No. 706,601. Patented Aug. 12, 1902.

J. E. SCOTT.

PUNCHING MACHINE.

(Application filed Aug. 26, 1901.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.

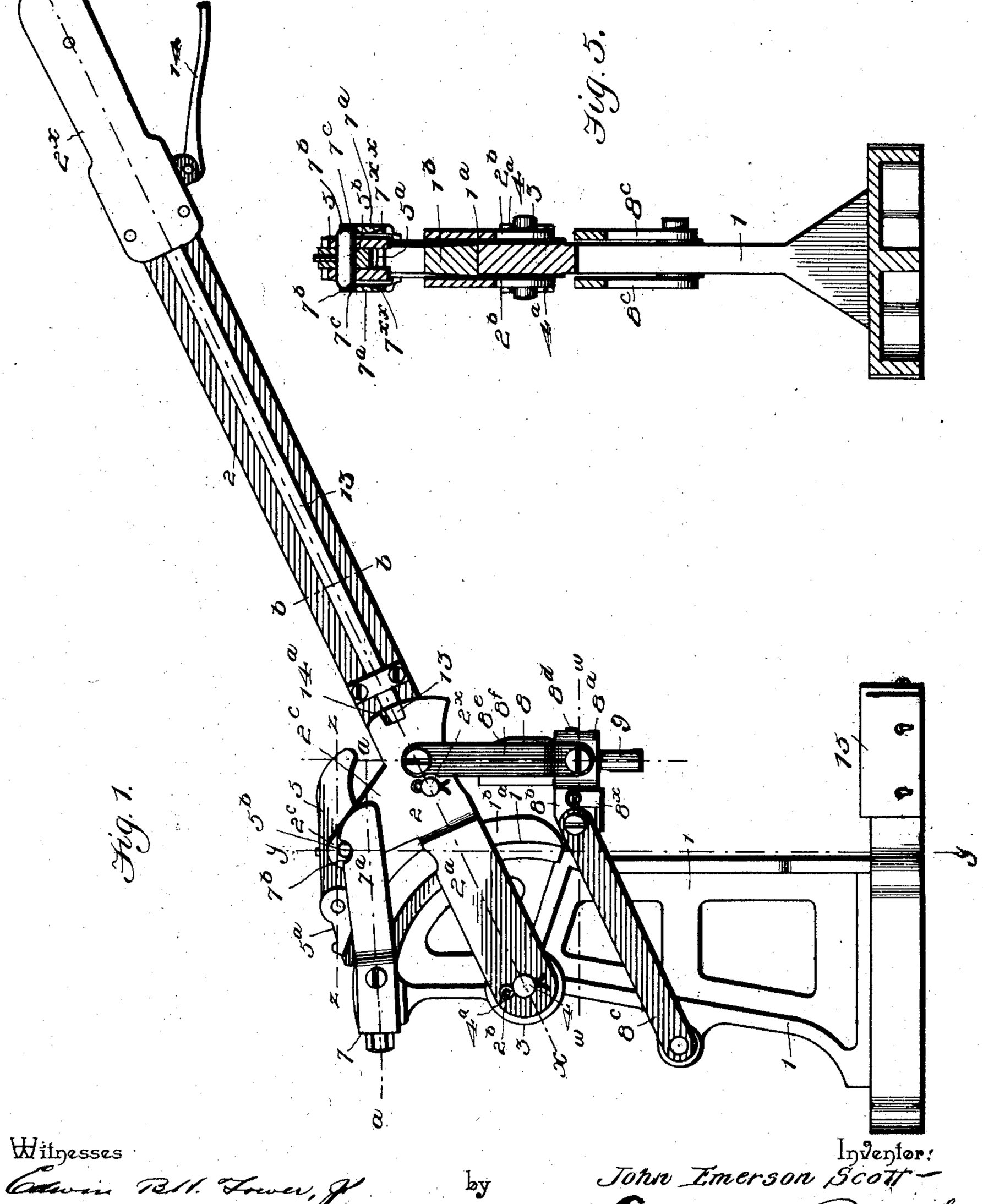

Fig. 5.

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No. 706,601. Patented Aug. 12, 1902.

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PUNCHING MACHINE.

(Application filed Aug. 26, 1901.)

(No Model.) 4 Sheets—Sheet 2.

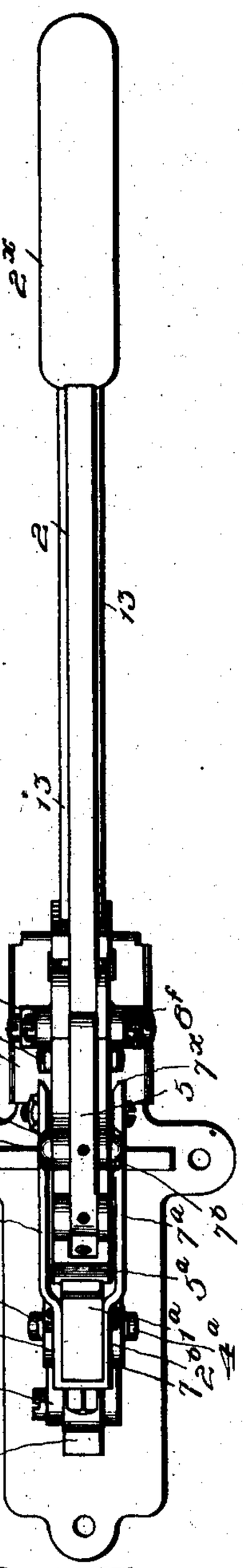

Fig. 2.

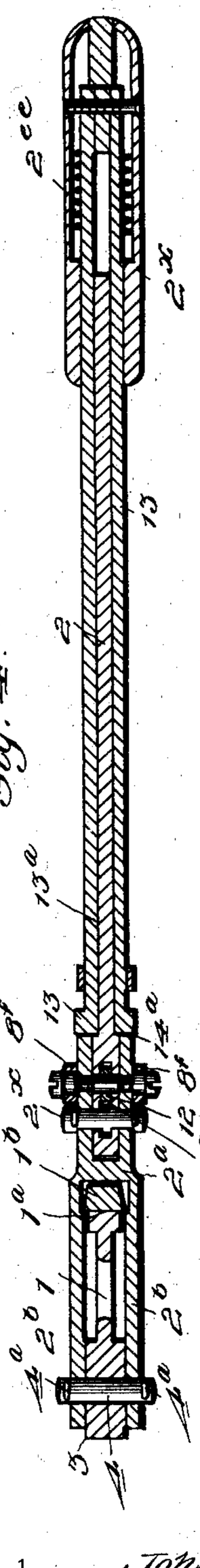

Fig. 4.

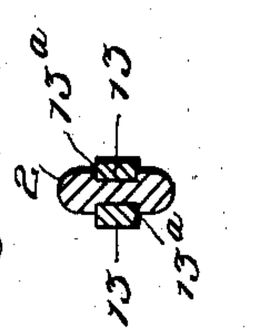

Fig. 11

Fig. 10.

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(Application filed Aug. 26, 1901.)

(No Model.) 4 Sheets—Sheet 3.

Fig. 6.

Fig. 12.

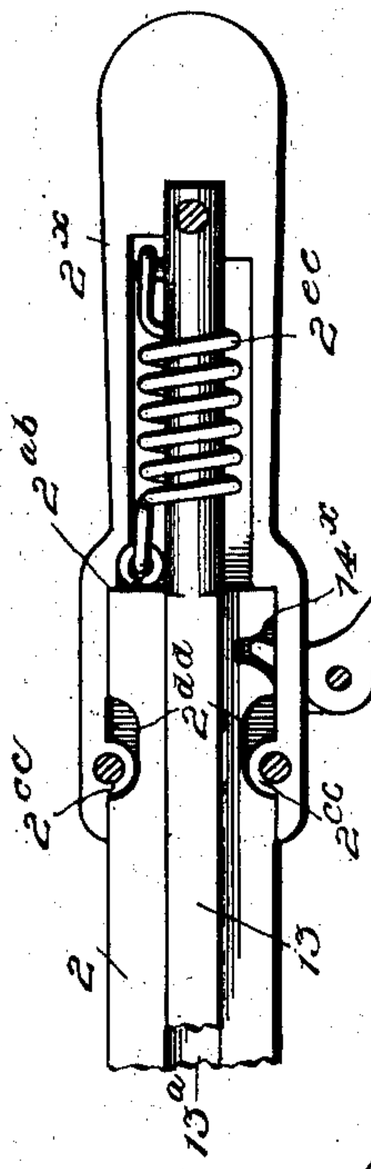

Fig. 3.

No. 706,601. Patented Aug. 12, 1902.

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PUNCHING MACHINE.

(Application filed Aug. 26, 1901.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 7.

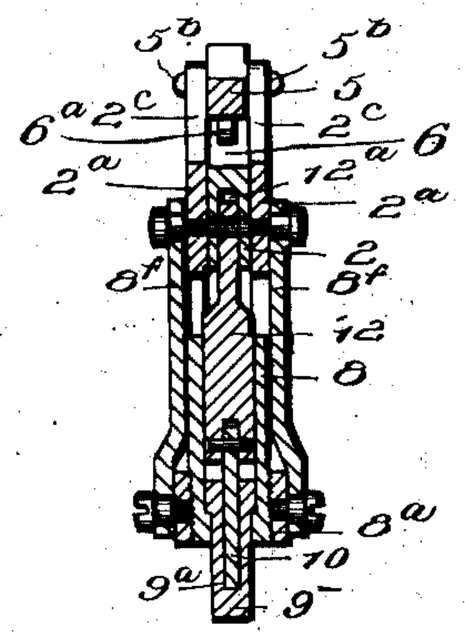


Fig. 8.

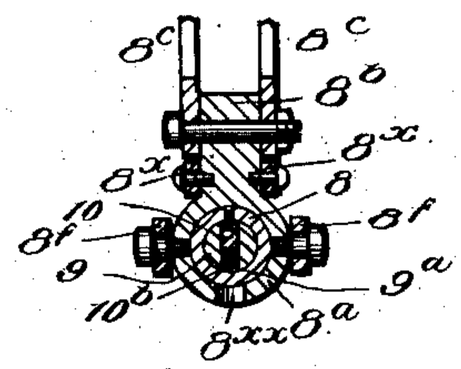
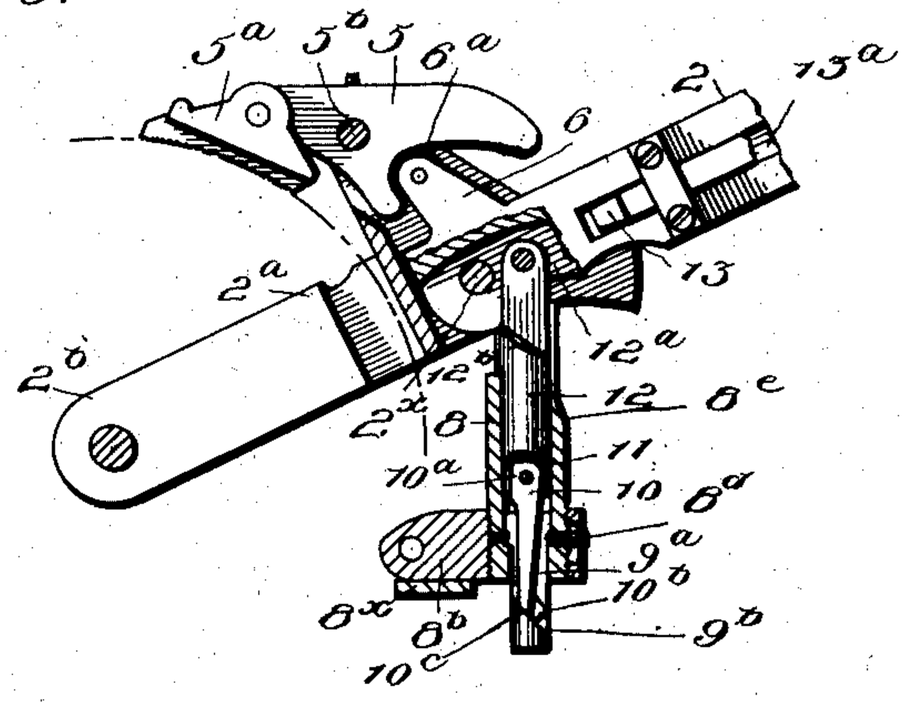


Fig. 9.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN EMERSON SCOTT, OF PHILADELPHIA, PENNSYLVANIA.

PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 706,601, dated August 12, 1902.

Application filed August 26, 1901. Serial No. 73,315. (No model.)

To all whom it may concern:

Be it known that I, JOHN EMERSON SCOTT, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Punching-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain improvements in machines belonging to the general class of punches, it being particularly designed for use in the application of thimbles or linings to the spindle-sockets of shoe-lasts.

The invention, as above noted, deals more especially with the securing or applying the thimble or lining to or within the shoe-last socket receiving the spindle for holding the last when in practical use, the same being effected herein with expedition and facility. It guards against liability of splitting the last from pressure or force exerted or delivered thereon through the spindle, as when the work is hammered upon the last. It provides for the insertion of the thimble or lining into the last previous to the punching or striking up the offsets or lips upon said thimble or lining and in continuation of said operation for such punching up of said lips or offsets, forcing said lips or offsets into the walls of the spindle-socket. Simultaneously with such penetration the fibers of the wood thus displaced will result in the formation of shoulders opposing said offsets or lips to effect the interlocking of the thimble and shoe-last to hold the thimble against accidental or premature withdrawal from the last. It also provides for simplicity of construction of the parts and the consequent manufacture of the same at a minimum cost, &c.

The nature of the invention consists, generically stated, of a plunger or carrier adapted to be suitably mechanically operated and having a cutter or punch adapted to be separately actuated to punch or strike up the lip or offset in the thimble or lining into which said plunger is inserted for the action of said punch or cutter.

It further consists of the particular means for the actuation of said parts as connected up therewith and the details of the construction and arrangement of parts, substantially as hereinafter more fully disclosed, and specifically pointed out by the claims.

In the accompanying drawings, illustrating the preferred embodiment of my invention, Figure 1 is a side elevation thereof with the complex lever for actuating both the thimble or tube carrier or plunger and the cutter or punch elevated. Fig. 2 is a plan view of the same. Fig. 3 is also a side view showing said lever depressed as in punching or cutting up the lips or offsets upon the thimble or lining. Fig. 4 is a longitudinal section taken on the line $x\,x$ of Fig. 1, extending through said lever. Fig. 5 is a vertical section taken on the line $y\,y$ of Fig. 1. Fig. 6 is a horizontal section taken on the line $z\,z$ of Fig. 1. Fig. 7 is a vertical section taken through Fig. 1, extending through said lever and the plunger and punch or cutter. Fig. 8 is a section taken on the line $w\,w$ of Fig. 1. Fig. 9 is a broken detailed section showing more particularly the punch, the interior of the plunger containing the same, and the point of connection between said punch and its actuating-lever. Fig. 10 is a horizontal section taken on the line $a\,a$ of Fig. 1. Fig. 11 is a cross-section taken on the line $b\,b$ of Fig. 1. Fig. 12 is a broken enlarged detailed view showing more particularly the detent-actuating spring and the finger-lever and sliding handpiece connection, with the punch, &c., actuating lever arranged in said handle.

Latitude is allowed herein as to details, as they may be changed or varied at will without departing from the spirit of my invention and the same yet remain intact and be protected.

In carrying out my invention I provide, primarily, a suitable stand or support 1, which may for lightness be cast or produced in skeleton form, with an arcuate or quadrant-like upper forward edge 1^a, preferably faced with a correspondingly-shaped wearing plate or surface 1^b, the purpose of which will appear presently. A hand-lever 2 has its inner end pivoted, as at $2^\times$, between the outer bifurcated or forked end of an arm 2^a, also additionally bifurcated or forked at its inner end and having the branches 2^b thereof thus formed pivoted to the stand or support 1 near its upper

end upon opposite sides. Said branches 2^b preferably fit flush against apertured plane-faced lateral projections 3, preferably disk-like, and through apertures in said branches coinciding with the aperture of said disk-like projections is inserted the pivot-pin 4, transversely through apertures or holes in which, outside of said branches, are inserted split keys 4^a. Said keys are preferably of a spring metal to permit the compression of their limbs in inserting the same through the transverse holes of said pivot-pin and said limbs to spring apart after such insertion to automatically secure said pins. Said arm 2^a has upward-extending parallel projections 2^c, one formed with each branch of its outer bifurcated end, to and between which projections, at their upper ends, is pivoted, as at 5^b, a dog 5, carrying at its inner end a pivoted concaved shoe 5^a, having a preferably roughened or serrated face and opposed to the arcuate upper forward edge or quadrant 1^a of the stand 1. The forward or outer end of the dog 5 is curved or concaved upon its under surface and projects some distance beyond its pivotal connection with the upward-extending projections 2^c of the arm 2^a and is adapted to limit the downward movement of the hand-lever 2 in effecting the depression of the plunger and the punching operation, as will more fully appear hereinafter. The lever 2 also has at its point of pivotal connection with the arm 2^a an upstanding projection 6, interposed between the similar projections 2^b of said arm and preferably equipped with a frictional roll or bearing 6^a, adapted to engage the lower concaved surface of the dog 5. The upstanding projections 2^b of the arm 2^a as the lever 2 is raised after previous depression carries the dog 5, with the shoe 5^a, upward between the parallel resilient or spring arms 7^a of a keeper 7, suitably secured or bolted to the upper inner end of the stand 1, as in effecting the suspension of said parts in an elevated position. Said spring-arms have their inner surfaces, from the outer ends inward a short distance, chamfered or beveled, as at $7^\times$, to permit the upper edge of the projection 2^c to readily engage and force apart said arms for the passage therebetween of said projections and other parts. Said beveled surfaces themselves have formed therein similar shallow recesses $7^{\times\times}$ for the passage of the ends of the pivot of the dog 5. Said spring-arms have in their upper edges, near the outer ends, preferably semicircular notches or seats 7^b, beveled upon their inner lower edges, as at 7^c, primarily to receive the projecting ends of the pivot 5^b of the dog 5, and thus permit of such suspension or upholding of said parts in their elevated position, as when placing the thimble or lining for the spindle-socket on the shoe-last upon the plunger, as presently more fully disclosed. The beveled surfaces or edges 7^c of said seats or notches permit the pivot ends to readily enter said notches or seats 7^b, while said pivot ends seat themselves in said notches as the resilient arms 7^a of the keeper 7 spring toward the projections 2^c of the pivoted arm 2^a, thus arresting further movement of the aforesaid parts and automatically securing the same in position.

A tubular stock or barrel 8 is screwed or held in a sleeve or collar 8^a, having an inward or rearward extending lug or projection 8^b, pivotally or flexibly supported in position by parallel bars or links 8^c, connected or pivoted, preferably as shown, to said lug and the stand near its inner edge. The lug or projection 8^b is equipped upon its underside with a cushion of leather or like material $8^\times$, having lateral upward-extended portions held, preferably, by screws to the sides of said lug to prevent the marring or impairing by contact with said lug or projection of the shoe-last held thereunder in the punching operation. Said collar or sleeve is also pivotally or flexibly suspended from the pivoted arm 2^a by additional bars or links 8^f, pivoted or connected, preferably as shown, to said lever and collar. Said collar or sleeve has preferably in one side a vertical elongated slot $8^{\times\times}$, and through said slot is inserted a holding-screw 8^d, having, preferably, a tapered inner end and engaging a screw-threaded opening in the stock or barrel 8. Said stock or barrel has its upper forward or outer edge beveled or sloping downward and forward, as at 8^e, to permit a limited play of the parts independently of each other. The stock or barrel 8 has suitably secured concentrically thereto within its lower end a pendent plunger or carrier 9, having a vertical slot 9^a, with its bottom surface inclined downward and forward or outward, as at 9^b, the purpose of which will be apparent presently.

The punch or cutter 10 comprises a shank slightly flared upward, with an inclined offset or shoulder 10^a at the upper rear edge of said flare and a preferably pyramidal point or punch proper, 10^b, at the extreme lower forward edge of the side of said shank. The tapered or effective oblique edge of said point or punch faces or is presented upward, while the apex thereof projects outward or forward in the horizontal central plane of said point. Said punch has at its extreme lower rear edge a downward and forward sloping or beveled edge, as at 10^c, conforming to the corresponding beveled or sloping bottom of the slot in the plunger, to aid in the outward or lateral movement or deflection of said punch. The cutter or punch 10 is pivotally hung or suspended, with its offset 10^a near the point of suspension, at its upper end in a downward-facing slot 11 in the lower end of a preferably cylindric link or plunger 12, also pivotally hung in a downward-facing elongated slot 12^a, formed in the inner or inclosed end of the lever 2. The link or plunger 12, near its pivoting point, is laterally sloped or beveled, as at 12^b, forward and downward from a flat upper end portion, giving a limited independent play

between the parts, as necessary in the working of the device.

The lever 2 is equipped with opposite detents or pawls 13, preferably in the form of offset bars, suitably confined in position and sliding in angular grooves or channels 13^a, provided leaterally in said lever. Said detents have their distant ends let into and suitably fixed to a handpiece or handle $2^\times$ by a screw or rivet, as shown particularly in Fig. 12, said handpiece or handle also receiving the distant end of the lever 2. Said handpiece or handle, preferably in halves or sections held together by transverse screws or rivets, among them the above-referred-to screw or rivet, as shown, is adapted to slide upon said lever 2, having internal shoulders or stops 2^{ab}, abutting the end of said lever, as shown. The halves or sections of said handpiece or handle have around the first-referred-to rivets opposite bosses 2^{cc}, received by elongated recesses or notches 2^{dd} in the edges of the lever 2 to permit and limit the sliding movement of said handpiece or handle upon said lever, as required in actuating the detents or pawls 13. A spring 2^{ee}, peferably coiled or slipped upon cylindric end portions of the detents or pawls 13 and having one end suitably connected to one of said detents and its other end connected to the end of the lever, provides for the automatic inward movement of the detents or pawls, as presently seen.

A finger-lever 14 is suitably pivoted upon the handpiece or handle $2^\times$ and has an inner toothed end engaging a notch $14^\times$ in the edge of the lever 2, by suitably actuating which the handpiece or handle $2^\times$ is moved outward, carrying with it the detents or pawls, thus permitting their disengagement from the notches of the arm 2^a and the movement of the lever 2 independent of said arms for the purpose above noted. The release of said finger-lever permits the automatic inward movement of the detents when the lever 2 is alined with the arm 2^a, and consequently like reëngagement of said detents with the notches 13^a in the outer end of the arm 2^a, for the purpose before disclosed. In the forward edges of the branches of the outer bifurcated end of the pivoted arm 2^a are notches 14^a, adapted to receive the inner offset ends of the detents or pawls 13.

The base of the stand 1 may be supplied with a piece of leather, as 15, or other suitable soft material to serve as means to prevent the marring or impairment of the last placed in position for the insertion of the thimble or lining in the spindle-socket therein.

In operation the hand-lever 2 being elevated and locked in position the thimble or lining is slipped upon the plunger or carrier and the shoe-last then brought into position to permit the insertion of said thimble into the spindle-socket therein. The lever 2 is forced downward by hand. With this movement of said lever the spring or resilient arms 7^a of the keeper 7 will be spread apart, thereby releasing the projecting ends of the pivot of the dog 5 from their seats or notches in said spring-arms, permitting the continued descent of the pivoted arm 2^a, with the dog 5 and its attached shoe, and said hand-lever forcing the thimble or lining well into said socket of the shoe-last. Also during said movement of parts the dog 5, with its shoe or brake, will likewise be carried downward and said shoe caused to approach the arcuate portion or quandrant of the stand 1. The frictional roll of the upstanding projection of said hand-lever at the same time will engage the concaved surface or face of said dog and thus cause said shoe or brake to bind upon said quadrant, and thus hold the pivoted arm, with its adjunctive parts, at that point, or against further downward movement. In this depressed position of said parts the finger-lever 14 is actuated, having the effect to disengage the detents from the notches in the outer end of the pivoted arm 2^a. The hand-lever 2 is thus rendered free to be moved independently of said pivoted arm farther downward. Such further movement of said hand-lever causes the punch or cutter 10 to be depressed into the plunger or carrier, its rear sloped edge passing down the inclined or sloping bottom surface of the slot in said plunger or carrier, directing said punch at its effective pointed end laterally outward through said slot, engaging and punching up the thimble or lining with a lip or offset. Said lip or offset will of course be simultaneously forced into the wood of the shoe-last. By the displacement of the fibers of the wood thus produced a shoulder or abutment will be formed opposite to said lip or offset, thus effecting the interlocking of said thimble or lining and the shoe-last. In moving upward the lever 2 upon its pivot the finger-lever 14 is simultaneously actuated, effecting the reëngagement of the detents or pawls with the notches of the pivoted arm, thus locking said arm and the lever together, permitting by continued upward movement of said lever the return of the parts to their elevated position for a repetition of the aforesaid operation thereof.

It is here observed that the machine is also adapted to operate upon tubes of any length without a closed end, as in the present instance, and punch up the same with a lip or lips. It is also noted herein that while it is stated, as above disclosed, that the punching up of the lip or offset from the thimble is effected simultaneously or continuously with the forcing or thrusting said lip or offset into the wood of the last, yet it will be understood that my machine is adapted for effecting such forcing of said lip or offset into the wood of the last without regard to the time of punching up such lip or offset from the thimble, also that when the machine is thus used the cutting edge of the punch is omitted and such edge made of sufficient width or extent as shall be commensurate with the

cross-sectional area of the inner diameter of the thimble to properly effect such forcing out of the lip, especially when said lip or offset initially protrudes interiorly of the thimble.

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

1. In a machine of the character described, the combination of a plunger for the thimble of a shoe-last spindle-socket of tubing, a punch having longitudinal movement independent of, and adapted to work laterally to, said plunger, and means for separately actuating said plunger-carrier and punch, substantially as set forth.

2. In a machine of the character described, the combination of a plunger for tubing, a punch having longitudinal movement independent of, and arranged to work laterally to said plunger, and means for separately actuating said plunger and punch, substantially as set forth.

3. In a machine of the character described, the combination of a plunger for tubing, having a longitudinal slot therethrough with a sloping bottom surface, a punch or cutter having a beveled heel and a point upon its forward side, at the lower end, and means for separately actuating said plunger and punch, substantially as set forth.

4. In a machine of the character described, the combination of a plunger for tubing, having a longitudinal slot with an inclined bottom surface, a punch having its shank provided with an inclined offset near its rear edge, and its lower end inclined forward and downward, and having a pyramidal point upon its forward side, at the lower end, and means for separately actuating said plunger and punch, substantially as set forth.

5. In a machine of the character described, the combination of a plunger for tubing, a punch having longitudinal movement independent of said plunger with its cutter or point adapted to work laterally to said plunger, and means for separately operating said plunger and punch, substantially as set forth.

6. In a machine of the character described, the combination of a plunger for tubing, a punch having longitudinal movement independent of said plunger with its effective edge adapted to work laterally to said plunger, a lever, and means for connecting said punch to said lever, substantially as set forth.

7. In a machine of the character described, the combination of a plunger for tubing, a punch with its effective point adapted to work laterally to said plunger, a lever, and a second plunger or link connecting said punch to said lever, substantially as set forth.

8. In a machine of the character described, the combination of a plunger for tubing, a punch having longitudinal movement independent of said plunger with its effective edge or point adapted to work laterally to said plunger, a hand-lever, and means for connecting said hand-lever to said punch, substantially as set forth.

9. In a machine of the character described, the combination of a plunger for tubing, a punch with its effective edge or point adapted to work laterally to said plunger, a hand-lever, and an additional plunger or link connecting said hand-lever and punch, substantially as set forth.

10. In a machine of the character described, the combination of a plunger for tubing, a punch having longitudinal movement independent of said plunger with its effective edge or point adapted to work laterally to said plunger, a lever connected to said punch, and means for lowering and raising said plunger, substantially as set forth.

11. In a machine of the character described, the combination of a plunger for tubing, a punch with its effective point or edge adapted to work laterally to said plunger, means for actuating said punch, a lever, and a stock or guide carrying said plunger and connected to said lever, substantially as set forth.

12. In a machine of the character described, the combination of a plunger for tubing, a punch with its effective point or edge adapted to work laterally to said plunger, a complex lever adapted to separately actuate said plunger and said punch, substantially as set forth.

13. In a machine of the character described, the combination of a plunger for tubing, a punch with its effective point or edge adapted to work laterally to said plunger, a lever mechanism comprising a pivoted arm and a hand-lever pivoted to said arm, said arm being connected to said plunger and said lever being connected to said punch, substantially as set forth.

14. In a machine of the character described, the combination of a plunger for tubing, a punch having longitudinal movement independent of, and adapted to work laterally to, said plunger, a tubular stock or barrel for said plunger, a lever mechanism for carrying said stock or barrel and actuating said punch, substantially as set forth.

15. In a machine of the character described, the combination of a plunger for tubing, a punch, a lever mechanism connected to said plunger and punch, a dog with its shoe adapted to serve as a brake and said dog adapted to be acted upon by a member of said lever mechanism, substantially as set forth.

16. In a machine of the character described, the combination of a plunger for tubing, a punch, a lever mechanism, comprising a pivoted arm and a lever proper, a dog carrying a pivoted shoe, a stand having an arcuate surface engaged by said shoe, one member of said lever mechanism adapted to engage said dog and force said shoe upon said arcuate surface, substantially as set forth.

17. In a machine of the character described, the combination of a plunger for tubing, a punch, a lever mechanism comprising a piv-

oted arm and a lever proper connected to said arm, and said lever mechanism connected to said plunger and punch, and a keeper having spring-arms adapted to hold said parts elevated, substantially as set forth.

18. In a machine of the character described, the combination of a plunger for tubing, a punch with its effective edge or point adapted to work laterally to said plunger, a tubular stock carrying said plunger, and a lever having link or plunger connection with said punch, moving through said stock, substantially as set forth.

19. In a machine of the character described, the combination of a plunger for tubing, a punch with its effective edge or point working laterally through said plunger, a tubular stock carrying said plunger and linked to a suitable support, a lever linked to said stock, and means for actuating said punch, substantially as set forth.

20. In a machine of the character described, the combination of a plunger for tubing, a punch with its effective edge or point adapted to work laterally through said plunger, a lever suitably connected to means carrying said punch, a pivoted arm connected to said lever and linked to said plunger, substantially as set forth.

21. In a machine of the character described, the combination of a longitudinally-slotted plunger for tubing, a punch, a tubular stock carrying said plunger, a pivoted arm connected to said stock, a lever connected to said arm, and an additional plunger connected to said lever and working in said stock, and connected to said punch, substantially as set forth.

22. In a machine of the character described, the combination of a longitudinally-slotted plunger for tubing, a punch, a tubular stock carrying said plunger, a collar or sleeve connected to said stock and linked to a suitable support, a pivoted arm connected to said collar or sleeve, and a lever connected to said arm and to said punch, substantially as set forth.

23. In a machine of the character described, the combination of a longitudinally-slotted plunger for tubing, a punch, a tubular stock carrying said plunger and linked to a support or fixture, a pivoted arm linked to said collar, a lever connected to said arm, an additional plunger working in said stock and loosely connected to said punch and similarly to said lever, substantially as set forth.

24. In a machine of the character described, the combination of a plunger for tubing, a punch, a pivoted arm having upstanding projections, a dog pivoted between said projections and carrying a pivoted shoe, a stand having an arcuate portion adapted to be engaged by said shoe, means for connecting said plunger to said pivoted arm, and a lever connected to said arm and to said punch, and means to effect a binding action between said lever and dog, substantially as set forth.

25. In a machine of the character described, the combination of a plunger for tubing, a punch, a lever having an upstanding projection, means for connecting said lever to said punch, a dog pivoted to said upstanding projection and carrying a pivoted shoe, and means to effect a binding action of said shoe, and means to secure a like action between said lever and dog, substantially as set forth.

26. In a machine of the character described, the combination of a plunger for tubing, a pivoted arm having upstanding projections, and connected to said plunger, a dog equipped with a pivoted shoe or brake adapted to effect a binding action with the arm-support, a keeper having spring or resilient arms, adapted to effect engagement with the ends of the pivot between said dog and arm, and means connected to said punch for the actuation of the last named, substantially as set forth.

27. In a machine of the character described, the combination of a plunger for tubing, a punch, a pivoted arm, means connecting said arm to said plunger, a lever connected to said arm and to said punch, a dog pivoted to upstanding projections of said arm and a keeper provided with spring-arms having in their upper edges notches adapted to receive the ends of the pivot between said dog and upstanding projections, substantially as set forth.

28. In a machine of the character described, the combination of a plunger for tubing, a punch, a pivoted arm connected to said plunger, and having upstanding projections, means connected to said arm and to said punch for the actuation of the last named, a dog pivoted to upstanding projections of said arm, and a keeper having its spring or resilient arms with inner forward beveled surfaces and in their upper edges with notches to receive the ends of the pivot between said dog and upstanding projections, substantially as set forth.

29. In a machine of the character described, the combination of a plunger for tubing, a punch with its effective edge or point adapted to work laterally through said plunger, a pivoted arm connected to said plunger, and having upstanding projections, said resilient arms having inner forward beveled surfaces and beveled recesses indenting said beveled surfaces, substantially as set forth.

30. In a machine of the character described, the combination of a plunger for tubing, a punch, a pivoted arm, means connecting said arm and plunger, a lever connected to said arm, means connecting said lever to said punch, a sliding handle arranged on said lever and sliding detents adapted to engage notches in the outer ends of the forward bifurcated portion of said pivoted arm, and a finger-lever pivoted upon said handle and connected to said detent, substantially as set forth.

31. In a machine of the character described, the combination of a plunger for tubing, a punch arranged interiorly thereof, a pivoted arm carrying said plunger, a lever connected

to said arm, a sliding handpiece or handle arranged on said lever and spring-acted-upon detents connected to said handpiece and adapted to engage one end of said arm, substantially as set forth.

32. In a machine of the character described, the combination of a plunger for tubing, a punch arranged interiorly thereof, a pivoted arm carrying said plunger, a lever connected to said arm, a sliding handpiece or handle arranged on said lever, detents or pawls arranged laterally of said lever and adapted to engage one end of said arm, and a finger-lever pivoted to said handpiece and adapted to engage said lever, substantially as set forth.

33. In a machine of the character described, the combination of a plunger carried by a pivoted arm, a punch arranged within said plunger, a lever connected to said arm and carrying said punch, a handpiece sliding upon said lever, detents arranged laterally of said lever and adapted to engage one end of said arm and acted upon by a spring and a finger-lever pivoted upon said handpiece and engaging said detents, substantially as set forth.

34. In a machine of the character described, the combination of a plunger carried by a pivoted arm, a punch arranged within said plunger, a lever connected to said arm and to said punch, a sliding handpiece arranged upon said lever and having bosses moving in elongated recesses in said lever, detents or pawls arranged laterally in said lever and adapted to engage said arm, and connected to said handpiece—and a spring connecting said detents or pawls and said lever, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN EMERSON SCOTT.

Witnesses:
JAMES ALCOCK,
CHAS. P. ROMEY.