

J. E. Coffin.
Book-binding Mach.

N^o 24,425. Patented Jun. 14, 1859.

Fig. 1.

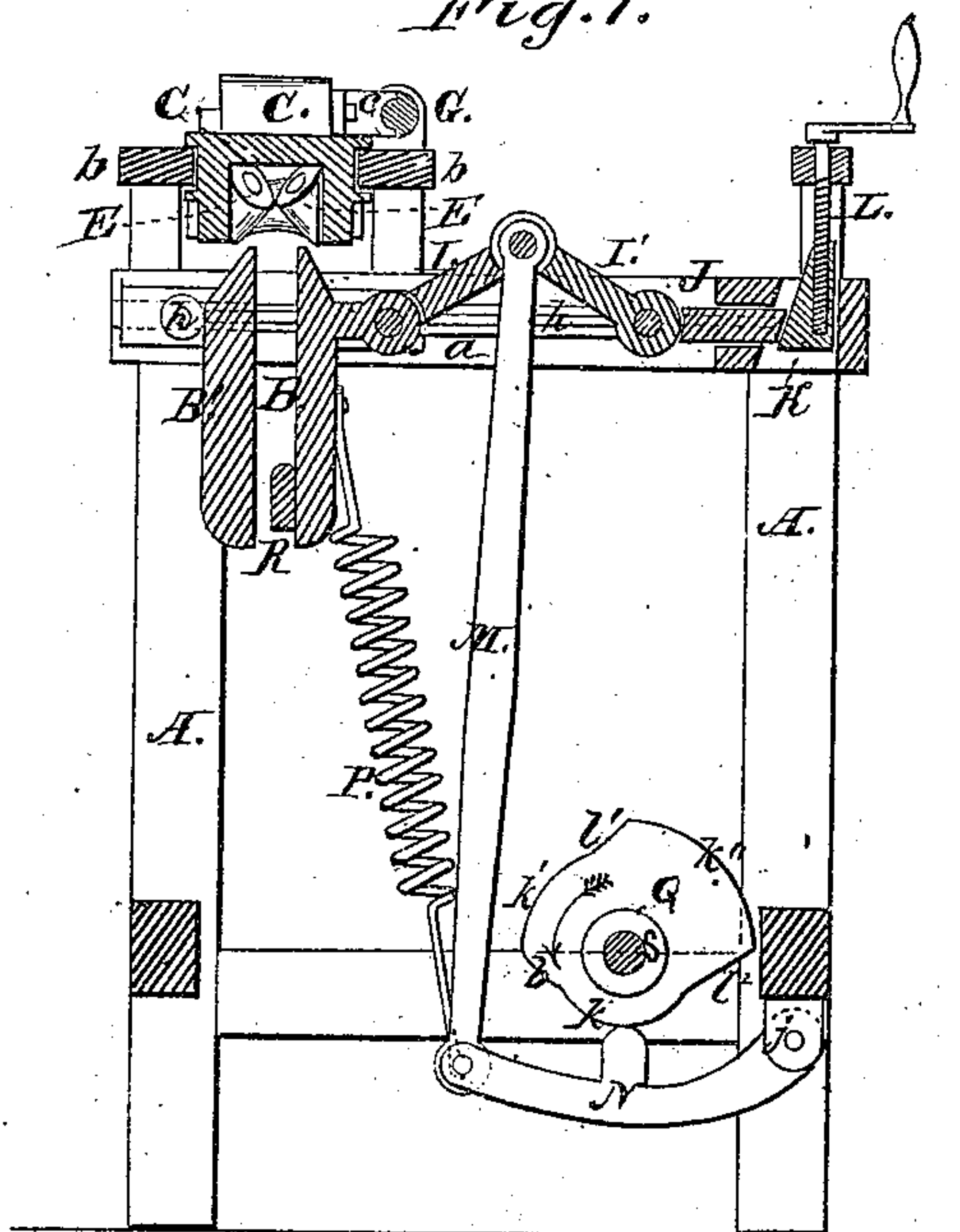


Fig. 3. Fig. 4. Fig. 5.

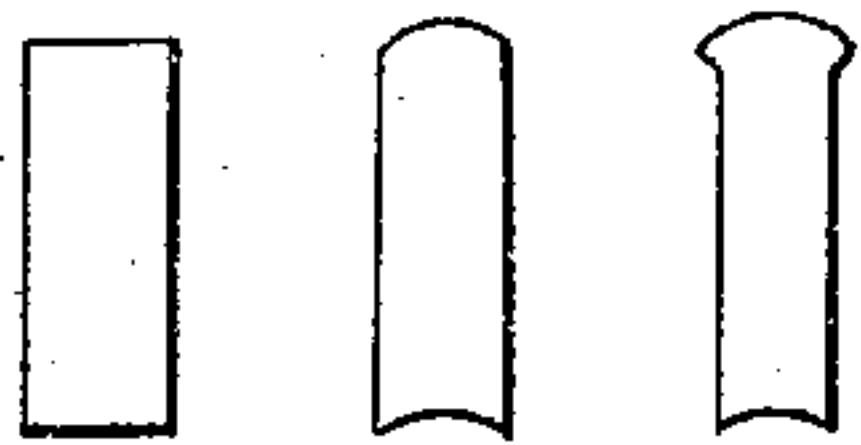
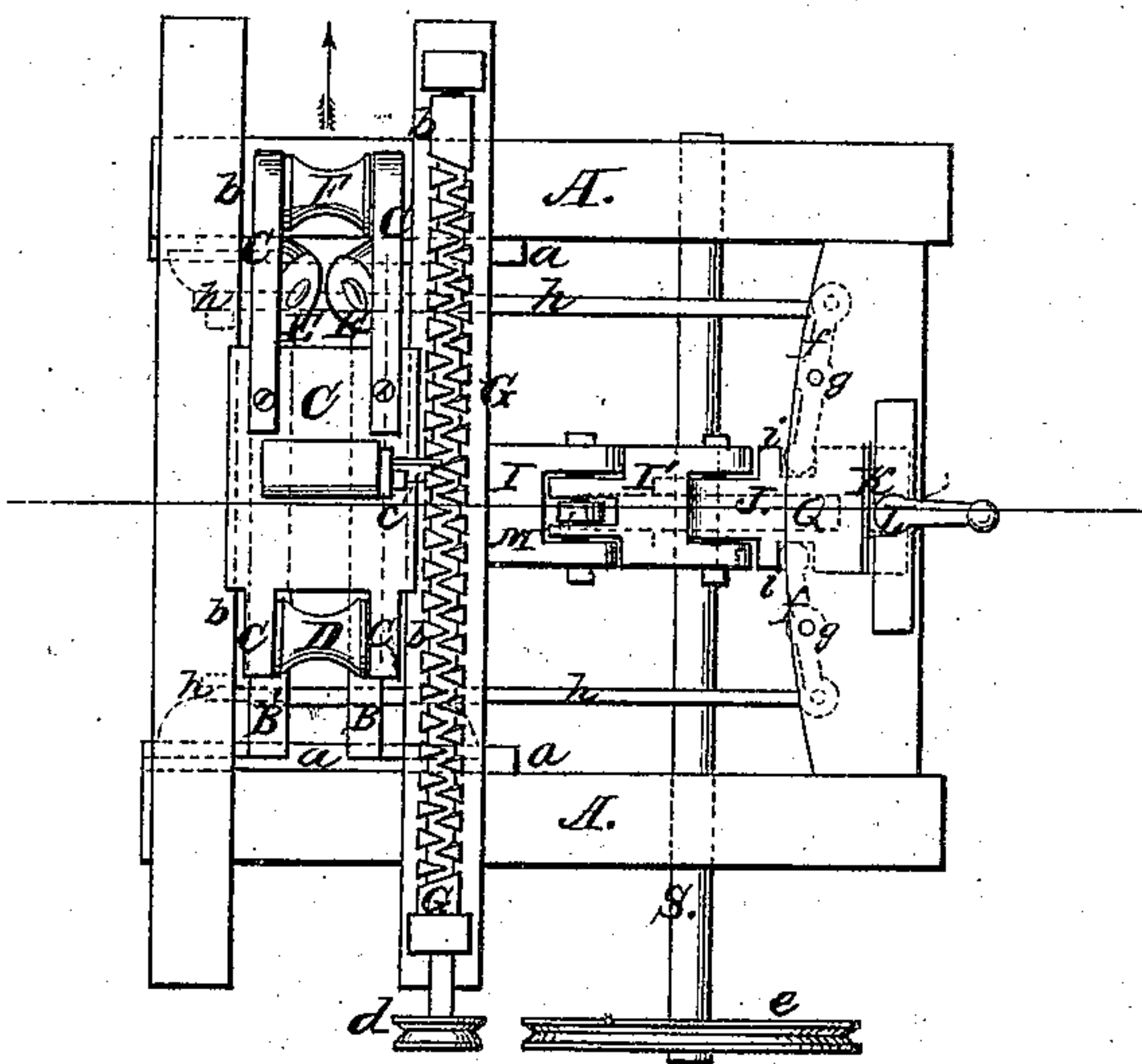


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN E. COFFIN, OF PORTLAND, MAINE, ASSIGNOR TO A. F. GERRISH, OF SAME PLACE.

MACHINE FOR SHAPING THE BACKS OF BOOKS.

Specification of Letters Patent No. 24,425, dated June 14, 1859.

To all whom it may concern:

Be it known that I, JOHN E. COFFIN, of Portland, in the county of Cumberland and State of Maine, have invented a new and Improved Machine for Shaping the Backs of Books; and I do 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, in which—

Figure 1 is a vertical section of a machine with my improvements. Fig. 2 is a plan of the same. Figs. 3, 4 and 5 exhibit the form of the transverse sections of the book before, during, and after the backing operation.

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

My invention consists in a novel arrangement of a pair of clamping jaws, and a roller carriage for the purpose of holding the book and shaping its back; and it further consists in so combining the mechanism which operates the jaws, and that which operates the roller carriage as to make a machine for shaping the backs of books that is perfectly automatic in its operation.

To enable others to make and use my invention I will proceed to describe its construction and operation.

A is the frame of the machine, furnished with stationary horizontal ways *a, a*, to which are fitted the pair of sliding clamping jaws *B, B'*, in which the book is held, and with other stationary horizontal ways *b, b*, arranged some distance above and at right angles to *a, a*, to receive the sliding carriage *C*, which contains the rollers *D, E, E* and *F*, for rounding the backs of the books.

The rollers *D*, and *F*, are arranged with their axes horizontal and parallel with each other, and at right angles to the ways *b, b*, on which the carriage *C*, travels; and their journals are fitted to bearings in the carriage *C*, one of said rollers being at one end of the carriage, and the other at the other end, and the distance between them being some distance greater than the length of the longest book the machine is required to operate upon. The longitudinal profile of the roller *F*, is of a concave form corresponding with the intended transverse curve of the finished back. The longitudinal profile of *D*, is also concave but may be of a less abrupt curve than that of *F*. The rollers *E, E*, may be cylindrical, or very slightly concave and are arranged opposite each other

with their axes inclined in opposite directions from the same point in a vertical plane passing longitudinally through the carriage midway between the ends of the rollers *D, F*.

The roller carriage *C*, is furnished with a swivel tooth *c*, gearing with a right and left hand cross threaded screw *G*, which is arranged parallel with the ways *b, b*, in bearings on the top of the said ways, and which carries a small pulley *d*, over which there runs a band from a pulley *e*, on the main shaft *S*, of the machine, said band serving to drive the screw and cause a slow reciprocating movement of the carriage on the ways *b, b*, while the shaft *S*, is in motion.

The clamping jaws *B, B'*, are connected together by a toggle *I, I'*, one link *I*, of which is connected directly with the back of the jaw *B*, and the other *I'* is connected with a block *J*, which is fitted to slide horizontally in and out of a cavity in the back of the frame and which has notches *i, i*, in its sides to receive the ends of two levers *f, f*, which are arranged to work horizontally on fixed fulcrum pins *g, g*, secured in the frame *A*, and which are connected by rods *h, h*, with the jaw *B'*. The jaw *B*, has attached to the lower part of its face a block *R* to support the book and this block may be made capable of adjustment higher or lower to suit books of different widths.

K, is a vertical wedge fitted into the back part of the framing to form a bearing for the block *J*, and combined with a screw *L*, which is so applied as to serve the purpose of raising and lowering it.

M is a rod connecting the joint of the toggle *I, I'*, with a lever *N*, which works below the main shaft *S*, on a fulcrum pin *j*.

P is a spring connecting the lever *N*, with the jaw *B*, and always exerting a tendency to lift the said lever and the rod *M*, and so to bend the toggle and open the jaws *B, B'*.

Q is a peripheral cam fast on the shaft *S*, and situate directly over the lever *N*. This cam is composed of three concentric arcs *k, k', k''*, united by steps *l, l', l''*.

The machine may be used both for rounding the backs of books before applying the covers, and for finishing the backs after binding. Before inserting the book to be rounded, the smaller arc *k*, of the cam must be opposite to the lever *N*, when the jaws *B, B'*, will be open, and the roller carriage must be moved in the direction shown in Fig. 2, far enough to leave the clamping

jaws uncovered. On the book being dropped in between the jaws, and the shaft S being set in motion, the jaws are caused to close upon and clamp it by the action of the step 5 7, of the cam on the lever N, and consequent action of the said lever on the toggle. As the jaws close the roller carriage commences to move in the opposite direction to that indicated by the arrow in Fig. 2, and the roller 10 D, passing over the back gives it a preparatory rounding, changing it from the form shown in Fig. 3, to that shown in Fig. 4. After the roller D, has passed entirely over the book, the step 7' of the cam comes into 15 operation and forces the clamps tighter together, and after this, as the carriage C, continues its motion in the same direction the rollers E, E, come into operation to press down the corners of the back and these are 20 followed by the roller F, which completes the rounding and leaves the book in the form shown in Fig. 5. The return of the carriage produced by the change of the tooth c, from one thread to the other of the screw G, as it 25 arrives at the end of the threads, is followed by the opening of the jaws B, B', to liberate the book, such opening being produced by the spring P, on the arrival of the step 7² in contact with the lever N. The hook is 30 taken out from, and a new one placed between the clamps while the carriage is moving back in the direction of the arrow shown in Fig. 2, and the operation of the machine may be perfectly continuous, every revolution of the cam Q effecting the operation of 35 rounding or finishing the back of a book.

The jaws are adjusted for books of different thicknesses by raising or lowering the wedge K, which constitutes the bearing of the toggle block J. By raising the wedge 40 the jaws are made to close nearer together and vice versa. The connection of the back jaw B', with the toggle block J causes the wedge to adjust both jaws at once, and to the same extent and hence to bring the center of 45 the book always under the middle of the rollers when the jaws are closed.

I do not claim broadly the rounding and backing of books by means of concave rollers passed over the back in a longitudinal direction; but 50

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

1. The arrangement of the sliding holding jaws and the reciprocating roller carriage, 55 substantially as herein described.

2. Combining the toggle mechanism which operates the clamping jaws and the screw which operates the roller carriage with a cam and pulley, or its equivalent on the same 60 shaft in such manner as to make a machine for shaping the backs of books, which is perfectly continuous and automatic in its operation, and to and from which the books only require to be introduced and removed by the 65 attendant at the proper stage in its operation, substantially as herein described.

JOHN E. COFFIN.

Witnesses:

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WM. C. BROWN.