

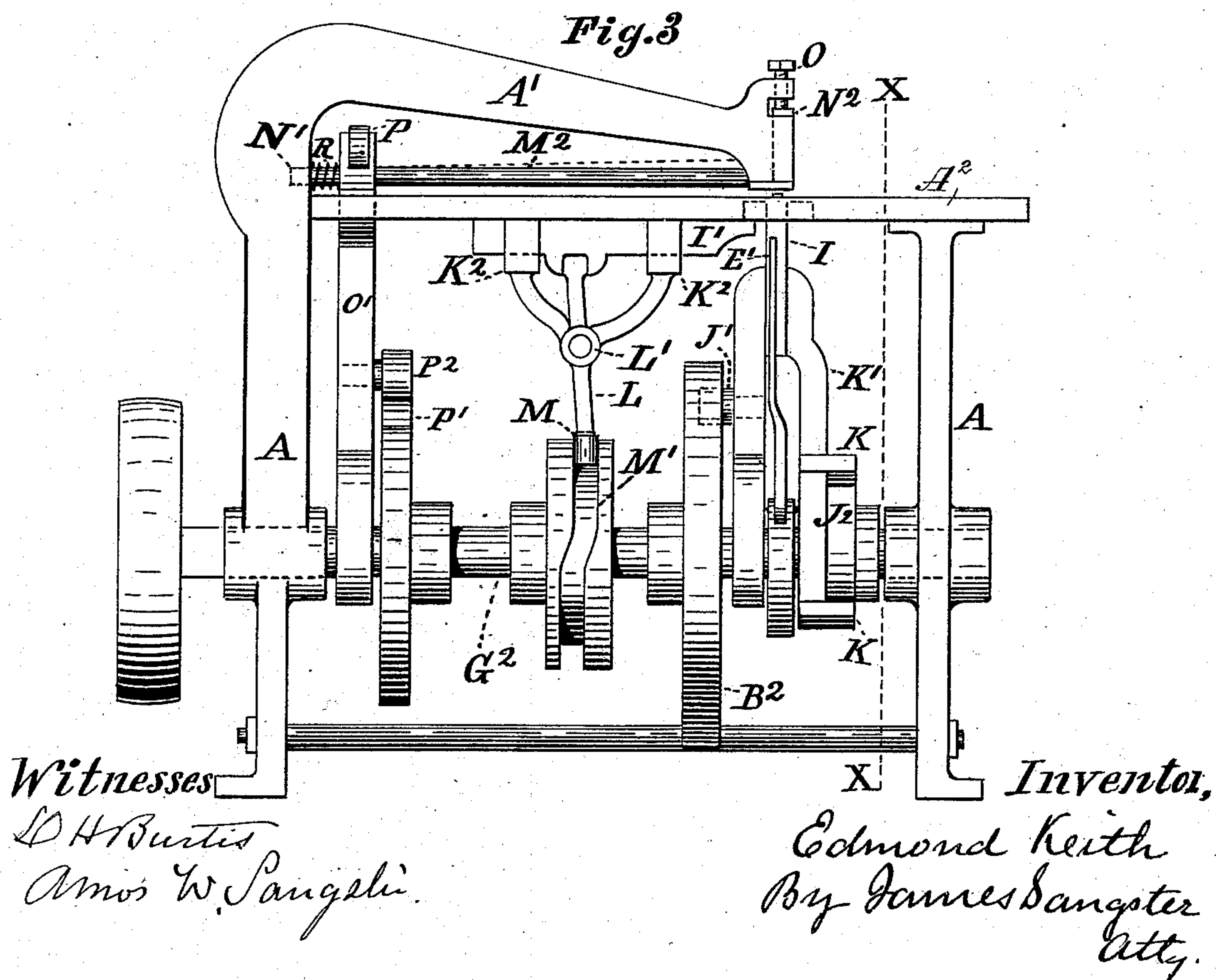
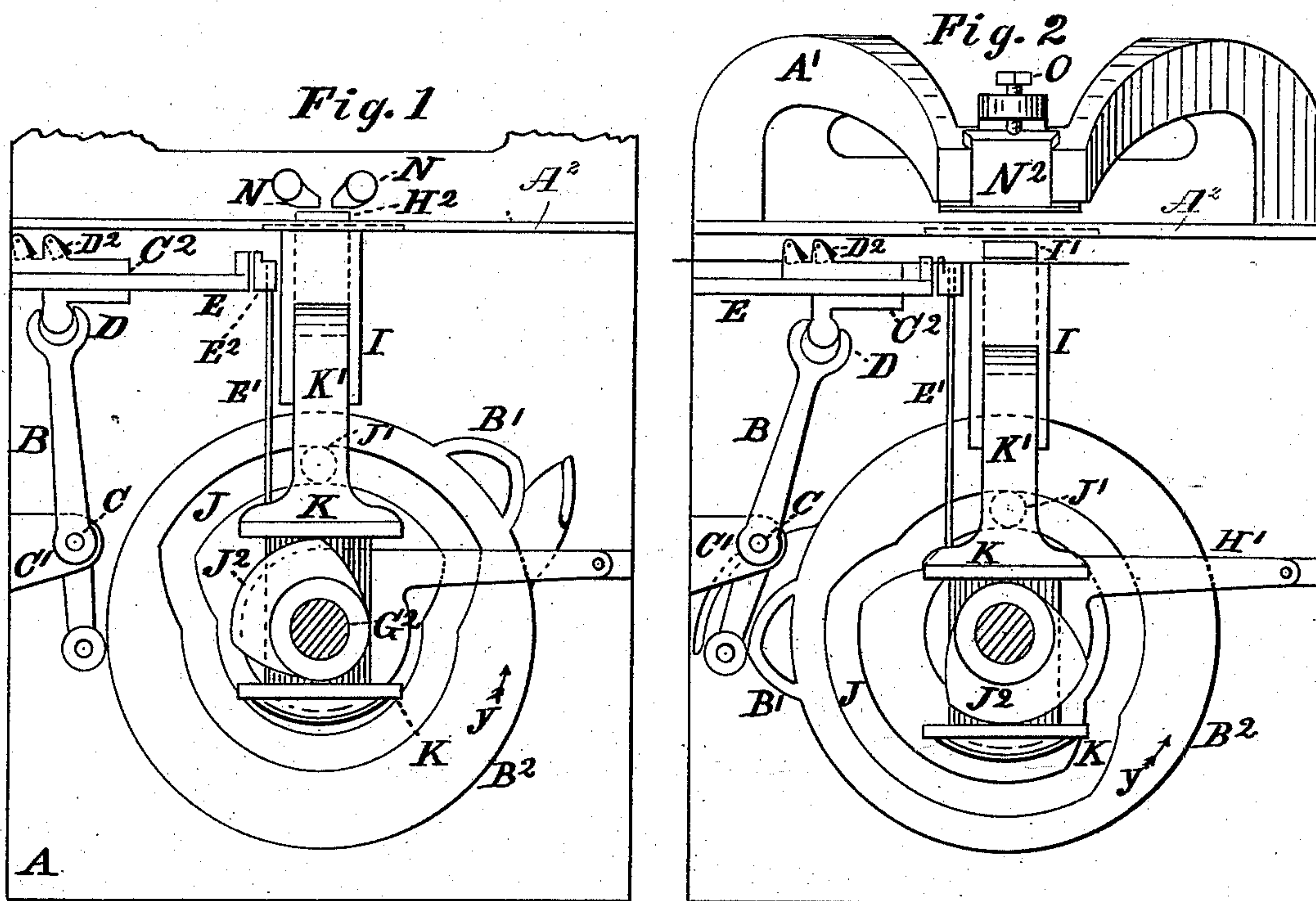
(No Model.)

3 Sheets—Sheet 1.

E. KEITH.
Book Stitching Machine.

No. 237,291.

Patented Feb. 1, 1881.



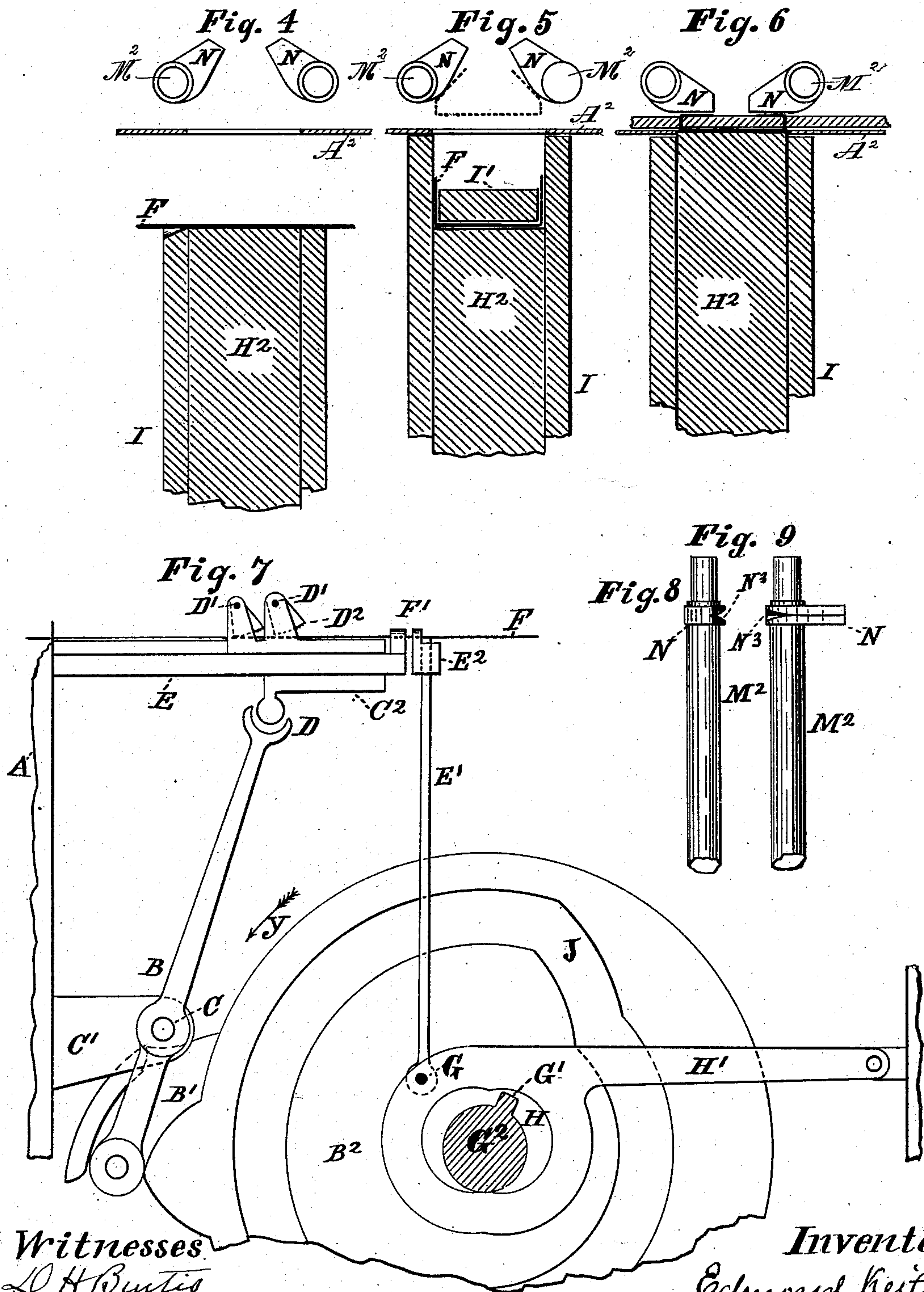
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Witnesses
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Amos W. Pangster.

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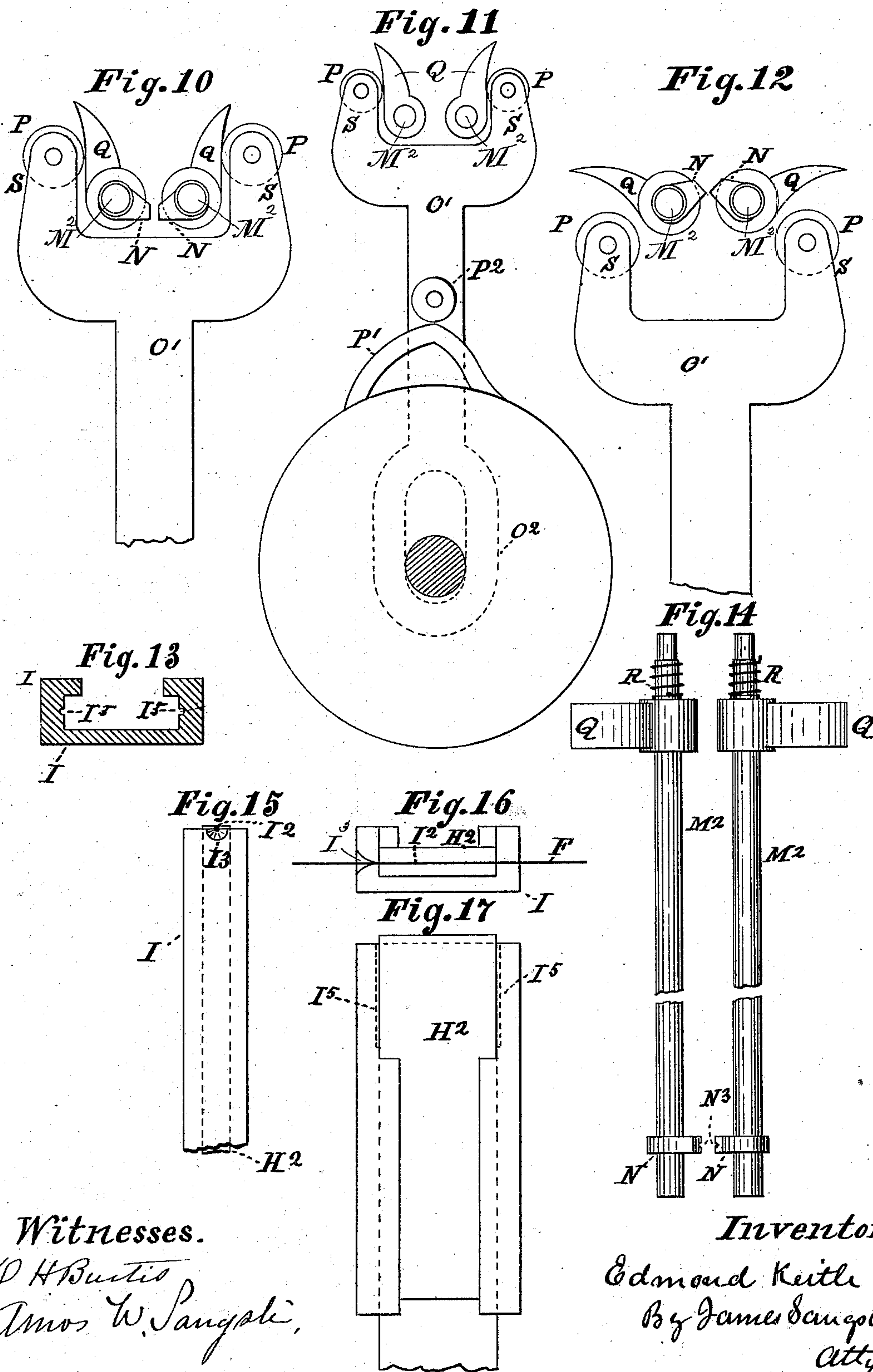
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UNITED STATES PATENT OFFICE.

EDMOND KEITH, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO
EDWARD M. JEWETT, OF SAME PLACE.

BOOK-STITCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 237,291, dated February 1, 1881.

Application filed July 17, 1880. (No model.)

To all whom it may concern:

Be it known that I, EDMOND KEITH, a citizen of the United States; residing in Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Book-Stapling Machines, of which the following is a specification.

The object of my invention is to provide an efficient and simple means for connecting the leaves of books with wire staples, which are cut, formed, driven, and clinched automatically by the machine; and it consists in the combination of parts hereinafter described.

Figure 1 represents a section through line X X, Fig. 3, showing a front view of the machine and the position of the several parts when the wire-feeding device is at its starting-point, the top portion of the machine being broken away, so as to expose an end view of the staple-clinching device. Fig. 2 is also a section through line X X, Fig. 3, showing a front view and the position of the cams and other parts when the wire-feeding device is at the limit of its forward movement. Fig. 3 represents a side elevation of the machine. Fig. 4 is a vertical section through an enlarged portion of the staple-forming device, showing it in its lowest position, with a piece of wire cut to its proper length. It also shows an end view of the staple-clinching device and the position of the clinching-jaws before a staple is being formed. Fig. 5 is a similar view, showing the position of the parts when the former is in place above the wire and the staple formed. Fig. 6 represents a similar sectional view, showing the wire in its place in a portion of a book and clinched. Fig. 7 is a side elevation of the wire-feeding device, showing it at the limit of its forward movement, also the cam for giving it its proper movements and the cutting mechanism and cam for operating it. Fig. 8 is a portion of the clinching-jaw shaft, showing a top or end view of one of the clinching-jaws; and Fig. 9 is a similar view of said shaft, showing a face view of one of the clinching-jaws. Fig. 10 represents a front view of the clinching-jaws and a portion of the device for operating them, and showing the position of the clinching-jaws and their operating parts when

a staple is clinched. Fig. 11 is a similar view of the same, showing a front view of the device and cam on a smaller scale. Fig. 12 is a front view of the clinching-jaws and a portion of the device for operating them, showing the position of the parts when not in operation. Fig. 13 represents a top view of the wire-bending sleeve, showing a similar view of the two grooves on its inner sides. Fig. 14 is a top view of the staple-clinching shafts, cam-levers, and clinching-jaws. Fig. 15 represents a side elevation of a portion of the wire-bending sleeve and driving-bar. Fig. 16 is a top view of the same, and Fig. 17 a back view of said sleeve and driving-bar.

A is the frame of the machine, and A' the upper portion of the same, and between these two is the table A². It may be made in any well-known form for holding the parts together.

B represents the arm for operating the wire-feeder. It receives its movements forward and back from the cam B' on the periphery of the cam-wheel B². (See Figs. 1, 2, 3, and 7.) The arm B is pivoted at C to a supporting-piece, C', attached to the frame, and is connected to the feeding-carriage C² by means of the forked end D. (See Fig. 7, which is an enlarged view.) To the carriage C² is pivoted, at D', one, two, or more pawls, D², having their lower or under surfaces curved, as shown, and made rough, similar to a file. The carriage C² is arranged in any well-known way, so as to slide easily in a guideway, E. It will be now seen that as the wheel B² turns in the direction of the arrow Y (see Fig. 7) the feeding device will be moved back and forth by the cam B' on said wheel, and that in the backward movement the pawls D² will move easily over the wire without moving it, and that in the forward movement the pawls are so formed that they will gripe the wire and carry it forward the required distance.

E' represents the cutting-bar. It passes up into the cutting-die E², as shown in Fig. 7, the cutting-die being perforated, so that the wire F passes easily through it, and also through the vertical end F' of the guideway E. The lower end of the cutter is pivoted to the arm H' by a pin, G, and it receives its proper movements from the cam G' on the main shaft G²,

which cam operates within the opening H in the lever H', said lever being pivoted at its opposite end to some convenient part of the machine. Its operation will be readily understood. As the shaft revolves, carrying the cam G' with it, the top of the cutting-bar moves up and cuts the wire and then drops down again.

The staple-forming device is composed of the vertically-movable bar H², the sleeve I, and horizontally-movable former I'. The bar H² is provided with a narrow groove, I², on its top face, (see Figs. 15 and 16,) into which groove the wire lies when pushed forward by the feeder, as shown in Fig. 16. The opening I³ at the side of the sleeve I is made flaring, so as to guide the wire into said groove I² and make it sure to enter. The driving-bar H² receives its movements at the proper times by means of the grooved cam J in the face of the wheel B² and a friction-roller, J', (see Figs. 1, 2, and 3,) and the sleeve I receives its movements from the cam J², which works within the projecting parts K of the bar K', to which said sleeve is fastened by screws or bolts. The former I' is held to the top of the machine by supports K², and is moved horizontally back and forth by the arm L (which is pivoted to a support by a pin, L') and friction-roller M, which fits into the grooved cam M', as will be clearly understood by reference to Fig. 3.

The clinching device is composed of the two round bars or shafts M² and jaws N. They are fitted in bearings N' at the back of the machine and at the front in a vertically-sliding block, N², which block is made adjustable by means of a set-screw, O, so that the jaws N can be adjusted up or down to answer for books of different thicknesses, the back ends of M² being fitted sufficiently loose to admit of the front ends being moved the required distance, which is never more than one-half of an inch in either direction. Each jaw N is provided with a groove, N³, which is flaring at the starting-point, as shown, into which the ends of the staple pass and are kept in place. The jaws N receive the required movement for clinching the staple from a vertically-movable yoke-bar, O'. (See Figs. 3, 10, 11, and 12.) It is held to the main shaft, which passes through a slot in its lower end, as shown by dotted lines O², Fig. 11. Its upper end is formed so that two portions project up, as shown, and marked S, and are preferably provided with friction-rollers P, although it would operate without them, but not so well. The bar O' receives a vertical movement up and down at the proper times by means of the cam P', which cam is rigidly fastened to the main shaft and turns with it, operating against the

friction-roller P². To the bars M² are rigidly fastened the cam-levers Q. It will now be seen that when the bar O' is at the upper part of its movement the clinching-jaws will be in the proper position for clinching the staple, (see Figs. 6 and 10,) and when said bar is at the limit of its downward movement the clinching-jaws will be up out of the way, as shown in Fig. 12. On the two inner sides of the sleeve I are two grooves, I⁵. (See Fig. 13 and the dotted lines I⁵, Fig. 17.) Into these grooves the sides of the wire staple adjust themselves while being formed. The object of the grooves I⁵ is to hold and protect the staple from bending while it is being driven up through the paper or book. They are made so as to be in the same line with the groove I² in the bar H². After the clinching-jaws have received their forward movement for clinching, by the upward movement of the bar O', they are brought back to the starting-point by the springs R. (See Figs. 3 and 14.)

The operation of the invention is as follows: The roll of wire is connected with the machine in any well-known way, and the end is slipped in under the pawls D² and through the hole in the part F' of the slideway E, the feed being in the position shown in Fig. 1. The main shaft G² is now started in the direction of the arrow Y, and the wire is carried over the top of the bar H² in the groove I², as shown in Figs. 2 and 16, when it is cut off by the cutting-bar E'. The former I' is now moved forward over the cut piece of wire by the cam M', and the sleeve I moves up and forms the staple, as shown in Fig. 5. The former I' is now withdrawn and the driving-bar H² moves up and forces the staple up through the book or paper, after which it is clinched by the clinching-jaws, as shown in Fig. 6. The book is now removed and another put through the same operation.

As the jaws N N are above the table and supported by overhanging arms and the staple forming and driving devices below, there is nothing to interfere with the insertion of a staple at any desired point, which cannot be done when the staple forming and driving devices obstruct the top.

I claim as my invention—

A suitable staple-forming device, substantially as described, in combination with the shafts M², provided with the clinching-jaws N, cam-levers Q, springs R, bar O', and cam P', substantially as and for the purpose set forth.

E. KEITH.

Witnesses:

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