

(No Model.)

2 Sheets—Sheet 1.

G. TROXLER, Jr.

MACHINE FOR SECURING LACING STUDS OR STAPLES.

No. 466,810.

Patented Jan. 12, 1892.

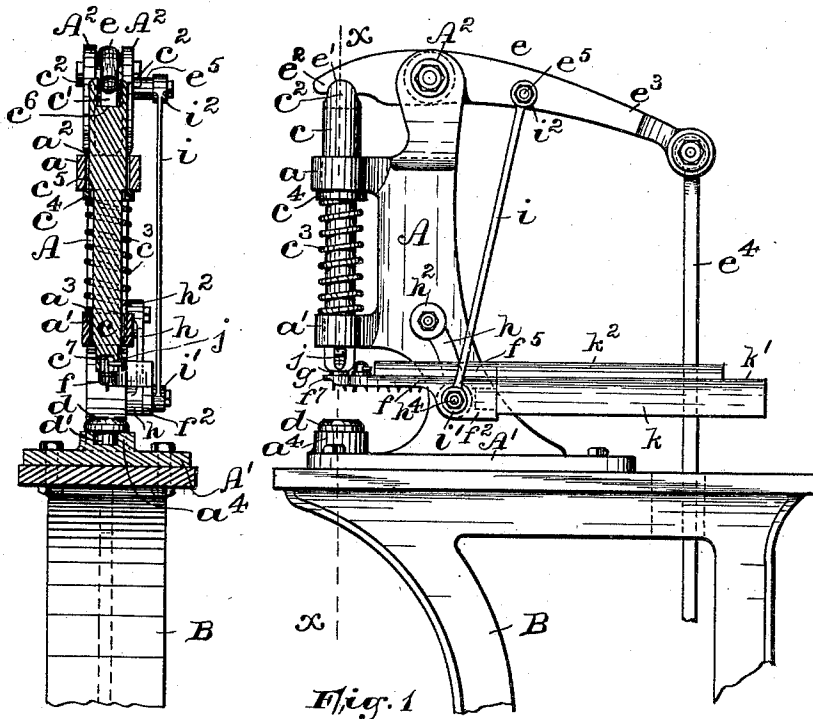


Fig. 1

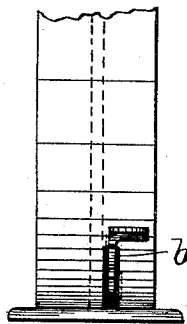


Fig. 2

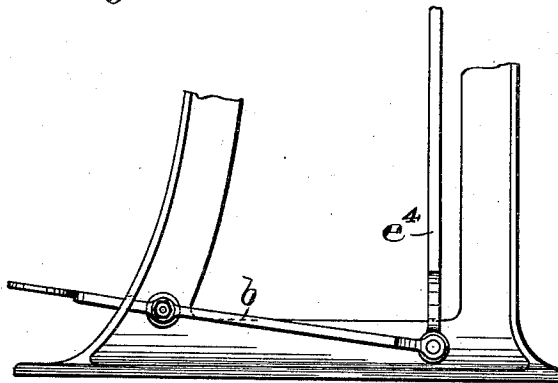
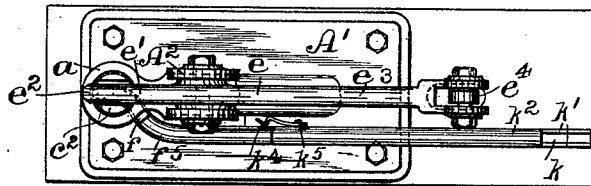


Fig. 3



WITNESSES:

Wm. H. Campfield, Jr.
Arthur Cresse

INVENTOR:

Gustavus Troxler, Jr.
BY Fred C. Haentzel, ATTY.

(No Model.)

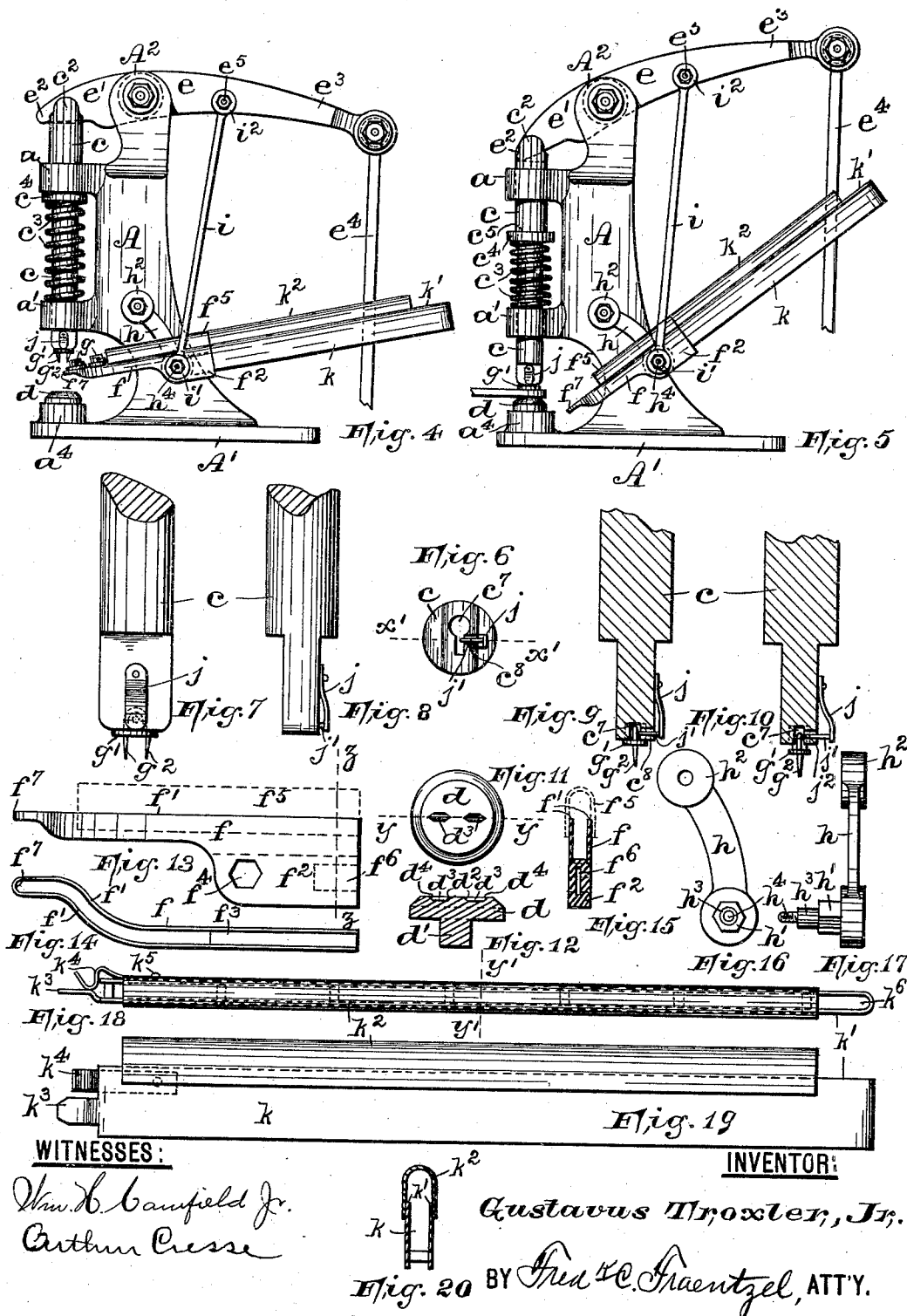
2 Sheets—Sheet 2.

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Patented Jan. 12, 1892.



UNITED STATES PATENT OFFICE.

GUSTAVUS TROXLER, JR., OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO ISAAC L. SILVERBERG, OF SAME PLACE.

MACHINE FOR SECURING LACING STUDS OR STAPLES.

SPECIFICATION forming part of Letters Patent No. 466,810, dated January 12, 1892.

Application filed July 2, 1891. Serial No. 398,271. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVUS TROXLER, Jr., a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Machines for Securing Lacing Studs or Staples to Shoe-Uppers; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

In United States Patent No. 442,277, issued December 9, 1890, which is for an improvement in lacing-studs for shoes, is illustrated a form of lacing-stud made from wire bent to form a staple provided with pointed ends adapted to be passed through a perforated bearing-plate and secured to the shoe-upper, and a tubular eye or pulley being arranged on one of the arms comprising the staple.

The purpose of the present invention is to provide a machine for automatically inserting the prongs of these lacing-studs through the shoe-upper, bending them over upon the opposite side of the upper, and thereby securely fastening the complete lacing-stud to the upper, the machine being of a simple construction.

The invention therefore consists of certain arrangements and combinations of parts, such as will be hereinafter more fully described, and finally embodied in the clauses of the claim.

In said drawings, Figure 1 is a side elevation of my machine, in which is shown the mechanism selected to illustrate the invention. Fig. 2 is a vertical section taken on line x in said Fig. 1, and Fig. 3 is a plan of the machine. Fig. 4 is a side view of the mechanism embodying the present invention in a position which immediately precedes that shown in Fig. 1, in which position one of the lacing-studs is clearly shown in position in the lower end of the punch, the stud or staple holding and feeding galley being in the operation of moving out of the way of the

downward movement of the staple-holding punch. Fig. 5 is a similar view, in which position, however, the stud or staple has been inserted through the shoe-upper and the prongs of the stud or staple have been brought in contact with the upsetting-die, whereby the stud is firmly secured to the shoe-upper. Fig. 6 is a plan view of the under side of the staple-holding punch, and Figs. 7 and 8 are an enlarged side and front elevation, respectively, of the lower part of said punch, clearly showing one means of holding a lacing stud or staple in position in the lower end of the same. Fig. 9 is a vertical section of the punch, taken on line x' in Fig. 6, showing the arrangement of a recess or cavity in the lower end of the punch and a spring-actuated pin for holding the stud or staple within said cavity. Fig. 10 is a similar view illustrating the position of the spring-actuated pin while the lacing stud or staple is being inserted into the cavity or being withdrawn therefrom when the prongs have been turned over upon the shoe-upper. Fig. 11 is a plan of the upsetting-die; and Fig. 12 is a vertical section of the same, taken on line y in said figure. Fig. 13 is a side view, and Fig. 14 a top view, of the lacing stud or staple chute for feeding the same beneath the punch. Fig. 15 is a vertical section of the chute, taken on line z in Fig. 13. Figs. 16 and 17 are detail views of an arm to which said chute can be attached for operating the latter. Figs. 18 and 19 are a top and side view, respectively, of a lacing stud or staple carrying galley provided with means for attaching and connecting the same to the end of the chute illustrated in Figs. 13, 14, and 15; and Fig. 20 is a vertical section of the galley, taken on line y' in Fig. 18.

Similar letters of reference are employed to indicate corresponding parts in each of the several views.

The machine shown in full in Fig. 1 is constructed and arranged to place the improved lacing stud or staple in a recess or cavity in the lower end of a downwardly and upwardly moving punching-rod, with the prongs projecting down from said rod, which during the downward movement of said rod are

forced through the shoe-upper placed upon a die, which causes said prongs to be turned outwardly and upwardly into the material of the shoe-upper, whereby the lacing stud or staple is firmly secured in position. To accomplish this the mechanism consists of a suitable upright A, extending up from a base A', which is bolted or otherwise secured to any suitable stand or table B. The upright A is provided with two outwardly-extending arms a and a' , having suitable openings a^2 and a^3 therein, in which is arranged the upwardly and downwardly moving staple holding and punching rod c . Said rod is provided on its upper end with a slot c' , formed by the two upwardly-projecting portions c^2 . Between the arms a and a' , encircling said rod c , is a coiled spring c^3 , the lower end of which is in contact with the upper surface of the arm a' , while its upper end is in contact with the lower side of a washer c^4 , which in turn engages with a shoulder c^5 near the upper portion of said rod c , as will be clearly seen from Figs. 2 and 5. Upon the base A' and in line with the central vertical axis of said rod c is arranged a die-plate d . Said plate d can be suitably secured to the base-plate A'; but it is preferably provided with a lug d' on its under side, adapted to be inserted into a perforation formed in a boss a^4 on said base-plate A'. The mechanism for producing the downward movement of said rod c consists of a lever e , which is fulcrumed between upwardly-projecting arms or ears A^2 on the upright A, and the forwardly-projecting portion e' of said lever e is provided with a nose e^2 , which extends down into the slot c' , formed by the arms c^2 on the rod c , while the oppositely-projecting portion e^3 of the lever e has pivoted thereto a connecting-rod e^4 , which projects down beneath the table portion of the stand B, where it is pivotally secured to the end of a suitable foot-lever b , by means of which said connecting-rod e^4 and the arm e^3 can be forced upwardly, causing the nose portion e^2 to engage with the surface c^6 between the arms c^2 of the rod c , thereby forcing the same down upon the die d , as will be evident. Of course any other suitable mechanism may be used instead of the foot-lever b for operating the rod e^4 —as, for instance, the lower end of said rod can be connected with a crank on a shaft operated by steam-power.

The chute for feeding the lacing studs or staples successively beneath the punching-rod c is preferably made from a piece of sheet metal, which is bent, as shown more especially in Fig. 14, being provided with parallel sliding edges or ways f' , upon which the plates g' of the lacing-stud g are arranged so that the prongs g^2 project down between the two sides of the chute f , while the staple portion and the pulley project above said ways f' , as clearly illustrated in Figs. 1 and 4. Said chute is provided with downwardly-projecting end portions f^2 , connected by a stiffening-bar f^3 ,

suitably arranged therebetween, which causes said ways f to retain their proper positions in relation to each other. A suitable opening f^4 is formed in said portion f^2 , whereby the chute f can be arranged on a projection h' , formed on the lower end of a lever h , which is provided at its upper end with an eye h^3 for pivotally attaching said lever to the upright A, as will be seen from Figs. 1, 2, &c. From said projection h' extends a cylindrical arm h^3 , on which is arranged a suitable link i , secured thereto by means of a nut i' , working on a threaded portion h^4 , extending from said arm h^3 . The upper end of said rod i is pivotally attached by means of an eye i^2 to a pin e^5 on the lever e . As will be seen from Figs. 1, 4, and 5, and also indicated in dotted lines in Figs. 13 and 15, said chute f may be provided with a suitable covering f^5 , formed integral with the sides of the chute or soldered or secured thereto in any well-known manner, which acts as a guard and prevents the lacing studs or staples from being displaced from the ways f' when said chute has been tilted.

As will be clearly seen from Figs. 2, 6, 7, 8, 9, and 10, the lower portion of the rod c is provided with a recess or cavity c^7 , provided with an enlarged portion, which conforms in outline to the form of the lacing-stud, thereby allowing the staple portion and its pulley to be inserted into said cavity when the chute f is in the position indicated in Fig. 1. The means for holding the stud or staple in said cavity c^7 consists of a spring-arm j , suitably secured to the lower portion of the rod c , being provided with a spring j' , which normally projects into a slot or perforation c^8 , communicating with said recess c^7 , and thereby holds said staple portion within said cavity, as indicated in Fig. 9.

I contemplate using with this machine a lacing stud or staple holding galley k , which is similar in construction to the chute f , being provided with ways k' and a suitably-formed guard k^2 . At the forward end of said galley k the same is provided with a tongue k^3 , which can be inserted into a slot f^6 in the portions f^2 of the chute f , and thereby held in position therein, as indicated in Figs. 1, 4, and 5. A peculiarly-bent spring k^4 projects in front of the ways k' of the galley k , as indicated in Fig. 18. This spring is attached to one side of said galley k by means of a pin or rivet k^5 . Said galley can be filled at its upper end k^6 with any desirable number of lacing studs or staples, the bent spring k^4 preventing the displacement of any of such studs or staples. When the tongue k^3 is being inserted into the perforation f^6 in the chute f , said spring k^4 is forced to one side of said chute, as clearly indicated in Fig. 3, and an unobstructed passage-way is thereby formed between the galley and said chute for the sliding down of the staples into position beneath the rod c .

The mode of operation of the above-described device for inserting the lacing studs or staples through the shoe-upper and bending down the prongs thereof is after the following manner: The galley *k*, which has previously been filled with lacing-studs, is attached to the end of the chute *f* in the manner just above described or in any other well-known manner. The mechanism is caused to assume the position indicated in Fig. 5, whereby the studs or staples are caused to slide down upon the ways *f'* of the chute *f* until the forward studs or staple reaches the curved end *f''* of the chute. The coiled spring *c*³ while the mechanism is in this position is compressed, and as soon as the power is taken from the rod *e*⁴ said spring causes the return of the rod *c* to the position indicated in Fig. 1. At the same time the lever *e* assumes its normal position, and by means of the intermediately-placed link *i* and the lever *h* said chute *f* and the galley are brought in the position shown in Fig. 1, causing the forward end or nose portion *f'* of the chute to project directly below the lower recessed end of the rod *c*, while the staple portion of the forward stud comes in contact with the rounded end *j*² of the spring-actuated pin *j'*, (see Fig. 10,) forcing the latter out and allowing the insertion of the staple portion and its tubular eye or pulley into the recess or cavity *c'*, where it is held by the action of the pin *j'*, which has been immediately returned to its normal position by the spring *j*, as indicated in Fig. 9. In order to attach the lacing stud or staple to the shoe-upper, the latter is placed upon the upper surface of the die *d*, and by means of the foot-lever *b* or other suitable power the rod *e*⁴ causes the lever *e* to swing upon its fulcrumal supports *A*³, whereby the chute *f* becomes tilted, as indicated in Fig. 4, leaving the lacing stud or staple, which is held by the spring-actuated pin *j'*, depending from the recess or cavity *c'* in the bottom of the rod *c*. By this time the nose portion *e*² of the lever *e* engages with the surface *c*⁶ between the arms *c*² on the rod *c*, which moves downwardly in the perforated arms or sleeves *a* and *a'*, the chute at the same time moving still further out of the way until the prongs *g*² of the stud or staple are forced through the upper and come in contact with the inclined portions *d*² of the cavities *d*³ in the die *d*. The inclined portions cause said prongs to be spread outwardly until their ends reach the inclined portions *d*⁴ in the same cavities, which cause the ends to be slightly turned upward and into the back of the shoe-upper, so that they will not project therefrom and thereby be apt to tear the wearer's stocking. When the stud or staple has thus been clinched, the spring *c*³ causes the return of the several parts of the mechanism to their normal positions, (indicated in Fig. 1,) whereby another stud or staple is inserted in the cavity *c'* and the operation of attaching the same to the shoe-upper can be repeated. In this man-

ner the studs or staples are automatically inserted and held in place in the recessed end of the rod *c*, and then firmly secured by means of said rod and the die to the shoe-upper until the lacing-studs contained in the galley *k* have been exhausted, when the empty galley can be removed from the chute *f* and a filled one inserted in its position.

One form of mechanism for producing the reciprocatory movement of the rod *e*⁴ is illustrated in Fig. 1, but not described herein, not being considered essential to an understanding of that portion of the machine, it being my intention to employ any other well-known means for operating said rod *e*⁴.

It will be understood that many variations of construction of the various parts herein described may be made. For instance, instead of soldering or otherwise securing the guards or coverings to the chute *f* and the galleys *k*, said part can be formed integral with the sides of the chute, or said covering may be entirely dispensed with.

Having thus described my invention, what I claim is—

1. In a machine for securing lacing studs or staples to shoe-uppers, the combination, with a punching-rod having in its lower portion a cavity *c'*, enlarged at one end to receive a roller or pulley upon the stud and provided in one side with an opening *c*⁸, of mechanism for automatically feeding and inserting a stud or staple provided with a roller or pulley in said recessed rod, and a spring-actuated pin secured to the side of said rod and entering said opening *c*⁸ and extending into said cavity *c'* for retaining said stud in place, substantially as and for the purposes set forth.

2. In a machine for securing lacing studs or staples to shoe-uppers, the combination, with a punching-rod having in its lower portion a cavity *c'*, enlarged at one end to receive a roller or pulley upon the stud and provided in one side with an opening *c*⁸, of mechanism for automatically feeding and inserting a stud or staple provided with a roller or pulley in said recessed rod, a spring-actuated pin secured to the side of said rod and entering said opening *c*⁸ and extending into said cavity *c'* for retaining said stud in place, and a die provided with the indentations *d*³, operating to bend the prongs of the stud, all the operations of feeding, inserting, and bending-down mechanism following consecutively, as and for the purposes set forth.

3. In a machine for securing lacing studs or staples to shoe-uppers, the base-plate *A'*, provided with an upright *A*, a spring-actuated punching-rod moving in arms attached to said upright, a recess or cavity *c'* in the lower end of said rod, provided with an enlarged portion for the reception of a pulley or roller on the stud, an opening *c*⁸, communicating with one side of said rod and with said recess *c'*, a spring-actuated pin attached

to the side of said rod, passing through said
opening c^8 and extending into said recess c^7 ,
a lever h and a chute f , an arm i , connected
with said chute f , and an arm e and a galley
5 k for feeding the studs or staples into said
chute, all arranged substantially as and for
the purposes set forth.

In testimony that I claim the invention
set forth above I have hereunto set my hand
this 29th day of June, 1891.

GUSTAVUS TROXLER, JR.

Witnesses:

FREDK. C. FRAENTZEL,
WM. H. CAMFIELD, Jr.