W. P. BOSWORTH.

MACHINE FOR MAKING HEEL LOGS.

APPLICATION FILED FEB. 4, 1909.

936,858.

Patented Oct. 12, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

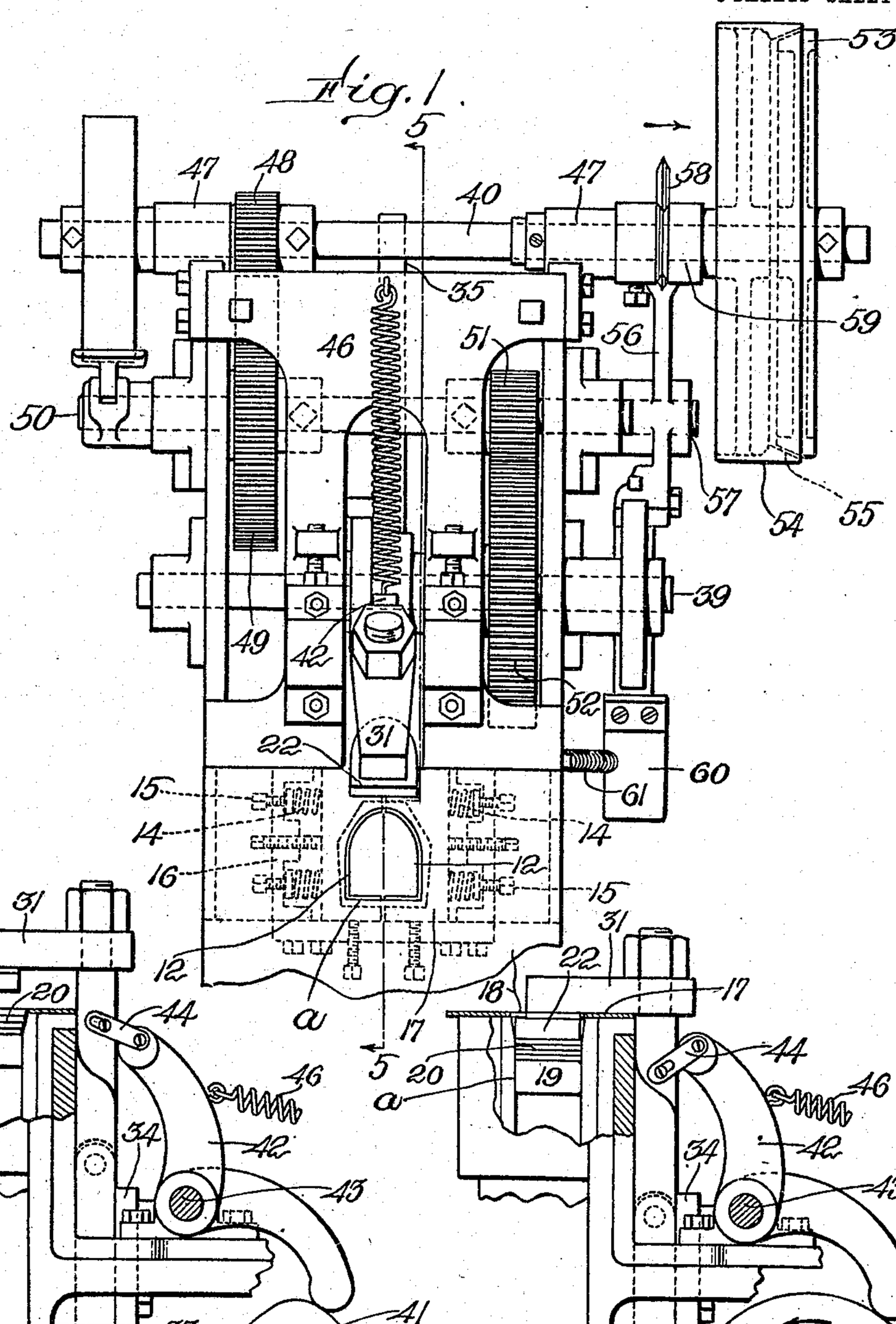

Fig. 2.

Fig. 3.

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P. H. Pezzetti

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3 SHEETS—SHEET 2.

Fig. 4.

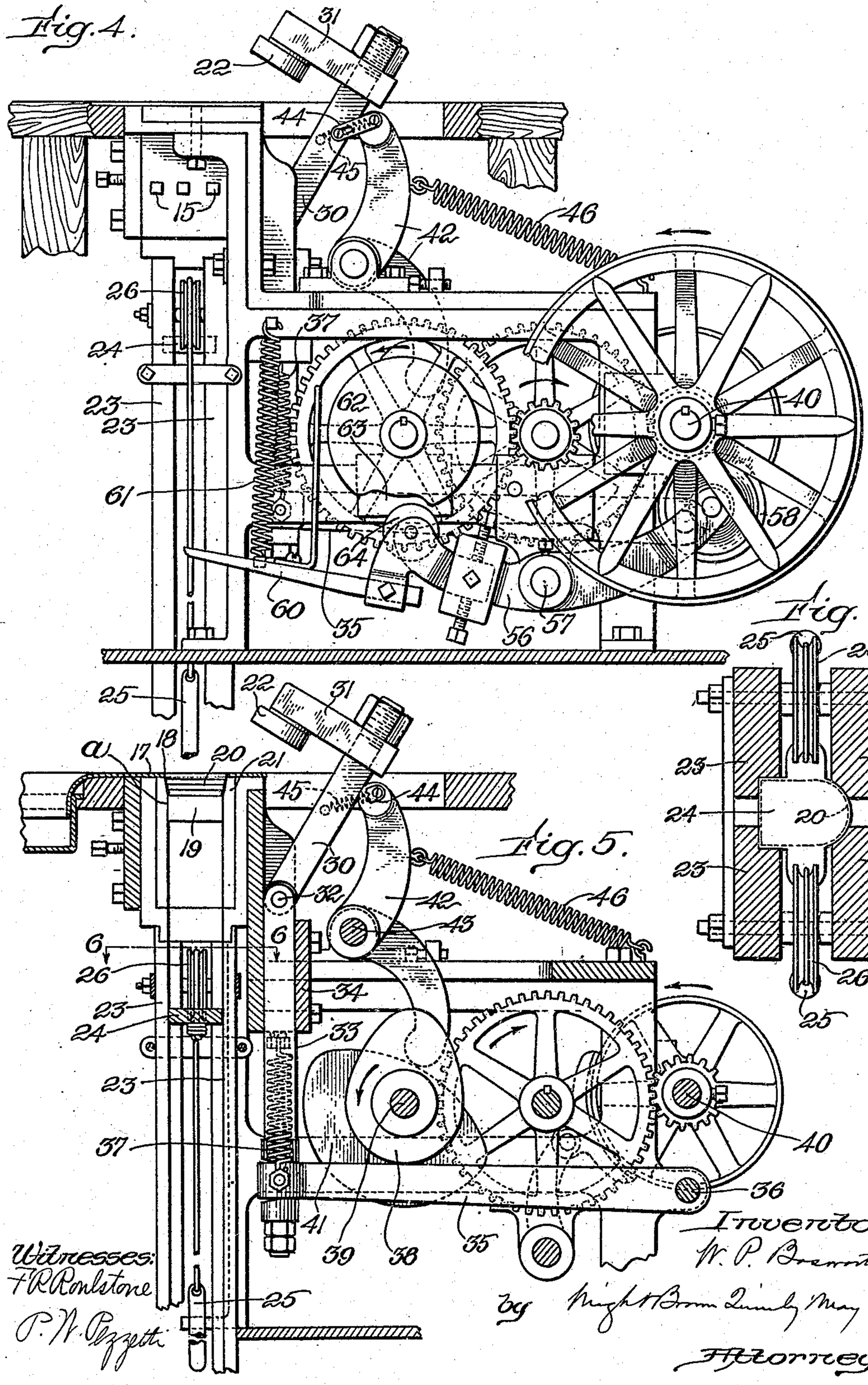

Fig. 6.

Fig. 5.

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3 SHEETS—SHEET 3.

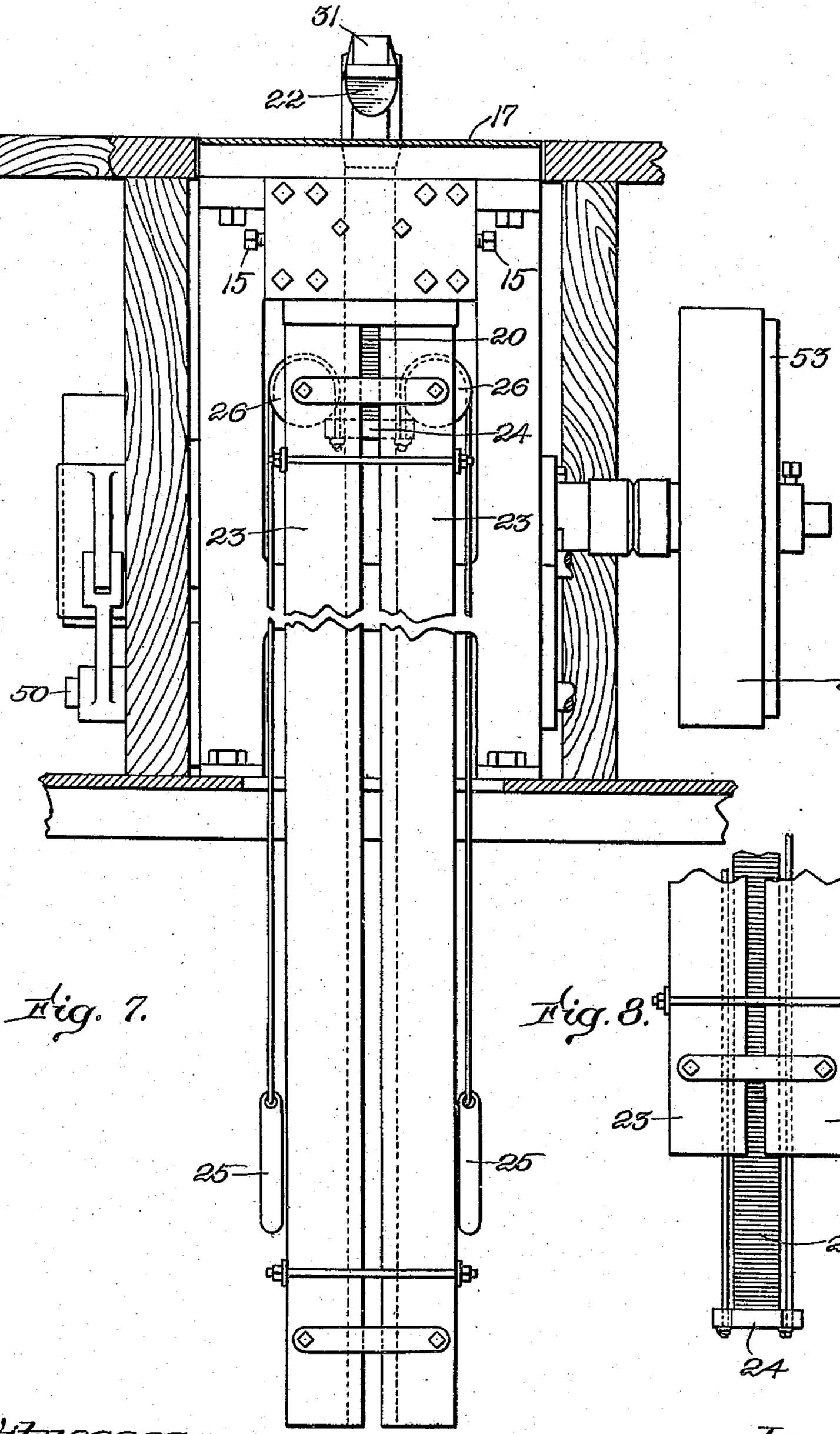

Fig. 7.

Fig. 8.

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UNITED STATES PATENT OFFICE.

WENDELL P. BOSWORTH, OF BROCKTON, MASSACHUSETTS, ASSIGNOR TO BROCKTON HEEL COMPANY, OF BROCKTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MACHINE FOR MAKING HEEL-LOGS.

936,858. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed February 4, 1909. Serial No. 476,124.

To all whom it may concern:

Be it known that I, WENDELL P. BOSWORTH, of Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Heel-Logs, of which the following is a specification.

This invention has for its object to enable the bodies of boot and shoe heels to be rapidly and economically produced, and of any height or thickness that may be required. By heel body I mean the main portion of a boot or shoe heel without the top lift.

The invention is intended to practice a continuous method of making heel bodies which consists in assembling or successively inserting cement-coated lifts in the receiving end of a guide until they form an elongated heel-log, or in other words, an elongated body which is heel-shaped in cross section, and is composed of lifts extending crosswise of the body, pressure being intermittently applied to the inserted lifts, to compress the same and move the log progressively endwise step-by-step, thereby projecting its advancing end from the delivering end of the guide, allowing the adhesive to harden in the advancing end portion of the log, and severing the hardened and projected portion of the log crosswise into sections or slices, each of which may form a single heel body, or a section adapted to be subdivided into a plurality of heel bodies. By this method, I am enabled to produce heel bodies of any desired height, by a practically continuous operation, the insertion and compression of the freshly cemented lifts causing the projection of the hardened and completed end of the log into position for subdivision into heel bodies without other transportation of the heel log prior to its subdivision.

The invention consists in certain improvements in mechanism adapted to produce a heel log by a practically continuous operation.

Of the accompanying drawings, forming a part of this specification,—Figure 1 represents a top plan view of a machine embodying my invention. Figs. 2 and 3 represent fragmentary views, partly in section, showing different stages of the operation. Fig. 4 represents a side elevation showing the mechanism for operating the plunger, portions of the machine being shown in section. Fig. 5 represents a section on line 5—5 of Fig. 1. Fig. 6 represents a section on line 6—6 of Fig. 5. Fig. 7 represents a front elevation of the machine. Fig. 8 represents a front elevation showing the lower end of the guide, and a heel log partially projected therefrom.

The same reference characters indicate the same parts in all the figures.

In carrying out my invention, I first introduce a charge of heel lifts, treated with paste or other suitable adhesive, into the receiving end of an elongated guide, then apply pressure to the charge to compact it and move it along the guide to make room for another charge, then introduce a second charge and apply pressure thereto to force it against the preceding charge and cause its adhesion thereto, this operation being repeated until an elongated heel log has been built up by successive accretions added to one end of the log and pressed against it, the log being moved endwise by the pressure applied to each charge until its advancing end is projected from the delivering end of the guide. The guide is of such length that the adhesive in the advancing end portion of the log hardens before leaving the delivering end of the guide. The projected and hardened portion of the log is severed transversely by a suitable cutter, or in any other suitable way, each subdivision being of the height or thickness required for a heel body. By this method, I am enabled to produce heel bodies of any height or thickness required, by a practically continuous operation, it being feasible to sever the log between the sides of one of the lifts composing it, so that the height of the heel body is not dependent in any way upon the number of lifts composing it.

The drawings illustrate a suitable machine adapted to be used in practicing the method above indicated, said machine including an elongated guide which comprises a mold portion *a* adapted to exert pressure on the edges of lifts forced through it, and forms the receiving end of the guide. The mold portion *a* is heel-shaped in cross section, and is preferably composed of sections 12, 12, (Fig. 1).

The sections 12 are preferably backed by stout springs 14, so that they are adapted to yield somewhat to the lifts which are pressed into the mold portion, as hereinafter de-

scribed, the yielding movement being sufficient only to prevent the liability of the binding or sticking of an assemblage of lifts to the walls of the mold portion. The springs 14 are supported by studs or bolts 15, which are screwed into a casing or holder 16 surrounding the mold portion.

At the upper end of the mold portion is a bed plate 17 having a heel-shaped opening 18, which is preferably somewhat larger than the interior of the mold portion, as indicated in Figs. 2, 3, and 5.

19 represents a plug having a close frictional fit within the mold portion *a*, said plug being preferably made of wood. The plug is placed in the upper end of the mold portion prior to the log-building operation, and is used during the building of the nucleus of the log, to oppose a yielding resistance to the downward movement of the log, and thus insure the application of sufficient pressure to bring the lifts firmly together. At the beginning of the operation, the plug 19 is placed somewhat below the upper end of the mold portion, as shown in Figs. 2, 3, and 5, a recess or cavity being thus formed in the upper end of the mold portion for the reception of a charge of heel lifts 20. The upper ends of the parts 12 of the mold portion are preferably beveled at 21, so that the mouth of the cavity above the plug 19 is somewhat enlarged. The operator assembles the lifts 20 in the recess or cavity thus provided, the lifts being assembled in charges, and each charge comprising either one or a plurality of lifts. The lifts, before being inserted in the cavity, are treated with paste or other suitable adhesive. Each lift may be pieced, or in other words, composed of a plurality of pieces adapted collectively to form a heel-shaped lift. In practice, when pieces are employed, the pieces forming one lift are shaped differently from those forming the next lift, so that the pieced lifts will break joints. After a charge of lifts has been inserted in the mold portion, they are subjected to pressure by a plunger 22 which is adapted to be forced downwardly into the mold portion, thus exerting pressure on the charge of lifts, and forcing said charge and the plug 19 downwardly into the mold portion, as indicated in Fig. 3. The charge of lifts is thus compacted and conformed to the interior of the mold portion, after which the plunger 22 is raised and another charge of lifts is inserted in the enlarged upper end of the mold portion, this charge being deposited upon the charge already inserted. The second charge is then subjected to pressure by the plunger 22, and forced downwardly with the first charge, and with the plug 19. The two charges now form the nucleus of a heel-log which may be built up to any desired length by repetition of the operations above described.

I contemplate extending the heel-log so that a considerable length,—say thirty to fifty or sixty feet,—will intervene and will be maintained between the freshly formed end and the point where the log is severed, the guide, as a whole, being adapted to suitably conduct the log until the adhesive with which the lifts were treated has hardened sufficiently to make the log rigid, and hold its members firmly together in its advancing end portion.

The portion of the guide which I term the mold may be of the same length as the maintained portion of the log. I prefer, however, to make the mold portion relatively short and provide as extensions thereof, completing the guide, parallel guide bars 23, which are formed to collectively engage different parts of the surface of the log, as indicated in Fig. 6, and are separated by longitudinal spaces which permit the access of air to the log for drying purposes. The arrangement of the bars is such that they offer practically no frictional resistance to the downward movement of the log between them. The lower ends of the bars 23 form the delivering end of the guide, and are located over an unobstructed space, as shown in Figs. 7 and 8.

To prevent the liability of the breaking off of the portion of the log between the bars 23 by its own weight, I provide a sliding platform or rest 24 adapted to support the lower end of the log, the rest being yieldingly supported by weights 25 on cords running over idle pulleys 26. When the lower end of the log emerges from the lower end of the mold portion of the guide, it comes in contact with the rest 24, said rest moving downwardly with the log as the length of the latter increases, until the rest reaches the lower ends of the bars 23, the advancing end portion of the log being then suitably dried so that when projected from the delivering end of the guide, it is ready for subdivision into sections, each of which may constitute a heel body, or may be of suitable length to be subsequently subdivided into a plurality of heel bodies. The log is projected step-by-step from the lower end of the guide, and the projecting portion cut off after a suitable projection of the log. The rest is projected from the guide by the advancing end of the log, as shown in Fig. 8, and may be moved edgewise out of contact with the projected end of the log while the projected portion is being severed, the supporting cords being flexible and permitting the displacement of the rest.

For the purpose of severing a projected portion of the log, a hand operated chisel may be employed or any equivalent appliance.

Of course, whenever a lower portion of the log has been cut off, the total length of the

log is temporarily less. As the log is built up at the upper end it again increases in length. The platform or rest 24 is, as has been stated, variable in height by reason of the counterweights 25, and it is laterally displaceable by reason of the supporting cords being flexible. Therefore the platform or rest 24 is constantly and easily variable in position so that it would move down with the lower end of the log as the latter emerges from the guide during the building up of the log, and it can be swung to one side to permit the removal of the cut off section or sections of the log, and is capable of immediately moving up into position to engage the new lower end of the log. If the temporary displacement of the rest 24, or the removal of a section of the lower end of the log, permits the body of the log in the guide to drop, the replacement of the support 24 may be made to immediately cause the log to be raised again to bring the upper end of it into proper relation to the presser 22.

The plunger 22 is provided with a shank 30 to which it is connected by an arm 31, the plunger being offset from the shank so that it is adapted to be located in alinement with the guide, as shown in Figs. 2 and 3, while the shank is located outside the guide. The shank 30 is pivoted at 32 to a carrier 33 located beside the guide and adapted to be reciprocated endwise in a fixed guide or way 34.

Means as next described are provided for reciprocating the carrier 33 to alternately project the plunger into the guide, as shown in Fig. 3, and retract it from the guide, as shown in Fig. 2, said means also having provisions for moving the plunger into alinement with the guide and holding it in such alinement while the plunger is entering the guide, and for moving the plunger out of alinement with the guide, thus uncovering the upper end of the latter, as indicated in Figs. 4 and 5, the order of the different movements of the plunger being as follows:—The plunger being in the position shown in Figs. 4 and 5, it is first swung forward into alinement with the guide, and projected into the guide to act on the lifts freshly deposited therein, and impart a longitudinal movement to the heel log; then retracted from the guide, and then swung backwardly to the position shown in Figs. 4 and 5. The preferred means for effecting the described movements of the plunger are as follows:—35 represents a primary lever pivoted at 36 to the frame of the machine, and held by a spring 37 in yielding contact with a cam shaft 38 affixed to a cam shaft 39. The said cam shaft is rotated by power imparted from the driving shaft 40, as hereinafter described, the said cam and the spring 37 acting alternately in reciprocating the carrier 33. 41 represents a cam affixed to the shaft 39 beside the cam 38. 42 represents a secondary lever pivoted at 43, said lever having two arms, one of which bears on the perimeter of the cam 41, while the other is engaged by means of a slotted link 44 and a spring 45 with the plunger shank 30. 46 represents a spring engaged with one arm of the lever 42, said spring holding the other arm of said lever yieldingly against the perimeter of the cam 41, and being adapted to normally move the plunger out of alinement with the guide.

The driving shaft 40, which is journaled in bearings 47 on the frame of the machine, is connected by gears 48, 49 with an intermediate shaft 50, the latter being connected by gears 51, 52 with the cam shaft 39. The driving shaft is provided with a friction clutch member 53 which is affixed to the shaft. 54 represents a driving wheel or pulley which is normally loose on the driving shaft, and has a complemental clutch member 55, which is normally separated from the clutch member 53. Means are employed for moving the driving wheel 54 to engage its clutch member with the complemental member 55, said means comprising a lever 56 pivoted at 57, and having at one end a disk 58 with a beveled periphery which bears against a beveled face on a collar 59 affixed to or bearing on the hub of the driving wheel 54. When the disk 58 is raised, its beveled periphery moves the collar 59 laterally in the direction indicated by the arrow in Fig. 1, thus moving the driving wheel so that its clutch member engages the clutch member 53 on the driving shaft. The lever 56 is provided with a treadle 60 which projects toward the front of the machine, and is adapted to be depressed by the operator to cause the engagement of the clutch members. A spring 61 connected with the treadle 60 and with the frame of the machine, normally raises the treadle end of the lever 56, and depresses the other end, including the disk 58, thus withdrawing the latter from engagement with the collar 59, and permitting the separation of the clutch members.

Means are provided for automatically holding the lever 56 with its disk 58 raised and in engagement with the collar 59 during a practically complete rotation of the cam shaft 39, so that when the treadle has been depressed and the clutch members engaged, they will not be separated until the cam shaft 39 has made a complete rotation, and has been instrumental in causing the above described series of movements of the plunger, so that after the operator has depressed the treadle 60, the lever remains in the position to which it is moved by the depression of the treadle until the plunger has been swung forward into alinement with the guide, projected into the guide, retracted

therefrom, and swung out of alinement with the guide. This result is secured by a stop disk 62 affixed to the cam shaft and having a recess 63 which interrupts the periphery of the disk, and a trundle roll 64 mounted on the lever 56, and adapted to engage the periphery of the disk 62. The said parts are so arranged that the lever 56 can assume its inoperative position with the disk 58 depressed out of engagement with the collar 59 only when the recess 63 reaches a position over the roll 64, the spring 61 then acting to depress the end of the lever carrying the disk 58. When the treadle 60 is depressed and the disk 58 raised, the resulting rotation of the cam shaft and of the disk 62 brings the periphery of the disk into contact with the roll 64, said periphery holding the roll and lever in its clutch-engaging position until the cam shaft has made nearly a complete rotation and the recess 63 again comes to position over the roll 64.

The cam 41 and lever 42 are so formed and arranged that after they have moved the plunger into alinement with the guide, they hold the plunger in alinement with the guide while the plunger is being projected into the guide, and retracted therefrom, so that the spring 46 does not exert a lateral pull on the plunger until the latter has been entirely retracted from the guide.

When the machine is to be operated, the plunger being out of alinement with the mold, the operator first inserts the plug 19 in the mold portion of the guide, and places a charge of lifts or lift sections on the plug. He then causes the described operation of the plunger operating means, by depressing the treadle 60, the plunger being first projected into the mold portion. The plug 19 offers a yielding resistance to the downward movement of the lifts caused by the projection of the plunger, and thus insures a firm pressure of the lifts against each other, and after the first charge has been inserted and compressed, a secure contact between each charge and the one previously inserted and compressed. The plunger is then successively retracted from the mold and moved out of alinement therewith.

It will be observed that the platform or rest 24 is adapted by the weights 25 to offer a yielding resistance to the inward pressure of successive charges into the mold portion by the plunger 22. As already stated, the guide bars 23 are preferably arranged so that they will permit the portion of the log which projects below the mold portion of the guide to pass freely between them without resistance other than that offered by the weighted rest 24.

The total length of the guide, that is, the combined length of the mold portion and guide bars, is such that the adhesive hardens in the guide, so that the portion projected from the lower end of the guide is always in condition to be converted into heel bodies.

It will be seen that the operation of forming and subdividing the log is practically continuous, and is characterized by the successive application of freshly cemented lifts to one end of an elongated series or log of superimposed lifts, the application of pressure to the applied lifts to compress the same and move the log endwise step-by-step, the drying of the cement in the advancing portion of the log, and the successive removal of dried and hardened sections from the advancing end. There is, therefore, no such interruption of the operation as would be involved if a log of determinate length were built up and then removed bodily or as a whole from the guide in which it is built, prior to subdividing it into heel bodies.

In my application for Letters Patent of the United States, filed September 12, 1908, Serial No. 452,761, I have claimed a continuous method of making heels, which consists in building up a heel log by successively adding cement-coated lifts to one end of a superimposed series, applying pressure to said lifts to move the log endwise step-by-step, allowing the cement to harden in the opposite end portion of the log, and detaching parts of the log successively from the hardened end portion.

I claim:

1. In combination, an elongated guide open at both ends, means for pressing heel lifts into one end of said guide to form a heel log therein, and a yieldingly supported rest movable in the guide, and adapted to yieldingly oppose the pressure which forces the lifts into the guide, and to be projected with the advancing end of the log from the delivering end of the guide, said rest being movable to a position below the guide to support the log after its lower end projects from the delivering end of the guide, the rest being laterally displaceable when below the guide.

2. In combination, an elongated guide, a yieldingly supported rest movable in the guide, a plunger-carrier located outside the guide, a plunger having an offset shank pivoted to the carrier, a cam shaft having a primary cam, a primary lever engaged with the carrier, a spring holding the primary lever against the cam, said cam, lever, and spring being adapted to project and retract the plunger, a secondary cam on the cam shaft, a secondary lever engaged with the secondary cam and with the plunger shank, said secondary cam and lever being adapted to move the plunger into alinement with the guide and hold it in alinement until the plunger enters the guide, and a spring adapted to move the plunger out of alinement with the guide when the plunger is retracted.

3. A machine for making heel logs, comprising a permanently mounted elongated guide open at both ends to permit heel lifts to be continuously supplied at one end and discharged through the other end, and a support or rest vertically movable below said guide and capable of being spaced therefrom to permit lateral removal of a portion of the log between said rest and the end of the guide.

In testimony whereof I have affixed my signature, in presence of two witnesses.

WENDELL P. BOSWORTH.

Witnesses:

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P. W. PEZZETTI.