C. J. COLEMAN.

SEWING MACHINE.

APPLICATION FILED JUNE 17, 1911.

1,038,853.

Patented Sept. 17, 1912.

4 SHEETS—SHEET 1.

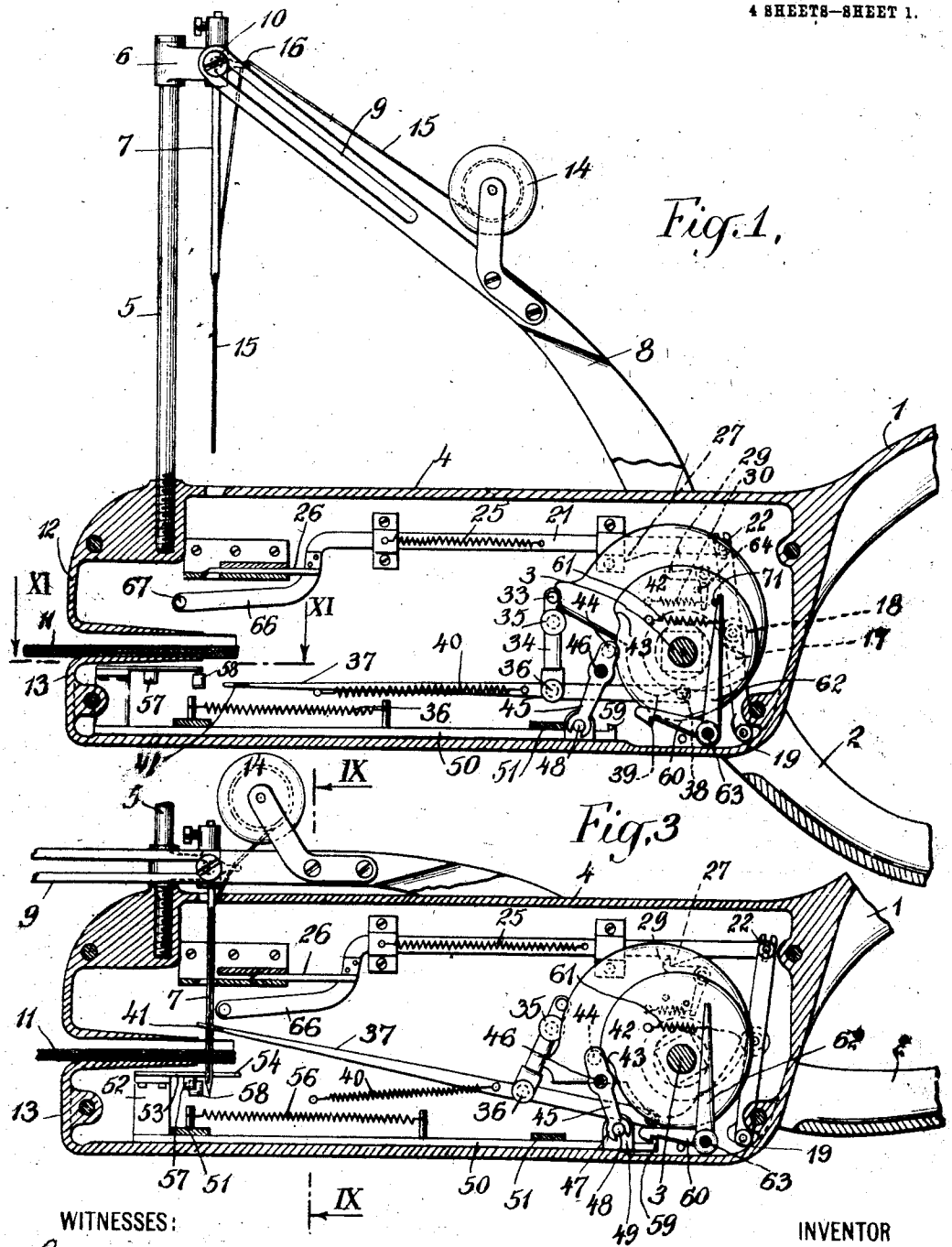

Fig. 1.

Fig. 3.

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4 SHEETS—SHEET 2.

Fig. 2,

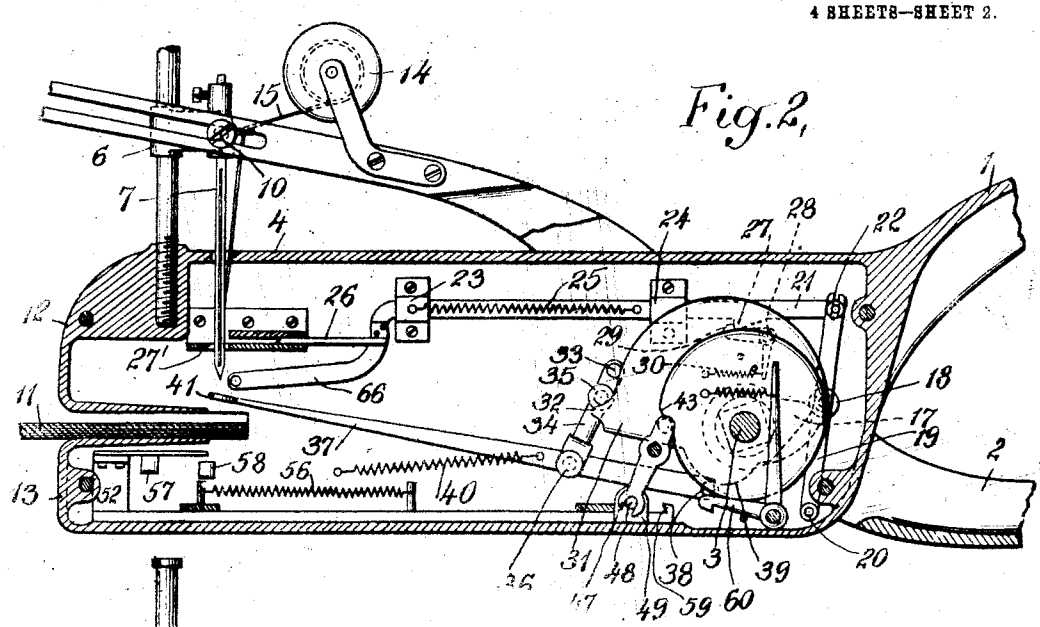

Fig. 5,

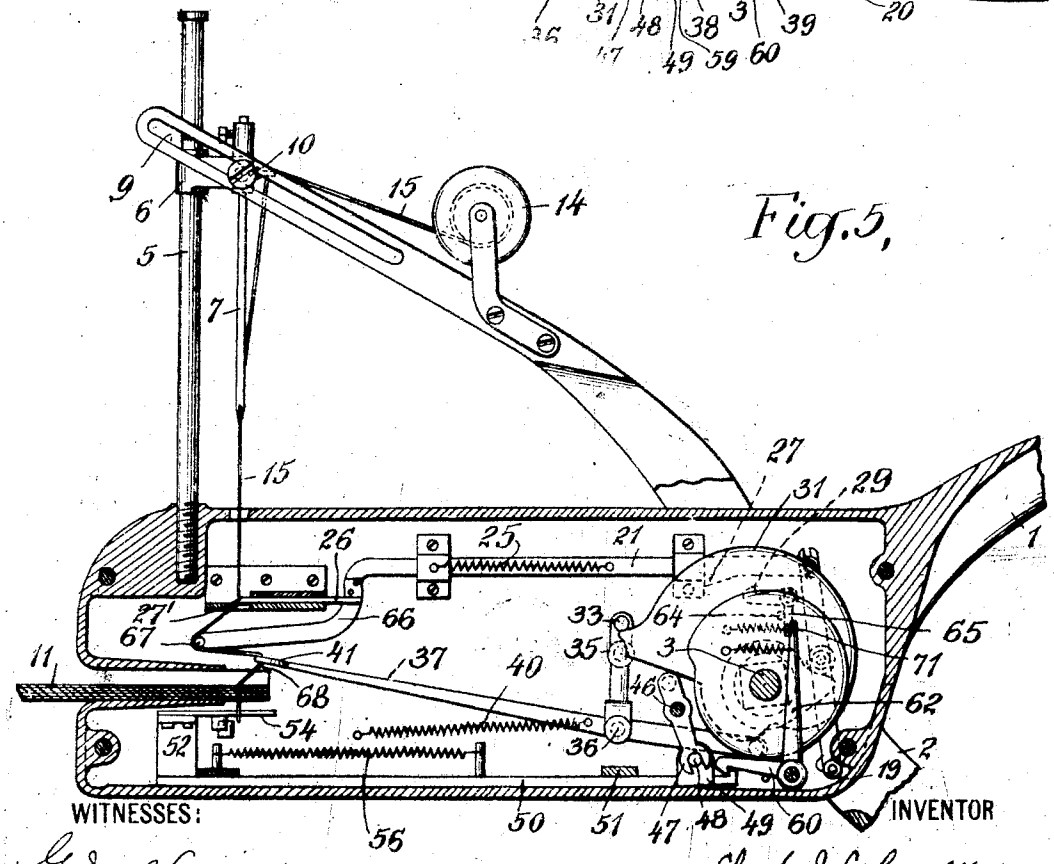

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Fig. 4,

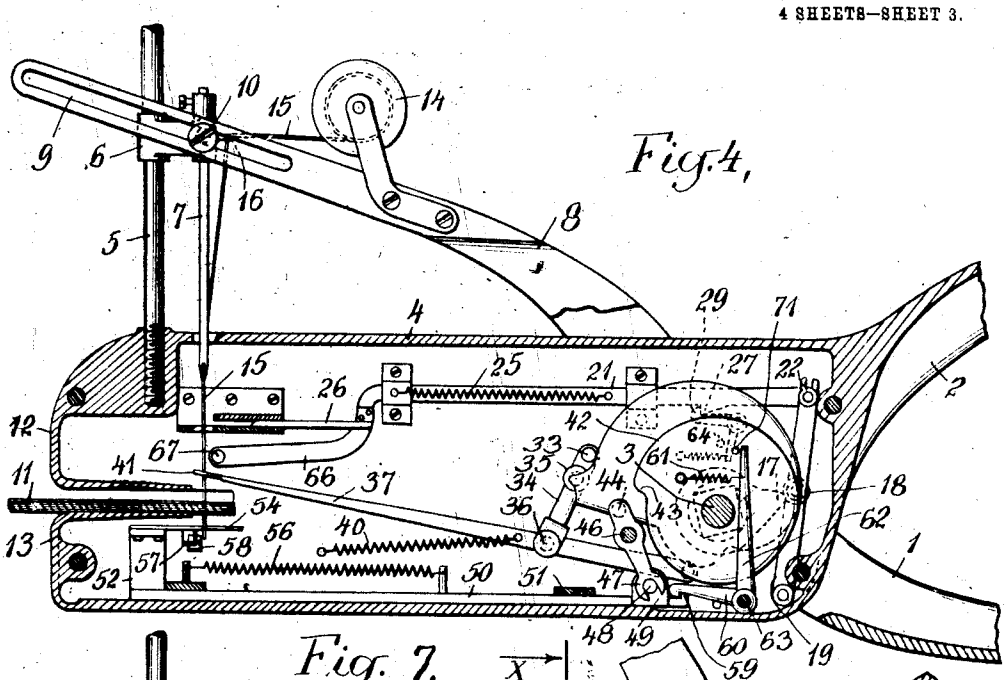


Fig. 7,

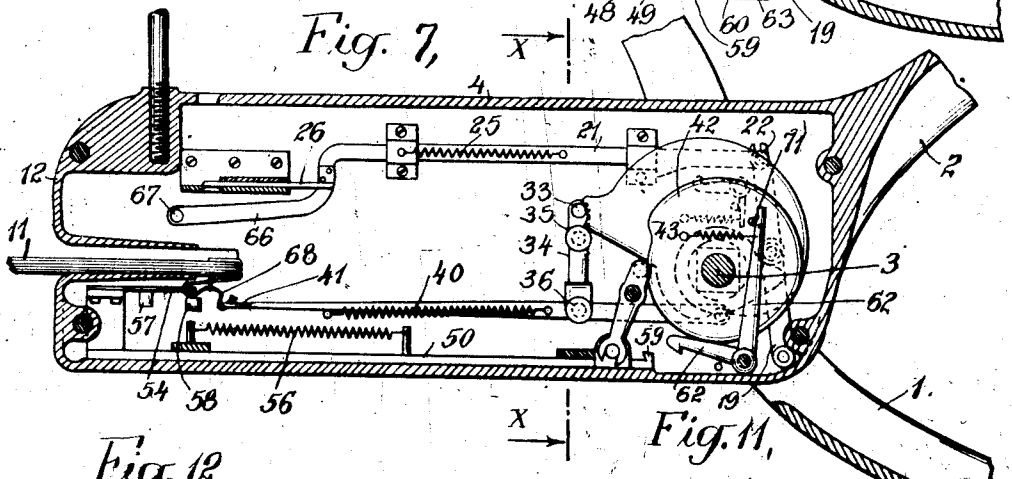


Fig. 11,

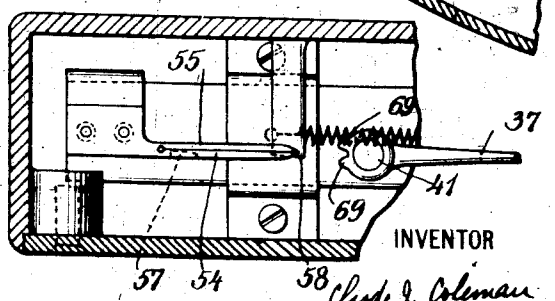
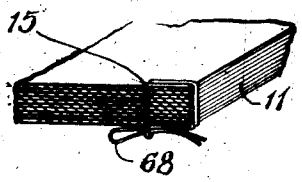


Fig. 12,



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4 SHEETS—SHEET 4.

Fig. 6,

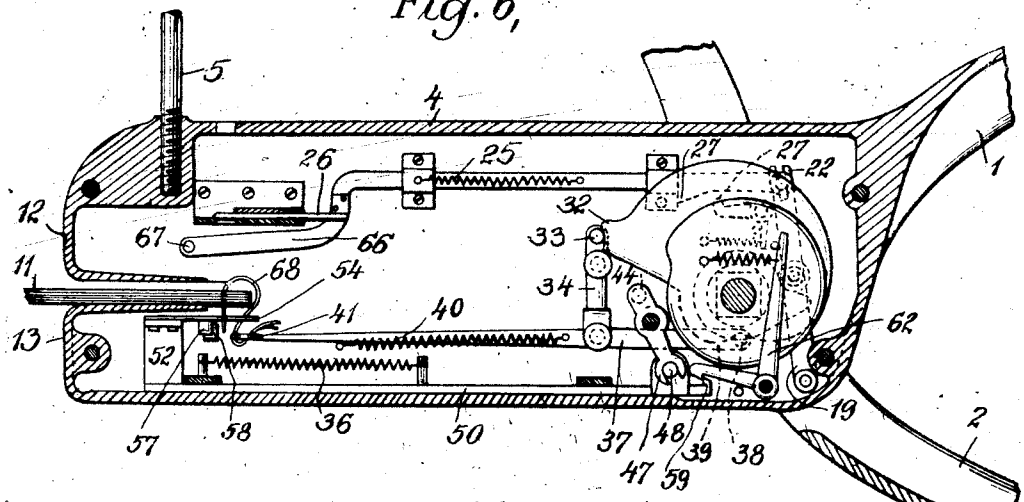


Fig. 8

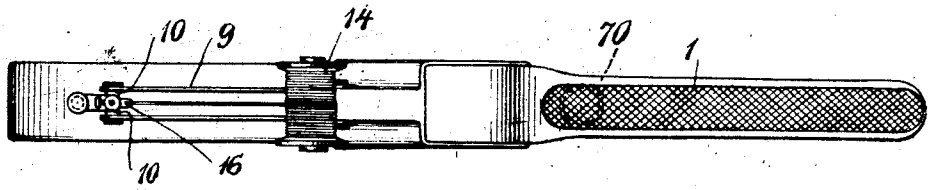


Fig. 9,

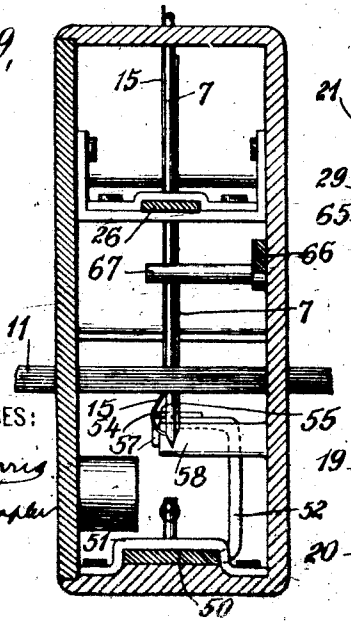
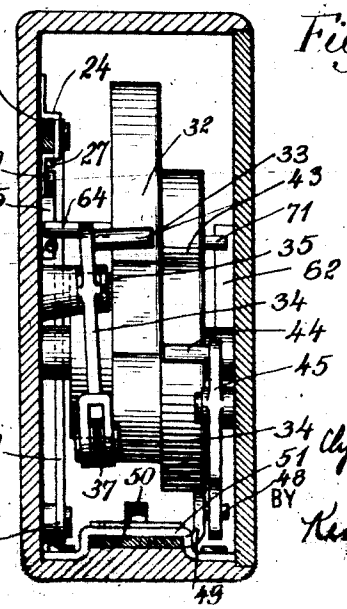


Fig. 10,



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UNITED STATES PATENT OFFICE

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SEWING-MACHINE.

1,038,853 Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed June 17, 1911. Serial No. 633,682.

To all whom it may concern:

Be it known that I, CLYDE J. COLEMAN, a citizen of the United States, and a resident of the city of New York, county and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to improvements in devices for securing together sheets of paper or the like, for the purpose of binding the same at or near the margin thereof.

One object of my invention is to provide a simple and efficient device for passing a thread or cord through the sheets of paper or the like, and forming a loop on one side thereof, and then carrying the thread ends through the loop in order to properly bind the sheets together.

A further object of my invention is to so arrange the various parts of the device that the thread may be cut off at the proper point in order to leave sufficient thread ends, and to so position and arrange the other parts of the device that it is simple and efficient in operation and easy and cheap of construction.

Further objects, features and advantages will more clearly appear from the detailed description given below taken in connection with the accompanying drawings, which form a part of this specification.

Referring to the drawings, Figure 1 is a vertical section showing my improved device at the initial stage of the binding operation. Fig. 2 is a similar view showing the next stage of the operation. Fig. 3 is a similar view showing a still further stage of operation. Fig. 4 is a similar view showing the next stage of operation. Fig. 5 is a similar view showing the next stage of operation. Fig. 6 is a similar view showing the next stage of operation. Fig. 7 is a similar view showing the last stage of the operation. Fig. 8 is a top plan view of the device. Fig. 9 is a section taken on the line IX—IX of Fig. 3. Fig. 10 is a section taken on the line X—X of Fig. 7. Fig. 11 is a detailed section taken on the line XI—XI of Fig. 1. Fig. 12 is a detailed view of the sheets in section showing the thread binding as completed.

Referring to the various figures, 1 and 2 represent suitable handles pivoted together by means of a shaft 3, which shaft 3 is rigid with the handle 2. The handle 1 carries a body frame portion 4, provided with an upright guide rod 5, having slidably mounted thereon an arm 6, carrying a needle 7. The handle 2 is provided with a projection arm 8, having at its upper end 2, slotted portions 9. The arm 6 is provided with pins operating on the slots of the portions 9, so that as the arm 8 is pressed downwardly the arm 6, with the needle 7, is forced downwardly, the pin at 10 operating in the slots at 9.

The material 11, to be bound, is inserted between two relatively fixed jaws 12 and 13, as clearly shown in the various figures. A spool of thread or similar material 14, is carried upon the arm 8, the thread 15 of which passes through an aperture at 16, in the arm 6, and then through the eye of the needle. On forcing the handles 1 and 2 together, the needle 7 is forced downwardly until it assumes the position shown in Fig. 2. This action causes the shaft 3 to rotate. The shaft 3 has rigidly secured thereto a cam member 17, the cam face of which engages a roller 18, on a link 19, pivoted at 20. The link 19 is connected to a sliding bar 21, at 22, the bar 21 sliding in guide ways 23 and 24. A spring 25 normally forces the bar 21 to the left. The bar 21 carries at its inner end a knife 26, coöperating with a fixed knife edge 27'. Upon the first slight turning movement of the shaft 3 the cam 17 engages the roller 18 to pull back the bar 21, against the action of the spring 25, and thus withdraw the knife 26 to the position shown in Fig. 2. The bar 21 is provided with a projection 27, and pivoted at 28 is a latch 29. Upon the projection 27 passing the latch 29, the latch 29 is thrown into engagement with the same by the action of the spring 30, so as to hold the knife 26 in the position shown in Fig. 2, until it is desired to sever or cut the thread. This same action or slight turning of the shaft 3 also causes the cam member 31, which is rigid therewith, to make a slight movement. The member 31 is provided with a cam face at 32, operating upon a roller 33, secured on a link 34, pivoted at 35 to the body 4. The link 35 has pivoted to its lower end at 36, an arm 37. The rear end of the arm 37 carries a pin or cam roller 38 adapted to engage with a cam face 39, on the cam 31. Upon the

slight turning of the shaft 3 above mentioned, the cam face 32 engages the roller 33, thereby forcing the arm 37 rearwardly. During the completion of this movement the cam face 39 engages the pin or roller 38, and thereby forces the same downwardly, in order to force the forward end of the arm 37 upwardly. As soon as this upward movement has been practically completed the cam roller 33 rolls off of the face 32, thereby allowing the arm 37 to move forward under the action of the spring 40, so that the arm 37 assumes the position shown in Fig. 2. Upon giving the handles 1 and 2 a further movement toward one another, the shaft 3 is still further revolved, with respect to the body 4, so that the parts assume the position shown in Fig. 3. In this position the knife 26 and the arm 37, remain the same as in Fig. 2. The needle 7, however, has been driven through the material 11, and also through the eye on the end of the arm 37. This same movement causes a slight rotation of a cam member 42, secured to the shaft 3, which cam member is provided with a cam face 43, operating upon a pin or cam roller 44, upon a lever 45 pivoted to the body portion at 46. The lower end of the lever 45 is forked, as at 47, and this forked portion engages a pin 48, secured to an ear 49, on a sliding bar 50. The bar 50 slides on the bottom of the body 4, and between guides 51 and the bottom of the body. At its opposite end the bar 50 carries an upright 52, having secured to its top a thread gripper 53, comprising two fingers 54 and 55 (see also Figs. 9 and 11). This last mentioned slight movement of the shaft 3, causes the cam face 43 to engage the pin 44, and rock the lever 45, so as to quickly pull inwardly the bar 50 against the action of the spring 56. This last action takes place at the end of the downward movement of the needle 7, so that the fingers 54 and 55 are inserted between the thread 15 and the needle 7, as clearly shown in Fig. 9. At the extreme end of the latter movement the finger 54 is separated from the finger 55, by means of a cam lug 57, rigid with and projecting downwardly from, the finger 54, engaging the end of a cam lug 58, in order to force to one side the finger 54, thus separating the fingers 54 and 55, which are integral with one another, but are made of resilient material, so that they may be sprung apart. At the other end the bar 50 carries a projection 59, adapted to be engaged by a latch 60, upon the extreme rearward movement of the bar 50. The latch 60 is thrown into engagement with the projection 59, by means of a spring 61, operating upon the arm 62, rigid with the latch 60, which is pivoted at 63, so that upon the latch 60 engaging the projection 59 the fingers 54 and 55 are held in the position shown in Fig. 3, until it is desired to release them. Upon now separating the handles 1 and 2, to the position shown in Fig. 4, which separation may be accomplished by a spring, as at 70 (see Fig. 8), in a well known manner, the parts assume the position shown in Fig. 4. In this position all of the parts remain the same except that the needle has been partially withdrawn, but the fingers 54 and 55 have engaged and held a loop of thread 15, on the opposite side of the material from which the needle entered. Upon allowing the handles 1 and 2 to still further separate slightly a pin 64, on the cam member 31, engages the depending arm 65 of the latch 29, thereby withdrawing the latch from engagement with the projection 27, so that the sliding bar 21 is released, and is quickly pulled forward under the action of the spring 25, thus causing the knife 26 to cooperate with the knife edge 27', to sever the thread. The bar 21 also carries a projecting arm 66, which has at its outer end a transverse pin 67, adapted to engage the thread 15, before the knife 26 severs the thread, so as to pull a sufficient amount of the thread through the needle in order that when it is severed a sufficient length of thread will be left above the material, so that the thread ends will be long enough. It will also be noted that the length of the thread hanging from the needle 7, after it is severed, is substantially the same as the length of thread projecting above from the material 11. Upon now allowing the handles 1 and 2 to separate still farther the parts assume the position shown in Fig. 6. In this position the cam face 32 has again engaged the roller 33, on the lever 34, and the cam face at 39 has again allowed the pin at 38, on the bar 37, to drop inwardly, so that the bar 37 assumes its original position, as in Fig. 1. The thread ends at 68 are, however, still held within the eye 41, on the end of the rod 37. The eye 41 has two small projections 69 (see Fig. 11), between which projections the thread ends 68, are engaged, as shown in Fig. 6, so that upon the arm 37 assuming the position in Fig. 6, the thread-ends 68 are forced between the fingers 54 and 55, as shown in Fig. 6. Upon now allowing the handles 1 and 2 to separate until they reach their initial position, the parts assume the position shown in Fig. 7. This movement causes the shaft 3 to be given a still further backward rotation, so that a pin 71 secured to the cam member 42, engages the arm 62 of the latch 60, so as to disengage the latch 60 from the projection 59, and allow the bar 50 to be rapidly withdrawn, under the action of the spring 56. This causes the fingers 54 and 55 to be rapidly drawn through the loop of thread below the material. Upon the first

slight rearward movement of the fingers 54 and 55, the fingers are pressed together firmly engaging and gripping the thread ends, because the cam lug 57 rides off of the cam lug 58. Therefore the fingers 54 and 55 firmly engage the thread ends 68, and pull them through the loop to the position shown in Fig. 7.

It will be noted that the fingers 54 and 55 pass to one side of the needle 7, but between the needle 7 and the thread 15. In order that the thread ends 68 may be properly carried between the fingers 54 and 55, by the carrying arm 37, and projections 69 thereon, the lever 34 has its pivot pin slightly inclined wtih respect to the other axes of the apparatus, as shown more clearly in Fig. 10. Thus when the arm 37 is in the position shown in Figs. 2 and 3, the eye 41 is directly under the needle, so that the needle will pass through the same, but upon the throwing of the arm 37, so that the eye 41 is beneath the material, as shown in Fig. 7, the eye 41, with its projections 69, is thrown to one side of the vertical plane of the needle 7 in order that the thread ends 68 may be sufficiently forced to one side of the needle 7, in order that they may be properly carried between the fingers 54 and 55.

From the above it will be clear that I have provided especially efficient and simple means for binding sheets of paper or similar material, and that the device operates most quickly, since it only takes one throw and release of the handles 1 and 2 to perform the entire operation. The releasing of the knife 26 and bar 50, by means of latches and springs, causes them to operate most quickly, thereby quickening the entire operation of the device.

Although I have described my improvements in great detail, nevertheless I do not desire to be limited to such details, except as clearly specified in the appended claims, since many changes and modifications may well be made without departing from the spirit and scope of my invention.

Having fully and clearly described my improvements, what I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, a support for the material, a thread carrying needle, fingers passing between the thread and the needle to form a thread loop, means for cutting off the thread, means for carrying the thread ends between the fingers, and means for causing said fingers to draw the thread ends through the thread loop.

2. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the material to form a thread loop, means for maintaining said loop at one side of the material, means for cutting off the thread, and means for carrying the thread ends about the edge of the material and through the thread loop.

3. In a device of the class described, a support for the material, a thread carrying needle, fingers passing between the thread and the needle to form a thread loop, means for carrying the thread ends between the fingers, and means for causing said fingers to draw the thread ends through the thread loop.

4. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the material and withdrawing the needle to form a loop at the opposite side of the material from which the needle enters, and means for carrying the thread ends about the edge of the material and through said loop.

5. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the material and withdrawing the needle, to form a loop at the opposite side of the material from which the needle enters, said means embracing two relatively movable handles pivotally connected with respect to one another, and means for carrying the thread ends about the edge of the material and through said loop.

6. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the material and withdrawing the needle, to form a loop at the opposite side of the material from which the needle enters, said means embracing two relatively movable handles pivotally connected with respect to one another, means for cutting off the thread after the needle has been withdrawn, and means for then carrying the thread ends about the edge of the material and through said loop, said cutting off means and thread carrying means being operated by the relative movement of said handles.

7. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle trough the work and withdrawing the needle to form a loop at the opposite side of the material from which the needle enters, means for engaging said loop, means for cutting off the thread, and means for then causing said engaging means to pull the thread end through said loop.

8. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the work and withdrawing the needle to form a loop at the opposite side of the material from which the needle enters, a thread gripper having two fingers for passing through said loop, means for separating said fingers, means for cutting off the thread, means for

carrying the thread ends about the edge of the material and between said fingers, and means whereby said fingers are closed and withdrawn to draw the thread ends through said loop.

9. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the work and withdrawing the needle to form a loop at the opposite side of the material from which the needle enters, means for cutting off the thread after the needle has been withdrawn, at a point so that substantially the same length of thread will be hanging from the needle as extends from the material, and means for carrying the thread ends through said loop.

10. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the work and withdrawing the needle to form a loop at the opposite side of the material from which the needle enters, a thread gripper having two fingers for passing through said loop, means for separating said fingers, means for cutting off the thread at a point so that substantially the same length of thread will be hanging from the needle as extends from the material, means for carrying the thread ends about the edge of the material and between said fingers, and means whereby said fingers are closed and withdrawn to draw the thread ends through said loop.

11. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the work and withdrawing the needle to form a loop at the opposite side of the material from which the needle enters, a thread gripper having two fingers for passing through said loop, means for separating said fingers, means for cutting off the thread, at a point so that substantially the same length of thread will be hanging from the needle as extends from the material, means for carrying the thread ends about the edge of the material and between said fingers, and means whereby said fingers are closed and withdrawn to draw the thread ends through said loop, and two relatively movable handles, said forcing means, thread gripper, cutting off means and thread carrying means being operated by the relative movement of said handles.

12. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the work and withdrawing the needle to form a loop at the opposite side of the material from which the needle enters, a thread gripper for passing through said loop, means for cutting off the thread at a point so that substantially the same length of thread will be hanging from the needle as extends from the material, means for carrying the thread ends about the edge of the material and into the said thread gripper, and means whereby said gripper is withdrawn to draw the thread ends through said loop, and two relatively movable handles, said forcing means, gripper, cutting off means and thread carrying means being operated by the relative movement of said handles.

13. In a device of the class described, the combination of a thread carrying needle, means for forcing the needle through the work, and withdrawing the needle, to form a thread loop, means for then cutting off the thread, and means for carrying the thread ends through said loop after the thread has been cut off.

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

CLYDE J. COLEMAN.

Witnesses:
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EDWIN SEGER.