(No Model.) 3 Sheets—Sheet 1.

H. WRIGHT.

EYELET HOLE PUNCHING MACHINE.

No. 521,068. Patented June 5, 1894.

Fig. 1.

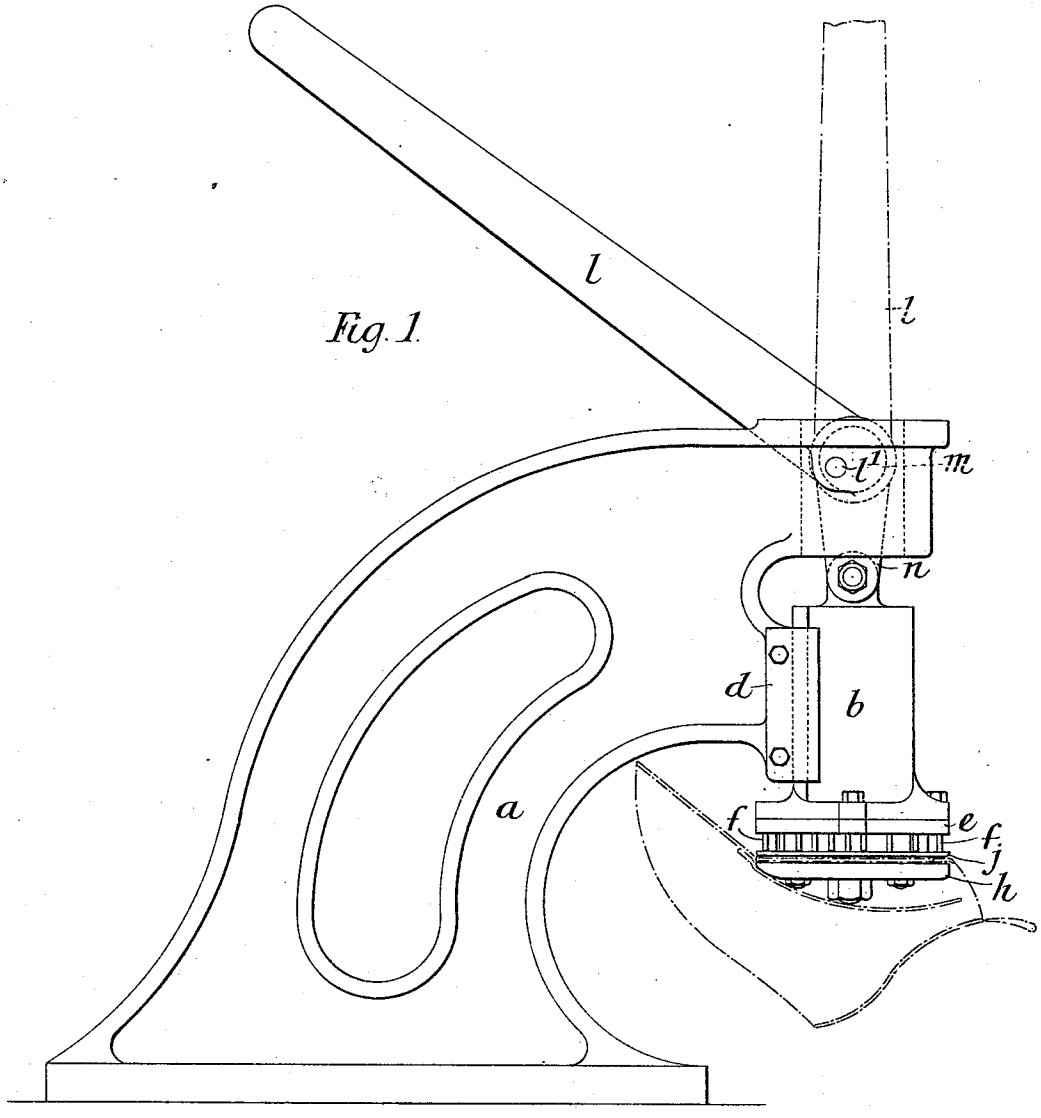
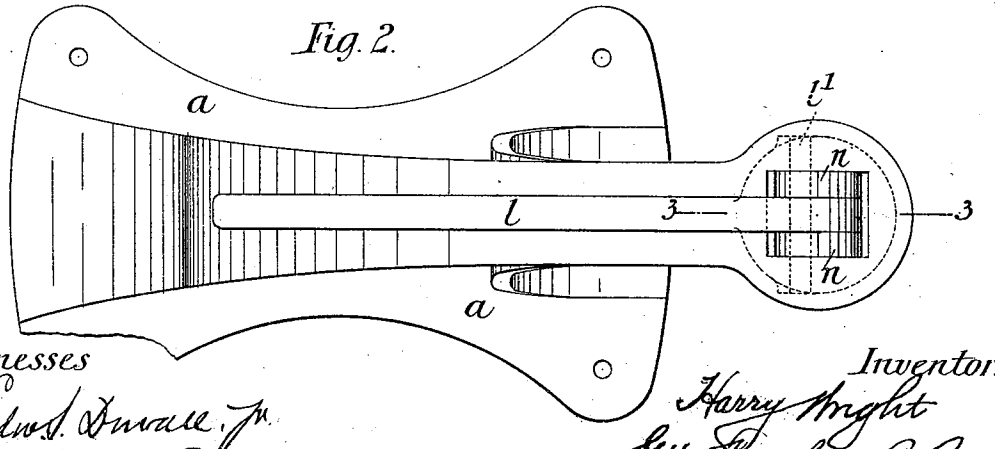


Fig. 2.



Witnesses
Edwd. Duvall, Jr.
Fred. B. Rhodes.

Inventor:
Harry Wright
by Pendleton & Brock
Attys

THE NATIONAL LITHOGRAPHING COMPANY.
WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

H. WRIGHT.

EYELET HOLE PUNCHING MACHINE.

No. 521,068. Patented June 5, 1894.

Fig. 3.

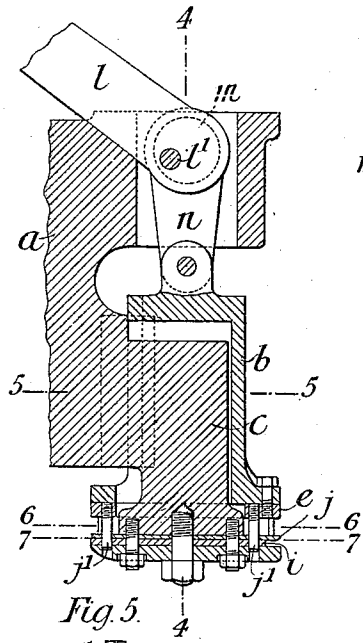


Fig. 4.

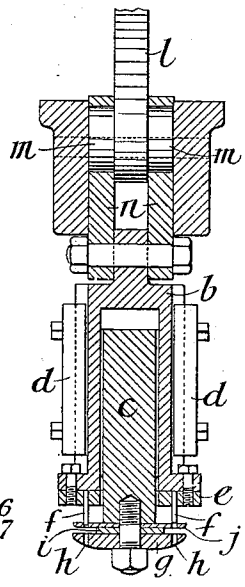


Fig. 7.

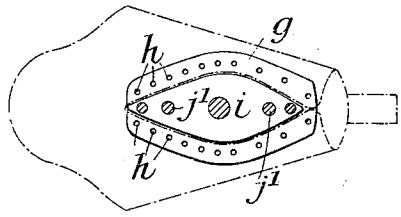


Fig. 8.

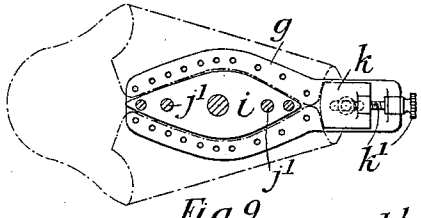


Fig. 9.

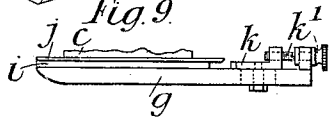


Fig. 5.

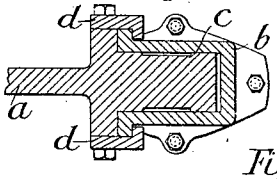


Fig. 6.

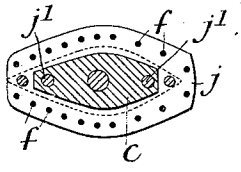


Fig. 12.

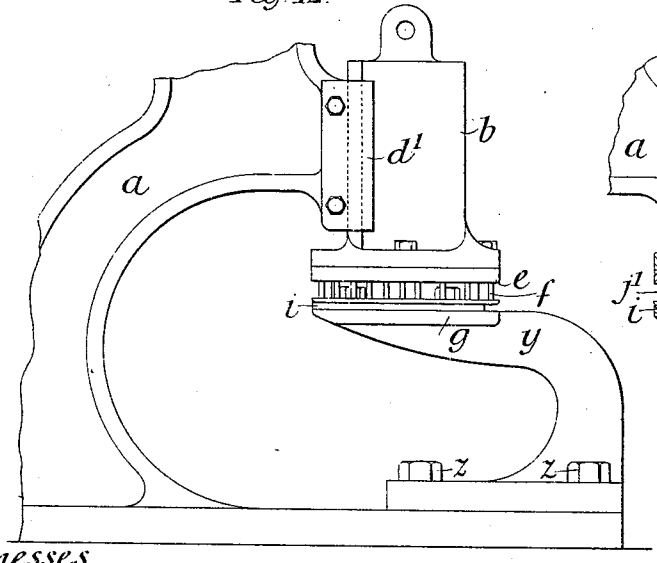
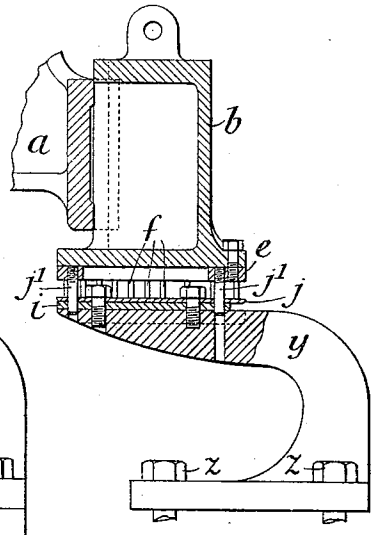


Fig. 13.



Witnesses.
Edw. L. Duvall Jr.
Fred B. Rhodes

Inventor:
Harry Wright,
by Shelton B. Brock
Atty

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

H. WRIGHT.

EYELET HOLE PUNCHING MACHINE.

No. 521,068. Patented June 5, 1894.

Fig. 10.

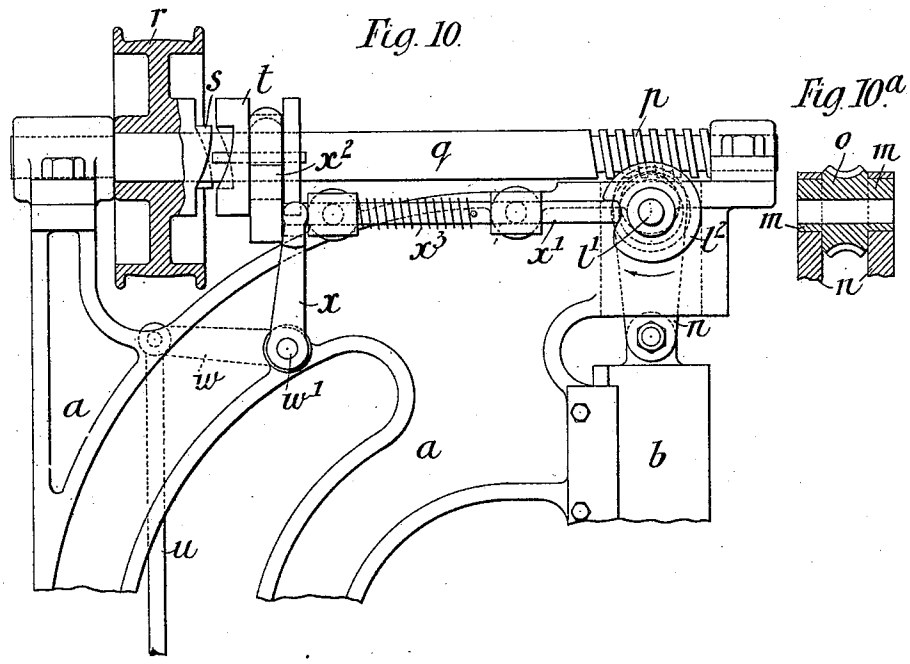
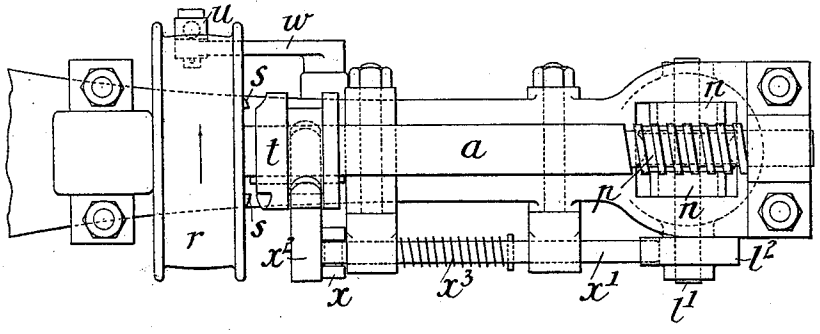


Fig. 10ª.

Fig. 11.



Witnesses.
Edwd. Duvall Jr.
Fred. B. Rhodes.

Inventor.
Harry Wright
by Thurlow B. Brock
Atty.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HARRY WRIGHT, OF KETTERING, ENGLAND.

EYELET-HOLE-PUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,068, dated June 5, 1894.

Application filed December 20, 1892. Serial No. 455,815. (No model.) Patented in England August 18, 1892, No. 14,944, and in Germany December 13, 1892, No. 69,648.

To all whom it may concern:

Be it known that I, HARRY WRIGHT, a subject of the Queen of Great Britain, residing at Kettering, England, have invented new and useful Improvements in and Relating to the Punching of Eyelet-Holes in Boots and Shoes, (patented in Great Britain, No. 14,944, dated August 18, 1892, and in Germany, No. 69,648, dated December 13, 1892,) of which the following is a specification.

My invention relates to the punching of eyelet holes in boots and shoes.

Hitherto the eyelet holes of boots and shoes have generally been punched separately but in some cases each side of the upper has been punched separately but always before the upper is closed.

According to my invention I punch all the eyelet holes at one operation and after the upper is complete, whereby I effect a great economy of time and produce a better finished article.

In carrying out my invention I employ a punching head carrying a number of punches corresponding with the number of eyelet holes to be punched. This punching head is adapted to slide on a guide in the frame of a press, the lower end of such guide carrying the under die. In connection with the under die is a gage adapted to fit the throat of the leg or upper to be perforated.

In some cases instead of suspending the under die as above described, I employ a horn-shaped under die fixed to the bed of the press; in which arrangement the punching head is carried and operated in the ordinary manner.

To enable my invention to be fully understood I will describe the same by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a hand-power machine constructed according to my invention; and Fig. 2 is a plan of the same. Fig. 3 is a section on the line 3—3, Fig. 2; and Figs. 4, 5, 6 and 7 are sections on the lines 4—4, 5—5, 6—6 and 7—7 respectively of Fig. 3. Fig. 8 is a view similar to Fig. 7 illustrating a slight modification of my invention; and Fig. 9 is a side view of the same. Figs. 10 and 11 are a sectional side elevation and a plan showing the arrangement of mechanism for driving my machine by steam or other power through the medium of a belt; and Fig. 10ª is a detail of the worm-wheel shown in Figs. 10 and 11. Figs. 12 and 13 are a side elevation and a sectional view illustrating the arrangement wherein the under die is carried by the bed of the press.

Similar letters of reference indicate corresponding parts in all the figures.

a is the frame of the machine, and *b* is the punching head which slides upon the guide *c* formed upon the frame *a*, being held in position thereon by means of the strips *d*, *d*, Figs. 1 and 3, and which carries at its lower end a removable plate *e* to which the punches *f*, *f* are secured.

g is the under die which has formed in it perforations *h*, *h* corresponding to the punches *f*, *f* and which is firmly fixed to the under side of the guide *c*, as clearly shown in Figs. 3 and 4.

i is the gage for the material to be perforated, and *j* is a plate perforated in a similar manner to the under die *h* and adapted to steady the punches as they enter the work placed upon the under die so that the said punches will correspond with the holes *h*, *h* in the said under die. Additional guide-pins *j'*, *j'* are sometimes employed to further steady the punches. This gage *f* and plate *j* are arranged between the under die *g* and the guide *c* as clearly shown.

In practice I find it advantageous to make the punches of slightly varying length, as shown in Fig. 4, so that the power required to work the machine will be less than if all the punches came down upon the material simultaneously.

In using my machine the upper to be perforated is introduced into the space between the under die *g* and the plate *j*, the throat of the said upper being drawn tightly around the gage *i*, as clearly shown in Fig. 7, the punching head *b* is then depressed so that the punches *f*, *f* perforate the upper.

In perforating what are known as Derby uppers, that is to say, uppers of the kind in which the tongue forms a continuation of the vamp of the upper, it is necessary to provide for adjusting the position of the upper relatively to the gage *i* as there is no point or V in the throat as in a Balmoral upper which

can be pulled against the gage *i*. This I accomplish by extending the die-plate *g*, as shown in Figs. 8 and 9, and mounting upon the extension a gage *k* adapted to be adjusted by a screw *k'* and against which the top of the upper is drawn, as shown clearly in Fig. 8, where the dotted lines represent an upper of the kind referred to.

The up-and down-movement of the punching head may be effected by any desirable means. As shown in Figs. 1, 2, 3 and 4 the said punching head is represented as being operated by a hand-lever *l* pivoted upon a pin *l'* and provided at each side with an eccentric *m*, connected by a link *n* with the punching head *b*, as shown most clearly in Figs. 3 and 4. It is obvious with this arrangement that when the said lever is moved from the position shown in full lines in Fig. 1 to the position indicated by the dotted lines in the said figure, the punching head will be depressed sufficiently to cause the punches to perforate the material upon the under die.

When my machine is to be operated through the medium of a driving belt, I advantageously provide the arrangement of mechanism shown in Figs. 10 and 11. In this arrangement the punching head *b* is connected by links *n*, *n* with eccentrics *m*, *m* upon a pin *l'* as in the arrangement last described: the said eccentrics *m*, *m* in this case, however, are secured or formed integral with a worm-wheel *o*, as shown in Fig. 10ª, with which a worm *p* on one end of a shaft *q* mounted in bearings upon the framing *a* engages: upon the other end of the shaft *q* is loosely mounted a pulley *r* having clutch-teeth *s* upon its boss with which the teeth of a clutch-box *t* (also mounted on the shaft *q* and sliding thereon) are adapted to engage. This clutch-box *t* is operated to move it into engagement with the clutch-teeth *a* by means of a foot-lever or treadle connected by a rod *u* with a lever *w* fixed to one end of a shaft *w'*, a bifurcated lever *x* being secured to the other end of the said shaft *w'* and with its arms embracing a sliding shaft *x'* and bearing against a fork x^2 attached to the said shaft *x* and engaging with a groove in the clutch-box *t*. With this arrangement it will be readily understood that when the foot-lever is depressed so as to force the clutch-box *t* into engagement with the clutch-teeth *s* the shaft *q* with its worm *p* will be rotated, whereby rotary motion will also be imparted to the worm-wheel *o* and to the eccentrics *m* which in this case make complete rotations instead of being oscillated as is the case in the arrangement described with reference to Figs. 1 to 9.

In order that after the foot-lever has been depressed to cause the engagement of the clutch-box *t* with the clutch-teeth *s* the said clutch-box shall remain in engagement with the said teeth until the worm-wheel has made a complete revolution without the necessity for the operator keeping his foot upon the treadle, I provide on the shaft *l'* a cam l^2 which acts against one end of the rod *x'*. Normally the said rod *x'* bears against the lowest part of the cam l^2: as soon, however, as the gear-wheel *o* commences to rotate the said cam also rotates and acts upon the rod *x'* to push the fork x^2 to hold the clutch-box into engagement with the clutch-teeth *s* until the cam has made a complete revolution when, under the action of a spring x^3 upon the rod *x'*, the said rod is moved back into the depression on the cam so as to allow the clutch-box *t* to be moved out of engagement with the said clutch-teeth.

In Figs. 12 and 13 which show the arrangement wherein the under die *g* is supported from beneath *y* indicates an arm upon which the said die is directly carried, the said arm being secured to the frame *a* by means of bolts *z*, *z*.

Although in the foregoing description I have referred to the punches as being arranged above the die-plate it is to be understood that this arrangement may be reversed, that is to say, that the die-plate may be uppermost and the punching head moved up to it from beneath.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination in a machine for punching eyelets in boots and shoes, of two dies one of which carries two lines of punches for punching all the eyelets in a complete upper at one operation, a gage interposed between said lines of punches and mechanism for operating the dies.

2. In a machine for punching all the eyelet holes in a complete upper at one operation, the combination of a fixed perforated die, a movable die carrying punches and a gage fixed to the perforated die and adapted to fit the throat of the upper to be perforated or punched, substantially as described.

3. The combination in a machine for punching eyelets in boots and shoes, of two dies, one of which carries two lines of punches for punching all the eyelets in a complete upper at one operation, a gage interposed between said lines of punches a gage disposed at one end of both lines of punches, and mechanism for operating the dies.

4. The combination of two dies, one carrying two lines of punches, a gage interposed between said lines, and an adjustable gage at one end of both lines of punches.

5. The combination with operating mechanism and a stationary die, of a standard having a stationary way or guide, and a die secured to the bottom thereof, a punching head embracing said guide having a die upon the foot thereof above the first mentioned die.

6. In a leather punching machine, the combination of a reciprocating die and head, a cam for operating said head mechanism for driving said cam, another eccentric upon the

same cam-shaft, a drive pulley, a clutch device between said pulley and the driving mechanism, and a clutch operating mechanism interposed between the clutch and the second eccentric for giving an intermittent reciprocating movement to the die-head.

7. The combination of a reciprocating die-head, a cam for moving the same, a worm-wheel upon the cam-shaft, a main driving shaft, a worm, a pulley and a clutch upon said driving shaft, a second cam or eccentric upon the said cam-shaft, a clutch operating device interposed between said second cam and the clutch and operated in one of its movements by said second cam, and a lever or treadle mechanism for engaging the clutch.

8. The combination of a stationary die-head, a die secured thereto, a steadying plate also secured to said head, and a gage interposed between said die and plate, a reciprocating die-head having a die thereon, and mechanism for operating the dies.

HARRY WRIGHT.

Witnesses:
G. F. REDFERN,
JOHN E. BOUSFIELD,
Of the firm of G. F. Redfern & Co., 4 South Street, Finsbury, London, Patent Agents.