

3 Sheets—Sheet 1.

No. 377,236.

Patented Jan. 31, 1888.



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A. E. Dowell.

INVENTOR

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(No Model.)

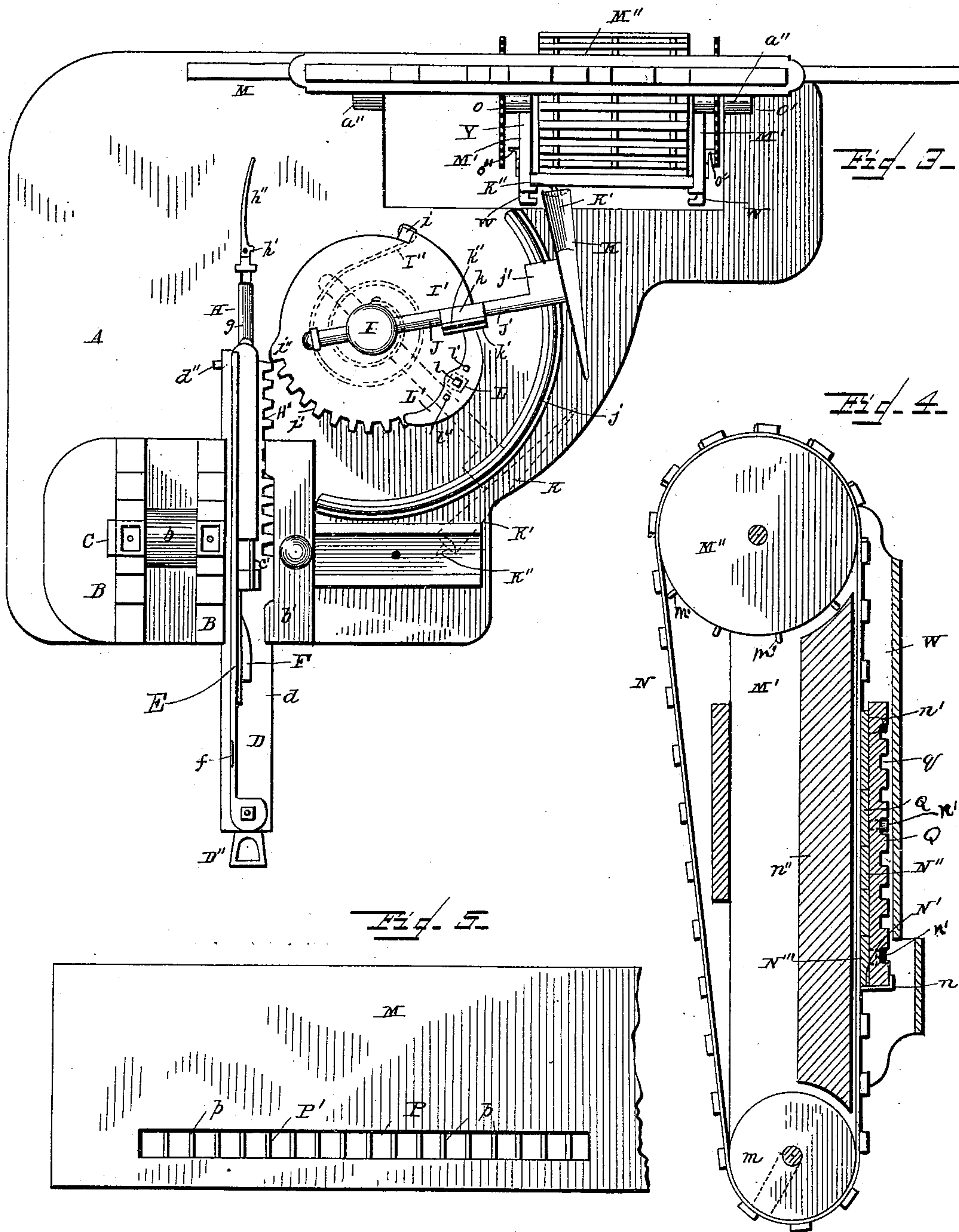
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J. R. CLUXTON.

WASH BOARD MAKING MACHINE.

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WITNESSES

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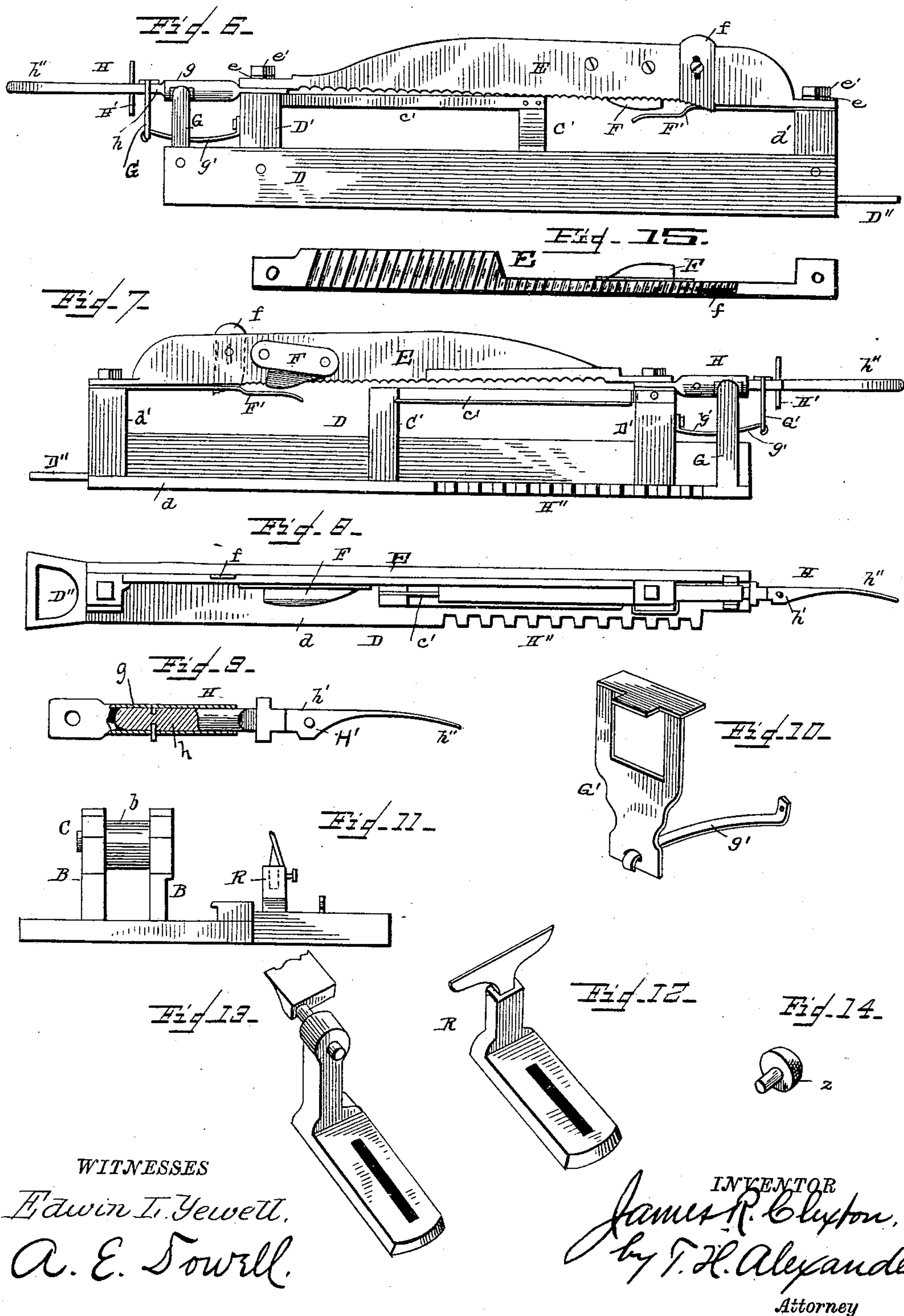
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J. R. CLUXTON.
WASH BOARD MAKING MACHINE.

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UNITED STATES PATENT OFFICE.

JAMES R. CLUXTON, OF XENIA, OHIO.

WASH-BOARD-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 377,236, dated January 31, 1888.

Application filed August 30, 1887. Serial No. 248,278. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. CLUXTON, of Xenia, in the county of Greene and State of Ohio, have invented certain new and useful
5 Improvements in Wash-Board-Making Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference
10 marked thereon, which form part of this specification, in which—

Figure 1 is a side elevation of my improved wash-board machine. Fig. 2 is a front elevation of the same. Fig. 3 is a top plan view of the machine. Fig. 4 is a vertical central section through the wash-board-back-blank-carrying mechanism. Fig. 5 is a detail of the
15 adjusting-rack of the same. Fig. 6 is a detail side elevation of the cutter-bearing frame D. Fig. 7 is an opposite side elevation of the same. Fig. 8 is a plan top view of the same. Fig. 9 is a detail of the spacing-arm on said frame. Fig. 10 is a detail of the retaining or locking device for said arm. Fig. 11 shows the blank-
25 turning devices detached and modified form of employing the same. Figs. 12 and 13 are detail views of rests and cutters employed with such modification. Fig. 14 is a view of one of the pins detached. Fig. 15 is a bottom plan
30 view of cutter-bar E.

This invention relates to improvements in wash-board-making machines, being especially designed for producing the scrubbing-boards of the wash-boards described and claimed in
35 my application for wash-board filed August 30, 1887, and numbered serially 248,328.

To these ends the invention consists in the novel mechanisms combined in one complete machine, which mechanisms are severally designed for producing from a wood blank the
40 wooden pins or tacks which form the scrubbing-surface of the wash-board, for automatically removing these pins when completed and severed from the blank and driving them in proper position on the wash-board back, and, lastly,
45 for holding the wash-board back in position for receiving said pins and automatically actuating the same to cause the pins to be driven into proper positions upon the wash-board
50 back.

Further objects of the invention are to provide means whereby the pin-forming devices

can be utilized to produce fancy regular wood turnings and rosettes.

To these ends the invention consists in the novel construction and arrangement of parts
55 hereinafter described, illustrated in the drawings, and particularly pointed out in the claims hereto appended.

Referring to the accompanying drawings by
60 letters, A designates the main supporting-frame of the machine, upon which are mounted the several mechanisms before referred to.

I will first describe the pin-forming mechanism. These pins *z* are shown distinctly in
65 Fig. 14, and it will be seen that they have a hemispherical rounded head and a straight shank of much smaller diameter than the vase of the head, as evident.

B B designate two upright brackets provided with suitable journal boxes and caps, and secured in proper manner to the upper surface of the top of frame A in close relation to each other. In these brackets are journaled
70 the ends of a short hollow shaft, C, which is of somewhat large diameter and answers a purpose hereinafter explained. Upon shaft C, between brackets B B, is splined a small driving-pulley, *b*, by which the shaft is rotated, and which is in turn rotated by a belt from
80 any proper source of power. The shaft C has its longitudinal central opening, *c*, made angular in cross-section, preferably squared, and through this shaft is run the end of a wood blank, Z, which is preferably of sufficient
85 length to produce a number of finished pins, *z*.

To the inside of the inner bracket, B, is arranged the cutter-bearing frame D, by which the blank Z is reduced to pins *z*. The shaft C in reality is a revolving mandrel by which the
90 wood blank is fed to the cutters and revolved, the cutters being mounted upon a longitudinally-moving frame, which is so arranged as to present the cutters to the revolving blank in such manner as to gradually and completely
95 form the pins *z*, and then to sever the complete pin from the main blank, and in the complete machine to hold said pin in position for removal by the setting and driving device hereinafter described. The frame D reciprocates longitudinally in suitable guides formed
100 on the inner face of the inner bracket, B, and in the opposite face of an adjoining stop, *b'*, as shown, so that while the frame has free lon-

gitudinal play any lateral motion is prevented and the cutters thereby held precisely and firmly to their work.

From the base d of frame D, near the opposite ends thereof, rise two uprights, D' d' , the inner one, D' , of which is slightly higher than the outer one, d' . Secured to and on top of these uprights D' d' is a metal cutter-bar, E, the inner end and teeth of which, when the frame D is retracted or drawn out of the machine to its full extent, are in such relative positions to the opening c of shaft C that the blank Z will be but barely engaged and its corners taken off by the first of the series of cutters on bar E. As the bar inclines downward toward upright d' , its cutters, as the frame is moved inward, successively engage the projecting end of blank Z and gradually reduce it to a perfectly cylindrical form. The inner end of cutter-bar E has its cutting-teeth widened, as shown, so as to round the blank the complete length of the pin z ; but its outer portion is narrowed abruptly, as shown, so that the cutters thereon will only act upon and form the shank of the head of the pin. The cutter-bar E is so arranged with frame D as to act upon blank Z close to the end of shaft C and side of bracket B, as shown. Too far retraction of frame D is prevented by means of a stop-lug, d'' , on its inner end, or other suitable means. The frame D is reciprocated in this instance by means of the handle-piece D'' on its outer end, as shown.

The cutter-bar E in the present instance is made of one piece of metal, and its cutters or teeth are formed by obliquely serrating its under surface, as shown; but I do not wish to confine myself to this precise form of cutter, as removable cutters may be employed mounted on a bar corresponding to bar E and arranged to have the same action upon blank Z. The bar E is mounted upon uprights D' d' by means of washers and bolts e e' , respectively, as shown.

It is obvious that by substituting washers of different thicknesses the relative height of the opposite ends of the bar E can be regulated or varied, thereby regulating the action of the cutters upon blank Z.

About centrally of frame D, between uprights D' d' , is another upright, C' , and secured to and between this upright C' and upright D' is a horizontal stop-bar, c' , which stands at right angles to the plane of the axis of shaft C, and is adapted to stop the inward movement of blank Z, so that only a proper length of said blank shall project from the inner mouth of opening c as will suffice to produce a pin, z . The upright C' is recessed on its upper face, as shown, so as to permit the same to pass by the unfinished pin z as frame D is moved inward, and the bar c' is adapted to keep the end of blank Z in proper position relatively to the cutter-bar E until the shank-forming cutters have a sufficient hold upon said blank to prevent its lateral movement.

Upon bar E, and outside of the cutters for

giving the cylindrical outline to the heads of pin z while the same is being cut from blank Z, is arranged and adjustably secured in suitable manner to the vertical portion of said bar and to the inside of the shank-forming cutters a cutter-blade, F, which is adapted to give the hemispherical or rounded form to the head of the pin z , and thereby perfect the same. This cutter F consists of a longitudinal blade having its cutting-edge rounded and cut obliquely from front to rear, as shown, so that when it first engages with the blank Z, which has previously been made cylindrical by the first cutters on bar E, it will engage the same at a point corresponding to the base or equator of the head of the pins, and then as the frame is moved inward will cut away the edges of the blank until finally it produces the completely-rounded head shown in the pin z . The shank-cutters act simultaneously with the other cutters of the bar, and continue their action after cutter F has disengaged the blank, continuing this action until the shank is reduced to a proper thickness, and then the completed pin is severed from the main body of the blank by means of the saw or cutters f , which is adjustably set into the face of the cutter-bar E, as shown, and rapidly severs the shank from the main body of the blank. However, before this saw f has severed the pin from the blank the shanks have been engaged by a flat spring, F' , which spring is secured to the under surface of cutter-bar E at its outer end and directly beneath its shank-cutting teeth and embraced the shank of the pin before it is severed, and upon the severing of said pin from the blank Z presses the shank upward against the teeth of bar E, thereby holding the pin suspended upon frame D, with its head projecting inward.

Upon the inner end of frame D is arranged a spacing-arm, H, hereinafter referred to, which is adapted in the complete machine to operate the wash-board-back-carrying device laterally, so that the pins z shall be arranged in proper horizontal lines thereon and in close relation to each other, as hereinafter specified. This spacing-arm H is supported and shifted as follows:

G designates an upright rising from the inner end of frame D, close to the upright D' .

g designates a tubular barrel or socket supported horizontally upon the tops of uprights D' G, as shown, and having its mouth opening toward the center of the machine. In this barrel g is secured the shank h of the spacing-arm H, which arm has a circumferential groove near its inner end engaged by a screw, pin, or lug in the side of barrel g , so that its escape from or longitudinal play in said barrel is prevented. The main portion of arm H, outside of barrel g , is flattened, and is widest at its junction with shank h , as shown at h' , tapering thence into a thin spring portion, h'' , which is slightly curved, as shown, in a horizontal direction. In order to hold the arm H in proper position, which is with one of its

broadest sides uppermost, I employ a retaining device consisting of a stirrup-shaped link, G', the opening of which is of sufficient extent to embrace the widest portion of arm H and permit its rotation therein, and the upper portion of link G' is flattened, so that when the arm H is in proper position and the link G' drawn down thereon by means of suitable springs the arm will be prevented from turning, as is evident from the drawings. In the present instance I employ a flat spring, g', secured at one end of the side of upright D', and projecting thence through a suitable slot in upright G, where it engages in an eye formed in the lower end of link G', as shown, whereby said link is continually depressed and held firmly upon arm H.

In order to prevent any accidental displacement of link G' on arm H, and in order to facilitate the half-rotation of the latter, which is necessary in order to cause its curved point to face in opposite directions, as hereinafter stated, I provide arm H with a cross-piece or rod, H', which is secured in a suitable opening in said arm, as shown, at a point adjoining the link G', but inside thereof and not interfering therewith.

On the inner edge of the base-plate of frame D is formed the rack H'', which engages with and actuates the pin-setting mechanism, as hereinafter stated.

The pin removing, setting, and driving devices are as follows:

I designate an upright revoluble post or shaft properly journaled or mounted upon the top plate of frame A, as shown. I' designates a disk secured on the lower end of post I, and to the under side of this disk I' is secured one end of a convolute spring, I'', the outer end of which is secured to a lug or upright arm, i, as shown. The disk I' is provided on about one-quarter portion of its periphery with the rack i'', the first tooth, i'', of which, when the parts are in normal position, stands in the line of and is adapted to engage with the rack H'' of frame D, and said tooth is enlarged, as shown, to insure the engagement of said rack H'' therewith. The rack H'' is adapted to rotate the disk I' and upright I about one-quarter of a revolution. As is evident, when frame D is moved inward, the movement of frame D is stopped at the end of the rack i'', as is evident by there being no more teeth to engage with; or, if desired, and preferably, a suitable stop is placed on frame D, or on the frame A, in position to properly limit the inward movement of said frame D, as is evident. When the frame D is retracted, which must be done quickly, the rack H'' first starts the disk I' in the reverse direction, but disengaging therewith the spring I'' gives it a quick and strong return throw, which is limited by a stop projection or shoulder, i'', formed at a suitable point on the periphery of disk I', and which at the proper time engages a suitable stop-lug on the top of frame A. In the

present instance the lug i limits the return movement of the disk I' and post I.

In the upper end of post I, and passing horizontally therethrough, is a hollow short shaft, J, as shown, of less length than the diameter of disk I', and standing vertically above and parallel with a diametrical line drawn from tooth i'' through the center of disk I', as will be seen by reference to Fig. 3. In this hollow shaft J is journaled the inner end of a shaft, J', which is prevented from longitudinal movement through said shaft J by means of a segmental rack, k, secured upon it to the outside of the outer end of shaft J', and hereinafter referred to, and by means of a suitable retaining bolt or nut and washer secured on the inner end of shaft J' to the inner side of the inner end of shaft J.

It is obvious that other devices may be employed for holding shaft J' in position within hollow shaft J, and I do not wish to confine myself to the precise form described and shown. The outer end of shaft J' is supported upon a segmental track, j, as shown, which extends from the stop-guide b' partly around the disk I' a distance of about one-third of a circle, having the post I as its center and its ends facing diagonally-opposite points of frame A. The track j stands horizontal and in about the same plane as the lowest portion of opening c of shaft C when the latter is revolving.

The shaft J' is kept from revolving while moving over track j by means of a weighted extension, j', as shown, standing from one side of the shaft J', and lying upon and moving over track j as the shaft J' is rotatively reciprocated by the movement of post I. The action of the extension j' is supplemented by the pin picker, carrier, and driver K, which has the general appearance of an ordinary hammer mounted on the shaft J', which forms its handle, the "hammer" K, as I shall designate said portion, lying horizontal with its head on the same side of the shaft as extension j', as shown. The head K' of hammer K is slightly concave, as shown, and from the center of this concavity projects a pin, K'', which extends somewhat beyond the face of the hammer, as shown. The concavity of said face should not be greater than the convexity of the head of pin z. In its normal position the head K' of hammer K stands at the end of track j farthest from frame D, and when the shaft J' is operated by post I it is necessary that the shaft J' be given a one half revolution in order to turn hammer K so as to bring its head K' to face frame D, for a purpose hereinafter shown. This semi-rotation of shaft J' is effected by means of the segmental rack k and engaging devices therefor, which I will now describe.

The rack k has but two teeth, which stand vertically above each other, in line with the shaft J' and on the side thereof and opposite the extension j', when the shaft is in normal position, as shown. When the hammer K is at the end of track j farthest from frame D,

the tooth k' of rack k is lowermost, the tooth k'' uppermost.

L designates an upright bracket suitably secured to the top of frame A at a point about centrally of track j and between the supports of the latter and the periphery of disk I'. On the upper end of bracket L is secured a segment, L' , which stands below the track j , as shown, and which has on its upper surface a central tooth, l , and at equal distances on opposite sides thereof the lugs $l' l''$, of less height than tooth l , as evident. Now, when the post I is rotated, similarly actuating shaft J', the parts being originally in normal position, the lower tooth, k' , of rack k passes over lug l' , but engages with tooth l and causes shaft J' to partially but not wholly rotate a one-half revolution, thereby throwing the head K' of hammer K toward frame D. As the shaft J is shifted farther by the movement of post I, the tooth k'' engages with lug l'' and causes shaft J' to complete a one-half revolution, as is evident, so that hammer K is presented squarely and truly toward frame D. When shaft J is retracted by the movement of post I, the tooth k'' of the rack k first passes over lug l'' , engages tooth l , and then tooth k' engages lug l' , thereby returning hammer K to its original position. It will be observed that this throw of the hammer is entirely effected at the central part of its movement on track j . The operation of these parts of the machine will be hereinafter described.

I will now describe the mechanism for holding the wash-board-back blanks into which the pins z are to be inserted.

A' designates an extension of frame A, which extension consists of two uprights, A'', a proper distance apart and rising considerably above the top plate of frame A, and connected together at top and bottom in suitable manner. In these uprights A'', at a proper point above the top surface of frame A, are formed vertical slots a , through which play a horizontal guide and supporting bar, M, as shown.

About centrally of bar M, and supported thereon and movable therewith, is the frame Y, carrying the supporting and guide devices for the wash-board blanks. This frame consists of two opposite uprights, M' M', the lower ends of which are below the top of frame A, and the upper ends of which stand close beneath the top connecting-bar of the uprights A'' A''. The uprights M' are placed a distance apart greater than the width of the wash-board blank. In the upper and lower ends of uprights M' are suitably journaled the shafts of endless-belt drums M'' and m , the upper one, M'', of which is provided with pins m' on its perimeter, suitably set to actuate the endless belt N, which is mounted on said drums, a corresponding amount of movement at each actuation of drum m , the movement of which is regulated as hereinafter shown.

Upon the inner portion of belt N, or on the side facing hammer K, as shown, is formed

the blank-holder N', consisting of a series of closely-set slats, N'', arranged outside of but on the belt proper, and the lowermost slat N'' is provided with the bottom projections, n , which support the board-back (which I shall letter Q and describe hereinafter) vertically, and with side projections, n' , as is also the uppermost slat N'', and others, if desired, which support back Q and prevent lateral play thereof in holder N'. The belt N, at the point opposite the hammer K, is re-enforced by a backing, n'' , as shown, by which the impact of the hammer in driving the pins z into place is received through holder N', as is evident. The back Q is prevented from falling forward out of its holder by means of inwardly-flanged slats or guards, W W, secured to the front edges of uprights M' M', as shown.

The lower drum, m , of frame Y is not supported in fixed journals, but has its bearings in angular slots in the lower ends of uprights M' M', as shown, for the purpose of keeping the belt N taut.

The device for dropping the back-holder N' a certain distance at each lateral reciprocation of the belt-supporting device is as follows: The shaft of drum M'' is extended on each side outside its bearings a proper distance, and has secured on its opposite ends the toothed or sprocket wheels O O', respectively, as shown. The shaft of drums M'' m are longitudinally movable in their bearings. The wheels O O' are secured to their shaft in such manner that their teeth, which are wide apart, do not correspond with each other, but alternate. The teeth of wheels O O' are respectively engaged by retainers $o o'$, which consist of metal straps bent outward at their upper ends sufficiently to engage the teeth of their respective wheels when the shaft is shifted to the opposite side of the frame Y, and which are pivoted at their lower ends in suitable manner to the outer sides of uprights M' M', and are kept vertical by means of stop-lugs o'' and springs O'', which hold them against said lugs, as shown. The drum M'' and its shaft are pushed to one side of frame Y, as shown, causing the engagement of wheel O with its retainer o , and consequently projecting wheel O' so much as to disengage it from its retainer o' . The frame Y, being then properly reciprocated, moves laterally until the end of the shaft of drum M'', upon which wheel O' is mounted, strikes against one of the uprights A'' or a suitable projection, a'' , thereon, causing the drum and its belt N and shaft and wheels O O' to be quickly shifted laterally to the opposite side of the frame Y, and this shifting of the shaft and wheels causes the disengagement of the wheel O with its retainer o , and throws the wheel O' into position for engaging the retainer o' , which it does after the weight of the belt has caused the drum M'' to rotate sufficiently to bring the tooth of wheel O' into contact with retainer o' . This action is repeated intermittently as the frame Y is reciprocated from side to side, and

the descent of the belt and back Q held thereon is intermittent and regular in degree of movement.

The frame Y is shifted laterally by the following means: In the lower edge of bar M, on the side adjoining the main portion of the frame A, is formed a rack, P', as shown, which consists of a longitudinal and horizontal slot, P, in the lower edge of bar M, and in which slot are arranged at regular intervals the vertical pins p, as shown. The bar M stands and moves at right angles to the frame D, and in such relation thereto that the spring end of arm H will enter slot P and successively engage the pins p thereof, and owing to the peculiar bend of arm H the point of said arm will engage a pin p not in the direct line of movement of arm H. Consequently said pin will be forced by arm H as it is pushed through slot P to a position corresponding with the line of movement of said arm, and thereby actuate bar M and cause it and its attached frame Y to move regularly from right to left by successive steps as the arm H engages the successive pins p. The point of arm H, while engaging the successive pins p, as described, when frame D is moved inward, has not sufficient power to cause the bar M to move back to its original position when the frame D is retracted. The movement of bar M and its attached frame is regulated as to direction by the set of arm H. When the point of said arm is set so that it turns toward the left, the bar will be moved toward the right, and when the point of the arm is turned toward the right the bar will be moved toward the left. The pins are set at such a distance apart that the bar M and frame Y are only moved sufficiently at each stroke of arm H to carry the back Q a distance laterally of one pin z, so that said pins will be secured to back Q close together in the horizontal rows; and the vertical movement of back Q, regulated by belt N, is so adjusted that the various horizontal rows of pins z on the board will be impinged against or set close to each other, and the pins z of one row fit in close to and between the pin z of the two adjoining, as shown in my application referred to.

The wash-board back Q, or blank therefor, is formed, as shown in Fig. 4, of a wooden board of suitable thickness provided with a series of horizontal transverse grooves, q, as shown. These grooves are made a proper distance apart and of sufficient width to fairly embrace the blanks of pins z, and have the heads of pins z in adjoining rows touch each other, so that when completed the scrubbing-board of the wash-board or the back Q will be completely hidden and studded by the pins z. The pins z preferably, in actual size, are about one-half inch in diameter through their heads, Fig. 14 representing about the actual size of the pins.

The operation of the machine is as follows: The parts being in the position shown in Fig. 3 and the back Q adjusted in its holder on

frame Y and in position to have its lowermost groove filled by the pins z, which position brings said groove in line with the plane of movement of hammer K, the frame Y may be at either end of its lateral play when the machine is started. The blank Z is inserted in mandrel C, which is then rotated at a high rate of speed. The frame D having previously been drawn out to its full extent, the blank Z is then pressed inward through mandrel C by any proper means until its inner end engages against the stop-bar c' on frame D. The operator then pushes frame D inward as rapidly as he can, the peculiar arrangement of cutters on bar E preventing their chocking and forming pins z, as described. As frame D moves inward it engages disk I', as described, thereby operating shaft J and hammer K and causing said hammer to strike the head of pin z centrally and squarely. Immediately after it is severed from the blank and held by the spring, as described, the pin in the head of hammer K sinks into pin z sufficiently to give the hammer a hold on said pin z, and as the frame D is retracted the hammer K is withdrawn, as described, turned over as it passes the center of track j, and presents the shank of pin z directly to and forces the same into the groove of back Q in line with the movement of the hammer, the power of spring I' being sufficient to cause the hammer to solidly set the pins z into the grooves. I will here state that preferably the back Q has its grooves filled or cemented with some water-proof cement which has not hardened when the pins z are set therein, so that when the back Q is converted into a scrubbing-board by the insertion of pins z the latter will be firmly secured to the board by said glue. The inward movement of frame D shifts bar M through arm H while the hammer K is turned toward the frame D, so that the frame Y will be perfectly steady when the hammer returns to insert the pin in the back Q. The same operation takes place at each reciprocation of the frame D. When a back Q has been covered with pins z, it escapes from its holder by reason of the latter turning under roller M'' and withdrawing the supporting-lugs from the bottom of the board, which drops from the frame Y upon a suitable receiver. The belt N is then turned backward until the holder N' for back Q is in proper position to receive another back, this backward movement of the belts being permitted by the springs, which allow the retainers o o' to yield.

If desired, the belt N and back-holder Q may be lengthened vertically to enable several boards to be filled with pins z before the belt has to be retracted.

It is obvious that the mechanism for cutting the pins z might be mounted on a separate machine and the pins fed to hammer K from an ordinary feeder without departing from the spirit of my invention. It is also obvious that other devices might be employed for reciprocating

cating and manipulating the backs Q, so that they would receive the pins z from the hammer K in regular order; but I prefer to use the devices described in the present application embodied in one machine. When used as a separate machine, the mechanism for forming the pins z may be adapted to various other uses with but little modification, as shown in Figs. 11, 12, 13.

10 In Fig. 11 the frame D is removed and a chisel-guide, R, substituted. The blank Z in the revolving mandrel can then have its face cut into various forms while it is revolved, as described, as is obvious, by the use of the ordinary turners' chisels and rest R.

15 If desired, a chisel-die might be mounted on the movable rest-guide and moved inward at regular intervals to engage the end of blank Z and cut rosettes thereon. Such a device is shown in Fig. 13.

The complete wash-board, the scrubbing-board of which is completed in the machine, is fully described and claimed in my application before referred to.

25 Having described my invention, what I claim is—

1. In a machine for forming wash-boards of the character described, a rotating mandrel for holding the wood blank, and the reciprocating frame carrying the series of cutters adapted to shape the pins to be inserted into the back of the board, and the wash-board-back carrying and adjusting devices, substantially as described, in combination with a reversible rotative hammer, substantially as described, adapted to remove the completed pin from its forming mechanism and to carry the same to and set it in place upon the back of the board, all constructed and arranged substantially as and for the purpose described.

2. The combination, with the wash-board-back-supporting mechanism and the pin-cutting mechanism, substantially as described, of the hammer K, its shaft J', guide-track j , and actuating mechanisms, whereby the hammer is adapted to remove the completed pins from the cutting mechanism and set them in place upon the back of the board, all substantially as and for the purpose described.

3. The combination of the revolving shaft C, having an angular axial opening for the reception of the wood blank, with the frame D, adapted to be reciprocated at right angles to said shaft, the cutter-bar E, mounted on said frame for operating upon the blank, and the stop-bar on said frame for limiting the longitudinal movement of the blank through the shaft, all substantially as and for the purpose specified.

4. In a machine of the character described, the pin setting and driving devices, composed of a revoluble post, I, the horizontal shaft J', revolubly mounted thereon, provided with a hammer, K, on its outer end, the segment k and its engaging devices for tripping the shaft J' and hammer K, and means for revolubly

operating said post I, all substantially as described.

5. The combination, with the supporting-bar, of the frame Y, composed of the uprights M' M', the drums M'' m and elevator-belt thereon, the toothed wheels on the shaft of drum M'' and retaining devices therefor on the sides of frame Y, and the supporting-frame N', mounted on belt N, all constructed and arranged substantially as and for the purpose described.

6. The combination, with the hollow shaft for carrying the revolving blank, of the reciprocating frame D, its inclined cutter-bar E, having the inner wide cutters and outer narrow cutters, the cutter-blade F, secured to the bar E and adapted to round off the front of the blank, and the saw f , for severing the blank, all constructed and arranged substantially as and for the purpose described.

7. The combination of the shaft C, having longitudinal angular opening c and mounted in suitable bearings, with the reciprocating frame D, the inclined cutter-bar E, adjustably mounted thereon and constructed substantially as described, the cutter-blade F on bar E, and saw f , and the stop-bar c' , all constructed and arranged substantially as and for the purpose described.

8. The combination of the revolving post I, disk I' and spring I'', for operating the same, and the stop-arm i , for regulating the throw of said disk, the horizontal shaft J', loosely mounted on post I, the toothed segment k , and hammer K, mounted on said shaft J', with the supporting-track for said shaft J', and the tooth l and lugs l' l'' , for engaging segment k , all constructed substantially as and for the purpose described.

9. A machine for the purpose described combining a pin-cutting device composed of a revolving blank-holding mandrel and reciprocating frame D, provided with suitable cutting devices for forming the pins, substantially as described, the revoluble post I, carrying the horizontal shaft J', provided with a hammer, K, at its outer end, adapted to remove the pins from said cutting device after separation from the blank and insert them into a suitable blank or wash-board back, and the mechanism, substantially as described, for supporting said blank and reciprocating it laterally and adjusting it vertically, all constructed and arranged substantially in the manner and for the purpose described.

10. The combination, with the reciprocating cutter-bearing frame D, having an adjustable arm, H, substantially as described, on its inner end, of the longitudinal reciprocating bar M, standing at right angles to frame D, and provided with a rack, P', adapted to be engaged by arm H of frame D and cause the reciprocation of bar M thereby, all constructed and arranged substantially as and for the purpose described.

11. The combination of the blank receiving

and holding shaft C and the reciprocating cutter-bearing frame D, having on its inner end the adjustable curved spring-arm H, and the reciprocating bar M, provided with rack P' and carrying the frame Y, and constructed substantially as described, with the revoluble hammer K, mounted on a shaft, J', journaled loosely in a post, I, provided with an actuating-disk, I', engaging a rack on frame D, and operated thereby so as to cause the reciprocation of shaft J' and hammer K, and the devices, substantially as described, for partially revolving shaft J' at the center of its movement, all constructed and arranged substantially as and for the purpose described.

12. The laterally-reciprocating frame Y, for the purpose described, composed of the uprights M' M', the drums M'' and m in its upper and lower ends, respectively, the conveyer-belt N on said drums, the holder N' on one portion of belt N and the backing n'' therefor, and the devices for regulating the movement of said belt, comprising toothed wheels O O' on the opposite ends of the shaft of drum M'', and the retaining devices o o', adapted to engage the respective wheels O O' as the drum is shifted laterally, all substantially as and for the purpose described.

13. The combination, with the revolving wood blank and its actuating devices, of the

reciprocating frame D, having uprights d' D', the inclined cutter-bar E, adjustably mounted on said uprights and constructed substantially as described, and the stop-bar c', secured between a central upright of frame D and upright d', all constructed and arranged substantially as and for the purpose described.

14. The combination, with the mandrel C and the cutter-bearing reciprocating frame D, having a rack, of the post I, the disk I' thereon, provided with rack i' for engaging the rack of frame D, the stop i'' on said disk, and the convolute spring I'' for retracting the same, the revoluble shaft J', mounted horizontally on post I and bearing at its outer end a hammer, K, provided with a pin in its concaved driving-face, the segment k on said shaft, and its engaging tooth and lugs on a bracket, L, and the supporting-track j for the hammer and shaft J', and the wash-board-blank carrying and adjusting device, all substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JAMES R. CLUXTON.

Witnesses:

A. E. DOWELL,
M. P. CALLAN.