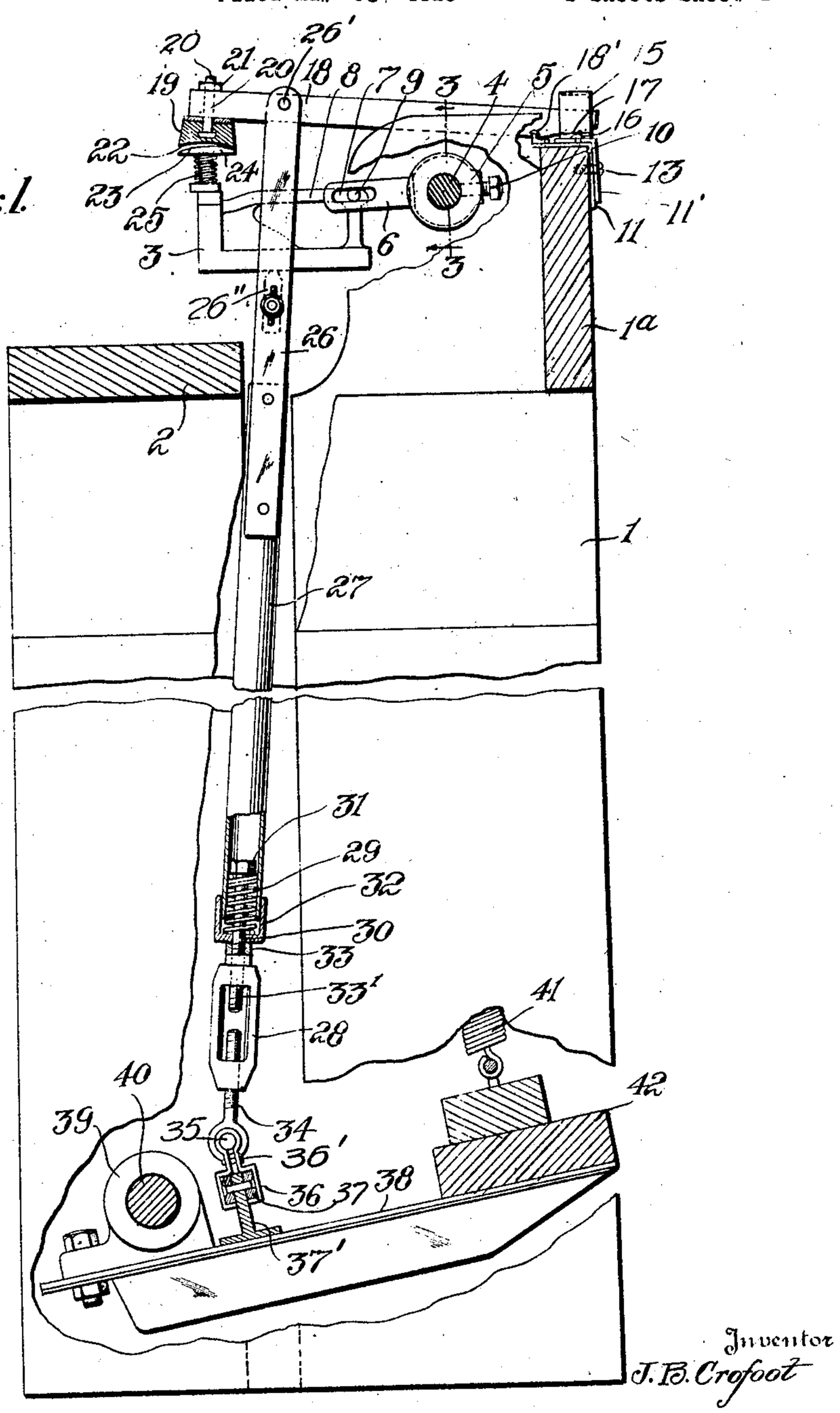
Nov. 18, 1924. 1,516,336

J. B. CROFOOT

STAPLING MACHINE

Filed May 18, 1923 2 Sheets-Sheet 1

Fig. 1.



Inventor
J. B. Crofoot

By L. B. Morrill

Attorney

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J. B. CROFOOT

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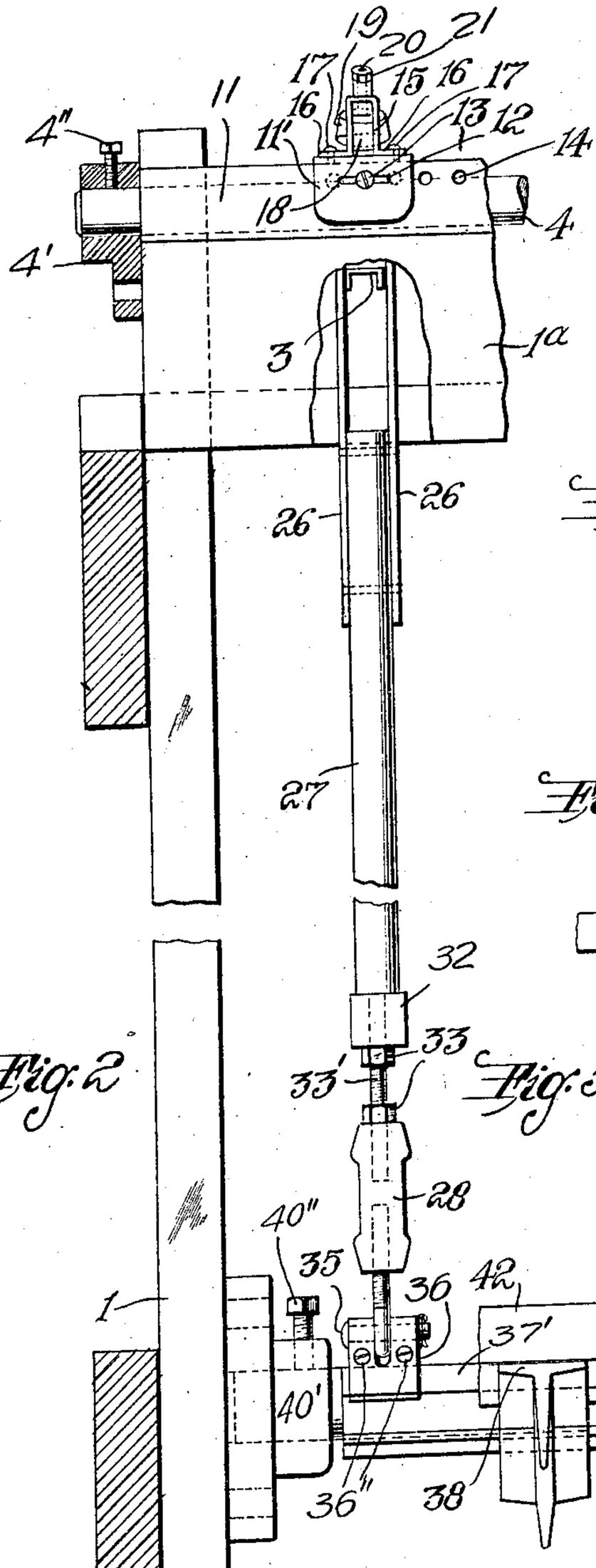

Fig. 2

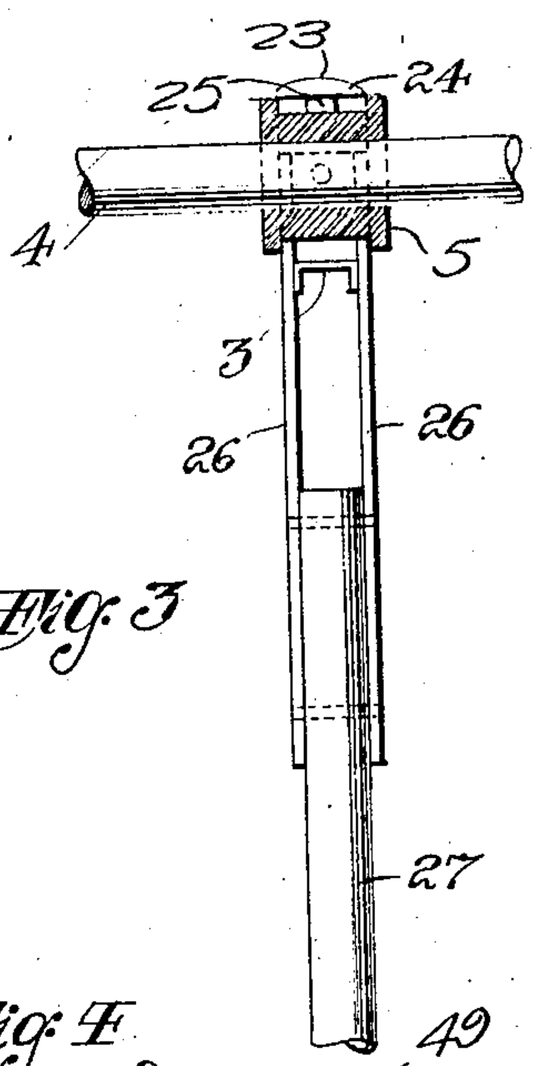

Fig. 3

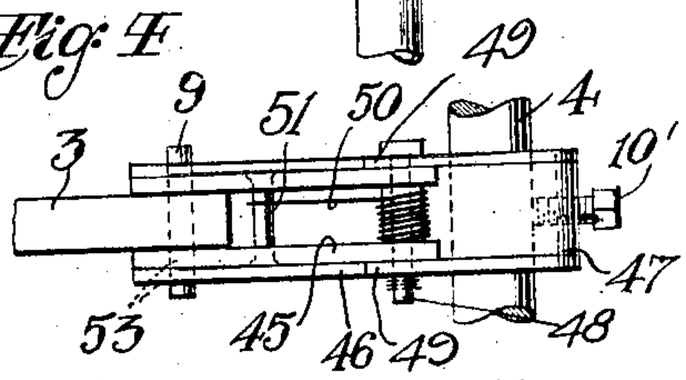

Fig. 4

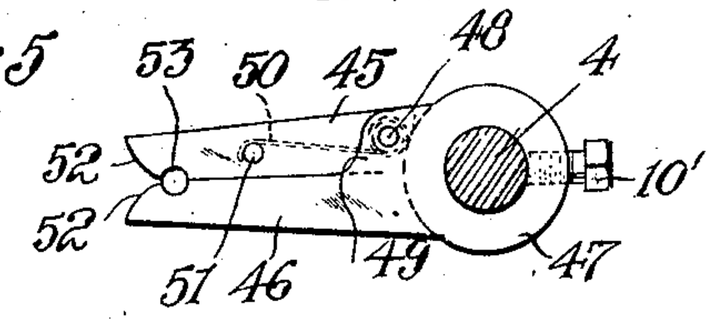

Fig. 5

Inventor

J. B Crofoot

By L. D. Marriel

Attorney

Patented Nov. 18, 1924. 1,516,336

UNITED STATES PATENT OFFICE.

JOHN B. CROFOOT, OF CHICAGO, ILLINOIS.

STAPLING MACHINE.

Application filed May 18, 1923. Serial No. 639,939.

To all whom it may concern:

Be it known that I, JOHN B. CROFOOT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stapling Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to stapling machines and has for an object to provide a mechanism for employing a plurality of stapling units, such as disclosed in my Patent #1,224,075, issued April 24, 1917, whereby the several units will synchronize to staple simultaneously in a continuous strip.

A further object of the invention is to provide an organization especially adapted and intended for stapling maps, shades, or the like to rollers, sticks or strips, whereby the process of stapling the entire article at spaced points throughout the length, may be accomplished at a single operation.

A further object of the invention is to provide a mechanism for employing a plurality of stapling units and for actuating the several units simultaneously and including means for adjusting the relative intervals between the several units whereby articles differing in length may be simultaneously stapled at predetermined intervals throughout its length or the intervals between such stapling varied as occasion may require.

With these and other objects in view the invention comprises certain novel elements, units, parts, combinations, arrangements, inter-actions and functions, as disclosed in the drawings, together with mechanical equivalents thereof, as will be hereinafter more fully described and claimed.

In the drawings:

Figure 1 is a vertical transverse sectional view through the machine showing one of the stapling units and actuating mechanism;

Figure 2 is a rear view of one end of the machine showing one of the stapling units in position and its actuating means;

Figure 3 is a sectional view taken on line 3—3 of Figure 1;

Figure 4 is a top plan view of a modified means for holding and pivoting one of the stapling units, and

Figure 5 is a view in side elevation of the holding mechanism shown at Figure 4.

Like characters of reference indicate corresponding parts throughout the several views.

As disclosed in my Patent #1,224,075, a hand stapling organization is provided and it is the purpose of this invention to employ a number of said units mounted in a battery which will be actuated simultaneously. To carry out this purpose a frame 1 is provided having a table 2 upon which the work being operated upon is positioned, and the unit itself is indicated by the numeral 3. No attempt has been made in the present drawings to illustrate the mechanism of the stapling unit and for the specific construction of such unit reference is had to the said patent.

Extending longitudinally of the machine and secured in the frame 1 is a shaft 4. This shaft 4 is secured in any approved manner, as by the keepers 4′ secured to the frame 1 provided with set screws 4″ for retaining the shaft in fixed relation.

Mounted upon this shaft 4 are a plurality of sleeves 5. Only one of these sleeves 5 and the associated parts is shown in any of the figures of the drawings, but it is to be understood that a plurality of such sleeves is contemplated, the number depending upon the length of the machine and the work performed which includes the number of staples which are to be set. Each of the sleeves 5 is provided with spaced arms 6 provided with registering slots 7 between which the top rib 8 of the stapling unit 3 is positioned with a pin or laterally extending lugs, indicated at 9, positioned and slidable in the slot 7. The vertical position of the pin 9 and consequently the angle of adjustment or position of the unit 3 may be varied by rotating the sleeve 5 upon the shaft 4, a set screw 10 being provided for securing the adjustment so attained.

Along the back of the frame upon a strip which has been designated 1ª, an angle iron 11 is secured and a plurality of clips 11′ are provided equal in number to the number of sleeves 5 and units 3. These clips 11′ are each provided with a slot 12 through which is inserted a screw 13 into any one of the threaded perforations 14 in the angle iron 11. It will be obvious that by loosening the screw

13 the clip 11′ may be adjusted within the limits of the length of the slot 12, or by removing the screw 13, the clip may be further adjusted and the screw inserted into some one of the other perforations 14, and by being tightened, will hold such clip 11′ in position.

Upon the clip 11′ an arch 15 is erected, secured in any approved manner, as by turning outwardly lateral branches 16 and employing rivets 17 for securing such lateral branches to the clip 11′.

A lever 18 is fulcrumed upon an upstanding rib 18′ and has its extremity extending through the arch 15 so that the extremity may move upwardly and downwardly within the arch as the device is operated, but lateral movement prevented. At its forward end, the lever 18 is provided with a head 19 which is secured to the lever 18 by means of a bolt 20 and nut 21. The under side of the head 19 is formed concave, as indicated more particularly at Figure 1 to fit over and conform to the upper convex surface of the head 24 of the stapling unit which is carried upon the plunger 25.

To actuate the lever 18 spaced bars 26 are provided pivoted to the bar at 26′, as indicated more particuarly at Figure 1 and rigidly and permanently secured to the tubular rod 27. The spaced bars 26 carry therebetween a stop 26″ which engages the under side of the unit 30, indicated at Figure 1 to maintain the relative positions of the unit and the lever.

Below the tubular shaft 27 a turn-buckle 28 is provided, a spring 29 being located within the tube surrounding the rod 30, which is provided with a head 31 bearing against one end of the spring 29, the opposite end of said spring bearing against the cap 32 of the end of the tube 27. Lock nuts 33 are positioned upon the threaded portion 33′ of the rod 30, whereby the relative tension acquired by operating the several parts just described may be maintained to vary the tension of the spring 29. An eye-bolt 34 provided with a screw-threaded portion engaging the turn-buckle 28 is also provided, pivoted upon the pin 35. The pin 35 is carried by a clamping member 36 having bolts 36′ by which the said clamping member is clamped upon the head 37 of the rail 37′.

Mounted upon the frame are a plurality of pedal levers 38, each provided with a sleeve 39 journaled upon the shaft 40, which extends longitudinally of the machine and is secured thereto in any approved manner, as by the keeper 40′ and set screw 40″. To raise the pedal levers 38 yieldingly to their upward or inoperative limit, one or more springs 41 are provided. A single one of these springs may be made to serve the purpose, as it is attached directly to the strip 42 which extends longitudinally the entire length of the machine and is attached to the several pedal levers 38. It is obvious that two of the pedal levers 38 will serve the purpose, as the strip 42 may extend between such two levers, and the rail 37′ also extend between the two levers, so that the plurality of organizations, one of which is shown at Figure 1, may be attached to this rail 37 for actuation.

Instead of connecting the stapling unit 3 with the mechanism by means of the arm 6, as disclosed in Figures 1, 2 and 3, a different type of securing means is provided, comprising an arm 45 pivotally connected to an arm 46, which in turn is preferably integral with the sleeve 47 which is mounted upon the shaft 4. A pintle 48 is inserted through ears 49 of the arm 46 and through the arm 45, and a spring 50 is mounted upon such pintle tending to hold the arms 45 and 46 in close relation. The spring 50 may be attached and connected in any usual and ordinary manner, but preferably by means of a pin 51 which spans the interval between the spaced arms 45, as indicated more particularly at Figure 4, upon which the spring 50 engages.

The extremities of the arms 45 and 46 are provided with equivalent tapers 52, as shown more particularly at Figure 5 with recesses combining and registering to form openings 53, as also preferably shown at that Figure, and proportioned to receive the pin or lugs 9 of the element 3. This type is very convenient in that the element may simply be forcibly moved in the direction of and against the tapers 52, thereby separating the arms 45 and 46 against the tension of the spring 50, whereupon such arms will yield to permit the passing of the pin or lugs 9 to engage within the opening 53 and retain the unit 3 in position. Whichever type of positioning means is employed, it is obvious that the shaft 4 may be rotated by manipulating the set screw 4″, thereby simultaneously adjusting all of the units 3, or either of said units 3 may be separately adjusted by adjusting the sleeve 5 upon the shaft 4 by the manipulation of the set screw 10. It is obvious that any one of the units 3 may be very readily removed, especially when the type of holding means shown at Figures 4 and 5 is employed, so that at times some of said units may be removed without disturbing the adjustment of the other units and to thereby simply eliminate certain staples, which would otherwise be set by the manipulation of the full battery of units.

In operation it will be understood that each of the units 3 is provided with a strip of staples of substantially the usual and ordinary type and in substantially the usual and ordinary manner, no novelty being claimed in the present instance to the rela-

tion of the machine or the staple strip. With the parts assembled as shown at Figure 1 the work is placed upon the table 2. Assuming this to be a map which is to be stapled to a roller, the roller is laid upon the table and the edge of the map positioned upon the top of the roller, whereupon the depression of the foot strip 42 will depress all of the several units 3 into engagement with the map and clamp the map in such position upon the roller, whereupon the further depression of the parts will cut off and set the staples in the usual manner and simultaneously. The release of the foot strip 42 will, by reason of the spring 41 and the associated parts, return the organization to the position shown at Figure 1.

What I claim is:

1. A stapling organization comprising a frame, a shaft extending longitudinally of the frame and fixed relative thereto, arms extending from and fixed to said shaft, a stapling unit pivoted to the arms, a foot pedal, a rod extending upwardly from the foot pedal to and above the stapling unit, means carried by the rod to lift the unit upon its pivot against gravity, and means carried by the rod adapted to actuate the unit upon the depression of the pedal.

2. A stapling organization comprising a frame, a shaft extending longitudinally of the frame and fixed relative thereto, arms extending from and fixed to said shaft, a stapling unit pivoted to the arms, a foot pedal, a bifurcated rod extending upwardly from the pedal to and above the stapling unit and embracing the unit in the bifurcation, means carried by the rod to lift the unit upon its pivot against gravity, and a hammer carried by the rod adapted to actuate the unit upon the depression of the pedal.

3. A stapling organization comprising a frame, a shaft extending longitudinally of the frame and fixed relative thereto, arms extending from and fixed to said shaft, stapling units pivoted to the arms, a foot pedal, bifurcated rods extending upwardly from the pedal to and above the stapling units and embracing the units in the bifurcations, abutments spanning the bifurcations of the rods and positioned to lift the units upon their pivots against gravity, and hammers carried by the rods adapted to actuate the units upon the depression of the pedal.

4. A stapling organization comprising a frame, a work-table carried by the frame, a shaft extending longitudinally of the frame, a plurality of groups of spaced arms extending radially from the shaft, stapling units inserted between and carried by the spaced arms, means to adjust the arms relative to the axis of the shaft to vary the position of the units, a foot pedal, and means connecting the pedal to actuate the several stapling units in unison.

5. A stapling organization comprising a frame, a shaft extending longitudinally of the frame, a plurality of sleeves adjustably positioned upon the shaft, spaced arms carried by the sleeves, stapling units introduced between and carried by the spaced arms, a foot pedal, a rail extending longitudinally of the machine and carried by the foot pedal, a plurality of connecting mechanisms carried by the rail and adjustable longitudinally thereof and corresponding in number to the sleeves, a like number of levers carried by the frame and adjustable longitudinally thereof, and levers extending from the means adjustable upon the rail to the levers providing organized units bodily adjustable longitudinally of the machine adapted to actuate the stapling units upon the depression of the foot pedal.

In testimony whereof I hereunto affix my signature.

JOHN B. CROFOOT.