No. 735,178. PATENTED AUG. 4, 1903.

W. E. TRUFANT.

MACHINE FOR DRIVING TACKS.

APPLICATION FILED APR. 1, 1899. RENEWED AUG. 19, 1902.

NO MODEL. 4 SHEETS—SHEET 1.

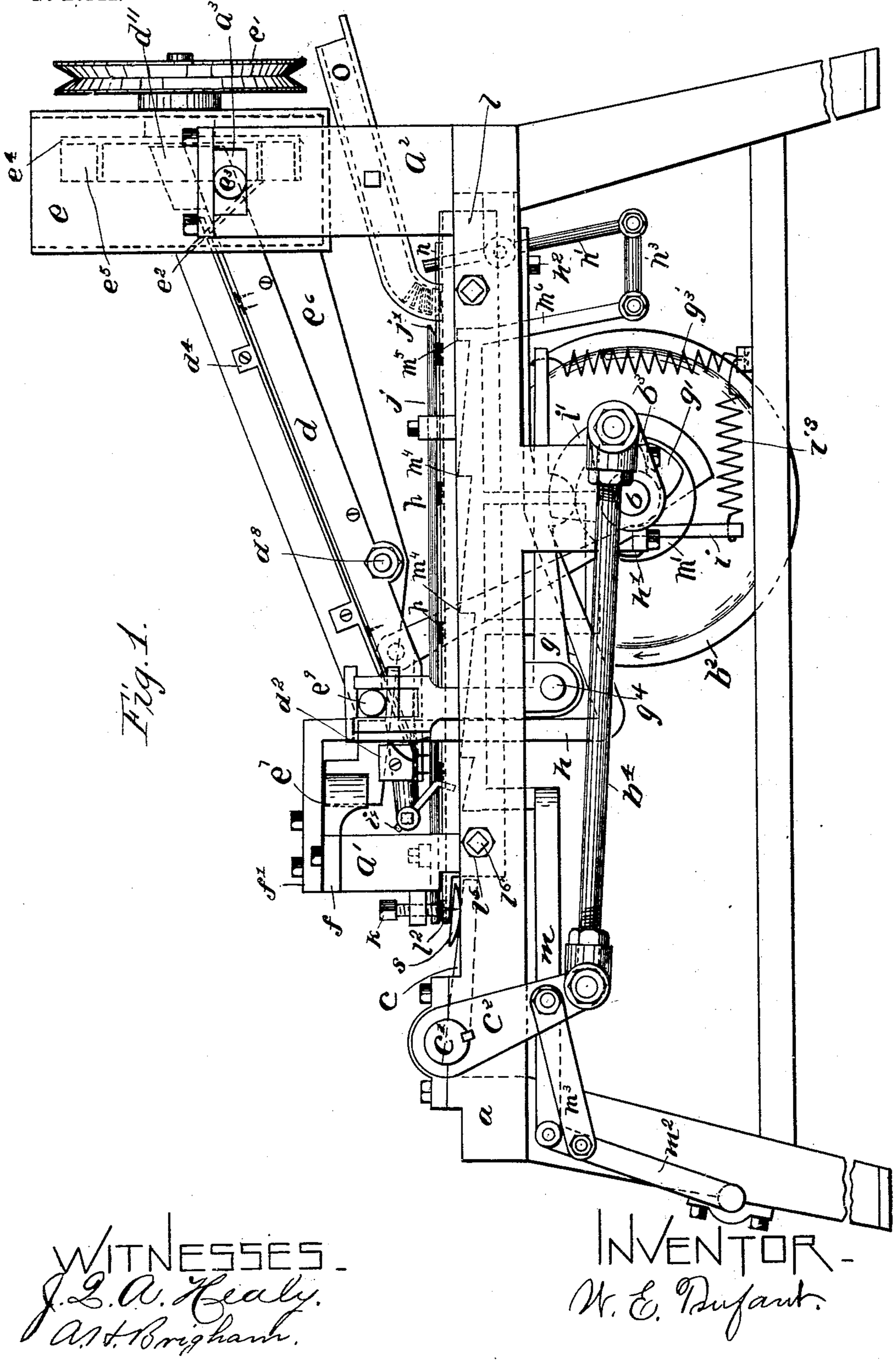

Fig. 1.

WITNESSES.
J. L. A. Healy.
A. D. Brigham.

INVENTOR.
W. E. Trufant.

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NO MODEL. 4 SHEETS—SHEET 2.

FIG. 2.

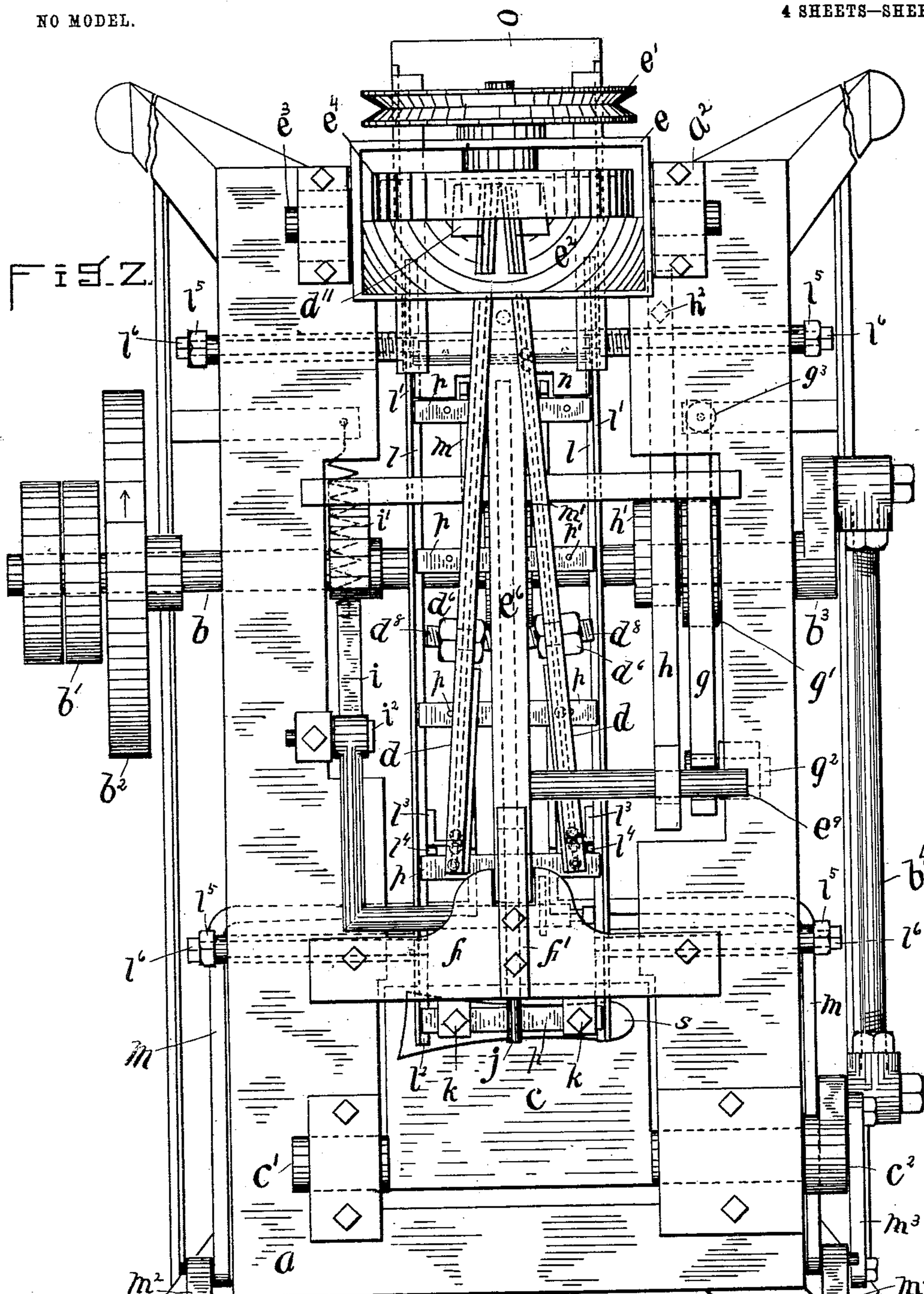

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Fig. 3.

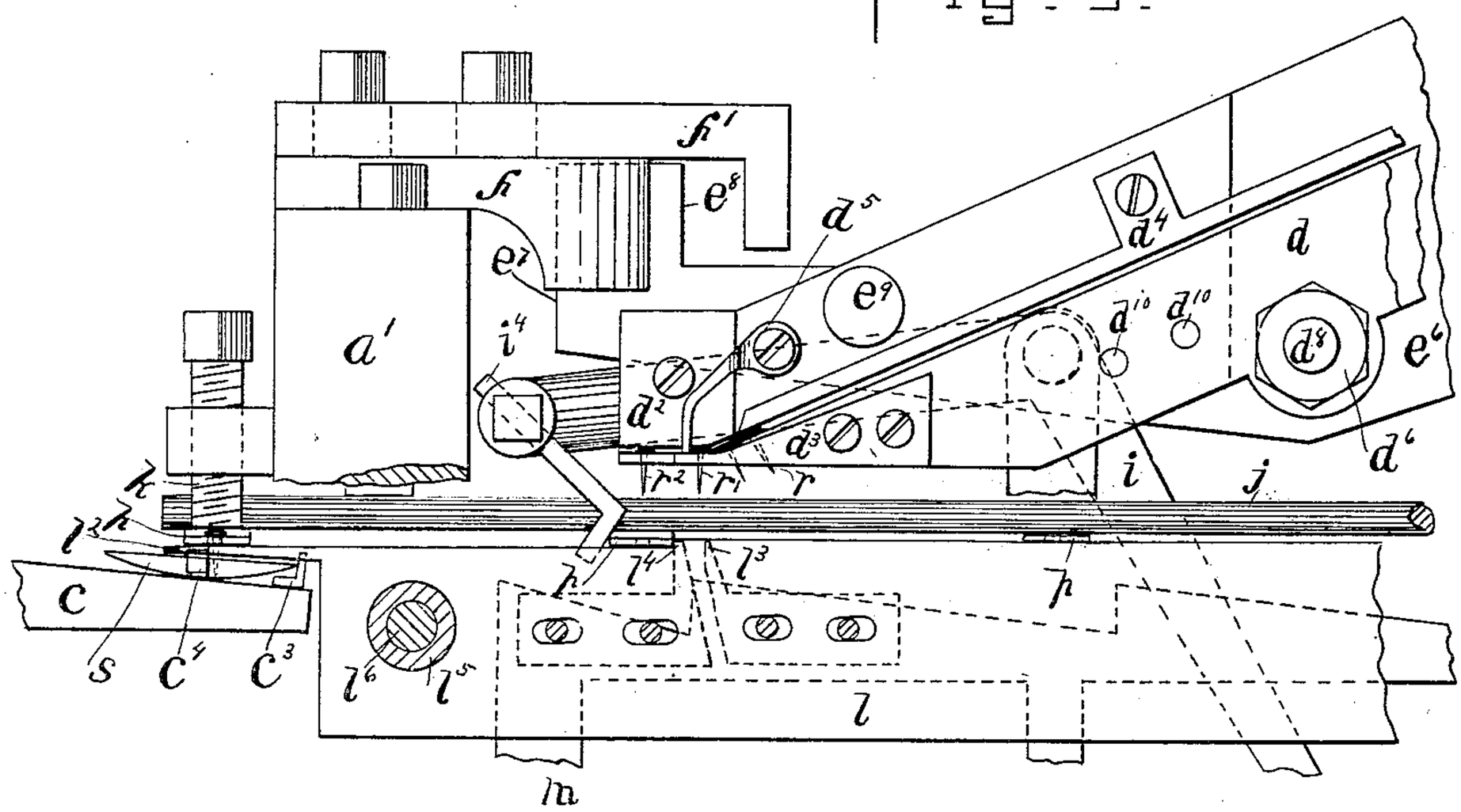

Fig. 4.

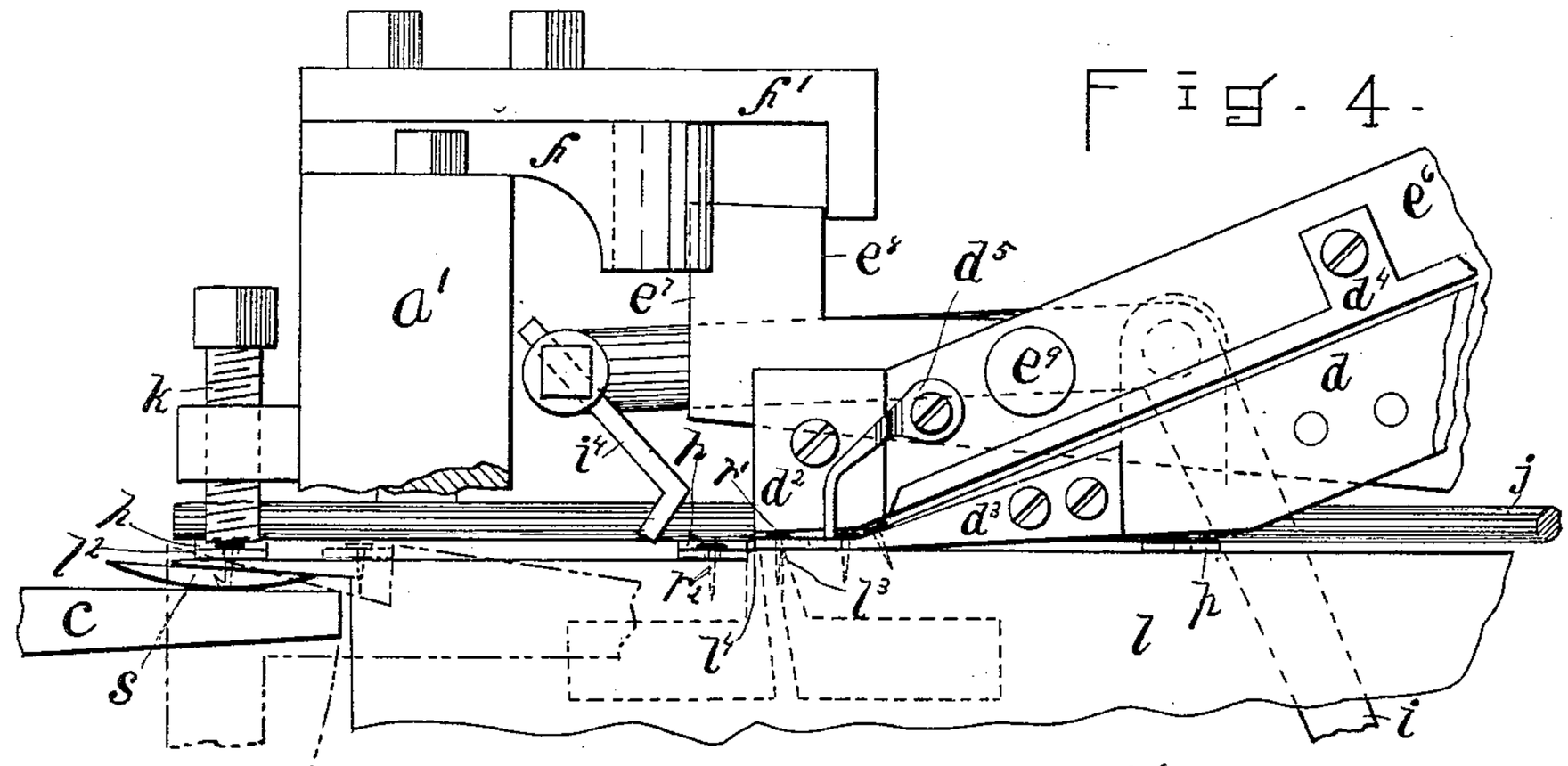

Fig. 5.

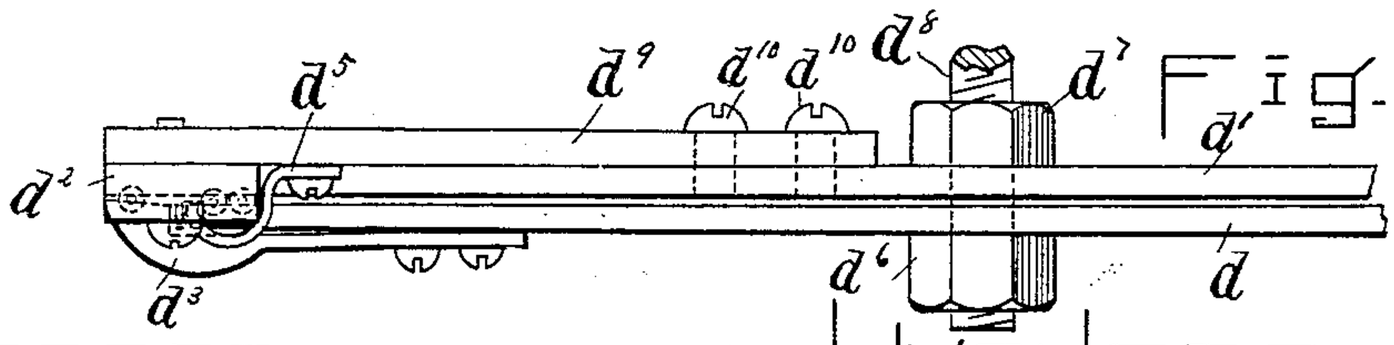

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Fig. 6.

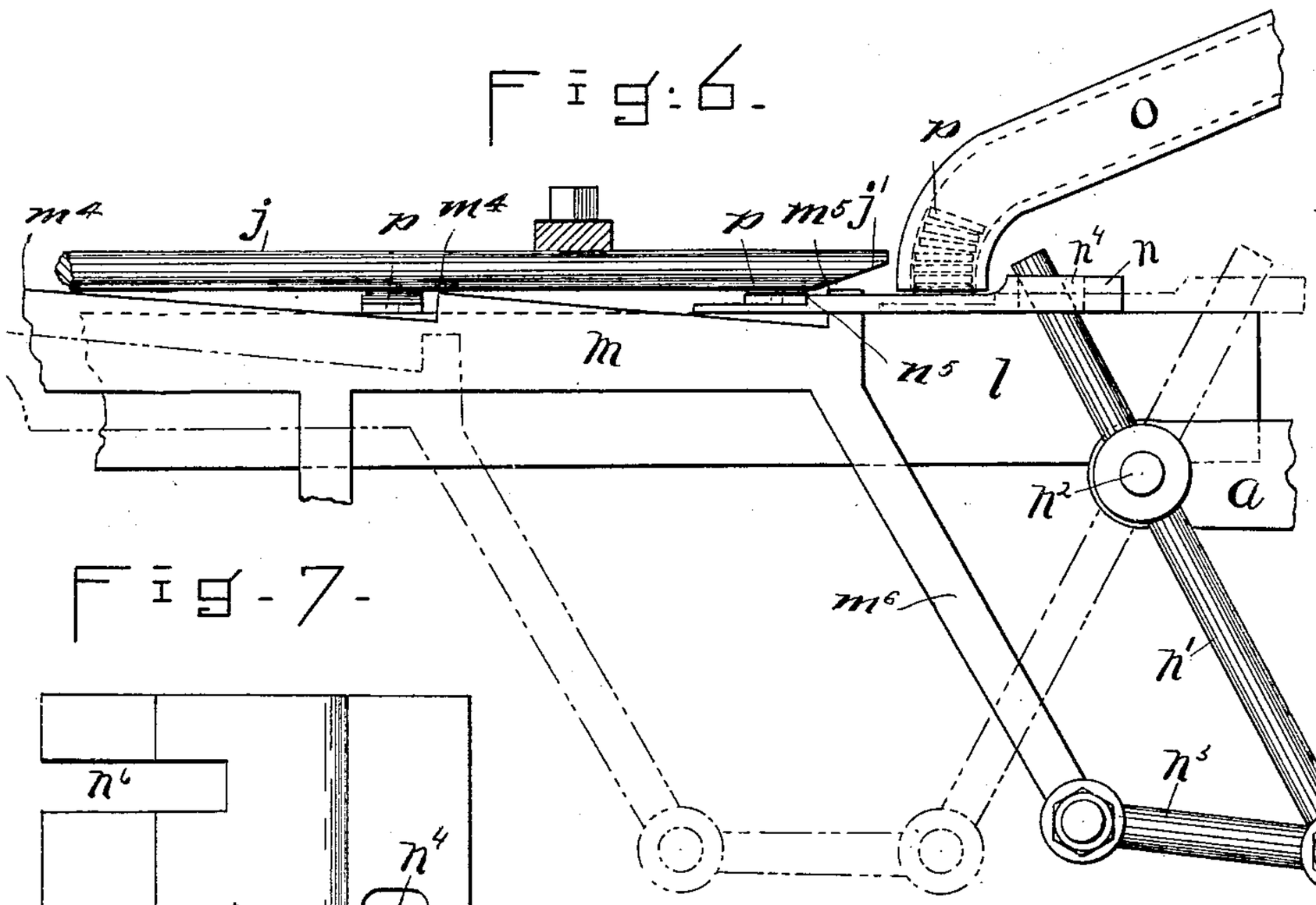


Fig. 7.

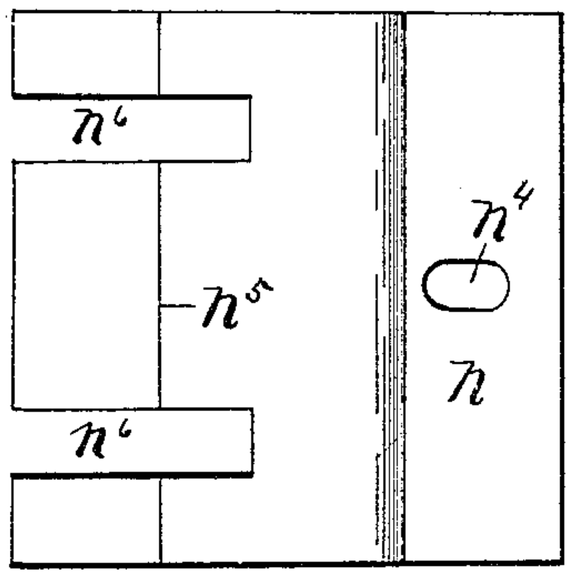


Fig. 13.

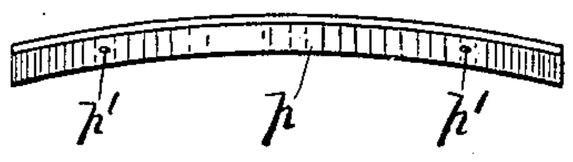


Fig. 10.

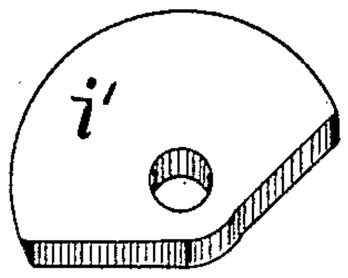


Fig. 8.

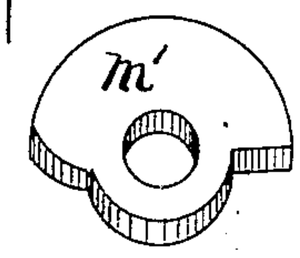


Fig. 9.

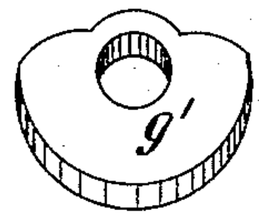


Fig. 11.

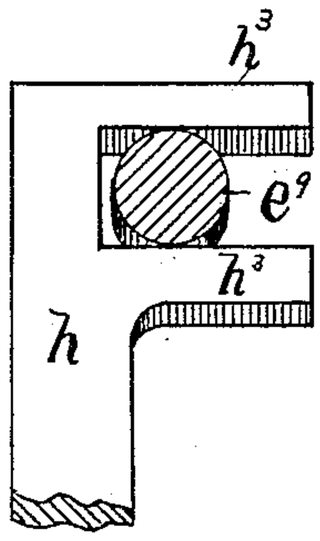


Fig. 12.

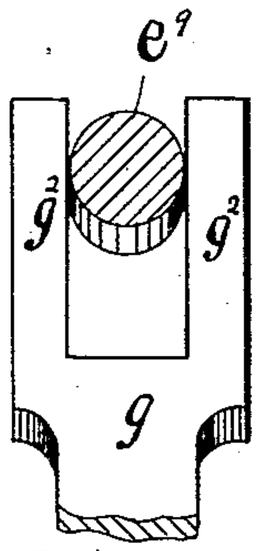
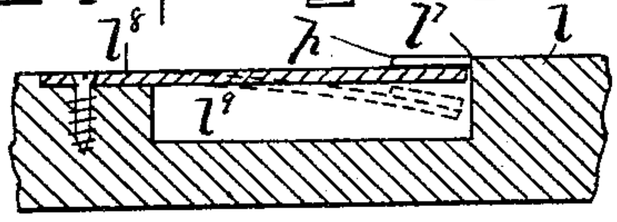


Fig. 14.



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INVENTOR.

W. E. Trufant.

No. 735,178. Patented August 4, 1903.

UNITED STATES PATENT OFFICE.

WALTER E. TRUFANT, OF WHITMAN, MASSACHUSETTS.

MACHINE FOR DRIVING TACKS.

SPECIFICATION forming part of Letters Patent No. 735,178, dated August 4, 1903.

Application filed April 1, 1899. Renewed August 19, 1902. Serial No. 120,263. (No model.)

To all whom it may concern:

Be it known that I, WALTER E. TRUFANT, of Whitman, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Machines for Tacking Pieces of Metal to Wood, Leather-Board, or other Material into Which Tacks May be Driven, of which the following is a specification, reference being had to the accompanying drawings, forming a part of this specification.

My invention has for its object to provide a machine by which tacks may be driven with accuracy through holes previously made in pieces of metal; and it consists in first placing the tacks in the holes in the metal and then forcing them into or through the softer material and clenching them, if desired; but many features of my invention will be found applicable to a machine for driving tacks with a blow from driving-hammers.

The embodiment of my invention here illustrated represents the tacking of spring-steel shoe-shanks to leather-board shoe-shanks.

In the said drawings, Figure 1 is a side elevation of my machine. Fig. 2 is a plan of same. Fig. 3 shows the tack delivering and driving devices on a larger scale. Fig. 4 is the same as Fig 3, but with the parts in a different position. Fig. 5 is another view of the tack-holding nose or point with some of the parts omitted. Fig. 6 is a view of the rack for holding the steels and the means for taking them out one at a time. Fig. 7 is the slide for pushing the steels out of the rack. Figs. 8, 9, and 10 are the cams which operate the parts. Figs. 11 and 12 are the forks which move the tack-placing parts. Fig. 13 shows one of the steels, which in this embodiment of my invention are tacked to leather-board shoe-shanks. Fig. 14 shows a modification of the ways.

a represents the bed of the machine, which has the uprights a' and a^2 for supporting the tack feeding and placing devices and also the journals for the driving-shaft b and the other working parts. Power is applied by belts to the pulley b', which, with the balance-wheel b^2, is on the shaft b, and also to the grooved pulley e' on the hopper e.

c is the platen, on which the material into which the tacks are to be driven is placed, and by the movement of the shaft c', operated by the arm c^2, crank b^3, and pitman b^4, is brought under the tack-driving screws k. The tacks are placed in the hopper e, which is supported on trunnions e^3 in slots a^3 in the uprights a^2 and has the arm or bar e^6, which is held at e^7 by the guide f. Within the hopper is the disk e^4, made to revolve by the pulley e'. On this disk are the buckets e^5, which bring up the tacks and drop them on the flanges d^{11} of the tack-channels d d. Those tacks which do not fall in the proper way to slide down the channels fall back to the bottom of the hopper over the chute e^2 and those which fall with their points in the channels are caught by their heads and slide down the channel under the cover d^4. The tacks r are held back by the spring-finger d^5 when they reach the position of r' in Fig. 3.

The metal pieces p to be tacked are perforated by the holes p' and are placed in the chute or hopper o with the bottom one resting on the push-plate n. The push-plate is operated by the lever n', which works in the slot n^4 in the plate and is pivoted at n^2 and connected by the connecting-rod n^3 with the feed-bars m by the arm m^6, so that the push-plate n has a movement opposite to the movement of the feed-bars. Pushing-points m^4 and m^5 are provided on the feed-bars to carry the metal pieces forward, and the feed-bars are given a longitudinal movement by the connecting-rod m^3, which is connected to the arm c^2. To give the feed-bar a movement approximately parallel to the ways l during the forward or feeding part of the stroke, the bar is supported at the front end of the machine by the forked bar m^2, which is carried by journals on the legs of the machine. The feed-bar is held up during the forward stroke and lowered during the return stroke by the action of the cam m'. As the shaft b revolves the feed-bar moves backward and the push-plate moves forward, carrying by the shoulder n^5 one of the steels p, and as the steel moves forward its upper side comes in contact with the beveled part j' of the friction-bar j, (see Fig. 6,) which presses it out nearly straight and prevents it being jarred or moved out of place. When the push-plate is at its extreme forward position, the feed-bar is in its extreme backward position. When

the cam m' raises the feed-bar, so that the feed-points are all above the edges of the steels and the feed-points m^5 in the slots n^6 in the push-plate back of the steel, so that when the plate moves backward and the feed-bar forward the steel is carried forward with it along the ways l, guided by the rib l'. At the end of the forward movement the cam m' has rotated so as to lower the feed-bar, as shown by the broken and dotted lines in Fig. 6, and through the other half of the revolution of the shaft the parts are returned to the point for carrying forward another steel. By the next revolution of the machine the steel is carried forward again by the next pair of feed-points, and so on until it is finally pushed out, with the leather-board attached, at the front of the machine. At each revolution of the machine the tack-placing or tack-positioning points are given four successive movements by the cams h' and g', which have the same contour, acting on the levers h and g, which terminate in the forks h^3 and g^2, respectively. (See Figs. 11 and 12.) These forks have their prongs arranged at right angles to each other and inclose the rod e^9 which is secured rigidly to e^6. The first position is shown in Fig. 3. The part of the lever h near the holding-screw h^2 is reduced, so as to act as a spring to keep the lever always in contact with the cam h', and as this cam revolves the lever draws the tack-nose down against the point l^3, which is adjustably secured to the ways l, the tack r' (see Fig. 4) going down in front of the point l^3. A perfectly vertical movement is secured by the guide or abutment f and the forked lever g, pivoted at g^4. The cam g' then allows the spring g^3, attached to the lever g, to draw the tack-nose back until e^8 comes in contact with the adjustable stop f' (see Fig. 4) when the tack has been drawn to the position of r^2 in Fig. 3. The cam h' then forces the parts upward, and the cam g' carries them forward to the first position described, with the face e^7 firmly against the face of the guide or abutment f, as shown in Fig. 3, with the tack r^2 directly over where the hole in the steel will be when the steel is placed. As the steel is carried or pushed forward on the ways l it is carried over and beyond the adjustable positioning-shoulder l^4 by the feed-bars and left there. The lever i, pivoted at i^2 and operated by the cam i' and spring i^3, then with the finger i^4 pushes the steel back firmly against the shoulder l^4. The tack-nose then descends, placing the tack r^2 in the hole in the steel and the next tack going down in front of the point l^3, when the finger i^4 is returned to its first position and the tack-nose draws back, leaving the tack in the hole in the steel and placing another tack ready for the next steel, and the motions just described are repeated each revolution of the machine. The tack-noses are in duplicate, so that a tack has also been placed in the hole in the other end of the steel at the same time. The steel is then moved forward by the feed-bar, with the tacks hanging by their heads in the holes in the steels and left on the reduced ends of the ways at l^2, with the driving-screws k resting on the heads of the tacks. The leather-board s or other material is then placed by the operator on the oscillating platen c, swinging on the shaft c' against the gages c^3 and c^4, and is carried by the action of the crank b^3 up against the tacks, which are thus forced through the leather-board and clenched on the platen. When the platen recedes, as shown by the broken and dotted lines in Fig. 4, it leaves the tacked pieces held by the steel on the ways l, and at the next revolution of the machine the completed shank is pushed off the ways and falls to the floor. To compensate for any unevenness in the width of the steel or any inaccuracy in adjusting the finger i^4, the lever i is actuated to place the steel by the spring i^3, which is sufficiently strong to move the steel firmly against the shoulder, and the cam operates to force the finger back to allow the steel to pass along to the drivers.

The abutment f is held by screws to the standards a', rising on each side of the bed of the machine, and extends across the top of the machine. The stop f' is secured to this abutment f by screws passing through slots in the stop, which allows for adjustment. To adjust the tack-channels, I provide a threaded bolt d^8 with the nuts d^6 and d^7, one on each side of the tack-channel, which holds them near their lower ends. To provide for the variation in the size or thickness of the heads of the tacks and to hold them firmly but yieldingly, the holding-plate d^2 is not fastened directly to the tack-channels, but is fastened to the piece d^9, which is fastened to the tack-channels by the screw d^{10} some distance back from the end of the channel, which allows the slight yielding desired, but is firm enough to bend the points of the tacks if they do not enter the holes in the steels. To hold the shanks of the tacks, I provide the ends of the tack-channels on the side d with the spring end d^3, which clamps the tack firmly against the other side d' of the tack-channel. The holding-plate d^2 holds the head of the tack down against the tack-channels and in a perfectly vertical position while they are being inserted in the holes in the steels. The ways l are held by the bolts l^6, (see Figs. 2 and 3,) which pass through the hollow adjusting-screws l^5 and are threaded to the ways. The adjusting-screws are threaded to the bed of the machine, and the adjustment for the different lengths of steels is obtained by loosening the bolts l^6 and turning the screws l^5 until the proper adjustment is obtained, when the bolts l^6 are tightened, which locks and holds the parts firmly. By this arrangement the ways may be adjusted from the outside of the machine.

It will be noticed that the steels shown in this case are flexible and that they are supported by their extreme ends, so that if a

steel is fed into the machine which has no hole in it or if the tack does not enter the hole in the steel the steel will give enough to allow the tack-nose to come down on the point l^3, so that a tack will be fed forward for the next steel, and as the tack is fed toward the point the unused tack, which may be considerably bent, is forced from the nose. In placing tacks in metal which will not spring enough to feed the next tack in case it is not used I provide the ways with a spring, as shown in Fig. 14, in which l^7 corresponds to l^4 in the other figures, so that the steel p is supported by the spring l^3 and over the space l^9, so if the tack does not enter the hole the spring will be deflected, as shown by the dotted lines, and the next tack will be properly placed.

In this case I use two tack-noses; but a greater or less number can be used, according to the number of tacks it is desired to drive through the metal piece at one time.

I do not confine myself to the means here shown for placing the tacks in the holes in the metal, but may use any tack-placing mechanism for the purpose, and in the claims by the term "tack-placing nose" I include any mechanical means for placing the tacks in the metal pieces.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a machine for tacking perforated pieces of metal to leather or other material, the combination of a rack for holding the metal pieces, means for pushing the metal pieces out of the rack one at a time and moving them along by successive steps, ways on which the said pieces are moved, a shoulder on said ways, means for moving the metal pieces against said shoulder, a tack-placing nose arranged to place tacks in the perforations as the piece is against the shoulder, means for adjusting and holding the tacks in said nose, devices which press on the heads of the tacks when the pieces are in driving position, a platen on which the material into which the tacks are to be driven is placed, and means for moving the platen, said platen and said driving devices coöperating to drive the tacks.

2. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal pieces are moved, means for moving said pieces along the ways, a positioning-shoulder on said ways for determining the position of the metal pieces, a tack-placing nose arranged to place tacks in the perforations as the piece is against the shoulder, means for adjusting and holding the tacks in said nose, devices which press on the heads of the tacks when the pieces are in driving position, a platen on which the material into which the tacks are to be driven is placed, and means for moving said platen, the platen and said pressing devices coöperating to drive the tacks.

3. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the pieces of metal are moved, a shoulder on said ways, means for moving said pieces along the ways and beyond the shoulder, means for pushing the pieces back against said shoulder, a tack-placing nose arranged to place tacks in the perforations as the piece is against the shoulder, means for adjusting and holding the tacks in said nose, devices which press on the heads of the tacks when the piece is in driving position, a platen on which the material into which the tacks are to be driven is placed, and means for moving the platen, said platen and said driving devices coöperating to drive the tacks.

4. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal pieces are placed, a tack-placing nose arranged to place tacks in the perforations in the metal pieces, means for adjusting said pieces under the tack-placing nose, devices which press on the heads of the tacks when the pieces are in driving position, a platen on which the material into which the tacks are to be driven is placed, and means for moving the platen, said platen and said pressing devices coöperating to drive the tacks.

5. In a machine for tacking perforated pieces of metal to leather or other material, the combination of a tack-placing nose, means for adjusting and holding the tacks in said nose, means for adjusting said metal pieces under the tack-nose, driving devices which press on the heads of the tacks when they are to be driven, a platen on which the material to which the metal is to be tacked is placed, and means for moving the platen, said platen and said driving devices coöperating to drive the tacks.

6. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal pieces are placed, a tack-placing nose arranged to place tacks in the perforations in the metal pieces, means for adjusting the said pieces under the tack-placing nose, means for adjusting the metal pieces under the tack-driving devices, and driving devices which press on the heads of the tacks as they are driven.

7. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal piece is moved, an adjustable positioning-shoulder in the path of said metal piece, means for moving the metal piece against the shoulder, and a tack-placing nose to place tacks in the metal piece as it is against the shoulder.

8. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal pieces are moved, means for moving said pieces along the ways, a positioning-shoulder in the path of said metal pieces, means for adjusting the metal pieces against said shoul-

der, and a tack-placing nose arranged to place tacks in the perforations in the metal pieces as they are against the shoulder.

9. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal pieces are placed, means for placing tacks in the perforations of the metal pieces, driving devices, means for moving the metal pieces under the driving devices, said ways being of thin vertical section at the point where the metal pieces rest when under said driving devices.

10. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal pieces are moved, means for moving said pieces along the ways, a shoulder on said ways, means for pushing the metal pieces against said shoulder, a tack-placing nose arranged to place tacks in the holes in the metal piece thus positioned, a platen on which the material to which the metal piece is to be tacked is placed, and means coöperating with said platen for driving the tacks.

11. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal pieces are moved, means for moving said pieces along the ways, a shoulder on said ways, means for pushing the metal pieces against said shoulder, a tack-placing nose arranged to place tacks in the holes in the metal pieces thus positioned, and devices which press on the heads of the tacks as they are driven.

12. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal pieces are moved, means coöperating with said ways for guiding the pieces as they are moved along, means for moving said pieces along the ways, a tack-placing device, and means for adjusting the pieces under said tack-placing device.

13. In a machine for tacking perforated pieces of metal to leather or other material, the combination of ways on which the metal pieces are moved, means for moving said pieces along the ways, a tack-placing device, and means for adjusting the pieces under said tack-placing device.

14. In a machine for tacking perforated pieces of metal to leather or other material, the combination of devices for driving the tacks in the holes in the metal pieces, a platen coöperating with said driving devices to drive the tacks, ways on which the metal pieces rest, said ways having ends of thin vertical section which extend over said platen, and means for moving the metal pieces along the ways.

15. In a machine for tacking perforated pieces of metal to leather or other material, the combination of means for assembling the perforated pieces and tacks with the latter in place in the holes, and means for thereafter driving into the said leather or other material said tacks so placed, said driving means being independent of said assembling means.

16. In a machine for tacking perforated pieces of metal to leather or other material, the combination of means for positioning the tacks in the holes in the metal pieces, means for driving the tacks, and mechanism for operating said positioning means and said driving means dissimultaneously.

17. In a machine for tacking perforated pieces of metal to leather or other material, the combination of means for positioning the tacks in the metal pieces, means for assembling the metal and leather pieces for fastening together, and independent means for subsequently driving the aforesaid positioned tacks through the metal and leather.

18. In a machine for tacking perforated pieces of metal to leather or other material, the combination of means for placing the tacks in the holes in the metal pieces, means for subsequently moving the said metal pieces and the tacks so placed to position with relation to the leather for driving the tacks, and means for driving the tacks when said tacks and piece are so positioned.

19. In a machine for tacking perforated pieces of metal to leather or other material, the combination of means for placing the tacks in the perforations of the metal pieces, means for withdrawing said placing means, and independent means for subsequently driving into the leather the said tacks so previously placed in said metal pieces.

20. In a machine for tacking perforated pieces of metal to leather or other material, the combination of means for assembling the perforated pieces and leather in position to be tacked, supporting mechanism engaging a perforated piece provided with means permitting the piece and leather to be moved into contact with each other at the point where the tack is to enter the leather, means maintaining said supporting mechanism in engagement with said piece during the tacking, and means separate from said supporting mechanism and operating independently thereof for moving the said piece and leather into contact with each other at said tack-entering point.

21. In a machine for tacking perforated pieces of metal to leather or other material, the combination of means for assembling the perforated pieces and leather in position to be tacked, supporting mechanism engaging a perforated piece provided with means permitting the piece and leather to be moved into contact with each other at the point where the tack is to enter the leather, means maintaining said supporting mechanism in engagement with said piece during the tacking, and a driver independent of said supporting means for moving the parts together and driving the tacks.

22. In a machine for tacking perforated pieces of metal to leather or other material, means for feeding metal pieces in the machine to a position to receive a tack, means for supporting the leather, a tack-positioning means for placing a tack in a metal piece fed thereto, and a tack-driving means for driving the positioned tacks into the leather, combined with mechanism for operating said positioning means and said driving means dissimultaneously.

23. In a machine for tacking perforated pieces of metal to leather or other material, the combination of tack-positioning means for placing a tack in a metal piece, means for supporting the leather, tack-driving means for driving said tacks in said metal piece, and mechanism for operating said positioning means and said driving means dissimultaneously.

24. In a machine for tacking perforated pieces of metal to leather or other material, the combination of a piece-positioning device comprising a fixed member and a yielding member for receiving the piece between them, and means for operating said two members for bringing said metal piece into fixed position with relation to said fixed member.

25. A tack-placing device consisting of channels down which the tacks are fed, a spring-finger to hold the tacks back in the channels, means for pushing the tacks by the finger one at a time, a slightly-yielding holding-plate which presses on the heads of the tacks to center their points when in placing position, and a spring side to the said channel which presses on the shank of the tack near the head.

26. In a machine, the combination of a rack for holding metal pieces, a push-plate for pushing the pieces from the rack one at a time, feed-bars for carrying the pieces along after being pushed from the rack, ways on which the pieces are carried along, said push-plate being operated by one end of a lever the other end of the lever being connected to the feed-bars, said lever being pivoted between its ends to give said push-plate a longitudinal movement opposite to the movement of the feed-bars.

27. In a machine, a movable bar to which tack-placing noses are attached, a grooved guide or abutment which regulates the forward movement of said bar, an adjustable stop which regulates the backward movement of said bar, and means for giving said bar successive motions to place the tacks.

28. In a tack-driving machine, the combination of ways along which the pieces to be tacked are moved, a rib on said ways to guide the pieces as they are moved along, hollow screws threaded to the bed of the machine and bearing against the ways, a bolt passing through each of the hollow screws and threaded to the ways to hold the parts when adjusted.

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

WALTER E. TRUFANT.

Witnesses:
A. H. BRIGHAM,
J. Q. A. HEALY.