forward feeding mechanism by which the slats are introduced in vertical position, assembling mechanism arranged in a lower horizontal plane, and means located between the forward feeding mechanism and the assembling mechanism for carrying the slats through an arc of a circle from the horizontal plane of the feeding mechanism to the lower horizontal plane of the assembling mechanism and changing the slats from a vertical to a horizontal edge-to-edge position before feeding them between the sheets of material.

12. A machine for making picture-back boards and the like, in which sheets of material are cemented upon opposite faces of a series of slats, comprising upper and lower feed-belts between which the slats are introduced

in vertical position and fed horizontally rearward, assembling mechanism arranged in a lower horizontal plane, and a toothed wheel interposed between the feed-belts and the assembling mechanism for carrying the slats through an arc of a circle from the horizontal plane of the feed-belts to the lower horizontal plane of the assembling mechanism and changing the slats from a vertical to a horizontal edge-to-edge position before feeding them between the sheets of material.

13. A machine for making picture-back boards and the like, into which sheets of material are cemented upon opposite faces of a series of slats and into which slats are first fed in vertical position, comprising a frame, forward feed-belts between which the slats are arranged in vertical position and fed horizontally rearward, a toothed wheel in the rear of the forward feed-belts for taking the slats as they come from the forward feed-rollers and arranging them in a loose edge-to-edge position, a curved track in the frame adjacent to the toothed wheel and extending downward from the rear of the feed-belts, a horizontal track in the rear of the curved track, intermediate push-rollers in the rear of the toothed wheel for pressing the edges of the slats closely together and feeding them rearward on the horizontal track, and tension-rollers in the rear of the push-rollers for pressing and cementing the slats between the interposed sheets of material.

14. A machine for making picture-back boards and the like, in which sheets of material are cemented upon opposite faces of a series of slats and into which slats are first fed in vertical position, comprising a frame, forward feed-belts between which the slats are arranged in vertical position and fed horizontally rearward, a toothed wheel in the rear of the forward feed-belts for taking the slats as they come from said feed-belts and arranging them in a loose edge-to-edge position, a curved track in the frame adjacent to the toothed wheel and extending downward from the rear of the feed-belts, a horizontal track in the rear of the curved track, intermediate push-rollers in the rear of the toothed wheel for pressing the edges of the slats closely together and feeding them rearward on the hori-

zontal track, tension-rollers in the rear of the push-rollers for pressing and cementing the slats between interposed sheets of material and an automatic cutting device for severing the completed back.

15. A machine for making picture-back boards and the like, in which sheets of material are cemented upon the opposite faces of a series of slats, having upper and lower tanks containing cement, a cement-carrying roller mounted above each of said tanks, an upper swinging arm and lower movable frame, each carrying rollers for guiding the upper and lower sheets of material into contact with the upper and lower cement-carrying rollers respectively, and common mechanism adapted to raise both coincidently to move the sheets of material out of contact with the cement-carrying rollers when the machine is not in operation.

16. A machine for making picture-back boards and the like, in which a series of slats are cemented between interposed sheets of material, having upper and lower pairs of rollers between which the slats are fed, a belt connecting the upper pair of rollers, a belt connecting the lower pair of rollers, a toothed wheel in the rear of the rollers, means for coating sheets of material with cement, guiding and cementing rollers in the rear of the toothed wheel, a driving-shaft, a connection between the driving-shaft and the toothed wheel, and connections between the toothed wheel and the pairs of feed-rollers, and the toothed wheel and guiding-rollers, as set forth.

17. A machine for making picture-back boards and the like, in which sheets of material are cemented upon opposite faces of a series of slats, comprising forward feeding mechanism by which the slats are introduced in vertical position, assembling mechanism for cementing the slats between cement-coated sheets of material, and means for turning the slats from a vertical position to a horizontal edge-to-edge position before feeding them into the assembling mechanism.

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