

G. W. CHURCH.
STAPLING MECHANISM.
APPLICATION FILED APR. 3, 1906.

993,649.

Patented May 30, 1911.

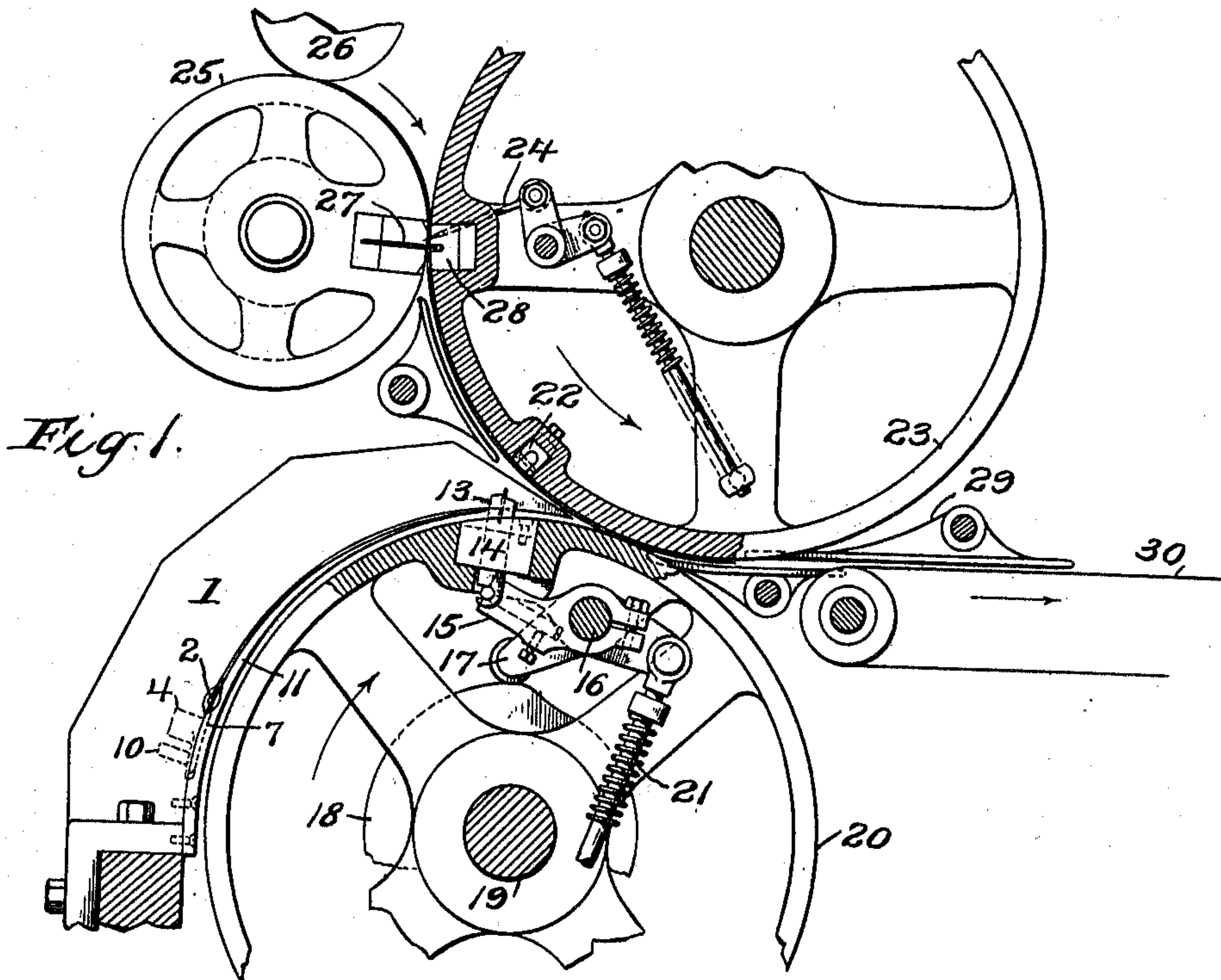


Fig. 1.

Fig. 2.

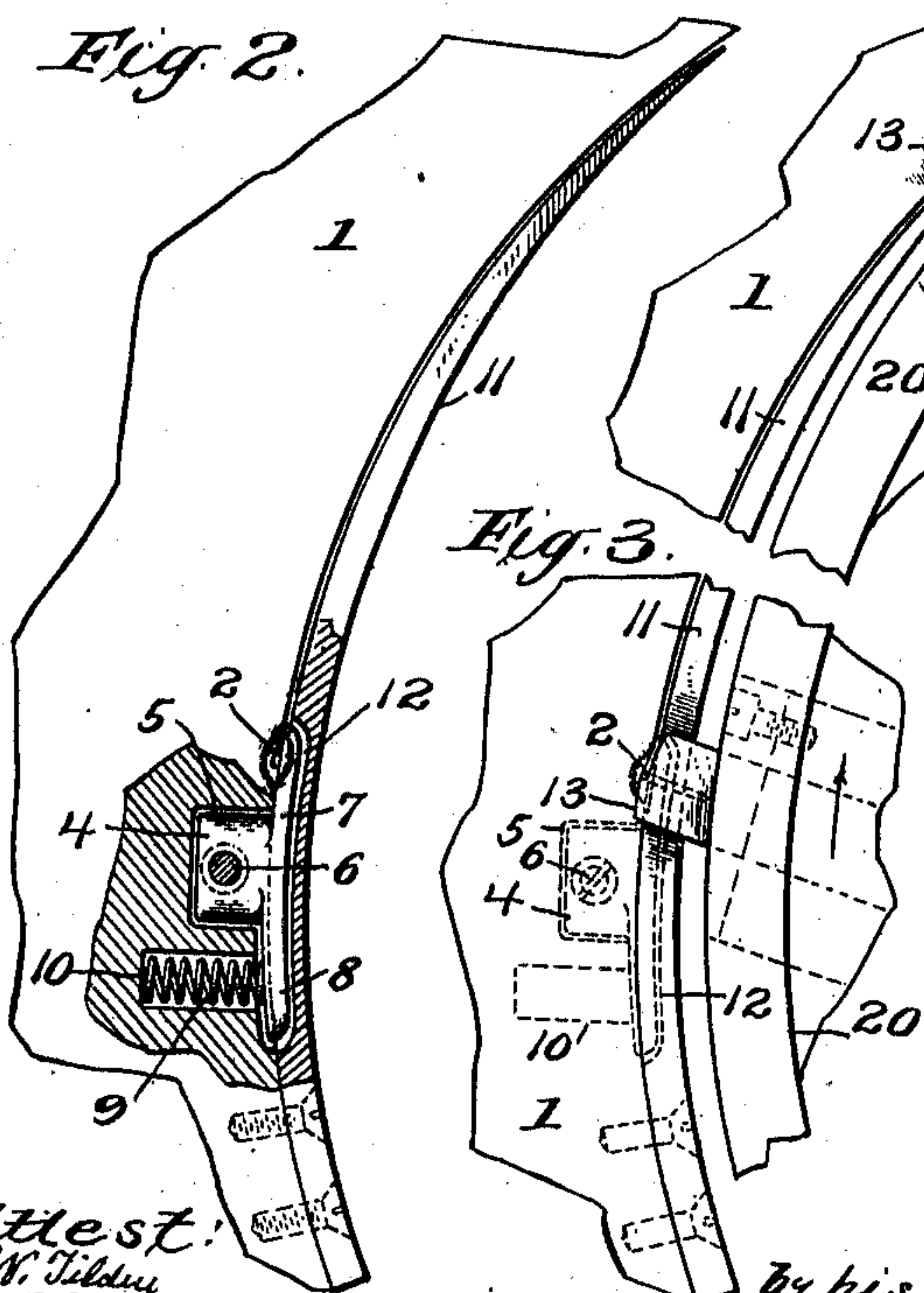


Fig. 3.

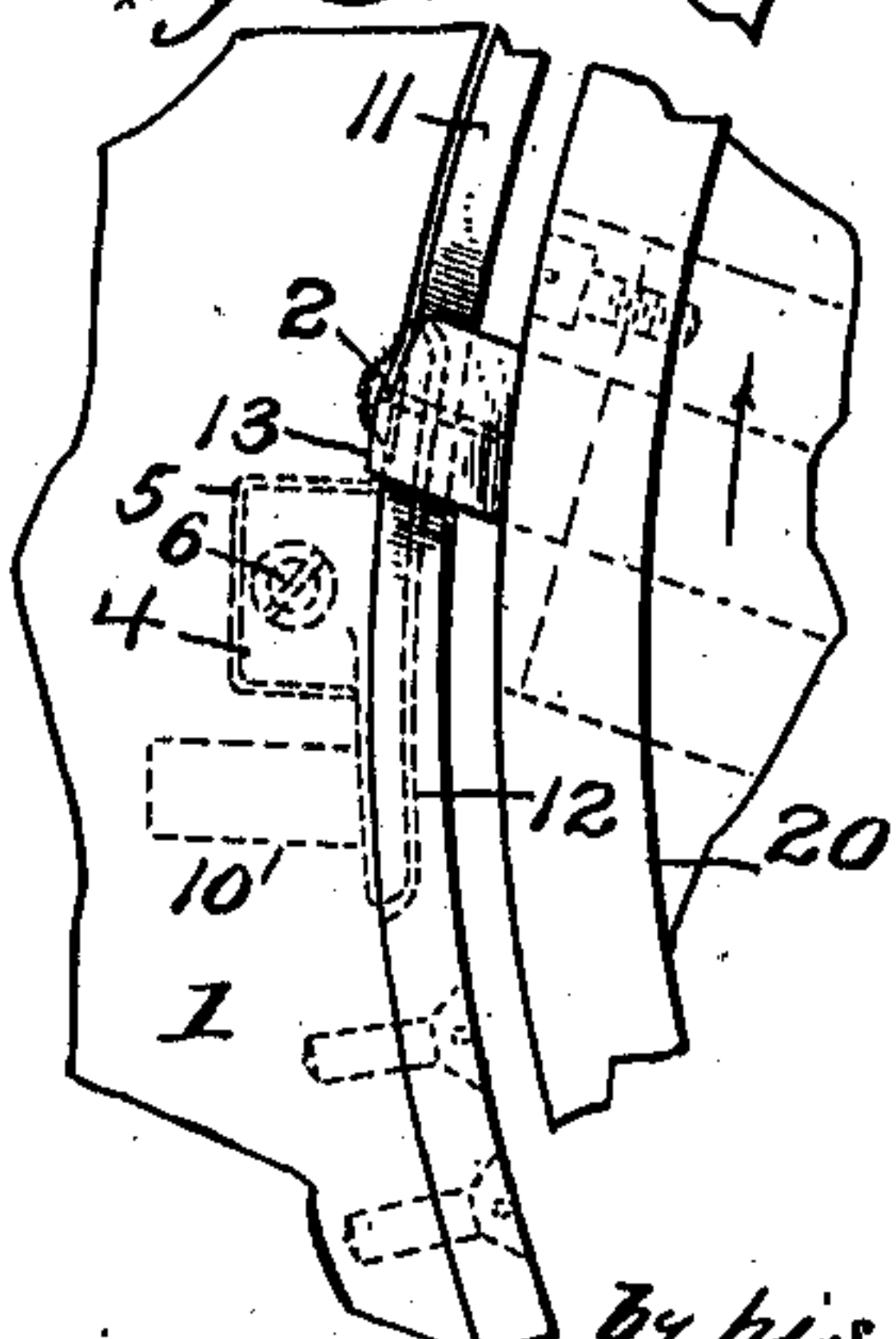


Fig. 4.

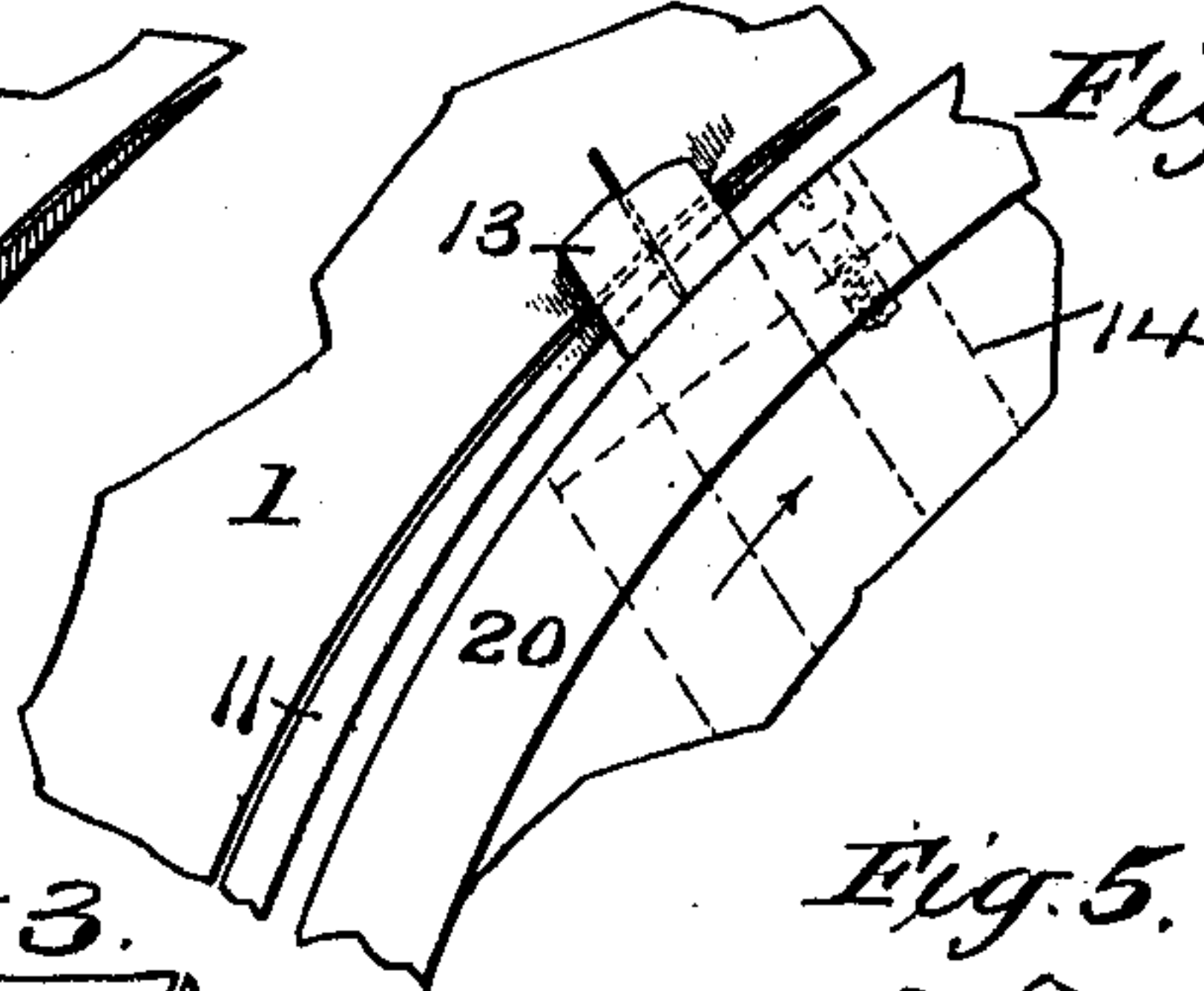


Fig. 5.

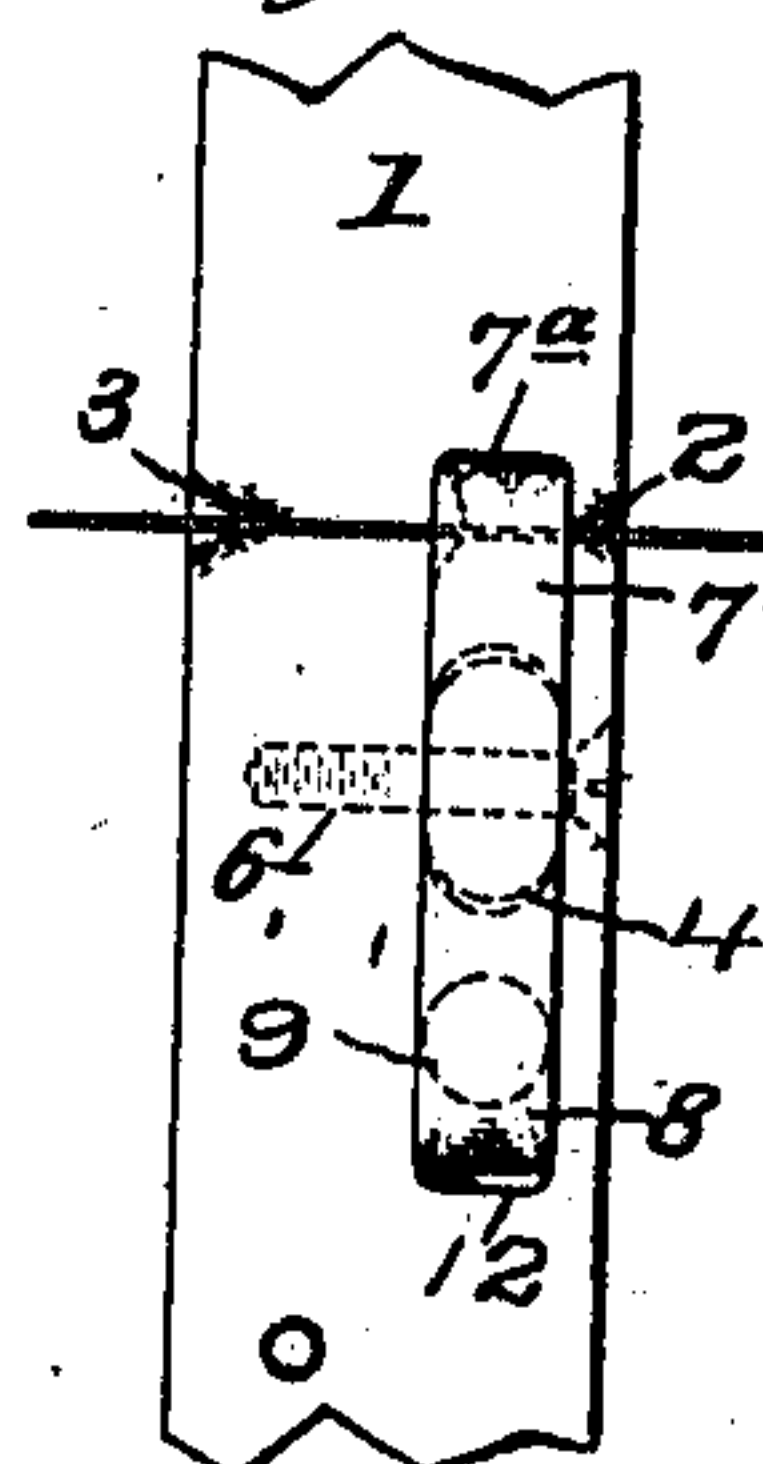
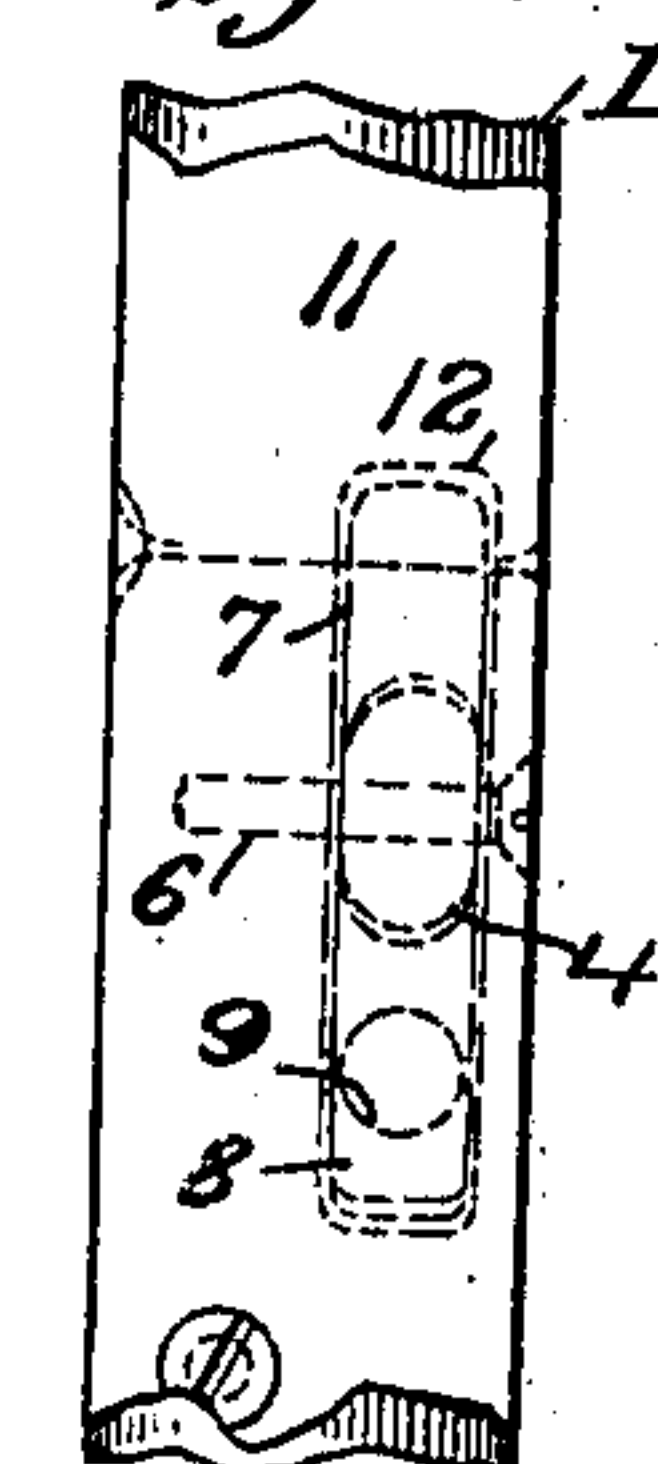


Fig. 6.



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UNITED STATES PATENT OFFICE.

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STAPLING MECHANISM.

993,649.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed April 3, 1906. Serial No. 309,578.

To all whom it may concern:

Be it known that I, GEORGE W. CHURCH, a citizen of the United States, residing at Stamford, county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Stapling Mechanisms, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in stapling mechanisms, and more especially to that class of mechanisms which are employed for stapling products such as webs or sheets, while in motion, or "on the run" as it is usually termed. In a certain class of constructions of this general type, the wire is fed at right angles to a former or horn and into a recess in the operating face of the same. While retained in this recess, a wire length is cut off, this length being caught by a cooperating staple bending mechanism which sweeps the wire length forward along the horn and at the same time bends the ends at right angles to the central part thereof, the bent ends forming the legs of the staple and the central portion of the wire length forming the crown, the staple being thereafter driven by the bending mechanism. In certain of these constructions, a guiding finger has been employed, this finger being located close to the under side or operating face of the horn but far enough away from the horn so as to permit the wire length to pass between it and the horn, the finger in connection with the horn forming a guideway through which the wire lengths are swept as they are being formed into staples. Difficulty has, however, been experienced, in properly positioning the wire length, so that its ends would be in proper relation to the staple forming mechanism by which it is caught and swept along the horn to form the staples, this being due sometimes to the tendency of the wire to jump under the action of the cutting device as a length is cut off, and sometimes to the fact that the wire is curled because it is wound upon and fed from a spool.

The object of this invention is to produce a holding device for the wire lengths to be used in stapling mechanisms, which wire length holding device shall be positive in its action and at the same time of such a con-

struction as to permit the wire length to be readily removed therefrom by the forming mechanism.

With this and other objects in view, the invention consists in certain constructions and in certain parts, improvements and combinations as will be hereinafter fully described and then specifically pointed out.

Referring to the drawings—Figure 1 indicates a side elevation of so much of a stapling mechanism as is necessary to an understanding of the invention, certain parts being broken out to show the construction of the wire length holding device. Fig. 2 is an enlarged detail view, partly in section, illustrating the construction of the wire length holding device. Fig. 3 is a detail view of a part of the horn, illustrating the position of the wire length at the time it is taken by the bending mechanism. Fig. 4 is a detail view of the horn and bending device showing the wire length formed up into a staple. Figs. 5 and 6 are detail views illustrating the position of the wire length holding device in the horn.

The details of the stapling mechanism with which the invention is employed may be varied within wide limits. In the particular construction shown, there is employed a bending device or horn 1, to the under side of which the wire is fed from a suitable source of wire supply, lengths being cut off by proper cutting mechanism, not shown. In the best constructions and as shown, the under or working face of this horn will be provided with a groove or channel 2 into which the wire is fed, this channel being of a size to easily receive the wire. If desired, the receiving end of this channel may be flared slightly, as indicated at 3, to permit the end of the wire to readily enter the recess or channel.

The wire lengths, prior to being taken by the staple bending device, are retained in position by holding means, the details of construction of which may be widely varied. As shown, this holding means consists of a block 4 which is located in a recess 5 in the under side of the horn. In the best constructions, and as shown, the block will be pivoted in the recess, the pivot of the block being indicated at 6, and the recess being large enough to permit a slight rocking movement of the block on its pivot. The block has a forward extension or jaw 7

which underlies the recess or channel 2 before referred to and a rearward extension 8 which is acted upon by a spring 9 located in a recess 10 in the horn, the spring acting to keep the extension 7 snugly up against the under or operating face of the horn, thus substantially closing the channel 2 before referred to and preventing the wire from springing out of the same. This construction acts to hold the wire length positively in position, that is to say, it prevents it from jumping or springing during the cutting operation and from getting out of position due to the fact that it is curled on the spool. If desired, the forward extension 7 may be cut away slightly on one edge, as indicated at 7^a, so as to guide the end of the wire into the channel if it should tend to spring out of it. The block and its extensions, if desired, may be narrower than the horn, as indicated in Figs. 5 and 6.

In the construction illustrated, the usual guiding finger 11 is employed, there being between this guiding finger and the horn a channel through which the wire length is swept during the process of bending it up into a staple. When this guiding finger is employed, it will, in the best constructions, be recessed out, as indicated at 12, to provide space in which the wire length holder may be located.

The construction by which the wire length is bent up into a staple and driven may be widely varied. As shown, there is provided a bending plunger 13 which slides through a guiding block 14, this plunger being actuated by an arm 15 fast on the shaft 16. This shaft is a rock-shaft and is provided with an operating arm 17 which coöperates with a cam 18 mounted on a shaft 19. This shaft 19 supports a carrier 20 which, as is usual in such mechanisms, carries the bending and driving mechanism. The shaft 16 is rocked in opposition to the cam by means of a spring rod construction 21 of ordinary type.

The staple clenching mechanism may be of any desired type. As shown, it consists of the usual clenching block 22, this block being mounted in a rotating carrier 23, this carrier being also provided with sheet taking pins 24 of the usual type.

In the operation of the machine, a web, which is shown as entering between cylinders 25, 26, the cylinder 25 being a cutting cylinder, is severed into sheet lengths by means of a knife 27 mounted on the carrier 25, said knife coöperating with the cutting wood 28 on the carrier 23. The sheet is then taken by the pins 24 and carried on between the carriers 20 and 23. In the rotation of carrier 20, the wire length which has been inserted into the groove 2 and which is firmly held in the groove by the wire length holder, is caught by the bender plunger and swept out of the grip of the

holder into the channel between the finger 11 and the horn. The carrier 20 is eccentric to the curve of the horn, as is usual in such constructions, so that as the wire length is swept onward, it is bent up into a staple, as indicated in Figs. 1 and 3, the bending plunger having the usual groove to receive the wire legs. At the proper time, the staple meets the sheet or sheets which are carried forward by the carrier 23, and is inserted thereinto and clenched. The sheets may then be delivered in any suitable manner, as by a stripping guide 29, coöperating with carrier tapes 30.

Changes and variations may be made in the construction shown for carrying the invention into effect. The invention is not, therefore, to be confined to the particular construction herein shown and described.

What is claimed is:—

1. In a stapling mechanism, the combination with a staple bending mechanism, of positively acting wire length holding means from which the wire lengths are taken by the bending mechanism to be formed into staples, said means including a member mounted to yield to allow the wire length to be taken by the bending mechanism.

2. In a stapling mechanism, the combination with a staple forming mechanism, of positively acting wire length holding members from which the wire lengths are taken by the forming mechanism to be formed into staples, said members being arranged to provide a substantially closed channel into which the wire lengths are introduced, and means for allowing one of the members to move to permit the wire length to be taken by the forming devices.

3. In a staple forming mechanism, the combination with a rotating carrier, of staple forming mechanism mounted thereon, positively acting wire length holding means stationary with respect to the carrier from which the wire lengths are taken by the forming mechanism, said means including a member mounted to move to allow the wire length to be taken by the forming mechanism.

4. In a staple forming mechanism, the combination with a rotating carrier, of staple forming mechanism mounted thereon, positively acting wire length holding members stationary with respect to the carrier from which the wire lengths are taken by the forming mechanism, said members being arranged to provide a substantially closed channel in which the wire lengths are received and one of said members being mounted to move to permit the wire lengths to be taken by the forming mechanism.

5. In a stapling mechanism, the combination with a staple forming mechanism, of positively acting wire length holding devices including a spring controlled jaw from

which the wire lengths are taken by the forming mechanism to be formed into staples, said jaw yielding when the wire is taken by the forming mechanism.

5 6. In a stapling mechanism, the combination with a staple forming mechanism, of positively acting wire length holding devices including a pivoted spring controlled jaw from which the wire lengths are taken by the forming mechanism to be formed into staples, said jaw yielding when the wire is taken by the forming mechanism.

10 7. In a stapling mechanism, the combination with a rotating carrier, of staple forming mechanism mounted thereon, wire length holding devices including a spring controlled jaw from which the wire lengths are taken by the forming mechanism, said jaw yielding when the wire is taken by the forming mechanism.

15 8. In a stapling mechanism, the combination with a rotating carrier, of staple forming mechanism mounted thereon, wire length holding devices including a pivoted spring controlled jaw from which the wire lengths are taken by the forming mechanism, said jaw yielding when the wire is taken by the forming mechanism.

20 9. The combination with a staple forming horn, of a rotating carrier having a co-operating staple forming device by which the wire lengths are taken, and a movable

positively acting jaw for holding the wire length against the horn.

10. The combination with a staple forming horn, of a rotating carrier having a co-operating staple forming device by which the wire lengths are taken, and a pivoted spring controlled wire length holding jaw coöperating with the horn.

11. The combination with a staple forming horn, of a rotating carrier having co-operating staple forming devices by which the wire lengths are taken, said horn having a wire length receiving channel therein, and a movable wire length holding jaw coöperating with the horn and arranged to substantially close the channel.

12. The combination with a staple forming horn, of a rotating carrier having co-operating staple forming devices by which the wire lengths are taken, said horn having a wire length receiving channel therein, and a pivoted spring controlled wire length holding jaw coöperating with the horn and arranged to substantially close the channel.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

GEORGE W. CHURCH.

Witnesses:

F. W. H. CRANE,
LOUIS ROEHM.