

(No Model.)

3 Sheets—Sheet 1.

A. F. PRESTON.
HAND TACKING MACHINE.

No. 510,443.

Patented Dec. 12, 1893.

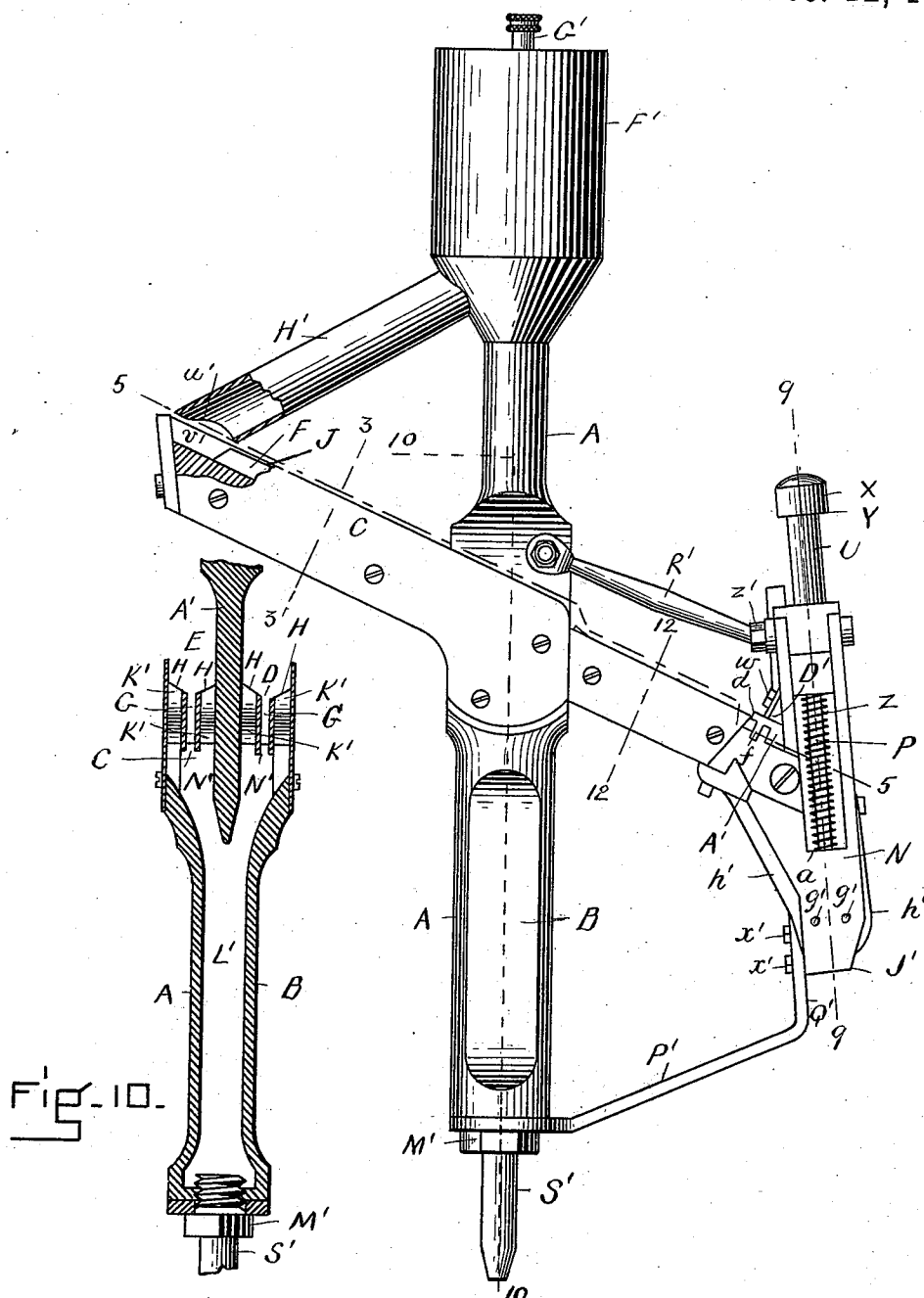


Fig. 10.

Fig. 1.

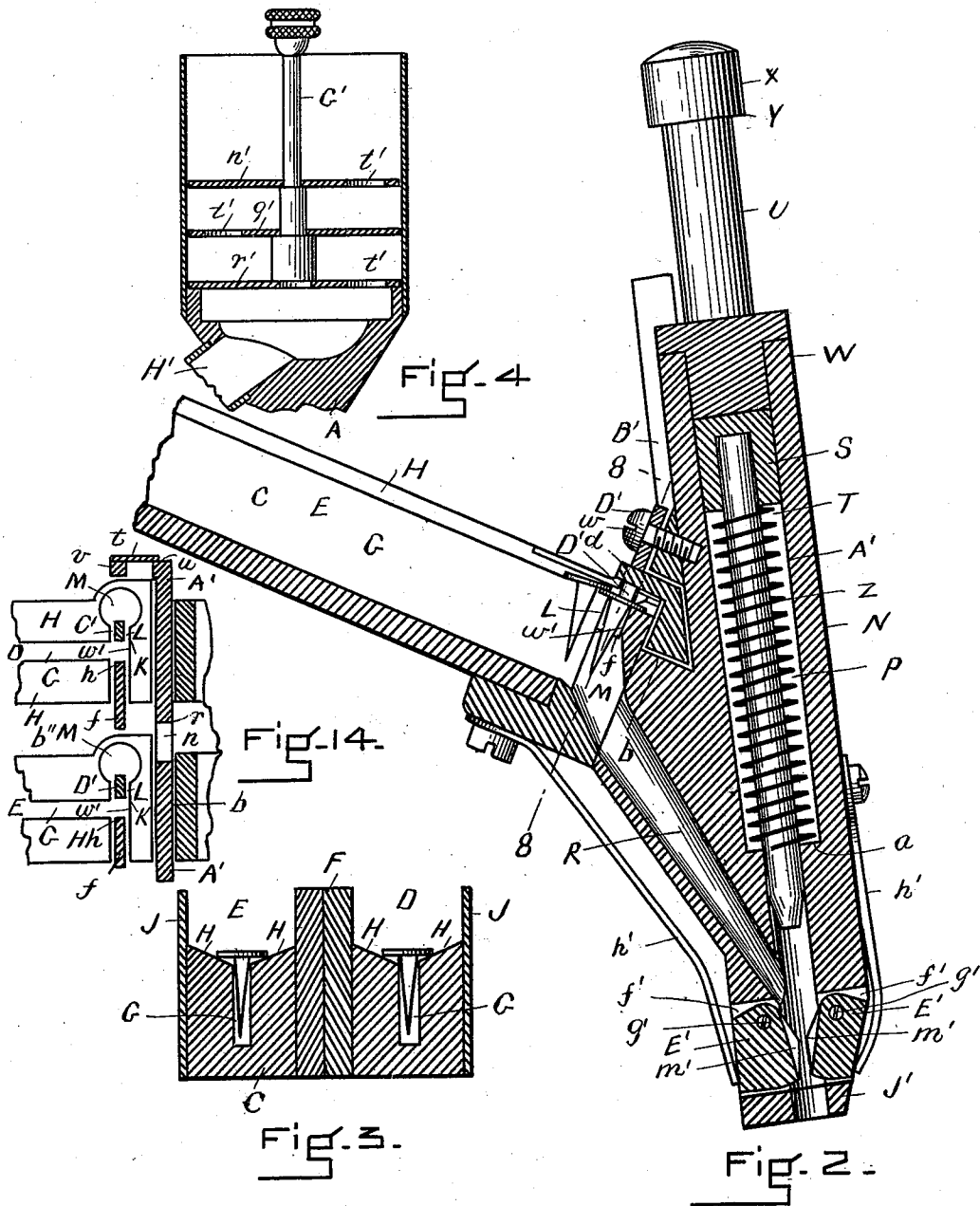
WITNESSES
Louis C. Huns,
Jeremiah J. Mackin.

INVENTOR
Albert F. Preston
Per Edwin M. Brown
Attorney.

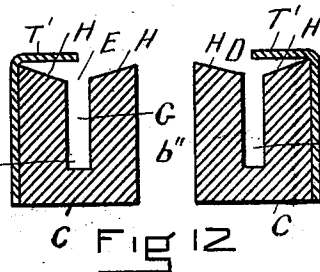
A. F. PRESTON.
HAND TACKING MACHINE.

No. 510,443.

Patented Dec. 12, 1893.



WITNESSES
Leah B. Amos
Jeremiah J. Mackin



INVENTOR
Albert F. Preston
Per *Edwin H. Brown*
Attorney

(No Model.)

3 Sheets—Sheet 3.

A. F. PRESTON.
HAND TACKING MACHINE.

No. 510,443.

Patented Dec. 12, 1893.

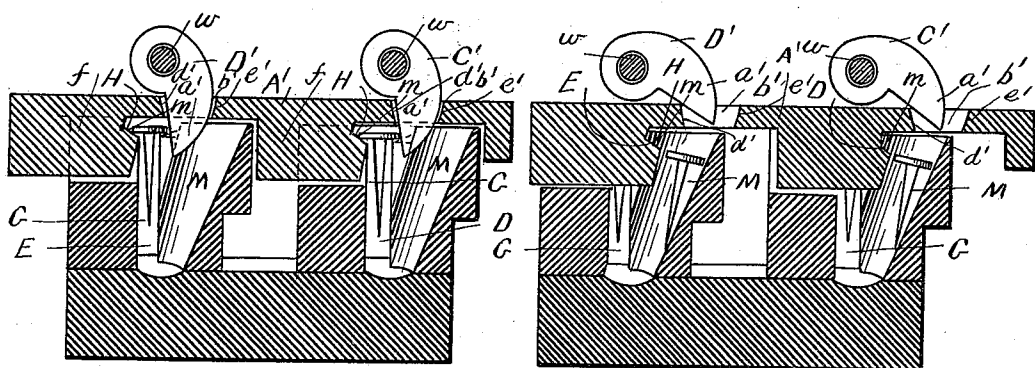
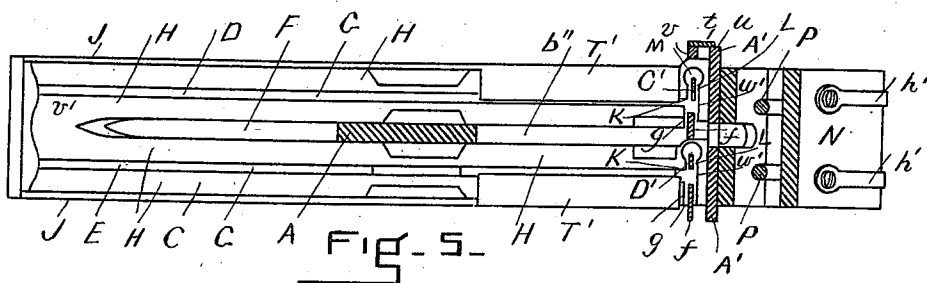


Fig. 6.

Fig. 7.

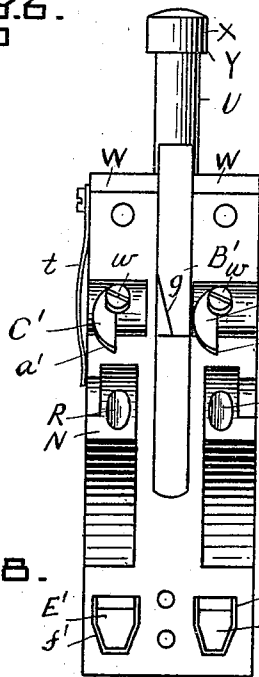


Fig. 8.

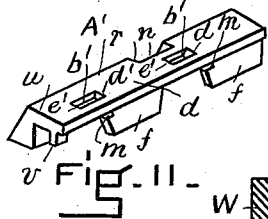


Fig. 9.

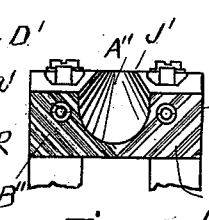


Fig. 10.

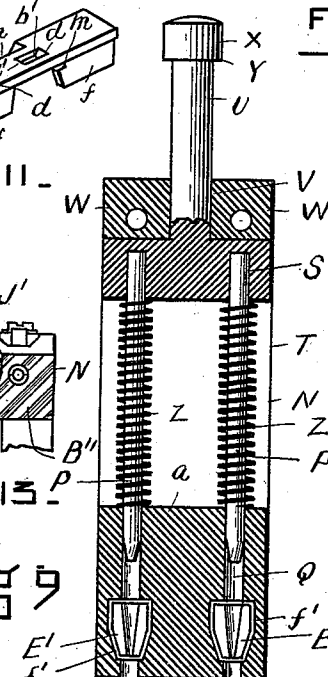


Fig. 11.

WITNESSES
L. C. Ann.
Jeremiah J. Mackin

INVENTOR
Albert F. Preston.
Per Edwin W. Brown.
Attorney.

UNITED STATES PATENT OFFICE.

ALBERT F. PRESTON, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
COLUMBIAN LASTING MACHINE COMPANY, OF PORTLAND, MAINE.

HAND TACKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,443, dated December 12, 1893.

Application filed June 9, 1893. Serial No. 477,059. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. PRESTON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Hand Tacking-Machines, of which the following is a full, clear, and exact description.

This invention relates to improvements in hand tacking machines for use more particularly in connection with lasting machines for boots and shoes, and for a lasting machine for which Letters Patent of the United States were issued to me dated January 1, 1889, and numbered 395,630, although it is applicable to other machines for lasting boots and shoes which stretch the upper over and hold it on to the last preparatory to securing it; it is also applicable as well to other uses where anything is to be secured by tacks or headed nails, and the invention consists of a hand tacking machine for feeding tacks or headed nails to a driver and driving the same, all substantially as hereinafter fully described and shown, reference being had to the accompanying sheets of drawings in which is illustrated a hand tacking machine constructed in accordance with this invention.

Figure 1, is a view in side elevation. Fig. 2, is a vertical central longitudinal section from front to rear along one of the raceways for feeding the tacks. Fig. 3, is a detail cross section on line 3—3, Fig. 1. Fig. 4, is a detail central vertical section. Fig. 5, is a plan view below line 5—5, Fig. 1. Figs. 6 and 7, are cross sections of some of the working parts showing the same in two different positions. Fig. 8, is a detail front view of some of the parts. Fig. 9, is a vertical cross section on line 9—9, Fig. 1. Fig. 10, is a detail central vertical section on line 10—10, Fig. 1. Fig. 11, is a perspective view of one of the parts. Fig. 12 is a detail cross section, on line 12—12, Fig. 1. Fig. 13, is a detail under plan view of one of the parts. Fig. 14, is a detail view of a part of Fig. 5, enlarged.

The hand tacking machine described and shown in this application is constructed to feed and drive two tacks or headed nails at the same time, there being two separate and distinct raceways for feeding the tacks to two separate drivers, the drivers being con-

ected and operating together, driving two tacks at the same time. There are also two separate devices for cutting off or separating the tacks, one from another, so that only one tack will be presented to each driver at a time, the machine being substantially two hand tacking machines in one frame or support.

In the drawings A represents a post to which the various working parts of the machine are connected, its portion B serving as a handle to be held in the left hand when using the machine and connected to this post is a bar C extending each side of the post in an inclined direction, as shown in Fig. 1, more particularly. In this inclined bar are two raceways D and E, side by side for feeding the tacks to the driving mechanism and they are shown in plan view in Fig. 5, and in cross section in Fig. 3, and each starts from near the upper end of the bar and runs its whole length, one on each side of the post, and separated from each other by a longitudinal partition F, above the handle. The post is cut away just above where the raceway bar is attached thereto so that the raceways are free and clear of the post, and also with the other parts of the machines are brought closer and nearer together, making the machine more compact and lighter.

Each raceway is composed of a central vertical groove or passage G, and from each upper edge of the groove each side gradually rises as at H, in an inclined direction, having a raised rib J which serves as a guard or shield, as well as for other purposes. The lower end of each raceway extends sidewise, or in a right angular direction backward, as at K, and its side groove L opens into a tapering socket or passage M which extends downward inclining forward and meets and merges at its lower end into the bottom portion of the vertical groove G of its longitudinal raceway, Figs. 6 and 7.

Attached to the lower end of the inclined raceway bar, is an upright N, which leans a little toward the post, as shown in Fig. 1, and which supports and carries the drivers P, for the tacks, which are arranged to move up and down in vertical passages Q. The passage M connects and communicates with another passage R, which is a continuation of it practi-

cally extending downward in an inclined direction in the upright and at its lower end opens into the vertical passage Q.

The two drivers P are rigidly secured to a cross head S, which is arranged to slide up and down and be guided in an opening T, in the upright and has a vertical rod U which extends up through a central socket V, in two blocks W, one half in each block, which blocks are secured by screws in the upper end of the opening T, in the upright, the rod having a head X, and shoulder Y, on its upper end. Each driver has a spiral spring Z, encircling it which bears against the under side of the cross head S and the bottom *a*, of the guide way opening, and which serves to hold the drivers up and their lower ends above the passages R, as shown in Fig. 1, the upward movement being limited by the abutment of the cross head against the blocks W.

A' is a bar or block adapted to slide back and forth across the raceway in a groove or socket *b*, at the junction of the upright and the inclined bar. This bar has a flange *d*, extending up and lying across and over the lower ends of the raceway grooves and their side portions and has extending down from its under side, at right angles two flat pieces *f*, in the same longitudinal line, of the sliding block, and which when the block is in its normal position as shown in Figs. 5 and 6, are disposed in forward extensions *g*, of each side groove, the rear end of each piece *f* being just flush with the side *h*, of the longitudinal raceway groove and shaped to correspond substantially to the side and inclined surface H, of the longitudinal raceway groove, as at *m*.

On the side of the driver rod U, is a flat piece B', its lower end when the rod is up being just over a groove *n*, in the side of the sliding block A' and having its edge a portion of its length, on an incline or wedge shape, as at *q*, so that when the driver is moved down its inclined edge enters the sliding block groove *n*, and bearing against the rear end *r*, of the grooves moves the sliding block backward, but as in the last part of its downward movement the straight or vertical part of the piece above the inclined edge reaches the groove, the block is not moved farther backward, but is held stationary; in such backward movement of the sliding block its edge pieces *f*, pass along into the side grooves L, respectively, and in front and across the lower end of its inclined raceway groove G, and in such position, the sliding block is held so long as the driver is down, but when the driver moves up a spring *t*, secured to the side of the upright, bearing by its end against the end *u*, of the sliding block moves it back into its normal position, its edge pieces *f*, moving forward into the forward extensions of the side grooves, the block being stopped by a projection *v*, on its end abutting against the side of the inclined bar.

Just above the sliding block on the side of

the upright arranged at an angle vertical to the plane of the inclined raceway are two pieces C', D', pivoted at *w*, so they can freely swing on their pivots, the lower pointed ends *a'* of which project down through openings *b'*, one opening to each, in the flange *d*, of the sliding block and when the sliding block is in its normal position the end of each of these swinging pieces lies in a side groove L, just back of the rear side of the groove of the longitudinal raceway, and as the sliding block is moved backward it swings these pieces on their pivots, by the edge *d'* of the openings *b'* pressing against the same, up and out and free of the side raceway, and as the block returns to its normal position, the edge *e'* of the openings moves the swinging pieces back and down into the side grooves again, into their normal positions at the side of the inclined raceway groove. See Figs. 6 and 7 more particularly.

At the lower end of the upright in openings *f'*, at each side of the vertical passage Q, to each driver P in the same vertical plane are two blocks E', pivoted at *g'*, to the upright and arranged to swing to and from each other, the blocks having springs *h'* respectively secured to the upright and bearing against the outside of the blocks, as shown in Fig. 2, more particularly, which springs serve to keep the two blocks together and if swung apart to move them back again. Each block has a central vertical open tapering groove *m'* in its side contiguous to the other block which makes a conical socket when together, in the same central vertical line as the central longitudinal line of the passage Q.

On the upper end of the post A, is a receptacle F', having three horizontal partitions *n'*, *q'*, *r'*, supported from a central rod G' dividing the receptacle into three separate chambers, one above the other, the partitions having openings *t'*, one in each, through them at one side, the opening in the middle partition *q'* being on the side of the receptacle opposite to the ones in the upper and lower partitions so that communication between the upper chamber and the lower chamber shall not be in a direct line. The holes in the partition increase a little in diameter from the upper partition to the lowest, that is, the hole in the upper partition is smallest, the one in the middle partition a little larger and the one in the lowest partition larger yet, in order to insure free delivery of the tacks from one chamber to the other.

An inclined tube or spout H' is attached to the receptacle and connects with the lower chamber, its lower or delivery end *u'* being close to and vertically over the upper end of the raceway bar and between the two raceways, the partition F, not extending up so far, as shown in Fig. 5. The rod and the partitions are made so they can be removed from the receptacle at pleasure.

The operation of the machine is as follows: Tacks are placed in the upper chamber of the

receptacle F', and the machine shaken somewhat, by which the tacks will gradually fall down through the openings *h'* in the partitions and chambers into the spout from which they drop on to the upper end *v'* of the raceways and thence pass to either raceway as it happens. The description of the passage of the tacks through one of the inclined raceways, side raceways and its connecting passages to its driver will answer for both, as each is practically a duplicate of the other. As the tacks pass down an inclined raceway because of its incline and of the lateral incline of its sides or edges H above the raceway groove G, the point or leg of the tack will pass into the longitudinal vertical groove of the inclined raceway, its head resting and lying on the laterally inclined surfaces and sliding down the same strikes and rests against the lower end *w'* of the groove in front of the side groove L, the next tack following it in the same manner and resting against the first tack and so on. A tack when the parts are in their normal position cannot enter the side groove L of the inclined raceway groove because a swinging piece C', or D', is disposed therein, and it cannot move into the forward extension of the side groove because the edge piece *f*, of the transverse sliding block or cut off block A' lies therein. The head of the tack driver rod is then struck a smart blow which carries down the two drivers into their lowermost positions and which pass by, and when down, close up the lower end of the inclined passage R, leading to its driveway passage Q. As the drivers pass down, the inclined edge or wedge B', of the driving rod U, moves the sliding block backward and its piece *f*, lying in the side groove, moves backward with it the first tack that is at the lower end of the raceway groove G. At the same time the pivoted piece C' or D', moves out of the way to allow the tack to move in such direction into the side groove and such tack then falls into the short sidewise inclined passage M down into the inclined passage R; while this first tack is moved backward to pass into the passage R the sliding block piece *f*, as it moves it backward moves in front of the lower end of the longitudinal groove G, and prevents the second tack passing to the lower end of this groove, in front of the side groove, but as the driver is returned (after the blow) to its upper and normal position by the action of its springs, the lower end of the driver passes up by the lower end of the passage R, allowing the first tack, just arrived there, to fall down into the passage Q, and into the conical socket, between the two swinging blocks E' in position for the driver P, when afterward moved down to drive the tack. At the same time the sliding block moves forward by the action of its spring *t*, and its edge piece *f*, moves from in front of the lower end of the inclined raceway groove, allowing the next or second tack to reach such lower end in front of the side groove, but which is prevented from passing to the side groove by the swinging down of the pivoted piece C' or D' into the groove behind the tack. The machine being held in the left hand the lower end J', of the upright is placed on the part where the tacks are to be driven and then the head of the driver is struck another blow, and the drivers forced down striking the first tack, which is then in the conical socket between the pivoted blocks and driving the tack. This movement moves the transverse sliding block A' as before pushing over the second tack into the side groove which drops down into the passage M, the edge piece *f*, then being over or across the end of the inclined raceway groove, preventing the third tack from moving any farther down; as the driver is raised the second tack then falls into the conical socket in the blocks and the third tack into the lower end of the inclined raceway groove ready to be pushed backward into the side groove into the passage M, to pass to the driver and so on for each tack. The movements of the driver down and up and the movements of the sliding block across the inclined raceway with the pivoted pieces, are so timed in relation to each other that only one tack can pass to the blocks E' to be driven at a time. The jar caused by striking the driver acts to shake the receptacle sufficient generally to cause the tacks to gradually pass through the openings in the several partitions through the several chambers to the raceways, and provided the raceway should not have a supply sufficient to feed the drivers as fast as they are operated, a slight shake given to the machine by the person holding it will cause the tacks to fall therein sufficiently. The construction of the inclined raceway in cross section in connection with its longitudinal incline and the outside edges or marginal ribs J is such that no matter how a tack drops onto the raceway, before it reaches its lower end, it will have found its true position in the raceway for its presentation to the drivers, that is, its body will be point downward in the groove G with its head resting on the laterally inclined surfaces at each side, as shown in Fig. 3, more particularly. The raceway groove G, is of a width to allow the body of the tack free movement therein, but not wide enough for its head, so that it will surely rest upon its upper inclined edges. The inclined surfaces of the raceways are of less width than the length of the body of the tack and the ribs or border edges as well as the sides of the partition not only serve to prevent the tacks from falling out of the raceways, but being nearer to the raceway groove than the length of the body of the tack it prevents any tack from lying at right angles or sufficiently so on the inclined surfaces with its head in the groove to interfere with its proper movements down the incline, so that it is forced naturally to lie at such an angle to the line of the groove that its point will surely fall into the raceway groove. At the middle portion of the raceway near

the post, are openings K' one each side of each raceway groove which extend down and communicate with a chamber L', in the handle which is a receptacle for what tacks happen to be clogged or thrown one side after being dropped in the raceway; as in such case it would drop into one of the openings K', and fall down into the handle chamber from which they can be removed at pleasure by unscrewing the screw nut M'. In each raceway groove G, near the handle is an opening N' made through the bottom communicating with this chamber L' through which any headless tacks will fall and thus get out of the way of the other tacks.

P' is a brace connected by one end to the bottom of the handle B by the screw nut M', and by its other end to side of the lower end of the upright by screws x' to hold the upright firmly in place. This brace where it joins the upright is bent so as to make a shoulder Q', with the bottom end J' of the upright to also serve as a guide in placing the machine on the work when driving the tacks.

R' are two other braces or rods above the inclined raceway, one each side of the post, each connected by one end to the post and by its other ends to the upright by screws Z' which with the other brace P' serve to hold the upright more firmly to the inclined bar.

The partition F, between the raceways only extends to the post, as below it is all open between the raceways as at b'', so that any tacks can drop through the space if moved out of place on the raceway at such place.

The pin S' of the screw nut M' is used to stand the machine up when not in use, by placing it in a socket in any suitable base.

Over the upper side of the lower end of each groove of the inclining raceway for each side secured thereto by screws is a plate T' which prevents the tacks after reaching this part of the raceway from jumping out thereof from any jar given to the machine and yet allows free movement of the tacks under it along the raceway. The sliding block flange d, also prevents the tacks from jumping out of the raceway grooves and is high enough to allow free movements of the tacks under it.

When operating the machine the first blow given to the driver does not drive a tack, as the first tack has only reached the lower end of the longitudinal raceway groove and cannot pass into the side groove until the transverse sliding block is moved to do so, which has to be done by moving the drivers down, and it is therefore necessary to operate the parts for the first tack to pass out of the inclined raceway groove into the side groove and drop down through the passage in connection therewith and to its position in between the blocks E' to be driven by the drivers. After the first tack has been driven, at each blow given to the driver a tack will be driven and on the return of the driver into position to again drive a tack, another

tack or the next tack will be in place to be driven, but in no case with proper handling of the machine can two tacks come together to a driver to interfere with the proper working of the machine. The side portion of the raceway is only wide enough for one tack to pass through it at a time and then when the block is moved backward only the lowermost tack will be moved, and this pushing piece is cut away as at d' for it to act more particularly upon the body of the tack, and thus no matter what the size of the head of the tack within reasonable limits in relation to the body, the tack will be sure to be moved, as described. As the tack is pushed through the side raceway into the inclined passage M, its head naturally moves faster than its point so that as it enters the inclined passage it will incline backward somewhat, that is, its point will be nearer to the inclined raceway at its lower end. Therefore this passage is made to incline backward for its lower end to be nearer the inclined raceway and for such lower end to merge into its groove, to have it in the same general inclined direction that the tack is in at such time, so that when the tack drops down into the passage its point will not strike the side of the passage or at such an angle as to interfere with its free movement through the passage to the driver passage as it might do if the passage were vertical or at a different angle from that in which the tack is at such time, as from the extreme sharpness or fineness of the point of the tack, if it should strike such side it would tend to stop the tack or turn it into such position as to interfere with its freely passing through the passage to the driver and therefore with other tacks following it clog the machine, but the incline of the passage being in the direction described and shown which as before stated is in the same general direction of the tack at that time and the passage merging into the longitudinal groove of the inclined raceway, the tack will not be interfered with in its movement to the driver passage, consequently insuring its being positively fed to the driver passage and with its point in the proper position and direction for the driving of the same. When the drivers are forced down to drive the tacks, the shoulder Y of its head abuts against the upper end of the upright, stopping farther downward movement than that which is sufficient to drive the tacks home.

The object of driving two tacks at the same time is for the machine to be used in connection with the lasting machine described and shown in the Letters Patent referred to and it is used after the upper has been drawn up and over the edge of the sole of the boot and held by the jaws of the lasting machine, the tack driving machine being held against the end of one set of jaws so that the tacks will be driven one each side of the jaws in to the upper and sole of the boot being lasted, se-

curing the two together, the tacking machine being then moved to the next set of jaws and two tacks driven as before.

To guide the machine in placing it against the end of the jaws when using it in connection with the lasting machine the side of the upright at its lower end, is cut away or hollowed out between the two tack drivers, as at A'' Fig. 13, to form a groove which groove is placed over and against the end of the jaws in the lasting machine, bringing the passages through which the tacks are driven, one each side of the jaws; and to assist somewhat in forcing or crowding up the material of the upper where it is tacked, the end of the upright is serrated or corrugated as at B'' in reverse diagonal directions, although the corrugations can run in any desired direction.

Having thus described my invention, what I claim is—

1. In a tack driving machine the combination with an inclined tack feeding raceway having a side raceway extension at its lower end substantially at right angles thereto, and a passage formed in the body of the machine communicating with the end of said side raceway and extending downward and inclining toward the longitudinal vertical plane of the inclined raceway, of a block or slide having a groove or shoulder and arranged to move back and forth in said side raceway, a tack driver arranged to move up and down in suitable guideways and provided with an inclined edge to engage with said groove or shoulder to move said block in one direction, and means for moving said block in the opposite direction for the purpose specified.

2. In a tack driving machine the combination with an inclined tack feeding raceway having a side raceway extension at its lower end substantially at right angles thereto, and a passage formed in the body of the machine communicating with the end of said side raceway and extending downward and inclining toward the longitudinal vertical plane of the inclined raceway, of a block or slide having a groove or shoulder and arranged to move back and forth in said side raceway, a tack driver arranged to move up and down in suitable guideways and provided with an inclined edge to engage with said groove or shoulder to move said block in one direction, and a spring bearing upon said block to move it in the opposite direction for the purpose specified.

3. In a tack driving machine the combination with an inclined tack feeding raceway having a side raceway extension at its lower end substantially at right angles thereto, and a passage formed in the body of the machine communicating with the end of said side raceway and extending downward and inclining toward the longitudinal vertical plane of the inclined raceway and thence downward to the driving mechanism, of a block or slide arranged to move back and forth in said side raceway, a tack driver arranged to move up

and down in suitable guideways and adapted to move said block in one direction and means for moving said block in the opposite direction for the purpose specified.

4. In a tack driving machine the combination with an inclined tack feeding raceway having a side raceway extension at its lower end substantially at right angles thereto, and a passage formed in the body of the machine communicating with the end of said side raceway, and extending downward and inclining toward and merging into and with the grooves of the inclined raceway and side raceway and thence extending downward to the driving mechanism, of a block or slide arranged to move back and forth in said side raceway, a tack driver arranged to move up and down in suitable guideways and adapted to move said block in one direction, and means for moving said block in the opposite direction for the purpose specified.

5. In a tack driving machine the combination with an inclined tack feeding raceway having a side raceway extension at its lower end substantially at right angles thereto, and a passage formed in the body of the machine communicating with the end of said side raceway, of a block or slide arranged to move back and forth in suitable guideways and provided with a downward piece projecting into said raceway, a tack driver arranged to move up and down in suitable guideways and arranged to move said block in one direction, and means for moving said block in the opposite direction for the purpose specified.

6. In a tack driving machine the combination with an inclined tack feeding raceway having a side raceway extension at its lower end substantially at right angles thereto, and a passage formed in the body of the machine communicating with the end of said side raceway, a block or slide arranged to move back and forth in suitable guideways having an opening in its upper side and a downward piece projecting into said side raceway, of a swing piece adapted to engage with said opening in said sliding block and projecting through the same into said side raceway back of said projecting piece, a tack driver arranged to move up and down in suitable guideways and adapted to move said block in one direction, and means for moving said block in the opposite direction for the purpose specified.

7. In a tack driving machine the combination with an inclined tack feeding raceway having a side raceway extension at the lower end substantially at right angles thereto, and a passage formed in the body of the machine communicating with the end of said side raceway, a block or slide having a groove or shoulder arranged to move back and forth in said side raceway and having an opening in its upper side and a downward piece projecting into said side raceway, of a swinging piece adapted to engage with said opening in said sliding block and projecting through the same into said side raceway back of said pro-

jecting piece, a tack driver arranged to move up and down in suitable guideways and provided with an inclined edge to engage with said groove or shoulder to move said block in one direction, and means for moving said block in the opposite direction for the purpose specified.

8. In a tack driving machine having an inclined raceway for feeding tacks and a tack driving mechanism, a receptacle for the tacks, consisting of a series of chambers, one having an outlet leading to said inclined raceway, horizontal partitions separating said chambers, each partition having an opening through it and said openings being alternately arranged on opposite sides of said receptacle, for the purpose specified.

9. In a tack driving machine having an in-

clined raceway for feeding tacks and a tack driving mechanism, a receptacle for the tacks, consisting of a series of chambers, one having an outlet leading to said inclined raceway, horizontal partitions separating said chambers, each partition having an opening through it alternately arranged on opposite sides of said receptacle and increasing in size or diameter from the upper partition to the lowest, for the purpose specified.

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

ALBERT F. PRESTON.

Witnesses:

EDWIN W. BROWN,
LEONA C. ARNO.