No. 889,274. PATENTED JUNE 2. 1908.

W. E. TRUFANT.

MACHINE FOR DRIVING TACKS.

APPLICATION FILED APR. 22, 1903.

7 SHEETS—SHEET 1.

FIG. 1

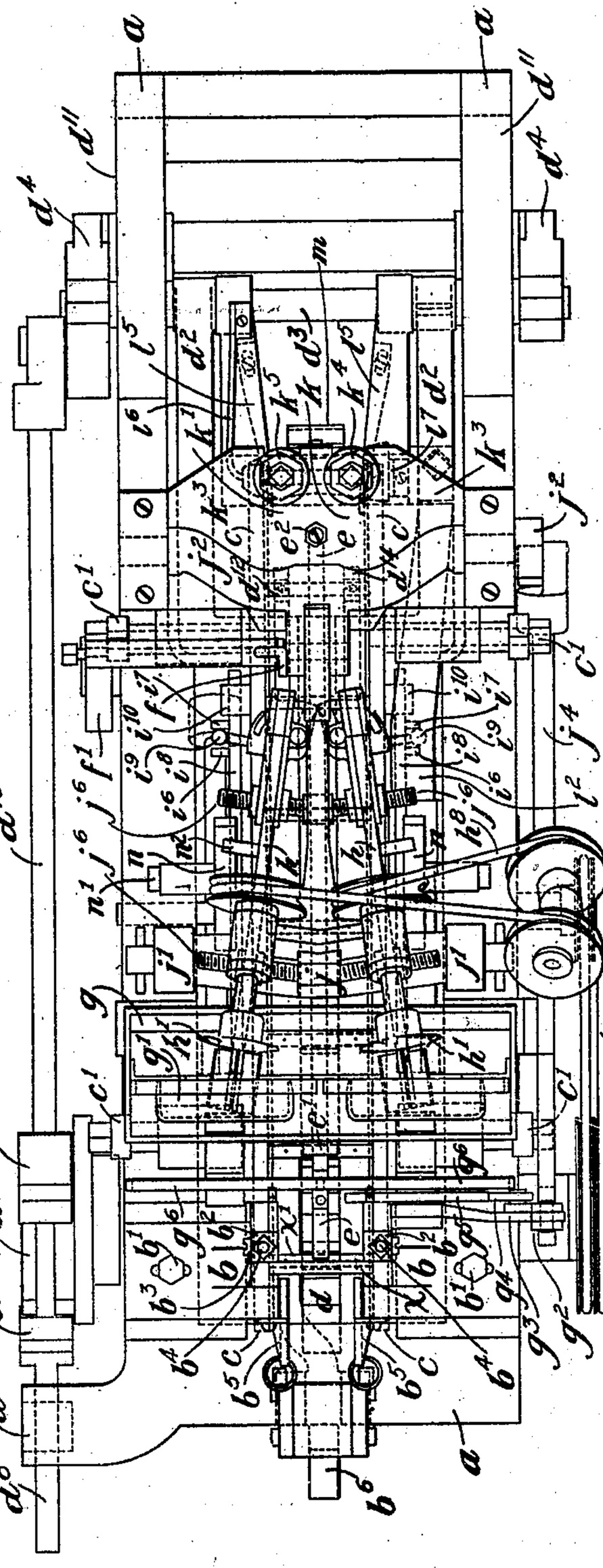
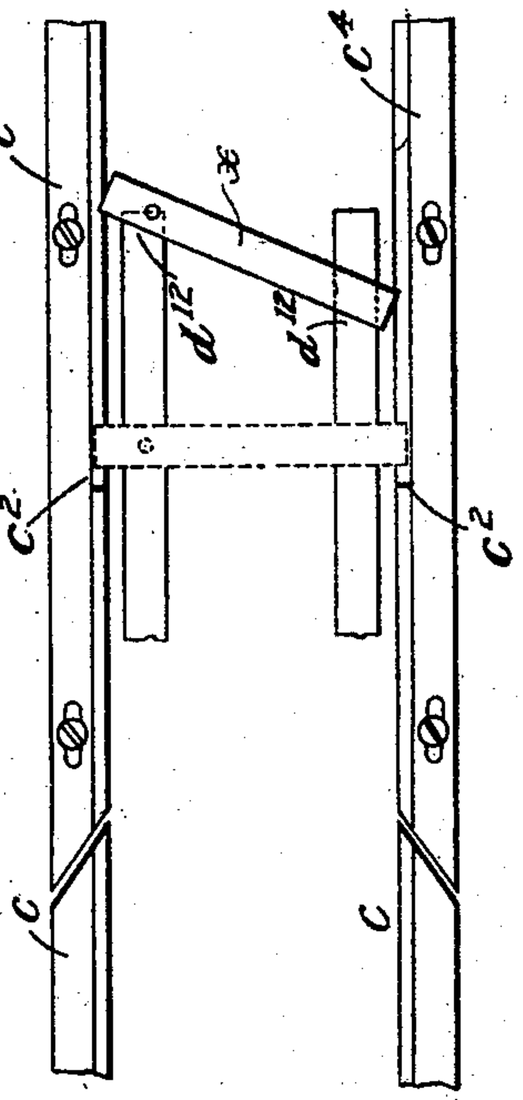


FIG. 2



WITNESSES,

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7 SHEETS—SHEET 2.

FIG. 4

FIG. 5

FIG. 3

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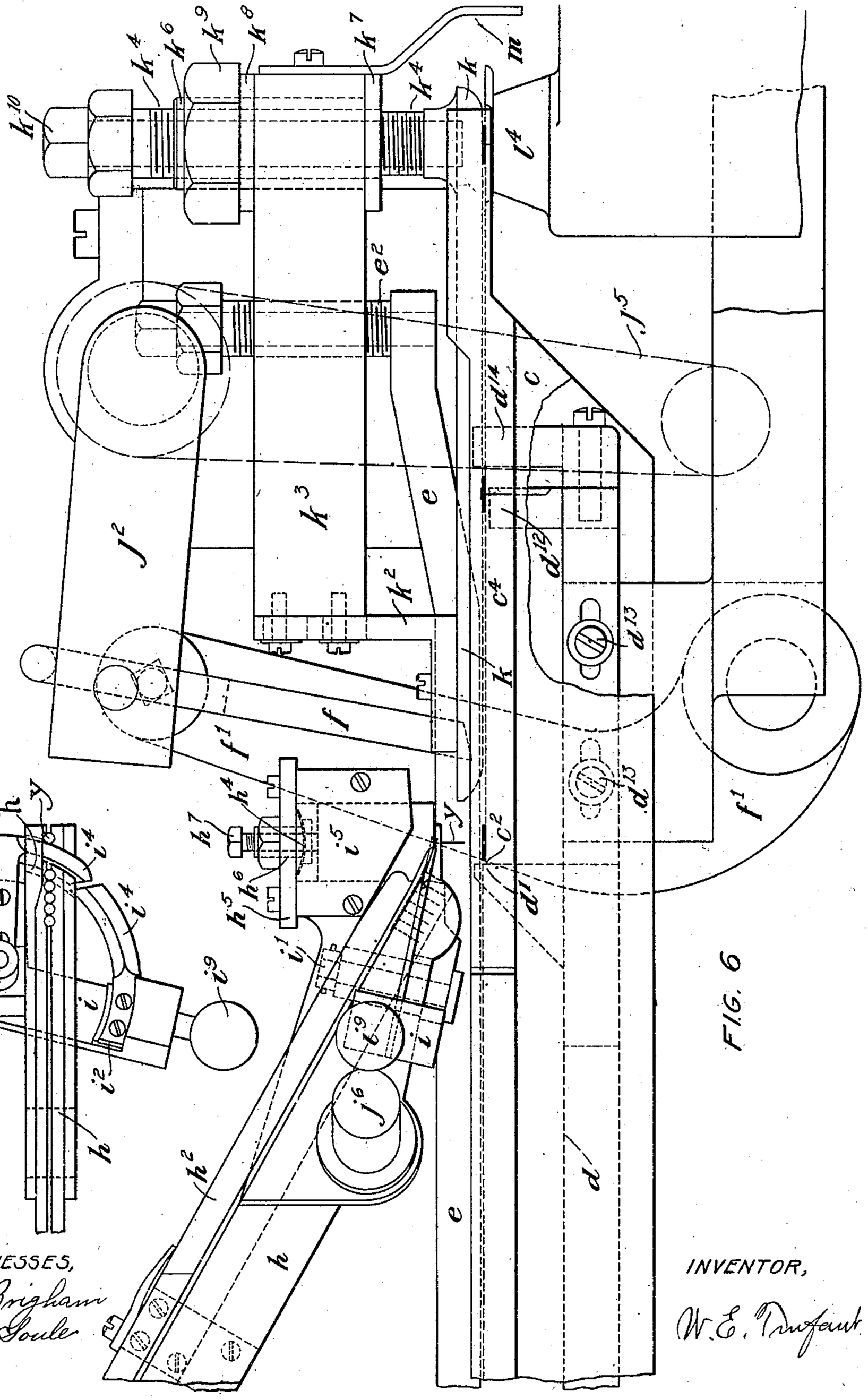

FIG. 6

FIG. 7

WITNESSES,

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7 SHEETS—SHEET 4.

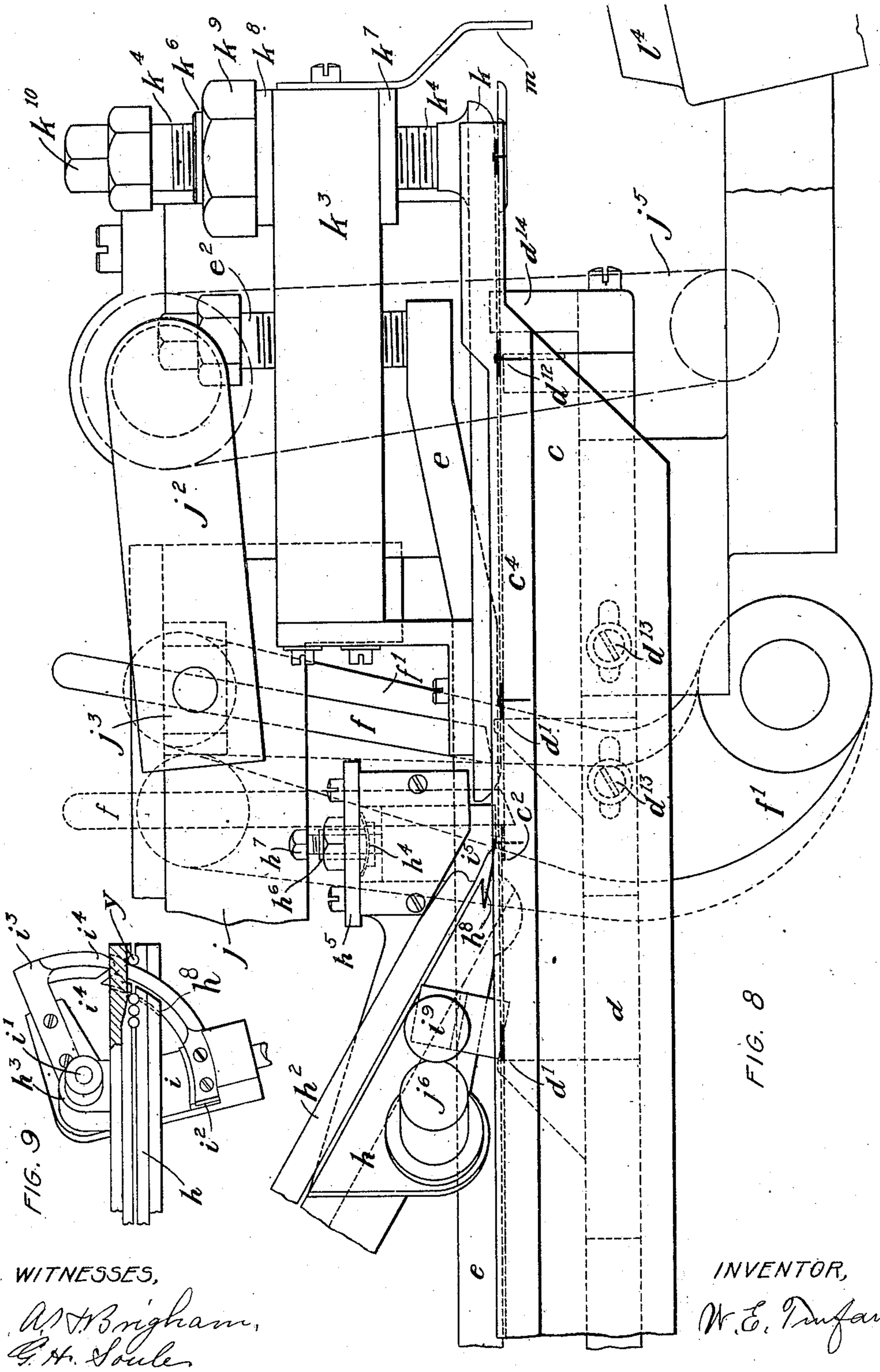

FIG. 8

FIG. 9

WITNESSES,

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7 SHEETS—SHEET 5.

FIG. 10.

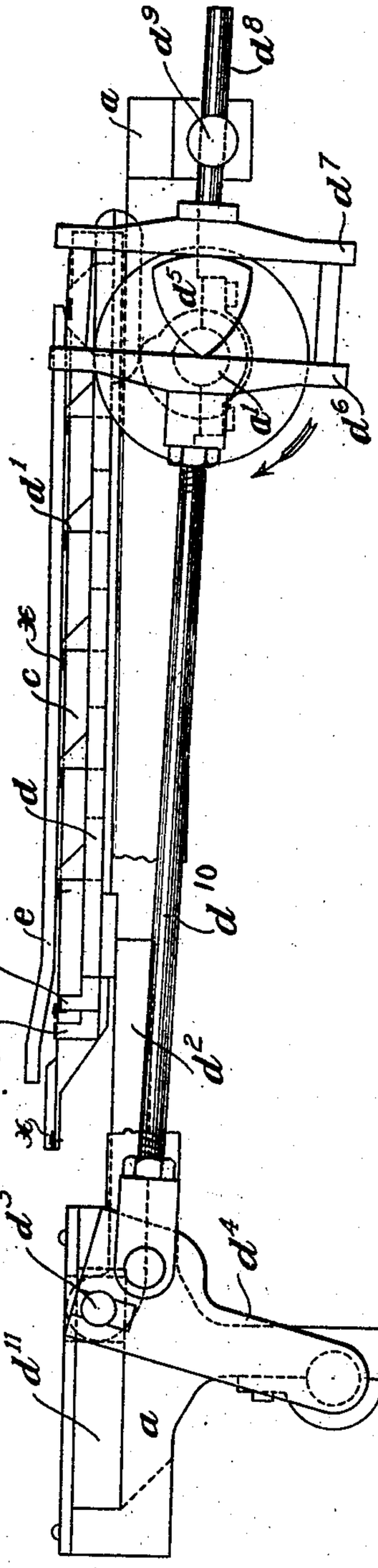
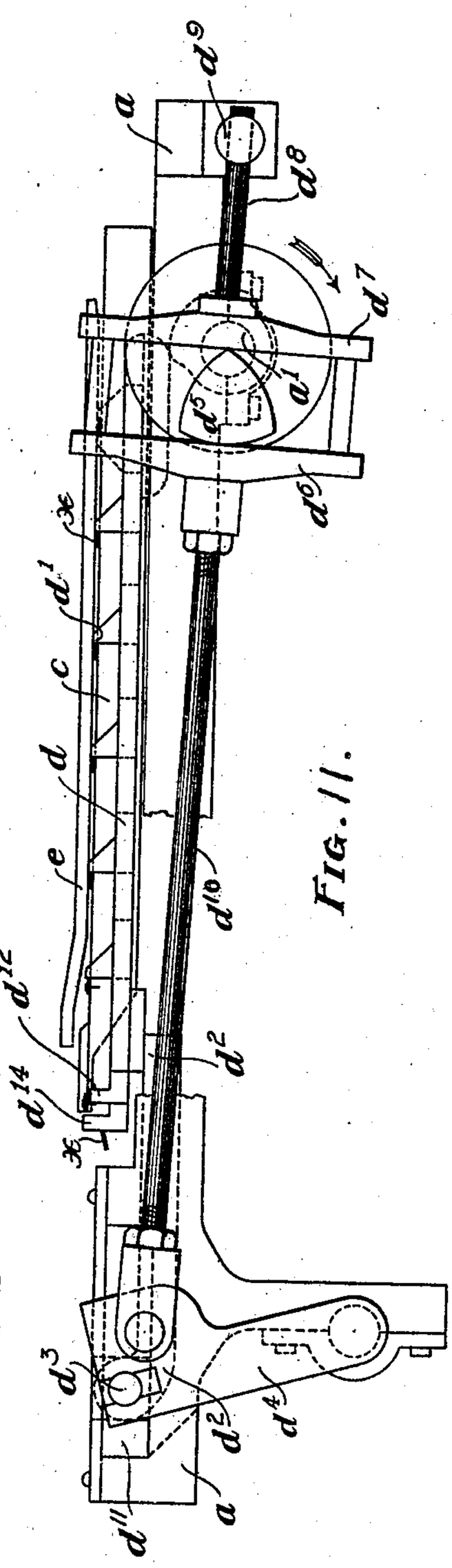


FIG. 11.



WITNESSES,

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No. 889,274. PATENTED JUNE 2, 1908.

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MACHINE FOR DRIVING TACKS.

APPLICATION FILED APR. 22, 1903.

7 SHEETS—SHEET 6.

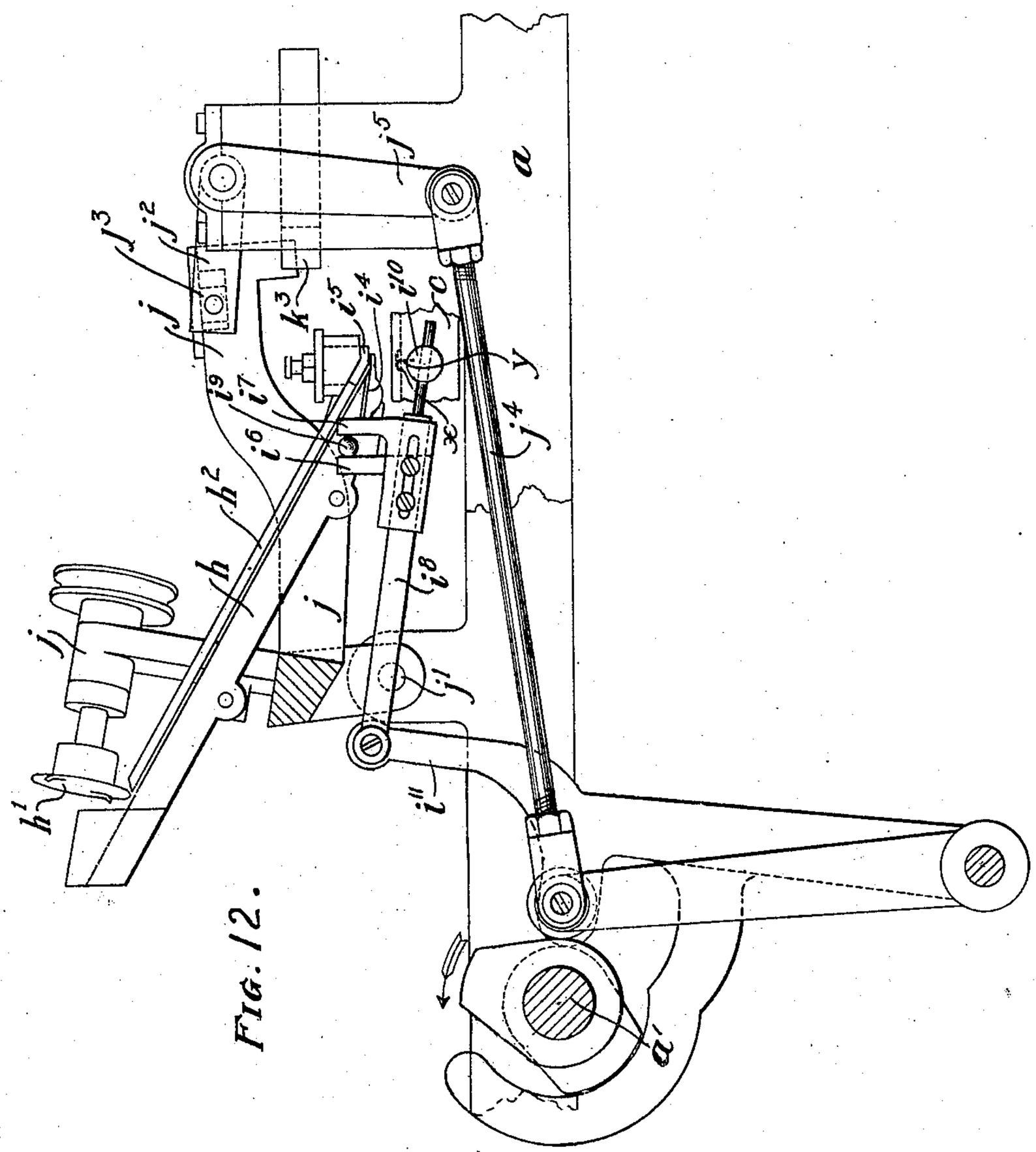

FIG. 12.

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7 SHEETS—SHEET 7.

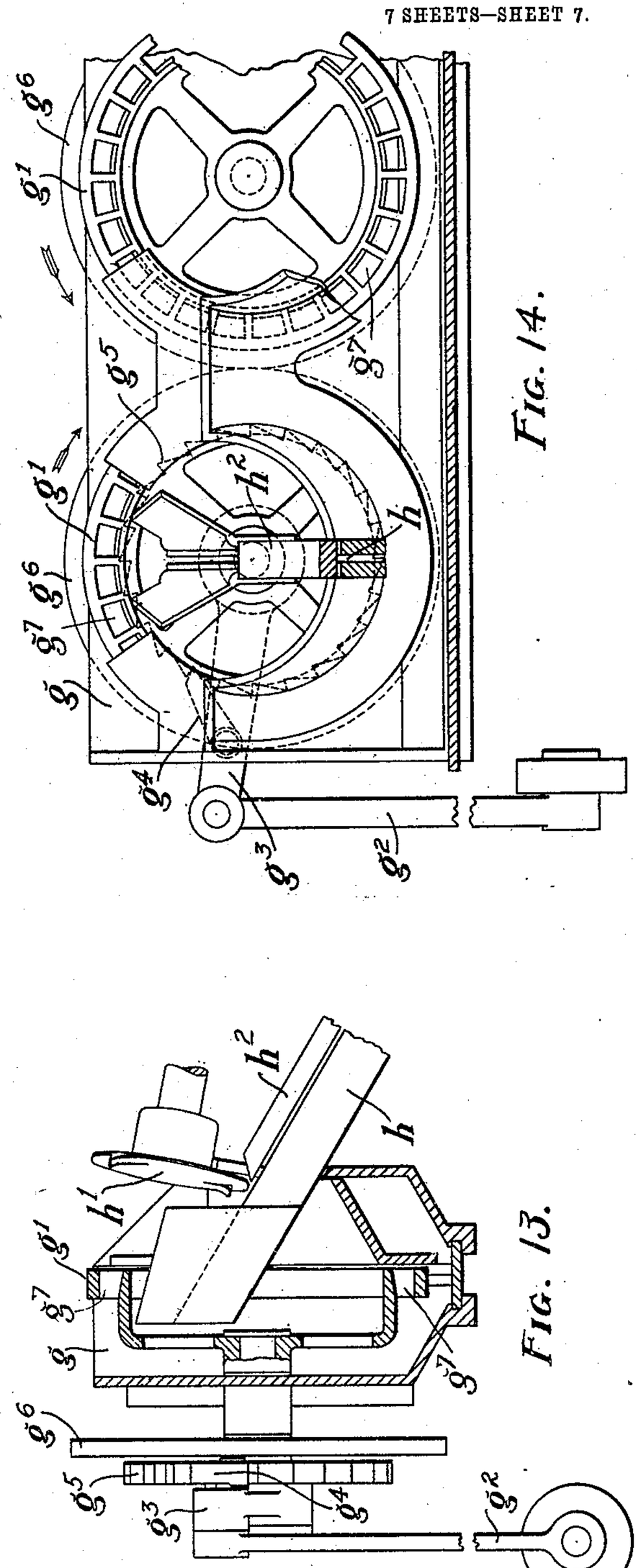

FIG. 14.

FIG. 13.

WITNESSES,

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UNITED STATES PATENT OFFICE.

WALTER E. TRUFANT, OF WHITMAN, MASSACHUSETTS.

MACHINE FOR DRIVING TACKS.

No. 889,274. Specification of Letters Patent. Patented June 2, 1908.

Application filed April 22, 1903. Serial No. 153,779.

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 Driving Tacks, of which the following is a specification.

My invention relates to machines for driving tacks and is here shown in tacking steel shoe shanks, in which the holes have been previously punched, to leather-board shoe shanks, and has for its object to provide a machine which will do this work rapidly and with certainty.

In Letters Patent No. 735,178 dated Aug. 4, 1903, granted to me I show a machine adapted for this purpose and my present invention is an improvement on the same. With all the machines made previous to my present invention there has been no way to prevent the machine from making defective work if from any defect in the steel or tacks, or from any other cause, there should be a tack driven through one hole of the steel and none in the other end. The goods will then be unfit for market and in some cases a great number are spoiled in this way before it is detected by the operator of the machine. In this machine I make this impossible by moving the steels from under the tack placer and along the ways about one half the distance to the driving position at one revolution of the machine and the next revolution the feeding points do not touch the steel but engage the tacks that are in the holes in the steels so that if there are no tacks in the steel it will not be moved at all, and if there is a tack in one end only of the steel that end will be carried along and the steel will fall from the ways before it gets to the driving point. This feature of my invention is also adapted to machines which drive tacks through strips of wood or other material which are to be tacked to another piece. It is desirable to move the steel away from the tack-receiving point whether there are tacks in the steel or not as they must make room for the next steel to be positioned to receive the tacks; otherwise it would be necessary to stop the machine and remove the steel every time the tacks failed to be placed, while by my invention the steels are simply dropped from the ways and the further operation of the machine in no way affected. In the patent to me above referred to the tacks are fed down the channels and by the angle at the lower end of the tack channels by gravity and then brought to position for placing, and placed in the steel by a vertical, then horizontal, then vertical and lastly longitudinal movement of the tack placing nose. In my present invention the tack placing nose has a simple vertical motion and has separate means for positioning the tacks in the placing nose.

In the drawings Figure 1 is a plan of the machine, Fig. 2 shows a steel with a tack in but one end and about to drop from the ways, Fig. 3 is an elevation of the machine, Fig. 4 is one of the leather-boards, Fig. 5 is a view of one of the steels or strips to be tacked, Fig. 6 shows the tack and steel placing and adjusting mechanism on an enlarged scale, Fig. 7 is a larger scale view of the tack separating and positioning device, Fig. 8 shows the tack and steel placing and adjusting mechanism in a different position from Fig. 6, Fig. 9 is a view of the tack separator in a different position from Fig. 7. Figs. 10 and 11 show the means for operating the feed bar and giving the longitudinal movement to the platen. Fig. 12, shows the mechanism for operating the separators and for placing or driving the tacks through the pieces to be tacked. Fig. 13 is a view of the means for operating the bucket wheels, and a section through the tack hopper, and Fig. 14 is a front view of the same.

a is the bed of the machine supported upon suitable legs which are not shown. On the rear of the bed are the racks *b b* in which the steels *x* are stacked, the lower one resting on the ways *c c* which run from the racks to a point just beyond the driving point so that the steels are supported by ways until the shank is completed. The ways *c c* are held to the bed and adjusted for different length of steels by the double adjusting screws c^1 c^1 c^1 c^1. The racks *b b* are secured to the bed by screws b^1 b^1 through a slot in the base of the rack which allows for adjustment for different length of steels. To adjust the rack to different width and thickness of steels I provide a bar d^2 d^2 forming one side of the rack and held to the same by screws b^3 b^3 and adjusting screws b^4 b^4. Between the end of the bars b^2 b^2 and the ways *c c* is a space just wide enough for the passage of a steel.

On the racks *b b* are fastened the spring fingers b^5 b^5 the ends of which rest on the ways just back of the stack of steels, and actuated by a cam on the shaft a^1 through the lever b^6 they push the lowest steel partly out of the rack to the position of x^1, from which point it is taken by the feed bar *d* carrying the feed points d^1 which move the steels along the ways by successive steps until after it has received the tacks in the holes. The feed bar *d* is carried at the front end by a casting having the forks d^2 d^2 through the ends of which pass the shaft d^3. The backward and forward motion of the feed bar is secured by the slotted rocker arms d^4 d^4 actuated by the triangular cam d^5 which works upon the vertical sides of the rectangular box d^6 d^7 see Figs. 10 and 11. A stud d^8 in line with the connecting rod d^{10} slides in a bearing or guide d^9 on the bed of the machine. The motion is transmitted through the connecting rod d^{10} to the shaft d^3 which passes through sliding blocks moving in the slot $d^{1\,1}$ (shown in Figs. 3 10 and 11) which gives the shaft d^3 and front end of the feed bar a true longitudinal motion. The rear end of the feed bar rests on a cam on the shaft a^1 which has sufficient throw so that when the feed bar is lowered by the cam during the backward movement of the same the feed points will pass under the steels without disturbing them. After the feed bar has made its backward stroke the cam raises the rear end until the feed points are all above the edges of the steels, when the bar moves forward carrying all the steels one step farther along the ways, and at the end of the forward movement the cam allows the bar to drop below the steels and it is returned by the backward stroke of the cam d^5. When the steels leave the rack they pass under the friction bar *e* (see Figs. 6 and 8,) which bears on the steels near the center of their length with sufficient force to keep them in place. This bar is adjusted at the rear end by the bracket e^1 which is bolted to the bar and secured by screws through vertical slots to the hopper *g* (see Figs. 1 and 3), and at the front end by the double screw e^2. The forward part of the ways *c c* extending from back of the tack receiving point to the ends of the ways consists of the longitudinally adjustable section c^4 (shown in Figs. 2 and 6,) secured to the ways by screws passing through slots in the section, and on this section is the positioning shoulder c^2. As the steel is carried along by the feed points d^1 it is left a short distance in front of the step c^2 as shown by the dotted lines in Fig. 2. The positioning finger *f* carried by the lever f^1 and operated by a cam on the shaft a^1 through the connecting rod f^2 (see Fig. 3,) pushes the steel back firmly against the shoulder, as shown by the dotted lines in Fig. 8; thus making the positioning of the steel dependent on the position of the shoulder and not on any moving part of the machine. The tacks *y* are placed in the hopper *g* in which are the bucket wheels g^1 g^1 which are caused to revolve by the action of a cam on the shaft a^1 through the bar g^2 ratchet arm g^3, pawl g^4, ratchet wheel g^5 and gears g^6, g^6 see Figs. 13 and 14. These bucket wheels bring up the tacks in the pockets or compartments g^7, (see Figs. 13 and 14) and as they reach the top they fall out upon the tack channels *h h* and slide down to the tack separators. Over the tack channels just inside the hopper are the fan wheels h^1 h^1 which revolve by the belt *h* just far enough above the channels to allow a tack, when hanging by its head in the channel to pass under it and down the channel under the cover h^2. If the tack does not fall from the buckets so as to properly enter the channels the wings on the fan wheels push them off so that clogging of the channels is prevented. After the tacks pass the fan wheels they are prevented from getting out of place by the cover h^2.

The tacks run down the channels until they rest against the tack separator which I will now describe.

On the inside of the channels near the lower end is formed the journal h^3 (see Figs. 7 and 9) through which passes the stud i^1 formed on the separator *i*. On the separator are secured by screws the separator blades i^2 and i^3. These blades work for a part of their width in a slot h^8 in the tack channels and the remainder of the top surface is beveled at i^4 i^4 so that they form a continuation of the top surface of the tack channels and allow the tacks to travel in a straight line until they reach the spring block i^5. The outside line of the separator blades is on the same radius but the blade i^2 is wider than the other so as to extend farther into the slot so that its point will be on a line just back of the foremost tack which rests against the blade i^3. At an angle between the ends of the blades is a space wide enough to allow the passage of a tack as the separator is oscillated to separate a tack as shown in Fig. 9. As the tack is carried along by the blade i^2 pushing against its shank near the head, with the under side of the head after it reaches the end of the slot in the channels, resting on the top of the separator, it is pushed to position under the spring block i^5. When the separator is returned to the position shown in Fig. 7 the tack head drops into the space between the separator blades and blade i^5 comes in contact with the edge of the head and pushes it still farther under the block i^5. The oscillating motion of the separators is obtained by the forks i^6 i^7 (see Fig. 12) on the reciprocating bar i^8, which rise on each side of the ball i^9. One end of the bar i^8 runs in the guide i^{10} and the other end is pivoted by a stud to the lever i^{11}, (see Fig. 3) which rests against a cam on the shaft a^1 of

the machine. A separate cam is used for each separator as when the tacks are to be placed near together it is necessary to operate them alternately to keep them from striking each other. The spring block i^5 rests on the heads of the tacks with sufficient force to hold them straight and firmly in position.

After the steel has been positioned as described against the shoulder on the ways and a tack has been positioned by the separator in the placing nose, the nose descends and places the tack in the hole in the steel as shown by dotted lines in Fig. 8. The tack channels are carried by the casting j which is pivoted at j^1 j^1 and at the front end is guided by a groove in the plate k^3. The vertical movement of the tack placing nose is caused by the rocker bar j^2 (see Figs. 1 and 12) which is connected by a sliding block j^3 with the casting j. This rocker bar is actuated by a cam on the shaft a^1 through the connecting rod j^4 and arm j^5.

When the tack placing nose goes down and places a tack in the steel it remains in that position until the carrier point d^1 rises and then moves forward carrying the steel with it and drawing the tacks out of the placer nose, (see Fig. 8) after which the nose rises again and the steel is carried along about one-half the distance to the driving point and left there to be carried along again at the next revolution of the machine. From the time the steels leave the rack until they are some distance beyond the tack receiving point they are kept from jarring out of place by the friction bar e, but beyond this point the bar is raised up clear of the steels and as the steels with the tacks in the holes leave the tack receiving point the tacks are covered by the driving bars k k^1 which bear on the heads of the tacks from the point the bar e ceases to bear on the steel. The friction and driving bars k k^1 are each held at the rear end by a slotted bracket k^2 secured to the plate k^3 by screws, and are held and adjusted at the front end by the adjusting screws k^4 k^5. The adjusting screws k^4 and k^5 are carried by a stud k^6 having the flange k^7 at its lower end and threaded for the nut k^9, bearing on the washer k^8, at the other. The holes in the plate k^3 through which the studs pass are larger than the shank of the studs which allows for horizontal adjustment in all directions, and screwing down the nut clamps it firmly in place. The stud is internally threaded for the screw k^4 which rests on the heading bar k and resists the action of the platen in driving and clenching the tacks. The bar k is held in place by the screw k^{10} passing through the axis of the screw k^4 and is threaded to the bar k. By loosening the screw k^{10} and turning screw k^4 vertical adjustment of that end of the bar k is secured. In this case the steels are carried one step beyond the tack receiving point whether they receive a tack or not, but from this point to the driving position the steel shanks are not touched by the feed points d^1; but the feed points d^{12} adjustably secured by screws d^{13} d^{13} to the bar d, which are too short to touch the steel, come in contact with the shanks of the tacks just below the steel and thus push the tacks and steel to the driving point, the heads of the tacks sliding on the bar k. If there is no tack in one end of the steel, that end will not be carried forward but the other end will be carried which results in the steel falling from the ways as shown in Fig. 2. If there is no tack in the hole in either end of the steel it will not be moved until another steel pushes it along and off the end of the ways.

The shaft d^3 besides carrying one end of the feed bar d carries the front end of the platen l which swings freely upon it and is supported at its rear end by the adjustable plate l^1 on the lever l^2. This lever is pivoted to the bed of the machine by the pin l^3 and is raised and lowered by a cam on the shaft a^1. A leatherboard shank such as shown in Fig. 4 is placed by the operator upon the anvils l^4 on the platen and against the gages l^5 l^5, l^6 and l^7 when the shaft d^3 and platen are at the front end of the slot d^{11} and is then carried under the steel, which is held in driving position with the tacks in the holes as previously described. It will be noticed that the shape of the cam d^5 gives a one-sixth of a revolution pause at each end of the stroke (see Figs. 10 and 11), which gives time for the operator to get the leather in position on the platen and allows time at the other end of the stroke for the platen to be raised to drive the tacks and then lowered so that the gages will not disturb the shank after it is tacked. After the leather is carried under the steel the lever l^2 raises the platen and forces the tacks through the leather and clenches them on the anvils l^4. The platen then drops leaving the leather fastened to the steel. At the driving point the ways are reduced to knife like edges so that a slight springing of the steel and leather allows them to be tacked together while the steel is still on the ways, and they remain in this position until the next forward movement of the feed bar when the feed points d^{14} push the completed shank from the ways and it falls through the space between the forks d^2 d^2 and the platen into a receptacle below. The guard m is fastened to the plate k^3 and extends down in front of the ways to prevent the shanks from flying upon the platen when they are pushed from the ways.

Near the lower end of the tack channels h are the guides or pocket which hold the pressure block i^5. That this block may have a slight vertical movement to allow the tacks to

pass under it and yet always bear firmly on the tacks to keep them in position I provide the spring h^4 which bears on the strap h^5 and collar of stud h^6. The tension on the block is regulated by the screw h^7 which is threaded to the stud and rests on the block.

The tack channels h h are held in place by being clamped between nuts on the threaded bolts j^6 running out from the casting j, and adjustment for different length of steels is cured by moving the nuts on these bolts. That the tacks may be kept moving in the channels, for each channel a striker n is provided which is pivoted at n^1 and strikes on a pin n^2, carried by the tack channels. The striker is operated by a belt over the pulley n^4 the tripping cam n^3 and spring n^5. The cams on the shaft a^1 are all plain contour cams giving their respective levers a simple movement toward and from their centers, and the levers are kept in contact with their cams by springs, but for the sake of clearness neither are shown.

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

1. In a machine for driving tacks through perforations in metal pieces, the combination of ways for supporting the metal pieces, means for placing tacks in the perforations, means for moving the pieces from the tack receiving point to a point intermediate the driving point, and a carrier to engage the tacks to move the pieces from said intermediate point to the driving point, said ways being constructed to allow the pieces carried by one tack only to fall from the ways.

2. In a machine for driving tacks through perforations in metal pieces, the combination of ways for supporting the metal pieces, means for placing tacks in the perforations, means for moving the pieces from the tack receiving point to a point intermediate the driving point, a carrier to engage the tack to move the steel from said intermediate point to the driving point, and means for driving the tacks.

3. In a machine for driving tacks through perforations in metal pieces, the combination of means for supporting the metal pieces, a tack placing means, means for driving the tacks, and a carrier engaging with said tacks to move the pieces to driving position.

4. In a machine for driving tacks through perforations in metal pieces, the combination of means for supporting the metal pieces, means for placing tacks in the perforations in the metal pieces, means controlled by said tacks for carrying the pieces to the tack driving point, and means for driving the tacks.

5. In a machine for driving tacks through perforations in metal pieces, the combination of ways for supporting the metal pieces, means for placing tacks in the perforations in the metal pieces, means for driving the tacks, means for carrying the metal pieces to the point to be acted upon by said driving means, and means for forcing the metal pieces from the ways before the driving devices act if the tacks are not in their proper place in said metal pieces.

6. In a machine for the purpose described, the combination of ways to support the pieces to be tacked, means for placing tacks through said pieces, means for driving the tacks, means for moving the pieces from the tack receiving point to the driving point, and two friction bars extending longitudinally between said ways and above the path of the tacks as they are carried in the pieces from the tack receiving point to the driving point to give frictional resistance to the movement of the pieces.

7. In a machine for the purpose described, the combination of ways to support the pieces to be tacked, means for placing tacks through said pieces, means for driving the tacks, means for carrying said pieces to the point to be acted upon by said driving means, and means for forcing the pieces from the ways before the driving pieces act if the tacks are not in their proper place in said piece.

8. In a machine for the purpose described, the combination of ways to support the pieces to be tacked, means for placing tacks through said pieces, means for moving the pieces from the tack receiving point to a point intermediate the driving point, a carrier to engage the tack to move the pieces from said intermediate point to the driving point, and means for driving the tacks.

9. In a machine for the purpose described, the combination of ways to support the pieces to be tacked, means for placing tacks through said pieces, means for moving the pieces from the tack receiving point to a point intermediate the driving point, and a carrier to engage the tacks to move the pieces from said intermediate point to the driving point, said ways being constructed to allow the pieces carried by one tack only to fall from the ways.

10. In a machine for the purpose described, the combination of means for placing tacks in the pieces to be tacked, ways to support said pieces, a platen on which the material to which the pieces are to be tacked is placed, and means to give said platen a longitudinal movement to bring the material under the pieces to be tacked and a vertical movement to drive the tacks.

11. In a machine for tacking pieces of sheet material provided with perforations to non-perforated pieces of sheet material, means for placing tacks in said perforations, means for feeding a row of said perforated pieces beneath said tack placing means, mechanism for tacking one of said perforated pieces to one of said non-perforated pieces, and ejecting means located between said tack-placing means and said tacking mechan-

ism for ejecting one of said perforated pieces that has failed to receive a tack in its perforation.

12. In a machine for tacking pieces of sheet material provided with perforations to non-perforated pieces of sheet material, means for placing tacks in said perforations, mechanism for tacking one of said perforated pieces to one of said non-perforated pieces, and ejecting means located between said tack-placing means and said tacking mechanism for ejecting one of said perforated pieces that has failed to receive a tack in its perforation.

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

WALTER E. TRUFANT.

Witnesses:
ALBERT H. BRIGHAM,
G. HOWARD SOULE.