

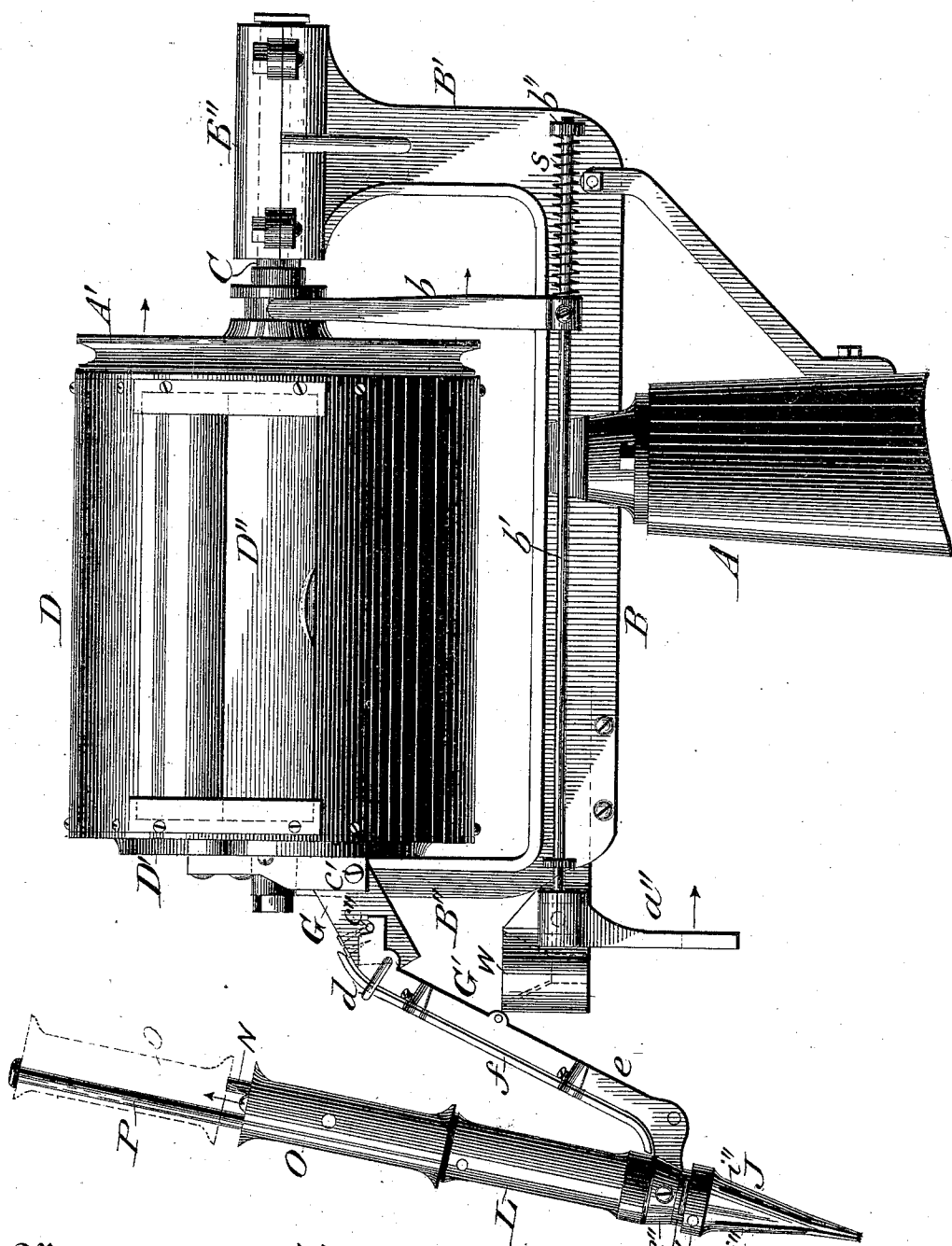
(No Model.)

6 Sheets—Sheet 1.

M. R. & F. N. ETHRIDGE.
TACK DRIVING MACHINE.

No. 513,384.

Patented Jan. 23, 1894.



Witnesses

H. H. Schott
Wm L. Boyden

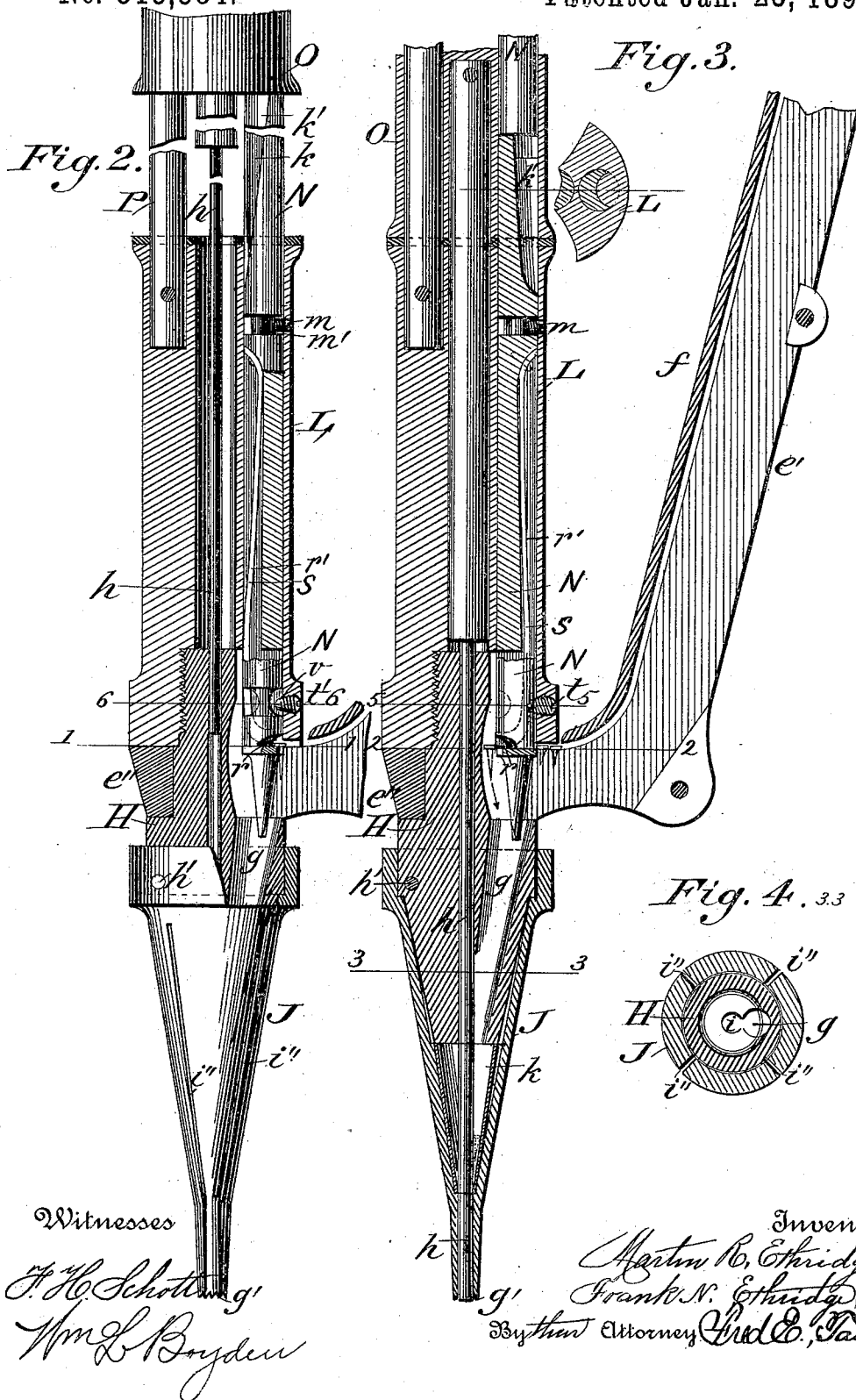
Fig. 1.

Inventors
Martin R. Ethridge,
Frank S. Ethridge,
By their Attorney *Edw. C. Tashner*

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Martin R. Ethridge
Frank N. Ethridge
By their Attorneys *Wm C. Tasker*

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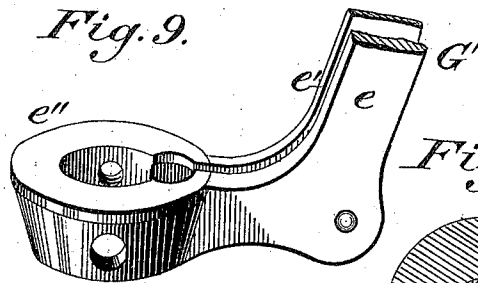
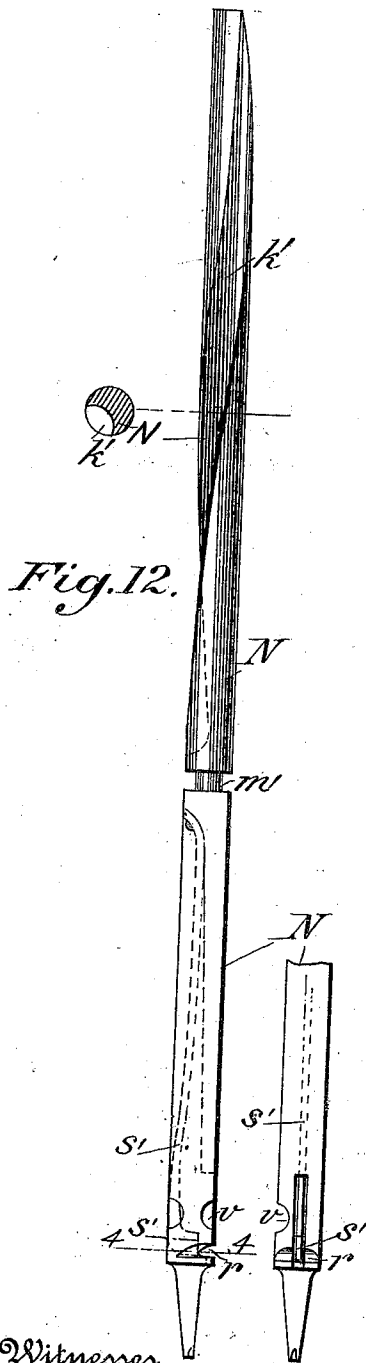


Fig. 10.

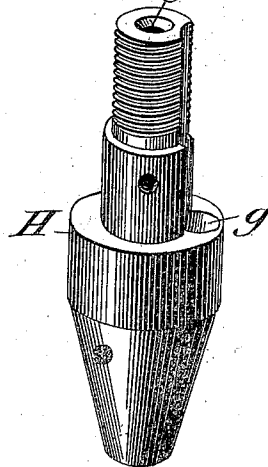


Fig. 11.

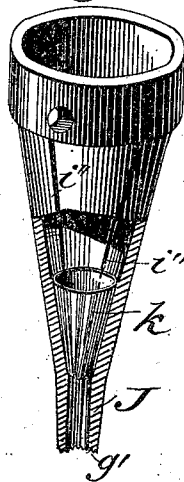


Fig. 5.

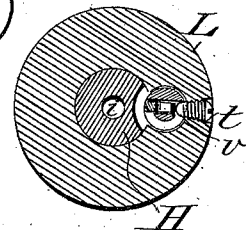


Fig. 6.

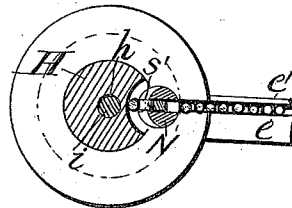


Fig. 7.

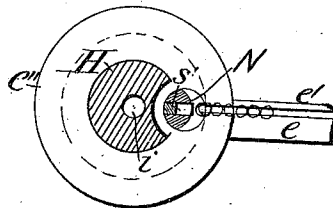
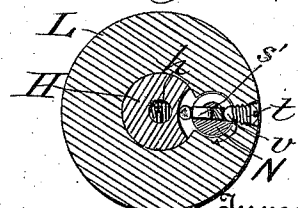


Fig. 8.



Witnesses

F. H. Schutt

Wm L. Boyden

Inventors
Martin R. Ethridge
Frank N. Ethridge
By their Attorneys Fred C. Foster

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Fig. 13

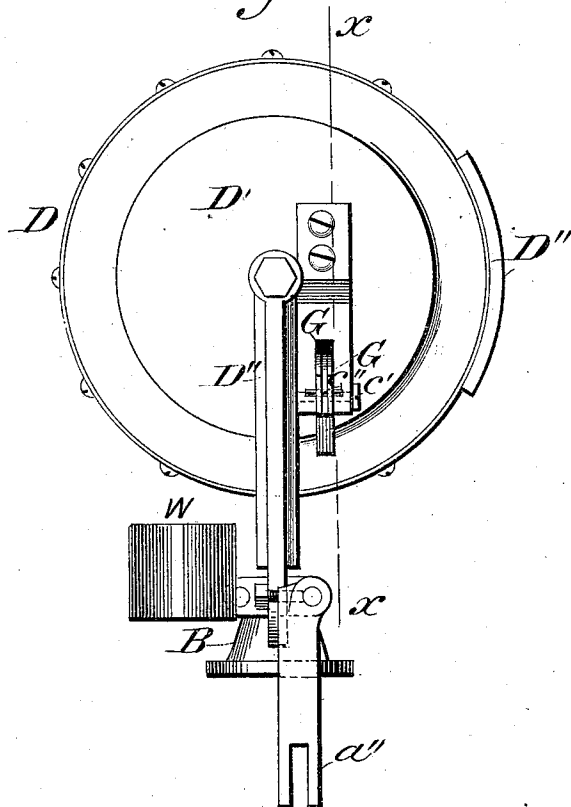
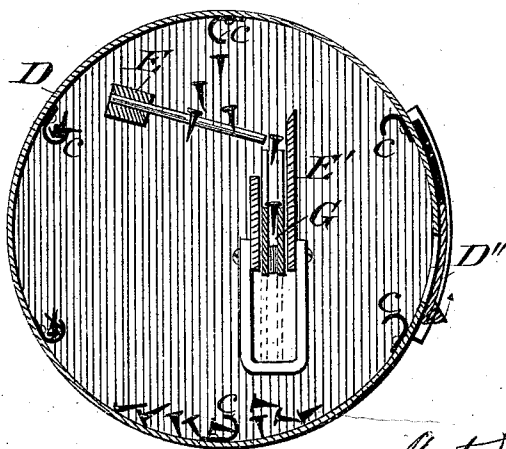


Fig. 14.



Witnesses

H. H. Schott
Wm L. Boyden

Inventors

Martin R. Ethridge,
Frank P. Ethridge,
By their Attorneys Fred C. Foster.

(No Model.)

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Fig. 15.

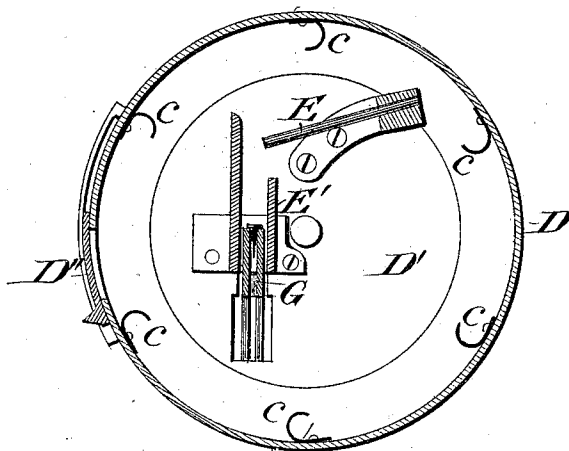
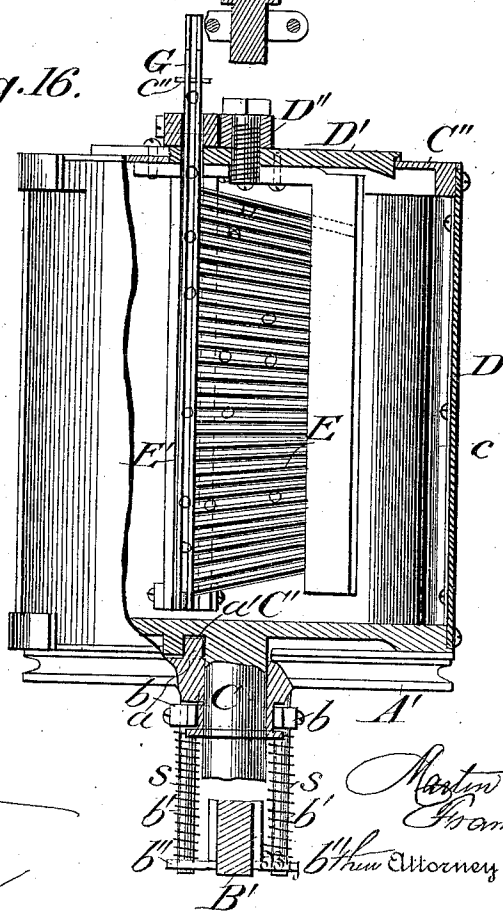


Fig. 16.



Witnesses

H. H. Schott
Wm L. Boyden

Inventors

Martin R. Ethridge
Frank N. Ethridge
Attorney *Wm C. Foster*

(No Model.)

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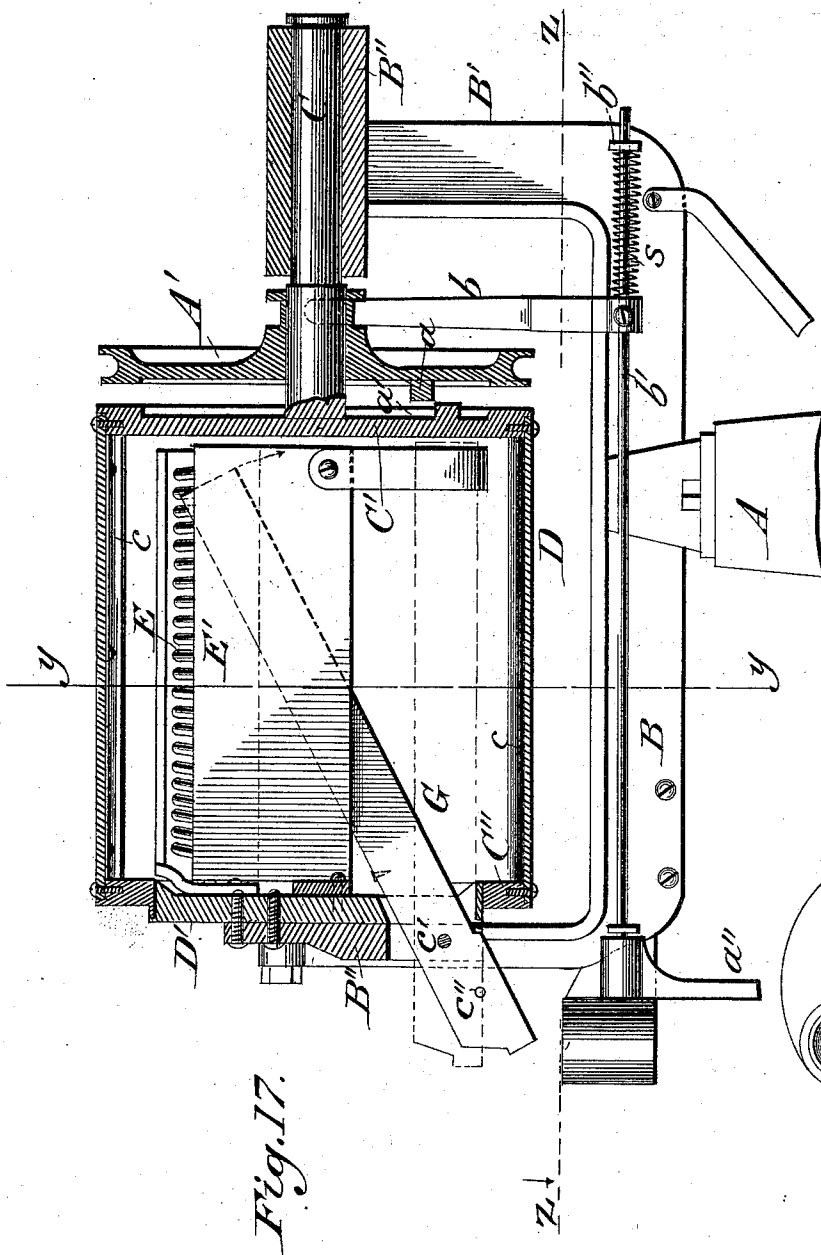


Fig. 17.

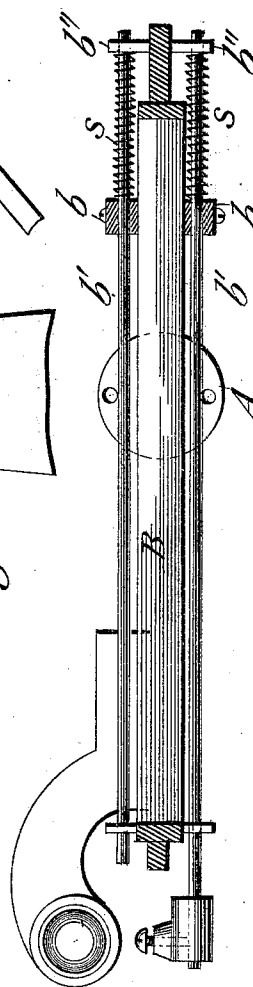


Fig. 18.

Witnesses

H. H. Schott
Wm L. Boyden

Inventors
Martin R. Ethridge
Frank N. Ethridge
By their Attorney *Frederick C. Parker*

UNITED STATES PATENT OFFICE.

MARTIN R. ETHRIDGE AND FRANK N. ETHRIDGE, OF LYNN, MASSACHUSETTS,
ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE COPELAND RAPID LASTER
MANUFACTURING COMPANY, OF PORTLAND, MAINE.

TACK-DRIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 513,384, dated January 23, 1894.

Application filed March 31, 1893. Serial No. 468,581. (No model.)

To all whom it may concern:

Be it known that we, MARTIN R. ETHRIDGE and FRANK N. ETHRIDGE, citizens of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Tack-Driving Machines; and we 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.

This invention relates to certain improvements upon the tack driving machine for which Letters Patent of the United States were granted to M. R. and F. N. Ethridge bearing date March 29, 1887, and numbered 360,147, the object being to improve the construction of the machine shown and described in said patent by certain devices placed within the tack carrying drum to insure the proper delivery of the tacks to the raceway that conveys them to the driver, and further by providing said driver with a split nose and sleeve to facilitate the delivery of the tacks and in various other details of construction as will be hereinafter fully described.

In the accompanying drawings, Figure 1 is a side elevation showing the separable and movable tack driving devices connected to the fixed tack arranging devices, the whole mounted upon a suitable support. Fig. 2 is a view partly in section of the plunger barrel with the driver up illustrating the relative positions of the plunger for driving the tacks and the devices for admitting said tacks in proper order to the nose of the machine. Fig. 3 shows a vertical section through the plunger barrel, its attached nose and the raceway that conveys the tacks from the drum to the driving apparatus the driver being down. Fig. 4 is a transverse section on line 3 3 of Fig. 3 and shows the manner in which the nose is divided longitudinally into four parts and the arrangements of the devices within said nose. Fig. 5 is a transverse section on line 6 6 Fig. 2 and shows the relation of the shifting rod N and screw t. Fig. 6 is a similar section on the line 2, 2 of Fig. 3 at the junction of the plunger barrel and raceway. Fig.

7 shows a transverse section on the line 1, 1, of Fig. 2 at the junction of the raceway and plunger barrel. Fig. 8 is a cross section on the line 5, 5 of Fig. 3. Fig. 9 is a perspective view of that part of the raceway which is connected with the plunger barrel. Fig. 10 is a perspective view of the lower section of the plunger barrel showing the openings through which the drive rod and shifter pass. Fig. 11 is a perspective view partly in section of the split nose piece showing the conical sleeve within the same. Fig. 12 represents side elevations of the shifter with cross sections at two points in its length. Fig. 13 is a front end elevation of the tack drum with the raceway attached. Fig. 14 is a diametrical section of the tack drum looking from the front end illustrating the manner in which the tacks are carried up and deposited in the raceway. Fig. 15 also represents a diametrical section of the drum looking from the back end with its support also showing the manner of securing the back of the comb and the end of the tack hopper. Fig. 16 is a top view of the tack drum partly in section showing its interior arrangement on line x x of Fig. 13. Fig. 17 is a vertical section of the tack drum showing the two positions of the swinging raceway G and its relations to the tack hopper E'. Fig. 18 is a horizontal section of the frame B on line z z Fig. 17 showing the arrangement of the tack drum starting and stopping mechanism.

In the drawings A represents a base or standard which supports the frame B which carries the operative parts of the machine, the frame B being secured to said standard in the usual manner and suitably braced as shown by Fig. 1. The rear end of the frame B, B' is projected upward and has the long bearing B² formed at its upper end as shown by Figs. 1 and 17.

In the bearing B² is mounted the shaft C. This shaft forms an integral part of, or is securely attached to the head C' of the tack carrying drum D. The opposite head C² of the drum D, has a large circular opening therein which bears and revolves upon the disk D' so as to form an inner bearing for supporting said drum. The disk D' is properly secured to the front upward projection

D^2 of the frame B. The tack carrying drum is revolved when desired, by means of a belt leading from any suitable source of power to the pulley A' mounted upon the shaft C between the head of the tack carrying drum C' and the bearing B.

The adjoining sides of the pulley A' and the head C' are provided with suitable dogs a and a' which when brought into contact in the usual manner cause the belt pulley A' to revolve the tack carrying drum D. The hub of the pulley A' extends for some distance along the shaft C and is provided with a groove with which the upper forked end of the shipper arm b , engages. The lower end of this arm is attached to the rods b' , and said rods are mounted in the lugs b^2 so that they can be moved or slid endwise. The lugs b^2 , may be attached to or formed integral with the frame B as desired. Springs s , are coiled around the rods b' between the arm b and the lugs b^2 and by their pressure on said arm keep the pulley A' normally in engagement with the head C' of the tack carrying drum D so that said drum will be revolved by the pulley.

A shipping handle a^2 is attached to the inner ends of the sliding rods b' by means of which the dogs a and a' may be disengaged at will by the operator and the revolution of the tack carrying drum D stopped. This drum is provided with an opening D^2 in one side which gives access to the interior for the purpose of examining the apparatus therein by which the tacks are arranged and conveyed to the driving mechanism. Through this opening D^2 the loose tacks are introduced into the drum, a sliding cover as shown by Figs. 1 and 14 closing the drum when in operation.

Secured to the interior of the drum D, is a series of buckets c , c , c , &c., which raise the tacks from the lower part of the drum as it revolves and delivers them upon the inclined wire comb E. The teeth of the comb are of metal which forms the back and this back is secured to the stationary disk D' in the manner shown by Figs. 15 and 17. As the tacks fall from the buckets upon the comb their shanks swing down between the spaces and they slide upon their heads down the inclined teeth of the comb until they fall into the hopper or guide pieces E' as shown by Fig. 14. The hopper or guide pieces E are also secured to the stationary disk D' as shown by Figs. 15 and 17.

To a suitable projection formed upon or secured to the stationary disk D' there is hung at C' the swinging tack raceway G, as shown by Figs. 13, 16 and 17. This raceway G is formed from two pieces of metal set the correct distance apart so that the shanks of the tacks will swing between them and be held therein by the under sides of their heads in the usual manner. The outer sides of this raceway are made of correct width to pass freely between the sides of the hopper or guide pieces E'

when the raceway is in the inclined position shown by the full lines in Fig. 17 and 14, a suitable rest being secured to the inner free end of the guide pieces E' to hold the raceway horizontal as shown by the dotted lines. The outer end of the raceway G is extended some distance beyond the stationary disk D' and part of the frame D^2 and is provided with the transverse pin c^2 which projects at each side of said raceway so that it will engage with suitable notches or hooks formed for that purpose in the side pieces of the part of the raceway G' fixed to the tack driver.

When the tack driver is not in use it is hung upon the part G of the raceway and that part will then swing to its angular position and whatever tacks there may be therein will flow into the part G'. At the same time the tacks being raised by the buckets of the drum D will fall from the comb E into the part G until it is full and then overflow in the usual manner. Removing the tacker for use allows the part of the raceway G to swing down to a horizontal position in the drum and prevents any tacks from flowing therefrom until the tacker is again replaced. The part of the raceway G' is fixed to the movable tack driver as shown by Figs. 1 and 3, and is made long enough to carry a charge of tacks sufficient to tack the largest amount of work required at one handling of the tack driver. The upper end of this raceway G' is cut out so that it will pass over the lower end of the part G as shown by Fig. 1 and suitable notches are formed thereon to engage with the pin c^2 and that part of the end which contacts with the end of the part G is fitted so that it will perfectly match the end of that part as shown by Fig. 17 and allow the free flow of tacks from the part G to the part G'. When the notches in the upper end of the part G' are engaged with the pin c^2 the two parts of the raceway align, the part G is inclined and the tacks therein will flow therefrom into the part G' until it is full.

When it is necessary to use the tacker it is removed from the part G by the operator, who replaces it thereon after the tacking process is finished, when the amount of tacks used from the part G' during the tacking process, is made good from those which have been arranged in the part G during the periods of tack driving and rest. The guide groove in the part G' is made the same width as that in the part G and is provided with the cover f , which retains the tacks therein in the usual manner. The upper end of the cover f extends over the lower end of the part G so as to turn and guide the tacks into the part G' when it is connected, and a loop of wire d is carried over the free end of this cover and secured to the two sides of said part by turning its ends into said sides as shown by Fig. 1. This loop d prevents the accidental contact of the free end of the cover with the top of the part G from changing its curvature and causing the flow of tacks into the

part G' to stop. The lower part of the raceway G' is formed into the ring e'' and this ring supports and is connected to the tack feeding and tack driving mechanism when the two parts of the raceway are connected as will be hereinafter described. Through this ring e'' passes the shank of the tack receiver H pierced longitudinally through the center with a hole i through which passes the driving rod h and having an inclined lateral opening g through which the tacks pass to the belt or hollow cone k by which they are directed to the nose piece J. This nose piece fits over the conical lower end of the receiver H and is secured to the same by the pin h' driven through registering holes in said nose piece and receiver at one side of the center. The lower part of the nose piece is of conical form and terminates in a serrated end g' which serration assists in retaining the tack driver in position upon the work. This conical part of the nose piece is also divided by slots i'' into four parts which in the case of a misformed or large headed tack entering the exit orifice expands and allows it to pass without injury to the machine. The upper part of the receiver H projecting through the ring e'' is screw threaded and enters a corresponding thread formed in the lower end of the handle piece L so that when said handle is screwed into place, it together with the receiver, is rigidly connected with said ring and the raceway G'. Through the center of this handle lengthwise of the same is bored a hole for the passage of the drive rod h and at the side of this next the raceway is bored a parallel hole for the reception of the shifting rod N. This shifting rod has a rotary motion in said handle but is prevented from moving longitudinally in the same by a screw m that passes through the side of the handle and enters a recess m' which encircles the rod, the rotary movement being given by the driver O which has a reciprocating motion communicated to it by hand or by any suitable mechanism. This driver is guided in its movements by the guide rod P secured to the handle L and passing upward through a suitable opening in the driver.

In order to enable the driver to rotate the shifting rod, the upper part of the latter which moves freely in a suitable longitudinal orifice formed for its reception through the driver, is provided with a spiral groove k' extending along that part of the same upon which the driver reciprocates. An anti friction metal guide block attached to the driver, enters the spiral groove and causes the shifting rod to rotate whenever the driver is moved thereon.

The method in which the shifting rod transfers the tacks from the raceway to the nose piece is as follows: It will be observed that the lower part of the shifting rod at the point where it is opposite the opening into the raceway is provided with a recess upon one side of sufficient size and of a proper form to re-

ceive a tack, the body of the tack entering a groove extending downward from the main part of the recess, while it is suspended by the floor of the recess coming up under the head of the tack. When the driver is raised the recess r is in a position to receive a tack from the raceway as shown in Fig. 2 of the drawings, but as the driver descends the shifting rod turns carrying the tack with it until it is carried over the inclined opening g at which point it is forced out of the recess by a projection on the lower end of the spring s' which is secured in a slot r' formed in the shifting rod, the lower end of said slot opening into the recess r. In order to force the spring forward at the proper time a round nose set screw t is inserted through the side of the handle its rounded end projecting into a recess v formed in the rod above the recess r so that as the shifting rod turns the end of the screw comes in the path of the spring forcing it inward and ejecting the tack which falls through the passage g into the hollow cone k by which it is directed to the exit, through the divided nose piece and is in position to receive the blow from the driving rod h connected with and operated by the driver O. Attached to the frame B is a projecting ring W which receives the conical nose piece of the driving mechanism when the latter is detained from the drum and forms a convenient stand for the same.

The operation of the machine will be understood by the description of its construction, but may be summed up as follows: The tacks to be driven are placed in the drum, and as the latter revolves they are carried up and deposited on the comb where they arrange themselves point down, hanging by their heads and in this position slide off the teeth of the comb, dropping into the raceway down which they travel by the force of gravity until they reach the shifting rod, by which they are admitted singly into the nose piece, where they receive the blow of the drive rod and are forced out through the split end of the said nose piece and into the material prepared to receive them, thus greatly facilitating the insertion of tacks, nails or any other similar fastening provided with a head, into the parts they are intended to connect.

Having thus described our invention, we claim as new, and desire to secure by Letters Patent, the following:

1. As an improvement in loose tack arranging and driving machines, the combination of the rotating drum provided with suitable elevating buckets, an inclined comb arranged to receive the tacks which are delivered thereto by the said buckets and the pivoted raceway arranged to receive the tacks from the comb, all operating substantially as and for the purpose described.

2. In a loose tack driving machine, the handle piece, a drive rod situated in a passage therein, a shifting rod likewise situated in a passage in the handle piece, the driver, and

the guide rod for said driver which is secured to the handle piece, all arranged for joint operations in the manner shown and described.

3. In a loose tack arranging and driving
5 machine, the combination of a suitable tack driver, tack arranging mechanism, tack raceway composed of two parts, one carried by the driver and the other pivoted to the tack arranging mechanism, and means for con-

necting the abutting ends of the raceway all substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

MARTIN R. ETHRIDGE.

FRANK N. ETHRIDGE.

Witnesses:

HENRY C. ETHRIDGE,

MARY E. WOODBURN.