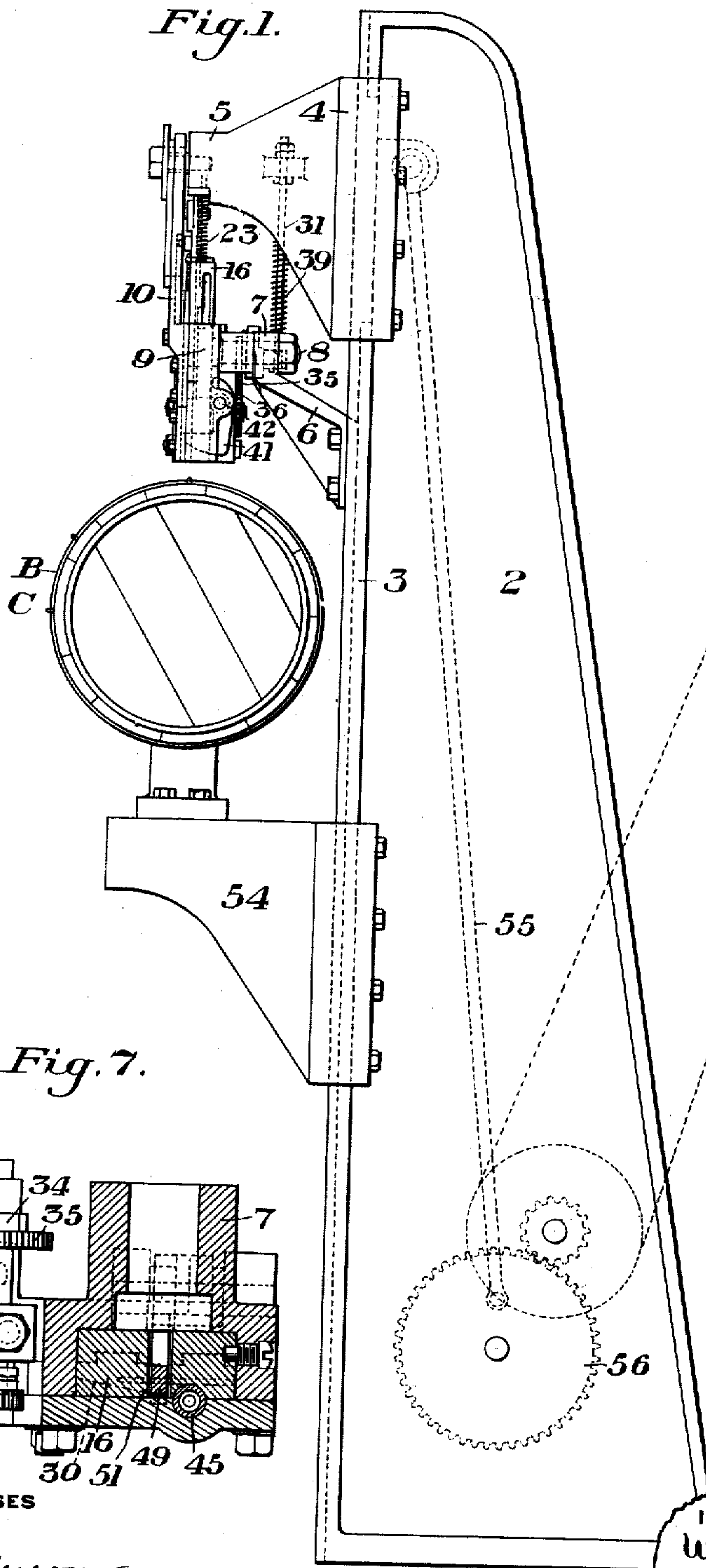


W. A. KILMER.  
STAPLE DRIVING MECHANISM.  
APPLICATION FILED JULY 16, 1908.

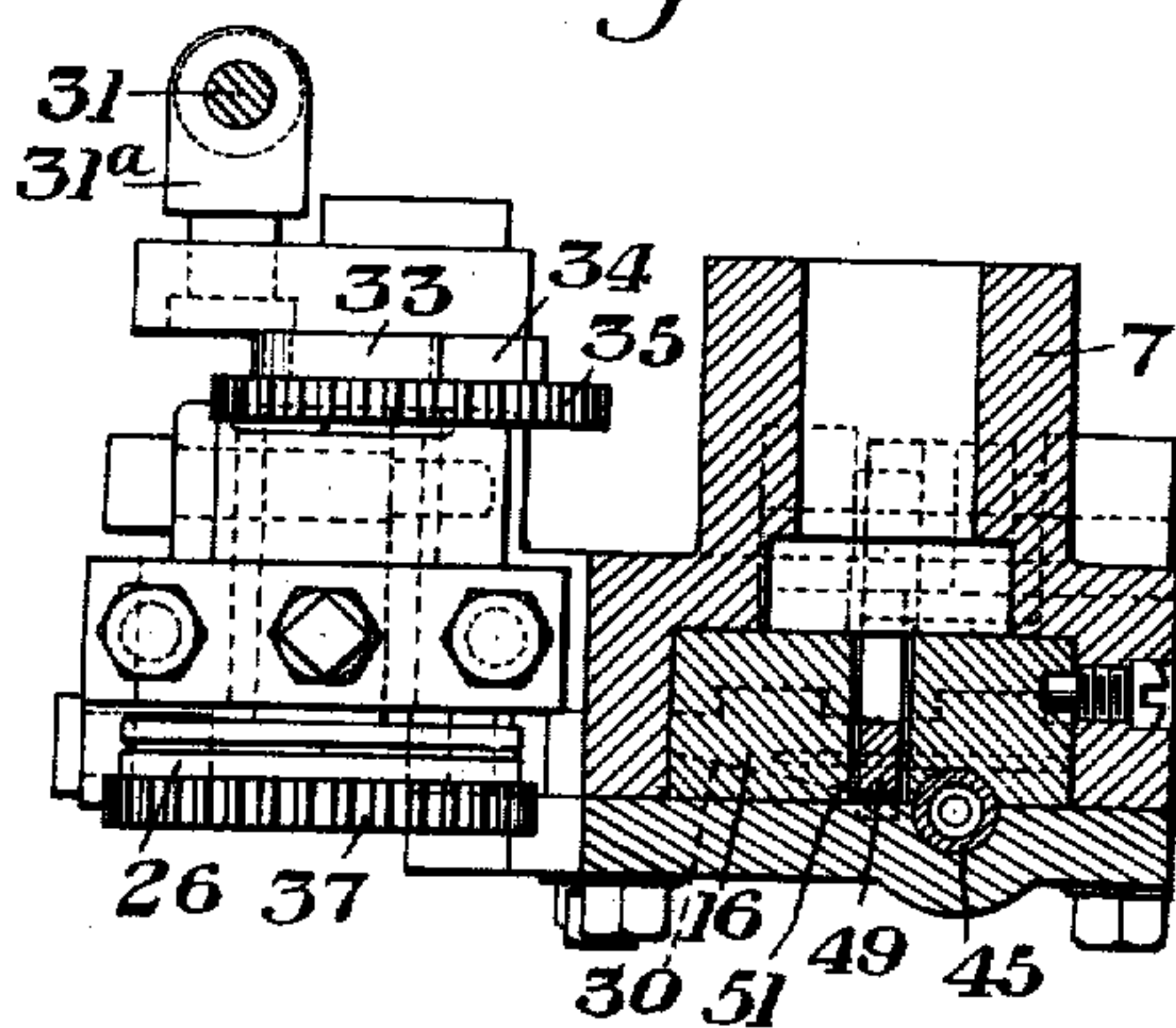
922,153.

Patented May 18, 1909.  
4 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 7.*



WITNESSES

*R. A. Balderson,*  
*W. W. Swartz*

INVENTOR

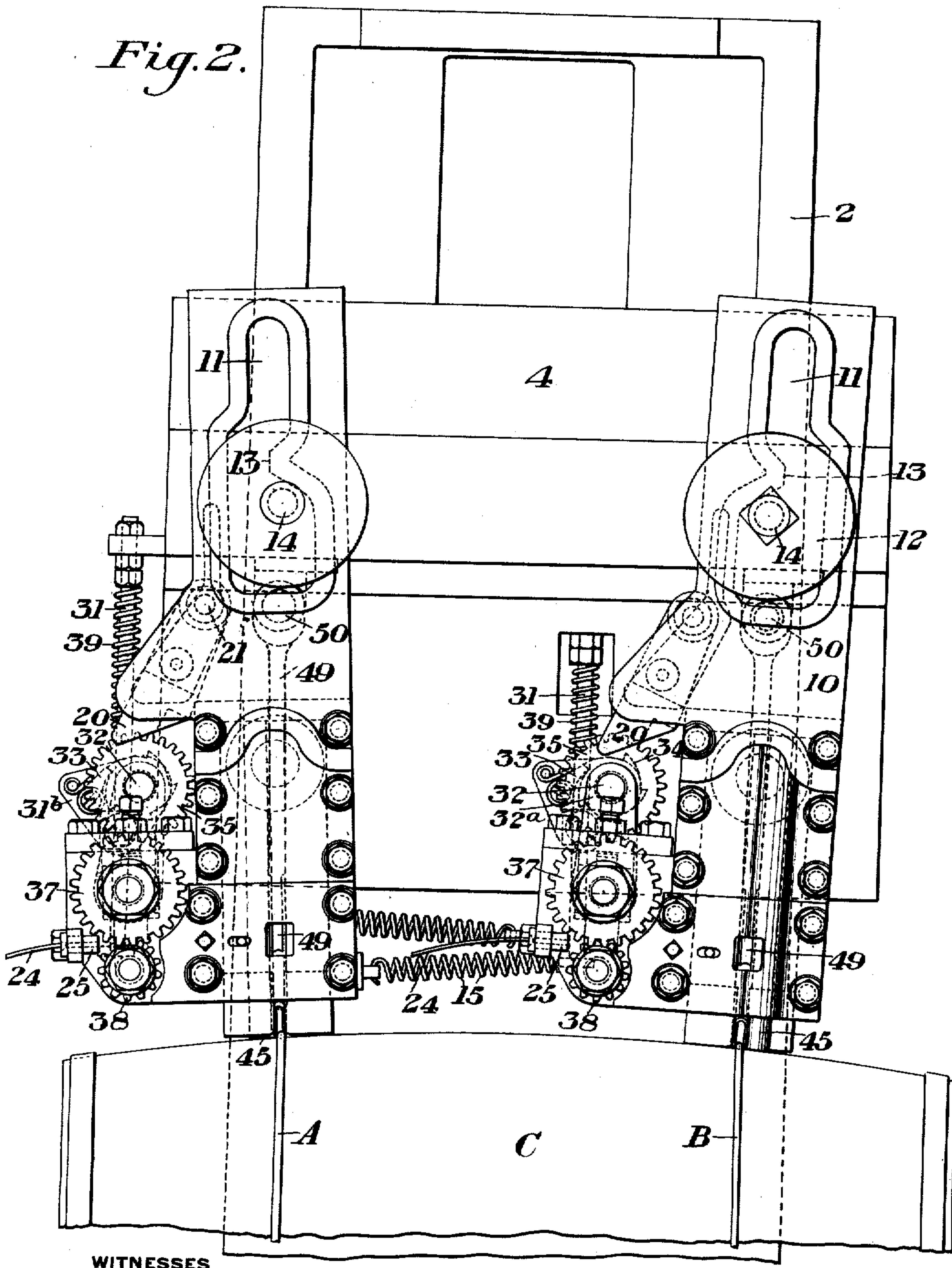
*Wm. A. Kilmer,*  
*by Bohrer, Byrnes & Parmelee,*  
*his Attys.*

W. A. KILMER.  
STAPLE DRIVING MECHANISM.  
APPLICATION FILED JULY 16, 1908.

922,153.

Patented May 18, 1909.

4 SHEETS—SHEET 2.



WITNESSES

*R. H. Balderson*  
*W. W. Swartz*

INVENTOR

*Wm. A. Kilmer,*  
*by Bohannon, Byrnes & Parmelee,*  
*his Attys.*

W. A. KILMER.  
STAPLE DRIVING MECHANISM.  
APPLICATION FILED JULY 16, 1908.

922,153.

Patented May 18, 1909.

4 SHEETS—SHEET 3.

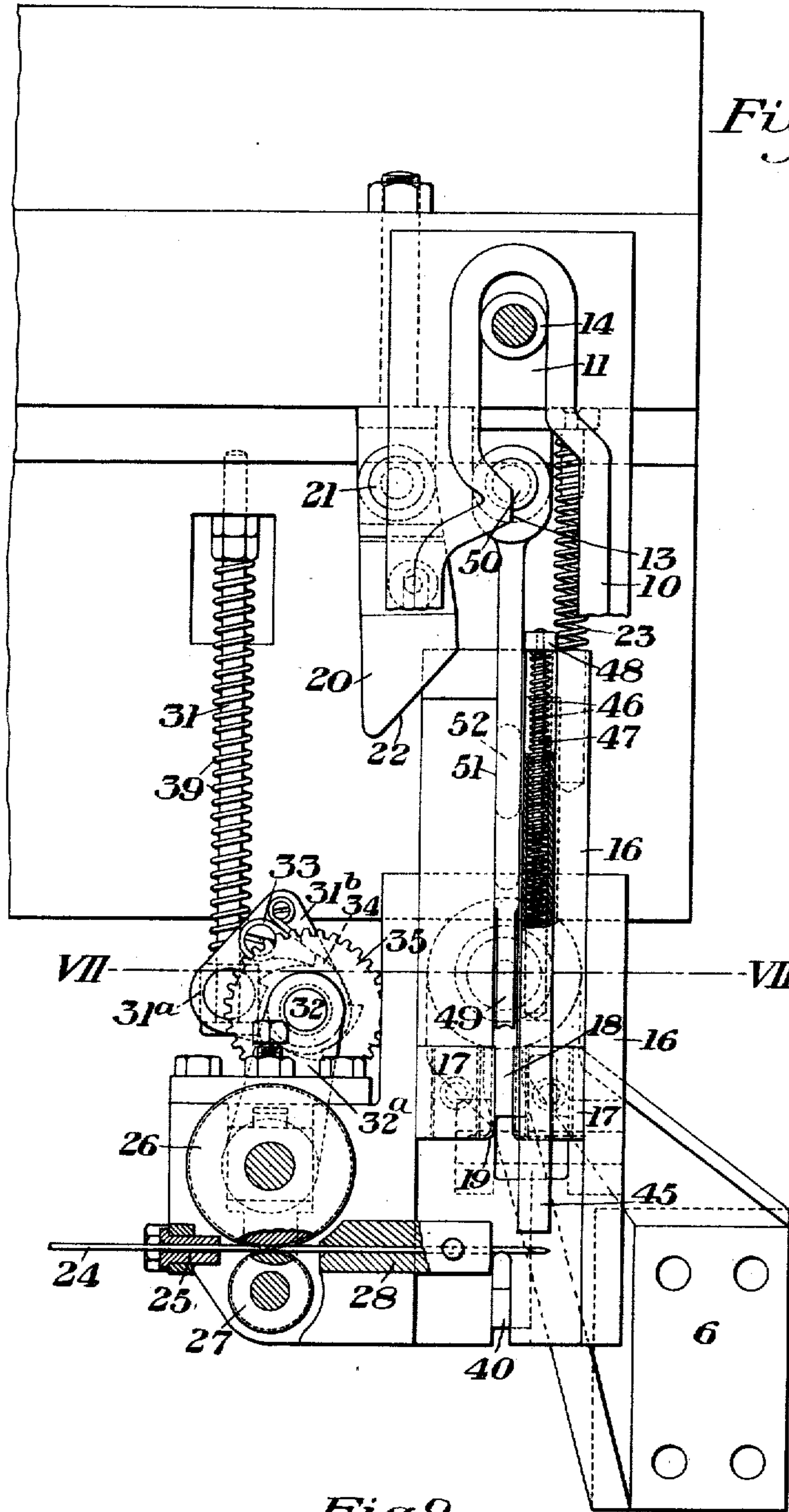


Fig. 3.

Fig. 8.

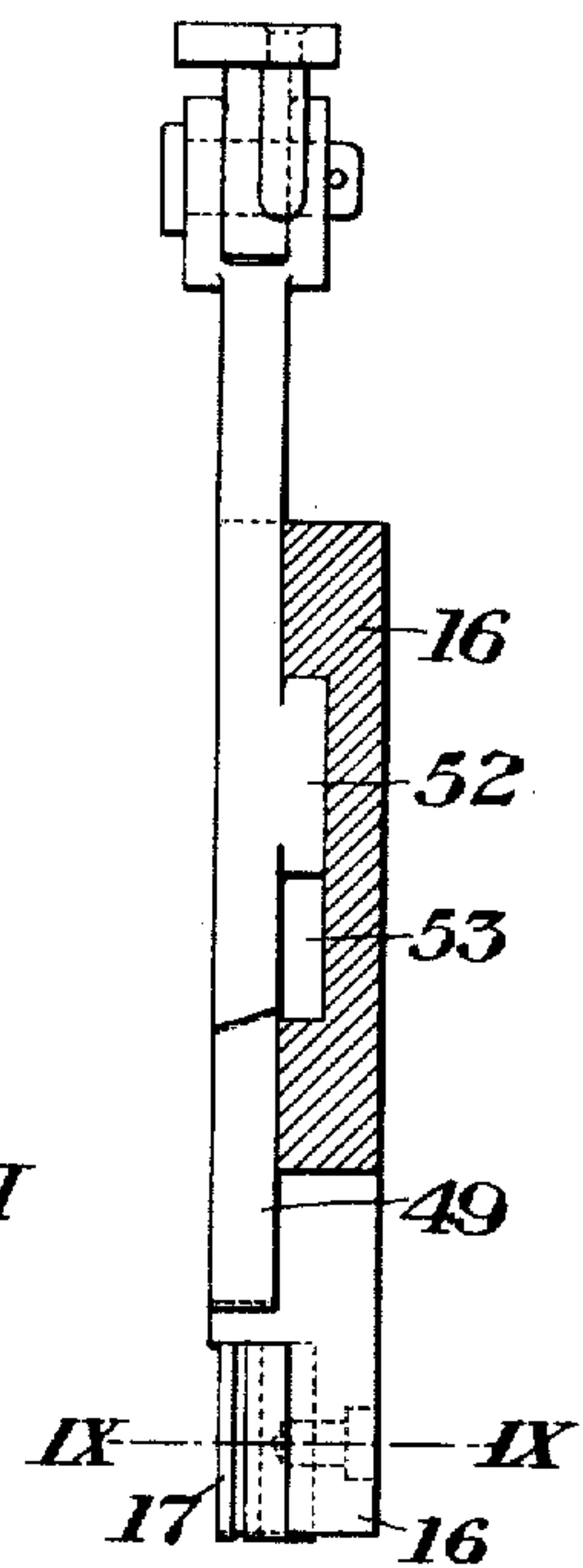
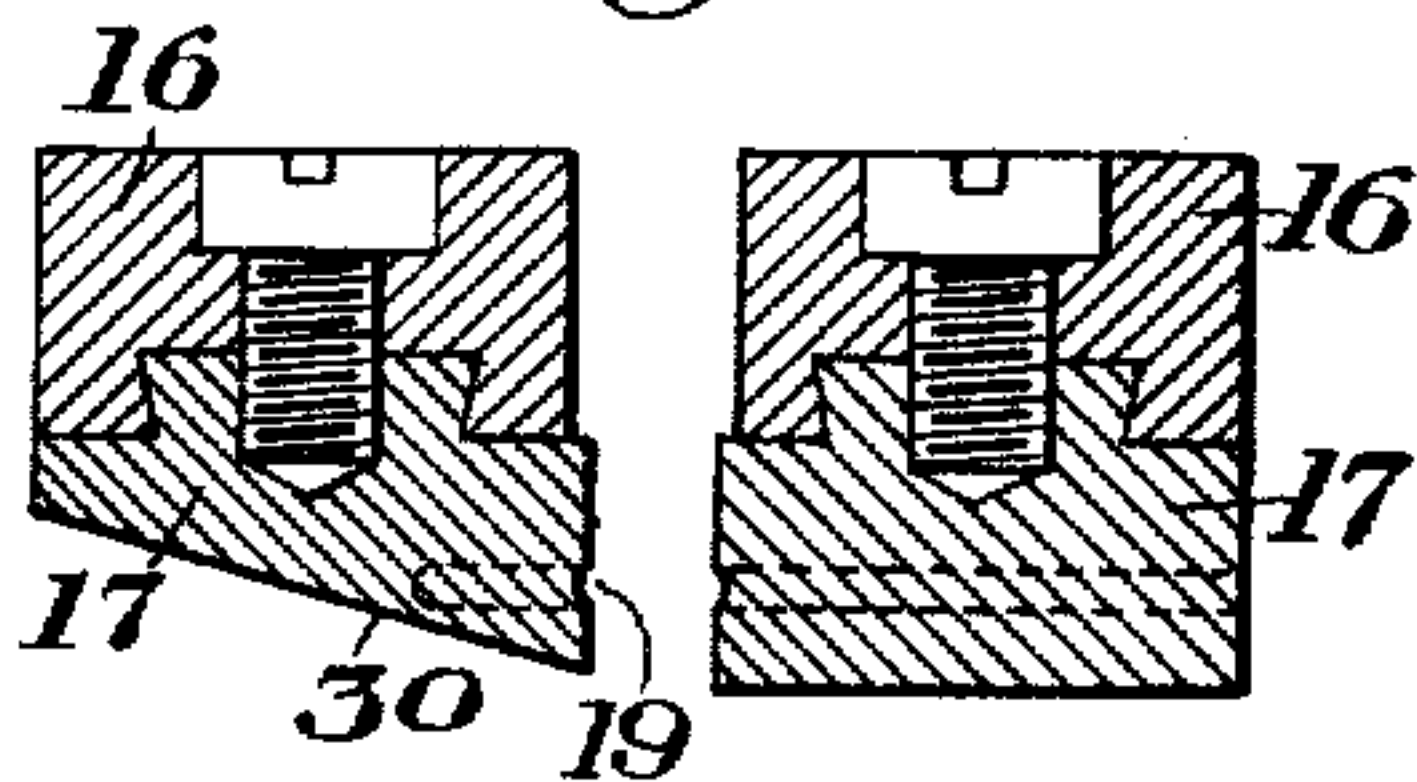


Fig. 9.

WITNESSES  
R. A. Balderson  
W. W. Swartz



INVENTOR  
Wm. A. Kilmer,  
by Bohrer, Byrnes & Parnell,  
his Attys.



W. A. KILMER.  
STAPLE DRIVING MECHANISM.  
APPLICATION FILED JULY 16, 1908.

922,153.

Patented May 18, 1909.  
4 SHEETS—SHEET 4.

Fig. 4.

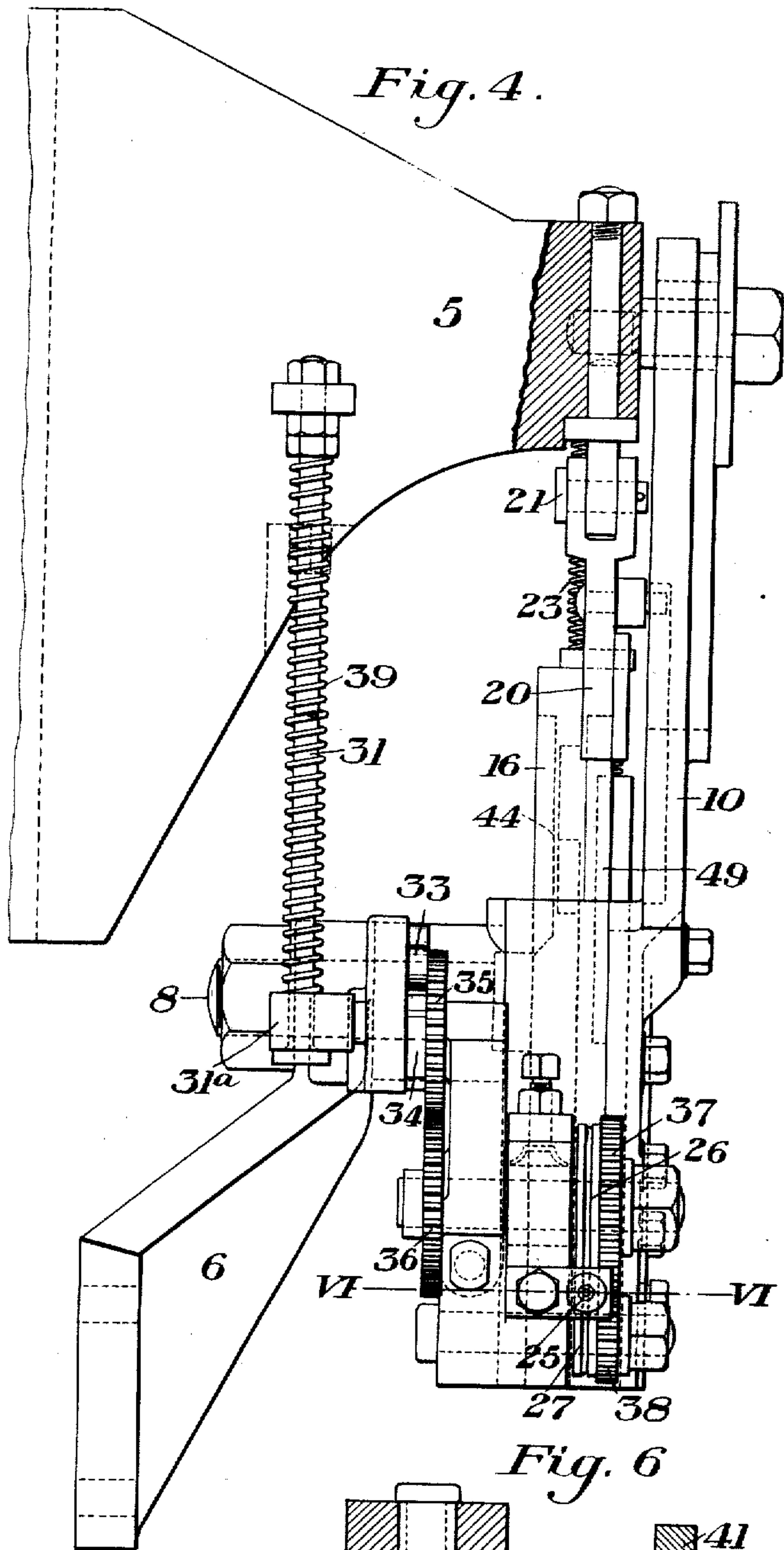


Fig. 5.

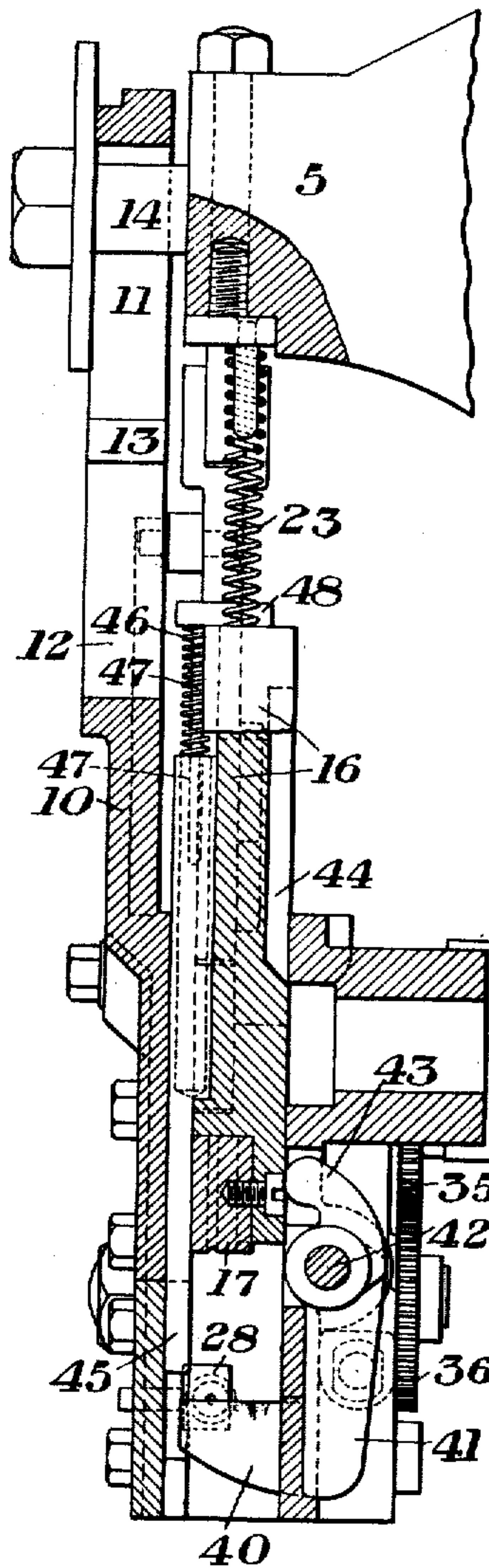
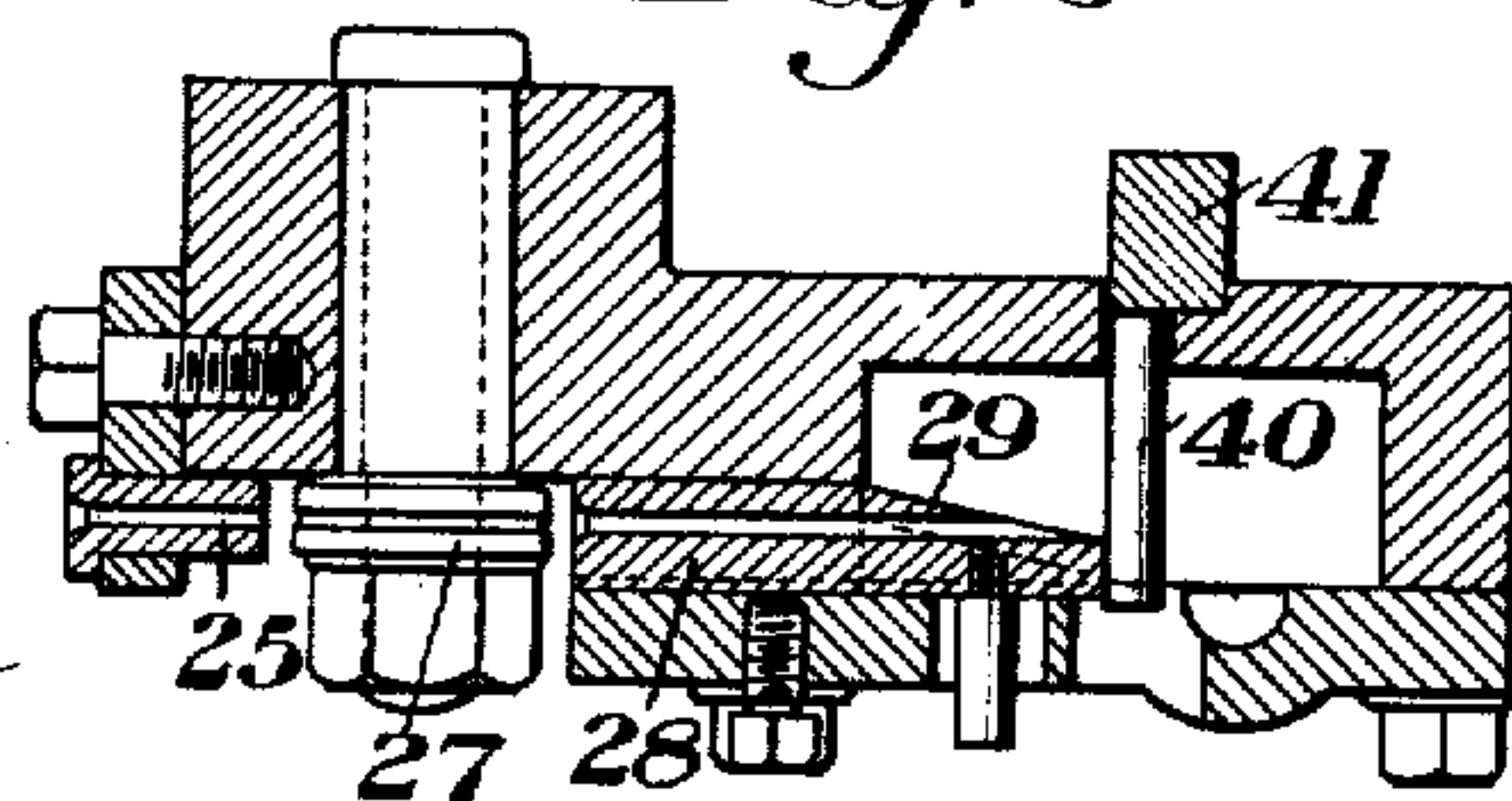


Fig. 6



WITNESSES

R. A. Balderson,  
W. W. Swartz

INVENTOR

Wm. A. Kilmer,  
by Bohrer, Byrnes & Parmelee,  
his Attys.



# UNITED STATES PATENT OFFICE.

WILLIAM A. KILMER, OF DE KALB, ILLINOIS, ASSIGNOR TO AMERICAN STEEL & WIRE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

## STAPLE-DRIVING MECHANISM.

No. 922,153.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed July 16, 1908. Serial No. 443,845.

*To all whom it may concern:*

Be it known that I, WILLIAM A. KILMER, of De Kalb, Dekalb county, Illinois, have invented a new and useful Staple-Driving Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end view illustrating my invention; Fig. 2 is a front elevation of the same on a larger scale and with a portion of the frame of the barrel or keg broken away; Fig. 3 is a side view partly broken away; Fig. 4 is an end view also partly broken away at the opposite end of the machine from Fig. 1; Fig. 5 is a vertical section of the parts shown in Fig. 4; Fig. 6 is a section on the line VI—VI of Fig. 4; Fig. 7 is a section on the line VII—VII of Fig. 3; Fig. 8 is a detail view showing the staple driving hammer or plunger; and Fig. 9 is a sectional view of the cutting and forming slide on the line IX—IX of Fig. 8.

My invention has relation to staple-driving mechanism, and is designed to provide mechanism of this character by means of which staples may be rapidly formed and driven.

The particular embodiment of my invention illustrated in the accompanying drawings has been more particularly designed for use in stapling hoops, kegs or barrels, and is of double form for simultaneously stapling a hoop at each end of the keg or barrel. It will be understood, however, that the invention is not limited thereto. The machine illustrated is also more particularly adapted as an attachment for nailing machines, but the machine can be constructed as will readily appear upon its own frame, or it can be used as an attachment to various machines.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction and arrangement by those skilled in the art without departing from the spirit and scope of my invention as defined in the appended claims.

As above stated, the machine shown in the drawings is of double form, being intended to simultaneously staple the two hoops A, B, at opposite end portions of the keg or barrel C. Inasmuch as both sets of these mechanisms are for the most part duplicates of each

other, the body of the description will be confined to the mechanism for stapling one of the hoops, and corresponding reference characters will be applied to the like parts of both mechanisms, reference being made to any parts in which the two mechanisms may differ from each other.

The numeral 2 designates the frame of a nailing machine, having guides 3, upon which is mounted a vertically reciprocating cross-head 4. Near each end this cross-head has a forwardly projecting arm 5.

6 is a bracket which is secured to and projects from the frame 2, and which has a seat 7 for a pin or bolt 8, upon which is pivoted a guiding housing or carrier 9, said housing or carrier being capable of a limited swinging movement upon this pin or bolt as a center. Secured to the housing or carrier is an upwardly projecting lever arm 10 having at its upper end a vertically extending cam slot composed of an upper portion 11 and a lower portion 12, which is offset with respect to the upper portion 11, and which is connected therewith by the inwardly projecting portion 13. This cam slot is loosely engaged by a roller pin 14, which projects from the arm 5 of the cross-head before referred to. The form of this cam slot is such that as the roller pin 14 moves downwardly with the cross-head, the engagement of said pins with the intermediate projecting portion 13 of the wall of the cam slot will swing the upper end of the lever arm 10 inwardly (to the left looking at the right-hand mechanism of Fig. 2), thereby moving the housing or carrier so that its lower end will move outwardly or to the right. The return movement of the housing or carrier and the lever arm is effected by a spring 15 connected thereto, and to the frame of the machine.

The lever arms 10 of the two mechanisms are duplicates of each other with the exception that the cam slots are of reversed form in the two arms, as shown in Fig. 2, so that the lower portions of the two housings or carriers will be simultaneously moved toward opposite ends of the barrel or keg C, for a purpose hereinafter described.

The housing or carrier is provided with guides, in which is mounted a vertically reciprocating slide 16 having at its lower portion the shear-forming plates 17. These plates are separated by the space 18, and are recessed as indicated at 19 (see Fig. 9) to re-



ceive a form and carrier for the formed staple in the manner hereinafter described. The slide 16 is actuated in its downward movement by pawl 20, which is pivotally connected at 21 to the cross-head, and which has a beveled edge 22. A spring 23 is also interposed between the upper end of the slide 16 and the cross-head. The pawl 20 engages the upper end of the slide and forces it downwardly until such time as the beveled edge 22 engages with the upper end of the housing or carrier to thereby cause the pawl to be swung outwardly out of actuating engagement with the slide, as shown in Fig. 2. When this occurs the continued downward movement of the cross-head compresses the spring 23, and at the proper time, as hereinafter described, said spring operates to complete the movement of the slide.

24 designates the staple-forming wire, which is fed through a guide 25 supported on the housing or carrier, and which passes between the two feed rollers 26 and 27, and thence through the guide 28, said feed rollers and the guide 28 being also supported on the carrier. The guide 28 has a beveled end portion 29, which coöperates with the beveled end 30 (see Fig. 9) of the shear plate 17 to effect an oblique or pointing cut of the wire, thereby forming a point not only on the adjacent end of the severed staple length, but also on the forward end of the stock, whereby both ends of each staple will be provided with a suitable driving point. Connected to the cross-head 4 is a rod 31, which, at its lower end passes through a lug 31<sup>a</sup> on a pawl-carrier 31<sup>b</sup>, which is pivoted on a shaft 32 journaled in a link 32<sup>a</sup> carried on the shaft of the upper feed roller 26.

33 is a spring-pressed pawl mounted on the carrier 31<sup>b</sup>, and arranged to engage the teeth of ratchet wheel 34, which is mounted on the shaft 32. The shaft 32 also carries a spur gear wheel 35, which meshes with a gear wheel 36 on the shaft of the upper feed roller 26, said shaft also carrying a gear wheel 37 which meshes with a gear wheel 38 on the shaft of the lower feed roller 27, thereby providing for a positive movement of each of the feed wheels 26 and 27. A spring 39 on the rod 31 is seated at its lower end on the lug 31<sup>a</sup>, and is compressed by the downward movement of the cross-head. During this downward movement the pawl 33 rides idly backward from the teeth of the ratchet wheel 34, but on the upward movement of the cross-head, the headed lower end of the rod 31 engages the lug 31<sup>a</sup>, and the pawl 33 is positively engaged with the teeth of the ratchet, thereby giving the proper feeding movement to the wire 24. After the staple length is sheared by the downward movement of the slide 16 before described, the continued downward movement of said slide causes the plates 17 to bend the severed length of wire

into U or staple shape over the projecting arm 40 of a former or anvil 41, which is pivoted to the housing or carrier at 42, and which has an arm 43, which extends above the pivot 42 and is engaged by the face of the slide 16, as shown in Fig. 5. This engagement of the arm 43 of the former with the slide holds the arm 40 in position while the bending of the staple is being effected. After this has been effected, however, the arm 43 drops into a recess 44 in the rear face of the slide 16, so that the continued downward movement of the slide will force the arm 40 backward out of the way.

45 designates a feeler, which is mounted to slide vertically in guides between the slide 16 and the lower portion of the lever arm 10. A spring 46 is seated within the hollow upper portion of this feeler about a rod 47, which extends downwardly from a lug 48 on the upper end of the slide 16, whereby as the slide moves downwardly the spring 46 will be compressed to actuate the feeler.

49 is the staple driving hammer or plunger, which is pivotally connected at 50 to the cross-head, and which extends downwardly through guides 51 of the slide 16. This plunger or hammer has a lug or projection 52, which extends into a recess 53 in the slide 16 (see Fig. 8), so as to permit limited independent movement of the slide and hammer.

The feeler 45 of the right-hand mechanism (looking at Fig. 2), is arranged at the front side of the housing or carrier, while that of the mechanism at the left-hand side of said figure is arranged at the back of the housing for greater convenience.

The operation is as follows:—The barrel or keg C whose hoops are to be stapled, is supported upon a bracket 54 attached to the frame, 2, as shown in Fig. 1. The cross-head is actuated by any suitable power connection, such as a pitman 55 connected with a driven gear wheel 56. As the cross-head descends, the shear plate 17 coöperating with the fixed shear and guide plate 28 cuts off the proper length of wire for a staple, and the continued downward movement of the slide 16 actuated by the pawl 20 bends this wire over the arm 40 of the former. The arm 43 of the former now drops into the recess 44 of the slide, allowing the former to swing back and out of the path of the slide and of the nail-driving plunger or hammer. At this time the roller pins 14 engage the portions 13 of the cam slots, thereby swinging the housings or carriers on the pins or centers 8, so that their lower ends move toward opposite ends of the barrel or keg and to one side of the line of the hoop or band to be stapled. When this has taken place, the feelers 45 have reached the keg or barrel, and the rollers 14 have passed into the lower portions 12 of the cam slots. The springs 15 secured to the lower ends of the



housings or carriers now act to swing the lower ends of the housings or carriers inwardly and thereby pull the feelers against the outer edges of the hoops where they are held by the action of these springs. The slide 16, now actuated by the compression of the springs 23, the pawls 20 having been disengaged by their engagement with the upper ends of the housings or carriers, forces the plate 17 into contact with the barrel or keg, and the continued downward movement of the cross-head actuates the plungers or hammers 49 to drive the staples home. On the return stroke of the cross-head the feelers and the staple-driving hammers or plungers return to their original positions, and the pawls or carriers resume their central positions. The rods 31 operate the ratchets 33 to effect the operation of the feed rolls 26 and 27 to feed forward a staple length of wire for the next staple, after which the operation is repeated.

It will be understood that the pawls 20 are released from the slide 16 as soon as the staple is formed, and that the remaining travel of these slides is effected by means of the springs 23, so that the slides and the feelers may adjust themselves to any unevenness of the surface in the keg or barrel, which would not be possible if these parts were positively actuated for their entire movement. It will also be understood that the positions of the bands or hoops vary somewhat, and that the purpose of the feelers is to correct and position the staples with reference to the hoops before they are driven.

The advantages of my invention will be apparent. The mechanism is simple and positive in its character, and can be readily applied to existing machines. By means of this mechanism the staples may be rapidly formed and driven, and by using the mechanisms in duplicate, as shown in the drawings, means are provided for repeatedly stapling the hoops, kegs or barrels.

I claim:—

1. In staple driving mechanism, a pivoted housing or carrier, staple forming and driving mechanism carried thereby, means for actuating said mechanism, a locating device also carried by the housing or carrier, and means for effecting a pivotal movement of the housing or carrier to effect the operation of the locating device; substantially as described.

2. In mechanism of the character described, a housing or carrier capable of a swinging movement, means for effecting such movement, staple forming and driving mechanism carried by the housing or carrier, and a feeler or locating device also carried on the housing or carrier, to stop the carrier when the feeler contacts with the ob-

ject to be secured with the staple; substantially as described.

3. In mechanism of the character described, a pivoted housing or carrier, a shearing and staple forming device carried thereby, positive actuating connections for oscillating the carrier and for effecting a portion of the working stroke of said staple forming device, and a spring for completing its working stroke, substantially as described.

4. In mechanism of the character described, a pivoted housing or carrier, staple forming and driving devices carried by the housing or carrier, means for actuating said devices, a locating device or feeler also carried by the housing or carrier, cam means for moving the housing or carrier in one direction, and a spring for moving the housing or carrier in the reverse direction; substantially as described.

5. In mechanism of the character described, a pivoted housing or carrier, staple forming and driving means carried thereby, a lever arm extending upwardly from the housing or carrier and having a cam slot therefor, an actuating cross-head having a pin engaging the cam slot to rock the housing or carrier in one direction on its pivot, a spring connected to the housing or carrier for moving it in the reverse direction, means actuated by the cross-head for actuating the staple forming and driving devices, and a feeler or locating device also carried by the housing or carrier; substantially as described.

6. In mechanism of the character described, the combination of a reciprocating cross-head, a pivoted housing or carrier, staple forming and driving devices carried by the housing or carrier and actuated by the cross-head, a feeler or locating device also carried by the housing or carrier, means for actuating the feeler, and means actuated by the cross-head for rocking the housing or carrier on its pivot; substantially as described.

7. In mechanism of the character described, the combination of a reciprocating cross head, a pivoted housing or carrier, a staple forming and driving device carried by the housing or carrier and actuated by the cross head, wire feeding means on the housing or carrier and also actuated by the movement of a cross head, and means to oscillate the carrier during each reciprocation of the cross head; substantially as described.

8. In mechanism of the character described, the combination with a reciprocating cross-head, of a pivoted housing or carrier, staple-forming and driving devices carried by the housing or carrier and actuated by the cross-head, wire-feeding means on the housing or carrier, and also actuated by the movement of the cross-head, and means for automatically moving the housing or carrier to



bring the formed staple into proper relation with the work; substantially as described.

9. In mechanism of the character described, the combination of a reciprocating cross-head, a pivoted housing or carrier, staple forming and driving devices carried by the housing or carrier and actuated by the cross-head, a feeling or locating device carried by the housing or carrier, and means for causing the staple forming and driving devices to adjust themselves to the object in which the staples are to be driven; substantially as described.

10. In mechanism of the character described, the combination of a vertical reciprocating cross head, a pivoted housing or carrier, a cutting and forming slide mounted to reciprocate in the housing or carrier, means carried by the cross head for actuating said slide, wire feeding mechanism also carried by the housing or carrier and actuated connection with the cross head, a feeler or locating device carried by the housing or carrier and means to oscillate the carrier during each reciprocation of the cross head; substantially as described.

11. In mechanism of the character described, the combination of a vertical reciprocating cross head, a pivoted housing or carrier, a staple cutting and forming slide mounted in guides of the housing or carrier, a pawl carried by the cross head and arranged to actuate said slide for a portion of its movement, means for then throwing the pawl out of operation, a spring actuated by

the cross head and completing the operation of the slide, and means to oscillate the carrier during each reciprocation of the cross head; substantially as described.

12. In mechanism of the character described, the combination of a vertically reciprocating cross-head, of two separately pivoted housings or carriers, staple forming and driving mechanism in each housing or carrier, means actuated by the cross-head for actuating the staple forming and driving mechanisms, a feeling or locating device carried by each housing or carrier, and means for moving the two housings or casings toward and away from each other; substantially as described.

13. In a staple driving mechanism, a pivoted housing or carrier, staple forming and driving mechanism carried thereby, means to reciprocate the said carrier, and means for oscillating the carrier during its reciprocation; substantially as described.

14. In a staple driving mechanism, a pivoted housing or carrier, staple forming and driving mechanism carried thereby, a cam carried by the carrier, means to reciprocate the carrier, and a projection engaging the cam to oscillate the carrier during its reciprocation; substantially as described.

In testimony whereof, I have hereunto set my hand.

WILLIAM A. KILMER.

Witnesses:

M. A. DOWDALL,  
T. D. TEMPLE.