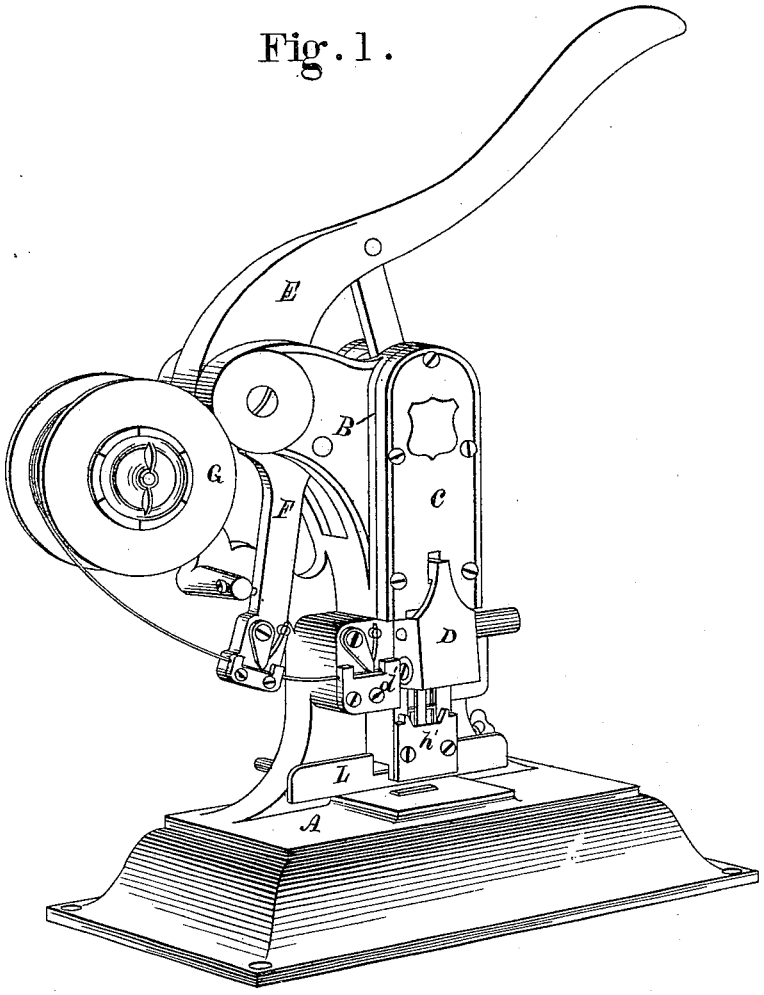
(No Model.) 3 Sheets—Sheet 1.

W. L. COOK & S. E. MOWER

BOOK STAPLING MACHINE.

No. 263,391. Patented Aug. 29, 1882.

Fig. 1.



WITNESSES:

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

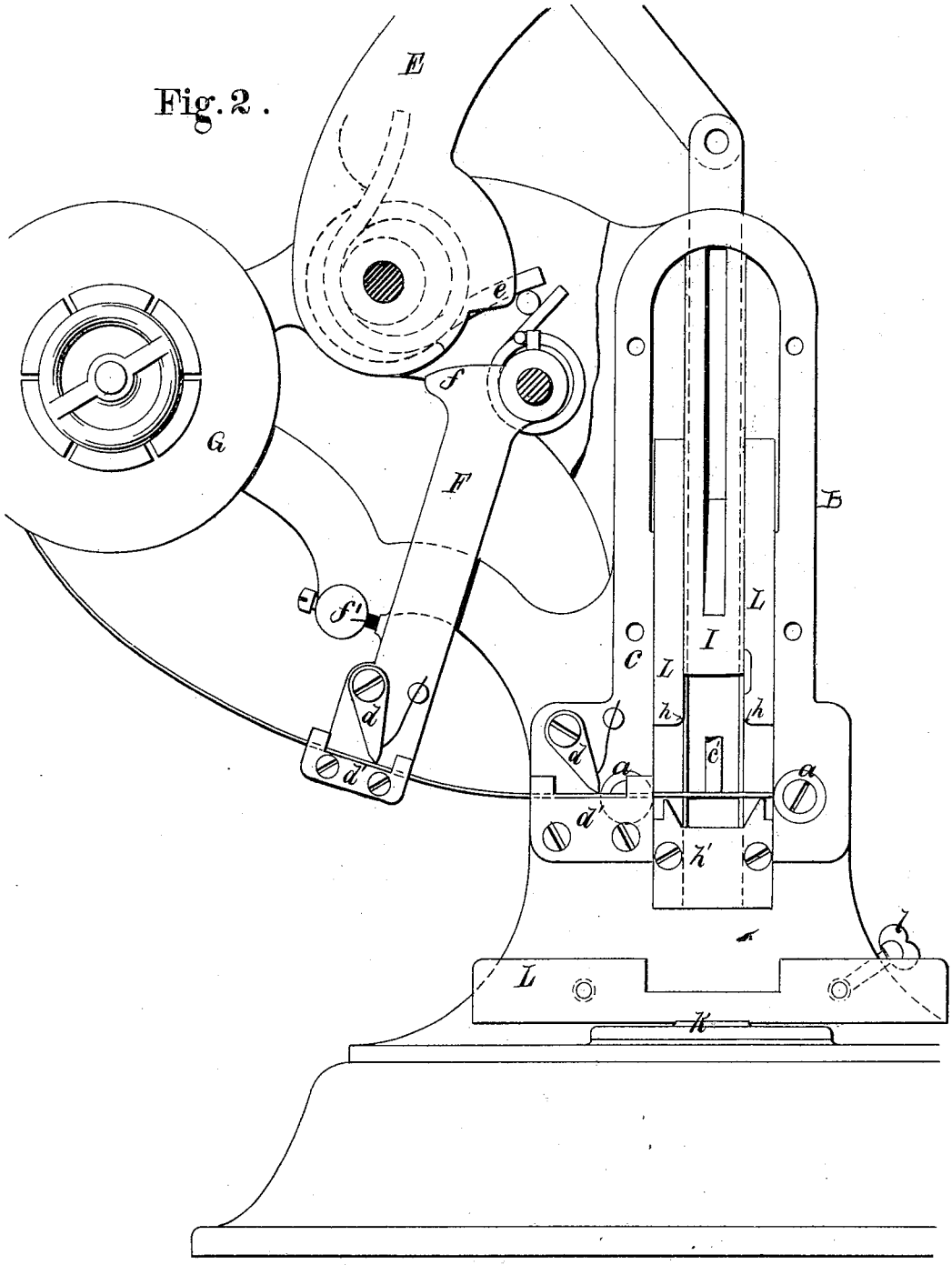

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Fig. 4.

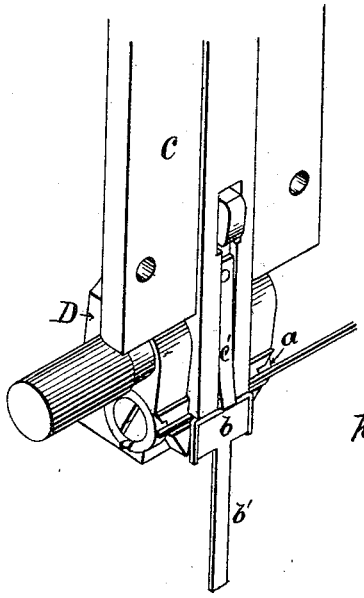


Fig. 5.

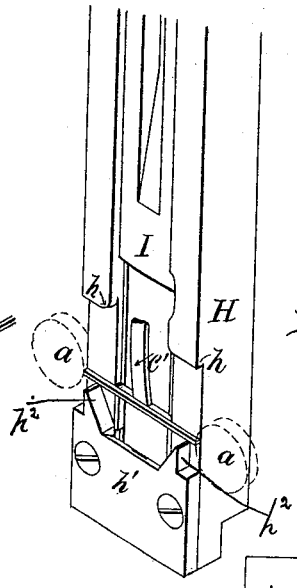


Fig. 3.

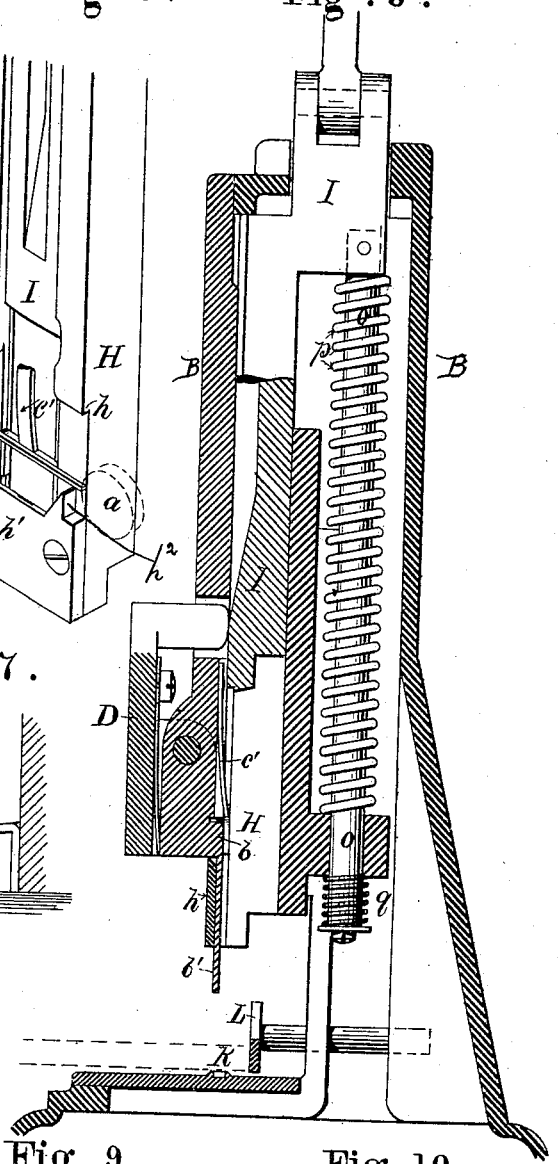


Fig. 7.

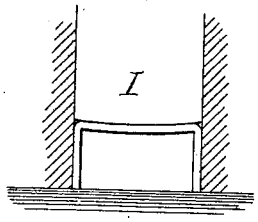


Fig. 6

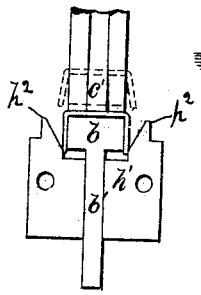


Fig. 8.

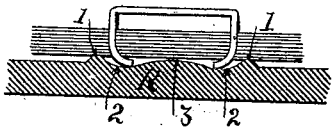


Fig. 9

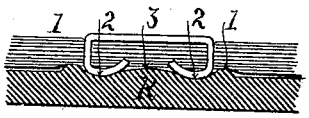
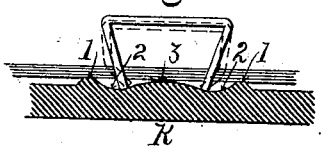


Fig. 10.



WITNESSES:

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INVENTORS.

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by Joseph A Miller atty

UNITED STATES PATENT OFFICE.

WILLIAM L. COOP, OF PROVIDENCE, RHODE ISLAND, AND SAMUEL E. MOWER, OF MILFORD, CONNECTICUT, ASSIGNORS TO HENRY G. THOMPSON & SON, OF NEW HAVEN, CONNECTICUT.

BOOK-STAPLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 263,391, dated August 29, 1882.

Application filed June 17, 1881. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM L. COOP, of the city and county of Providence, and State of Rhode Island, and SAMUEL E. MOWER, of Milford, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Machines for Binding Books with Wire Staples; and we hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and to the letters of reference marked thereon.

Corresponding letters of reference indicate corresponding parts in all the drawings.

This invention has reference to improvements in machines used for securing paper pamphlets or books together by means of wire staples made from a coil of wire and driven by the machine.

The invention consists in the novel construction of the various parts, as will be more fully set forth hereinafter, and pointed out in the claims.

Figure 1 is a perspective view of the improved machine, showing the wire in position. Fig. 2 is a front view, showing a full-size machine, parts of the frame and the front plate being removed so as to show the operating parts more fully. Fig. 3 is a vertical sectional view, showing most of the parts in their relative positions when the actuating-lever is raised to its highest point. Fig. 4 is a perspective view of the lower part of the front cover, showing the wire-cutting lever provided with circular cutters and the anvil over which the staple is bent. Fig. 5 is a perspective view of the presser and staple-bender, showing the cut length of wire placed ready for bending and a bent staple placed ready to be driven by the descending driver. Fig. 6 is a view of the anvil-plate and a fixed plate provided with beveled horns or guides by which the arms of the staple are held so as to enter the groove under the driver, as is shown in Fig. 5. Fig. 7 is a view of the end of the driver, showing the convex end thereof bearing on the center of the staple, and thereby holding the ends of the staple against the sides of the driving-groove. Figs. 8, 9, and 10 are sectional views of the clinching-plate, showing the staples in contact with the same, Fig. 10 representing the staple turned inward until the ends are at or nearly at right angle to the curved surface of the plate, when by the exertion of additional pressure the staple is bent, as is shown in broken lines. Fig. 8 represents the effect of the plate on the staple after it is so bent, and Fig. 9 shows the ends of the staple driven into the material and the staple firmly clinched.

In the drawings, A represents the base or table on which the paper or other material to be secured together is placed.

B is a hollow standard, to which and within which the various parts of the machine are secured.

c is the front plate, constructed so as to be readily removed to give access to the interior parts.

D is the wire-cutter hinged to the plate *c* on a pin provided with a thumb-piece, so that it can be readily withdrawn and the cutter removed.

E is the actuating-lever, by the vertical pivotal movement of which all the various parts of the machine are operated, so that at each downward motion a length of wire is delivered, a staple formed, and a staple driven, while at each upward motion a length of wire is cut.

F is the feed-lever by which the wire is fed, and G is the spool containing the wire from which the staples are formed.

H is the staple former and presser.

I is the driver provided with a beveled cam, against which a projecting arm of the hinged cutter D bears, so that in ascending the driver forces the upper end of the cutter outward and the lower inward to cut the wire, while in descending the opposite motion is performed, and the wire is free to enter the groove of the cutter to be cut on the next ascent of the driver.

K is the clinching-plate.

Referring now more particularly to the de-

tails of the machine, reference is made to Figs. 2, 4, and 5, in which the circular steel cutters *a a* are shown. They consist of short cylinders of steel, held in place each by a screw, the cylindrical cutters on the cutter-plate D having their axes at right angles to the cutters on the face of the machine. Each cutter can be turned on its axis when the cutting-edge becomes worn and a new cutting-edge presented, so that the one set of cutters will last an indefinite length of time. In a machine, as the present, which is intended for use in offices, and not under the care of a mechanic, the use of these cutters is an important improvement on this class of machines. The cylindrical cutters are ground to a true face on both ends, and when in time the whole of one circular end has been worn the other face can be presented and used around the whole circle of this end.

b is the anvil over which the wire staple is bent by the projecting sides *h h* of the presser H. The anvil *b* forms part of the front plate, *c*, and is provided with the extension *b'*, which forms a guide for the staple, and holds the staple under the driver until it has entered the material to be bound together.

c' is a spring secured in the front plate, *c*, the lower end of which spring bears upon the formed staple and holds the same until the driver in its descent compresses the spring *c'* and forces the staple downward to drive the same.

To the lower end of the presser H the plate *h'* is secured, and this plate is provided with beveled horns or guides h^2. The inner face of this plate *h'* is slotted, so as to receive the anvil *b* and form a bearing for the extension *b'*, as is shown in Fig. 6. Considering, now, that the presser H has in descending bent a staple over the anvil *b*, which staple is held by the spring *c'*, as is shown in Figs. 4, 5, and 6, then as the presser ascends the horns or guides h^2 of the plate *h'* will come in contact with the ends of the staple, and will force these ends against the anvil *b*. The driver I now ascends independent of the presser, and a new piece of wire is cut, the cutter pushing the first staple into the groove under the driver by which it is driven.

In machines as previously constructed the staple would not readily enter under the driver and would become cramped, so that the operation of the machine stopped, and the staple was obliged to be removed, causing loss of time and annoyance to such an extent that such machines were not adapted for practical general use.

To feed the wire to the machine automatically, we provide the actuating-lever E with the cam *e* and the feed-arm F with the cam *f*, and provide both of these with springs, by which they are returned to their points of rest after they have been operated. When, now, the actuating-lever E is moved downward the cam comes in contact with the cam *f* and moves the end of the arm F toward the cutters, and when the actuating-lever is raised the arm F returns to its place of rest against the adjustable stop *f'*, formed by a threaded screw, which can be turned and made to project more or less, so as to regulate the length of wire to be fed to the cutters.

To simplify the construction of the machine, and facilitate the adjustment of the wire in the machine, we provide the lower part of the arm F and the frame *c* with the hinged pawls *d*, and hold the same with a spring against the plate *d'*, so that the wire will be firmly held in one direction and free to pass between the pawl and plate in the opposite direction. The ends of the plate *d'* are slotted, so as to guide the wire and retain the same under the pawl.

The clinch-plate K forms part of the table A, on which the material to be secured together rests, and its peculiar configuration produces novel and valuable effects on the staple. It consists in a raised rim or edge, 1, forming a parallelogram of a length, as shown in connection with the staples in Figs. 8, 9, and 10, and of a width, as shown in Fig. 3, of practically a depth equal to the thickness of the staple, thus forming a groove with a raised edge on which the sheets of paper are compressed by the follower on the edge 11, and the staple is driven through this tightly-compressed paper or other material, striking first the concaves 2 2, on which the ends slide toward the convex center 3, until the ends of the staple are at or nearly at right angles with the surface of the plate, when the wire will bend, as is shown in broken lines in Fig. 10. The bent ends now follow the curved surface, as is shown in Fig. 8, and will enter the material, as is shown in Fig. 9, firmly clinching the staple and securing the sheets together; or the convex surface may be omitted, if the ends are not to enter the material. It must be remembered that during the driving of the staple the material is firmly compressed on all sides around the staple between the end of the presser and the raised edge 1.

L is an adjustable guide, against which the material to be bound together is held. The guide can be adjusted readily by drawing the same in or out, and can be quickly secured by means of the clamp-screw *l*.

The driver I is connected by means of a link, as shown in Fig. 2, with the actuating-lever E, thereby giving a positive motion to the driver, which is followed up until the staple is driven home and clinched. The presser is not directly connected, but has a yielding connection consisting of the rod *o*, around which the spring *p* is coiled. The rod *o* passes through a bracket on the rear of the presser, and the strain of the spring *p* is partially resisted by the coiled spring *q* on the lower end of the rod *o*, which also acts as a cushion against the presser when the actuating-lever is raised, causing the horns of the plate *h'* to bend the legs of the staple close to the anvil *b* and hold

the presser in position while the cutter forces the staple into the groove to be driven. The presser can thus adjust itself to the thickness of the material independent of the driver, which can be forced down to complete the driving and clinching, and the stored-up force of the spring *p* will assist the raising of the actuating-lever.

This machine is designed for hand use in offices, and for such purposes as it is adapted. It can be conveniently used by any one, and is not liable to get out of order.

We do not claim to be the first and joint inventors of the combination of a spool of wire and an automatic wire-feeding device, a wire-cutter, a staple-former, a presser connected with the driver by a yielding connection, a clinching-plate, and a single operating-lever, all connected and arranged so that one upward and downward movement of the single operating-lever will communicate the necessary movements to the other parts for feeding the wire, cutting the same, forming, inserting, and clinching a staple, as this is the sole invention of William L. Coop.

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

1. The combination, with the presser and the driver, of the clinching-plate K, consisting of the raised edge 1, the concaves 2 2, and the convex surface 3, constructed to bend the ends of the staple inward, as and for the purpose described.

2. The combination, with the presser provided with the shoulders *h h* and the driver, of the anvil *b*, provided with the downward projection *b'*, depending in front of the presser, substantially as described.

3. The combination, with the presser H and anvil *b*, of the plate *h'*, attached to the front of the lower end of the presser, and provided with the horns h^2, arranged to press the ends of the staple closely upon the sides of the anvil as the presser ascends, substantially as described, and for the purpose set forth.

4. In a machine for binding books with wire staples, the combination, with the wire-cutter and staple-former, of the anvil and the spring *c'*, constructed to hold the staple until it is released by the driver, as described.

5. In a machine for binding books with wire staples, the combination, with the presser, of a driver, the end of which is formed with a convex surface to bear against the staple near the center, as described.

6. The combination, with the actuating-lever E, the driver I, operated directly, and the presser H, connected by means of the rod *o* and spring *p*, of the spring *q*, constructed to counteract the force of the spring *p* and cushion the presser, as described.

In witness whereof we have hereunto set our hands.

WILLIAM L. COOP.
SAMUEL E. MOWER.

Witnesses for Coop:
J. A. MILLER, Jr.,
JOSEPH C. BOMS.
Witnesses for Mower:
HENRY G. THOMPSON,
H. GRANT THOMPSON.