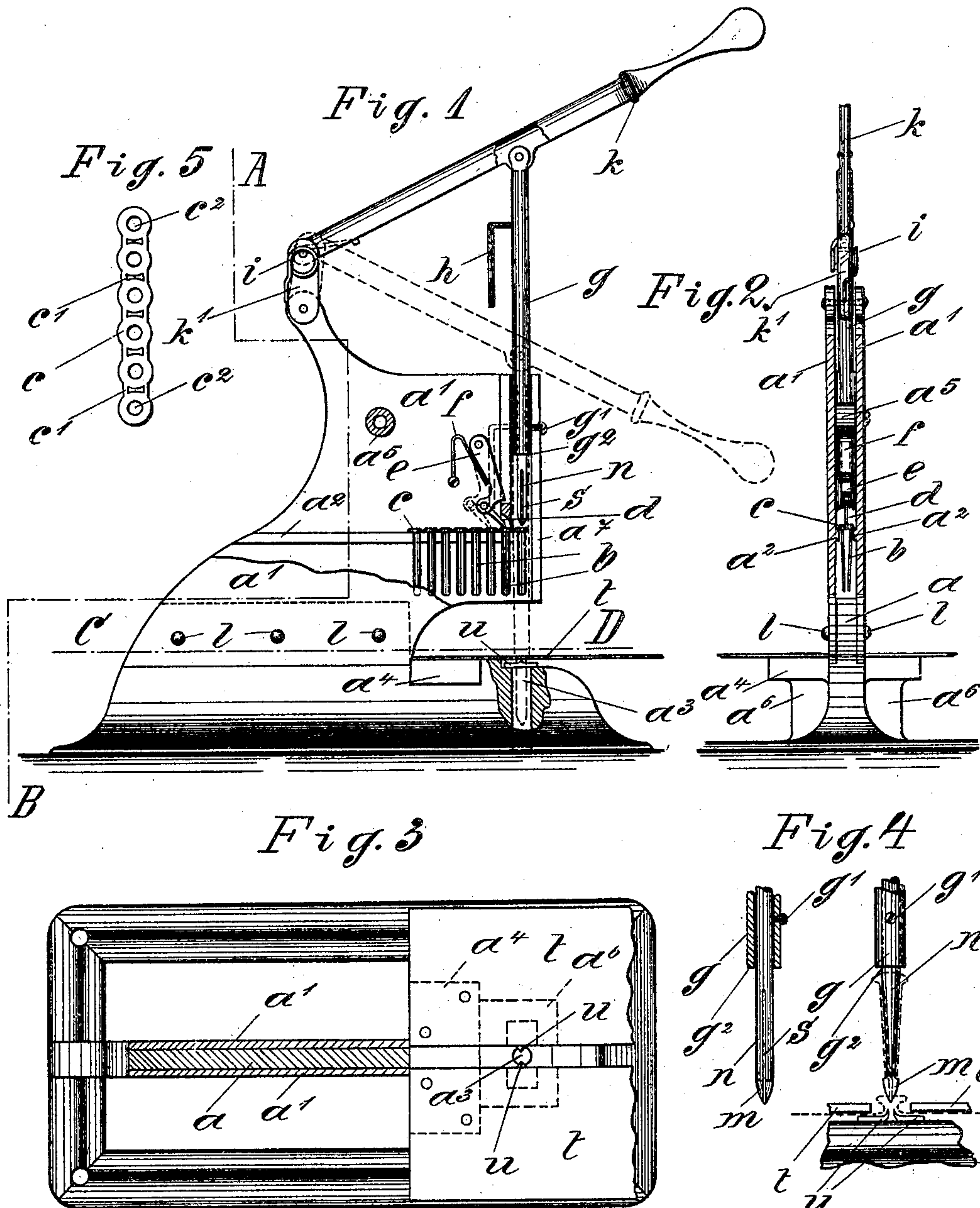


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PATENTED JUNE 5, 1906.

L. KOPPEL.  
STAPLING MACHINE.  
APPLICATION FILED DEC. 7, 1905.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

LEO KOPPEL, OF COLOGNE, GERMANY.

## STAPLING-MACHINE.

No. 822,527.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed December 7, 1905. Serial No. 290,800.

*To all whom it may concern:*

Be it known that I, LEO KOPPEL, a citizen of the Empire of Germany, residing at Cologne-on-the-Rhine, in the Empire of Germany, have invented a new and useful Stapling-Machine, of which the following is a specification.

My invention relates to a stapling-machine for connected staples, which machine is capable of binding materials that offer a greater resistance than paper, such as clothes, leather, felt, pasteboard, cork, and the like. The chief feature of this stapling-machine is a thick needle, which serves for piercing the materials to be bound and is provided with two shoulders near its point for supporting the respective staple and also with two opposite grooves, in which the upwardly-bent points of two benders secured on the anvil engage for bending the legs of the staple. This thick needle is secured in a plunger the lower face of which serves for detaching the staple-head from the remaining staple-heads and for forcing same downward, while the legs of the staple engage in the hole of the materials produced by the needle. Thus the legs of the staple need not themselves pierce the materials, for which they would be too weak.

I will now proceed to describe my invention with reference to the accompanying drawings, in which—

Figure 1 is an elevation of a stapling-machine, a part of the anvil being shown in section. Fig. 2 is partly an end view and partly a section through the broken line A B in Fig. 1 seen from left to right. Fig. 3 is a horizontal section through the same on the line C D in Fig. 1. Fig. 4 shows, on an enlarged scale, a needle with the lower end of the plunger in elevation and front view; and Fig. 5 is a plan, on an enlarged scale, of a series of connected staples.

Similar letters of reference refer to similar parts throughout the several views.

The standard of the stapling-machine consists of a base-plate  $a$  and two vertical parallel plates  $a'$   $a'$ , which are fastened on the base-plate  $a$  by means of rivets  $l$   $l$  or the like, while they are kept apart by means of a distance-piece  $a^5$  or the like. The base-plate  $a$  is provided with two flanges  $a^4$   $a^4$ , on which two tables  $t$   $t$  are secured, while leaving between them a slit. (See Fig. 3.) The anvil  $a^6$  is cast in one piece with the base-plate  $a$ , and its top face is a little beneath the two tables

$t$   $t$ . On this top face of the anvil  $a^6$  are fastened two opposite benders  $u$   $u$ , the points of which are bent upward and leave between them a certain small gap. (See Figs. 3 and 4.) Sufficient space for a staple-leg should be left between the top faces of the two benders  $u$   $u$  and the bottom faces of the two tables  $t$   $t$ .

The two vertical plates  $a'$   $a'$  are each provided with a horizontal ledge  $a^2$  and a vertical guide  $a^7$  for a plunger  $g$ . A hand-lever  $k$  is pivotally connected with the upper projections of the two vertical plates  $a'$   $a'$  by means of a link  $k'$ . A spring  $i$  of any known and approved construction serves for pressing the hand-lever  $k$  upward. The plunger  $g$  is pivotally connected with the hand-lever  $k$  and is provided in its lower part with a longitudinal bore, in which a needle  $n$  can be secured by means of a screw  $g'$  or the like. The needle  $n$  is preferably made cylindrical, and only at its lower end it is pointed. (See Fig. 4.) It is provided with two opposite inclined cut faces, so as to form two shoulders  $m$   $m$  above the point, and, moreover, it is provided in the two cut faces with two grooves  $s$   $s$ , which extend through the shoulders  $m$   $m$ . The upwardly-bent points of the two benders  $u$   $u$  are adapted to engage in these two grooves  $s$   $s$  of the needle  $n$ . The anvil  $a^6$  is provided with a vertical hole  $a^3$ , in which the needle  $n$  can engage.

The staple-heads  $c$   $c$ , connected with each other by means of narrow straps  $c'$ , (see Fig. 5,) are provided with central openings  $c^2$   $c^2$ , into either of which the needle  $n$  can engage. The staple-heads  $c$   $c$  are in any known manner each connected with two elastic legs  $b$ , which converge downward a little and are preferably made inwardly a little concave. They are adapted to bear on the two inclined faces of the needle  $n$  and to rest on the shoulders  $m$  of the latter, as is indicated by dotted lines in Fig. 4. The two horizontal ledges  $a^2$   $a^2$  on the two vertical plates  $a'$   $a'$  serve for supporting and guiding the heads  $c$   $c$  of the staples. The front ends of these two ledges  $a^2$   $a^2$  are at a small distance from the center line of the plunger  $g$ , so that the latter is permitted to go downward past them. A lever  $e$  is mounted to turn on a pin between the two vertical plates  $a'$   $a'$  and carries a pawl  $d$ , which is arranged to slide over the series of staple-heads  $c$   $c$  and to engage in either of their central openings  $c^2$   $c^2$ . This pawl  $d$  is provided with an arm, which normally bears on the rear face of the lever  $e$  and is pressed



thereon by a spring *f*. A hooked arm *h* is secured on the plunger *g* and is arranged to push the lever *e* rearward on the hand-lever *k* being moved downward. Thereby the pawl *d* is moved through such a distance that it can engage in the central opening *c*<sup>2</sup> of the following staple-head *c*.

The stapling-machine is operated as follows: The materials to be bound are placed on the tables *t t* and a series of connected staples is introduced between the two vertical plates *a' a'*, so that their heads *c c* rest on the two ledges *a<sup>2</sup> a<sup>2</sup>*. This series of staples is so adjusted that the front staple is in the center line of the plunger *g* and that the pawl *d* engages in the hole *c*<sup>2</sup> of the next following staple, as is clearly shown at Fig. 1. On depressing the hand-lever *k* the needle *n* will engage in the hole *c*<sup>2</sup> of the front staple and between the two legs *b* of the latter, which legs *b* are pushed aside until they snap above the two shoulders *m m*. Directly afterward the bottom face *g*<sup>2</sup> of the plunger *g* will bear on the head *c* and cut the straps *c'* to divide the front staple from the remaining staples. The front staple will slide a little down the needle *n* until its two legs *b* rest on the two shoulders *m*. Thereby the staple is prevented from falling off the needle *n*. At the same time its two legs *b*, being inwardly concave, will be prevented by their elasticity from slipping to either side. Immediately the needle *n* will pierce the materials, while the staple sliding upward on the needle *n* is soon checked by the bottom face *g*<sup>2</sup> of the plunger *g* and is thereby introduced through the hole in the materials produced by the needle *n*. The upwardly-bent points of the two benders *u u* will engage in the corresponding grooves *s s* of the needle *n* and will push aside the ends of the two legs *b*, and thereby consecutively bend the following sections of the latter. When the head *c* of the staple is on the materials, it will check the plunger *g*, (see Fig. 4,) where the staple in its final position is indicated by the dotted lines. Meanwhile, the hooked arm *h* on the plunger *g* will have pushed the lever *e* to the rear, so that the pawl *d* slides over the heads *c c* of two neighboring staples and engages in the central opening *c*<sup>2</sup> of the following staple; as is indicated by the dotted lines in Fig. 1. On again releasing the hand-lever *k*, it will be returned to its upper position by the spring *i*, or the hand-lever *k* may be moved upward and be held in its upper position by the spring. The materials bound can be withdrawn from the tables *t t*, when the legs *b* of the staple will bear from below against the materials, as it should be. During the upward motion of the hand-lever *k* of course the hooked arm *h* will release the lever *e*, which, together with the pawl *d*, will be pressed forward by the spring *f*, so that the staples will be fed forward until the front staple is in the center line of the plunger

*g*, when it will be ready for the following operation.

The stapling-machine may be varied in many respects without deviating from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a stapling-machine for staples, the annular heads of which are detachably connected and the legs of which converge downward and are inwardly concave, the combination with a standard provided with an anvil, of a horizontal guide for the staple-heads in said standard, a plunger vertically guided in said standard, a needle at the lower end of said plunger and provided with two opposite inclined cut faces to form two shoulders above the point, also with two grooves in the two cut faces and in the two shoulders, a vertical hole in said anvil in the center line of said needle, two benders on the top face of said anvil and adapted to engage with their upwardly-bent points in the two grooves of said needle, a table of sheet metal above said two benders at a distance approximately equal to the thickness of a staple-leg and having a slot, which reaches from the center line of said needle to an edge, means controlled from said plunger for feeding the staples, and means for depressing said plunger, said needle being adapted to engage through the head-hole and between the legs of the respective staple and to pierce the materials to be bound, while the legs of the staple are supported by the needle-shoulders, and said plunger being adapted to detach the staple-head from the remaining staple-heads and to force same downward.

2. In a stapling-machine for staples, the annular heads of which are detachably connected and the legs of which converge downward and are inwardly concave, the combination with a standard provided with an anvil, of a plunger vertically guided in said standard, a spring normally pressing said plunger upward, a needle at the lower end of said plunger and provided with two opposite inclined cut faces to form two shoulders above the point, also with two grooves in the two cut faces and in the two shoulders, a vertical hole in said anvil in the center line of said needle, two benders on the top face of said anvil and adapted to engage with their upwardly-bent points in the two grooves of said needle, a table of sheet metal above said two benders at a distance approximately equal to the thickness of a staple-leg and having a slot, which reaches from the center line of said needle to an edge, a horizontal guide for the staple-heads in said standard and extending to near the point of said needle in its normal position, an arm on said plunger, a lever mounted to turn in said standard and adapted to be acted upon by said arm, a pawl on said lever and adapted



to engage in the central hole of either staple-head, a spring pressing said pawl with said lever toward the center line of said plunger, and means for depressing said plunger, said  
 5 needle being adapted to engage through the head-hole and between the legs of the respective staple and to pierce the materials to be bound, while the legs of the staple are supported by the needle-shoulders, and said  
 10 plunger being adapted to detach the staple-head from the remaining staple-heads and to force same downward.

3. In a stapling-machine for staples, the annular heads of which are detachably connected and the legs of which converge downward and are inwardly concave, the combination with a base-plate provided with an anvil, of two parallel vertical plates fastened on said base-plate and each provided with a  
 20 horizontal ledge and a vertical groove, the two horizontal ledges forming a guide for the staple-heads and the two vertical grooves forming a guide, a plunger longitudinally movable in said vertical guide and provided  
 25 at its lower end with a longitudinal bore and a fastening-screw, a pin connecting the upper ends of said two parallel vertical plates, a link mounted to rock on said pin, a hand-lever pivotally connected with the upper end  
 30 of said plunger and with said link, a spring for normally pressing said hand-lever and said plunger upward, a pointed cylindrical needle engaging in the bore of said plunger and provided with two opposite inclined cut faces to

form two shoulders above the point, also with 35  
 two grooves in the two cut faces and in the two shoulders, a vertical hole in said anvil in the center line of said pointed cylindrical needle, two benders on the top face of said  
 40 anvil and adapted to engage with their upwardly-bent points in the two grooves of said pointed cylindrical needle, a table of sheet metal above said two benders at a distance approximately equal to the thickness of a staple-leg and having a slot, which  
 45 reaches from the center line of said vertical hole to an edge, an arm on said plunger, a lever mounted to turn between said two parallel vertical plates and adapted to be acted upon by said arm, a pawl on said lever and  
 50 adapted to engage in the central hole of either staple-head, and a spring pressing said pawl with said lever toward the center line of said plunger, said pointed cylindrical needle being  
 55 adapted to engage through the head-hole and between the legs of the respective staple and to pierce the materials to be bound, while the legs of the staple are supported by the needle-shoulders, and said plunger being adapted to  
 60 detach the staple-head from the remaining staple-heads and to force same downward.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LEO KOPPEL.

Witnesses:

BESSIE F. DUNLAP,  
 LOUIS VANDORY.