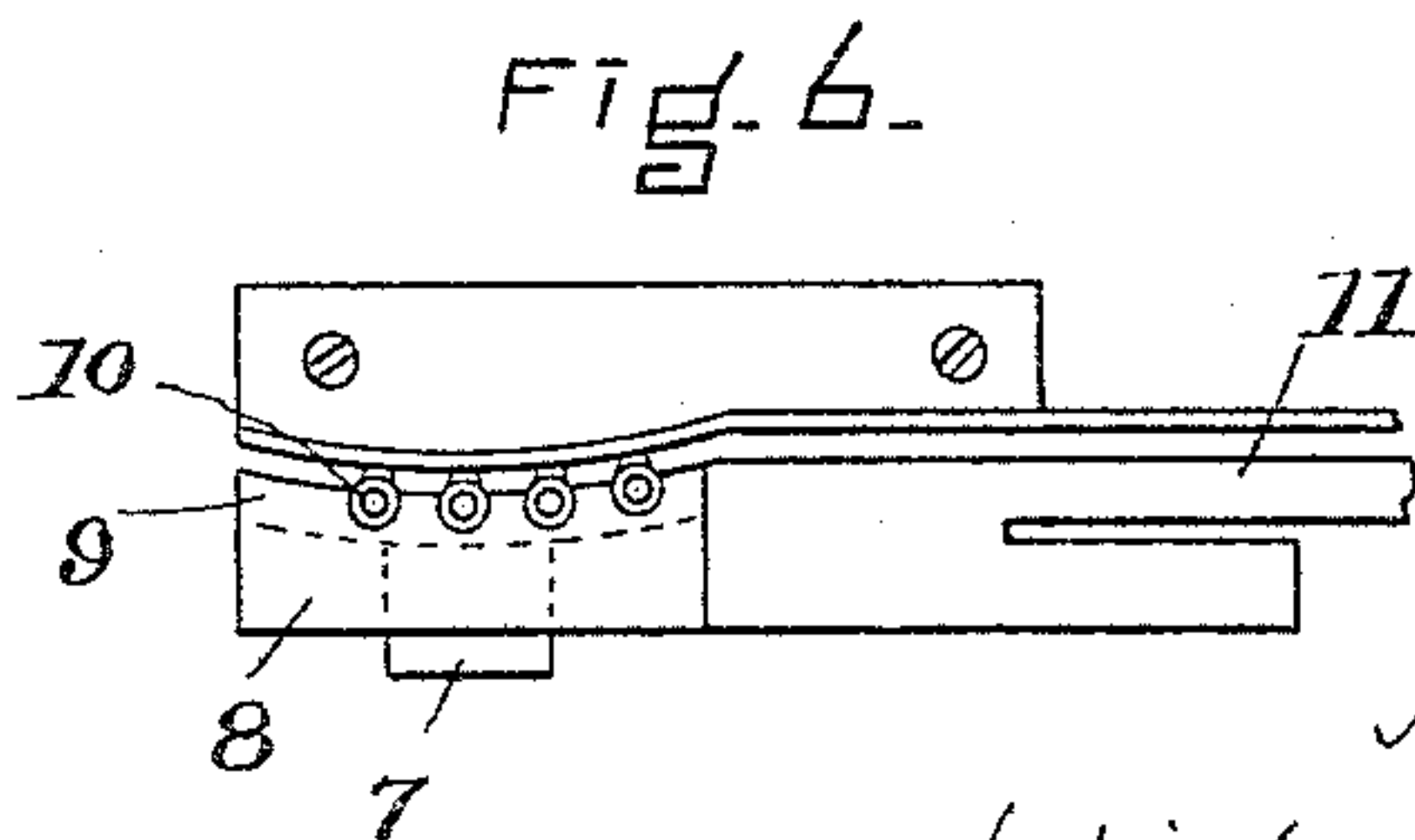
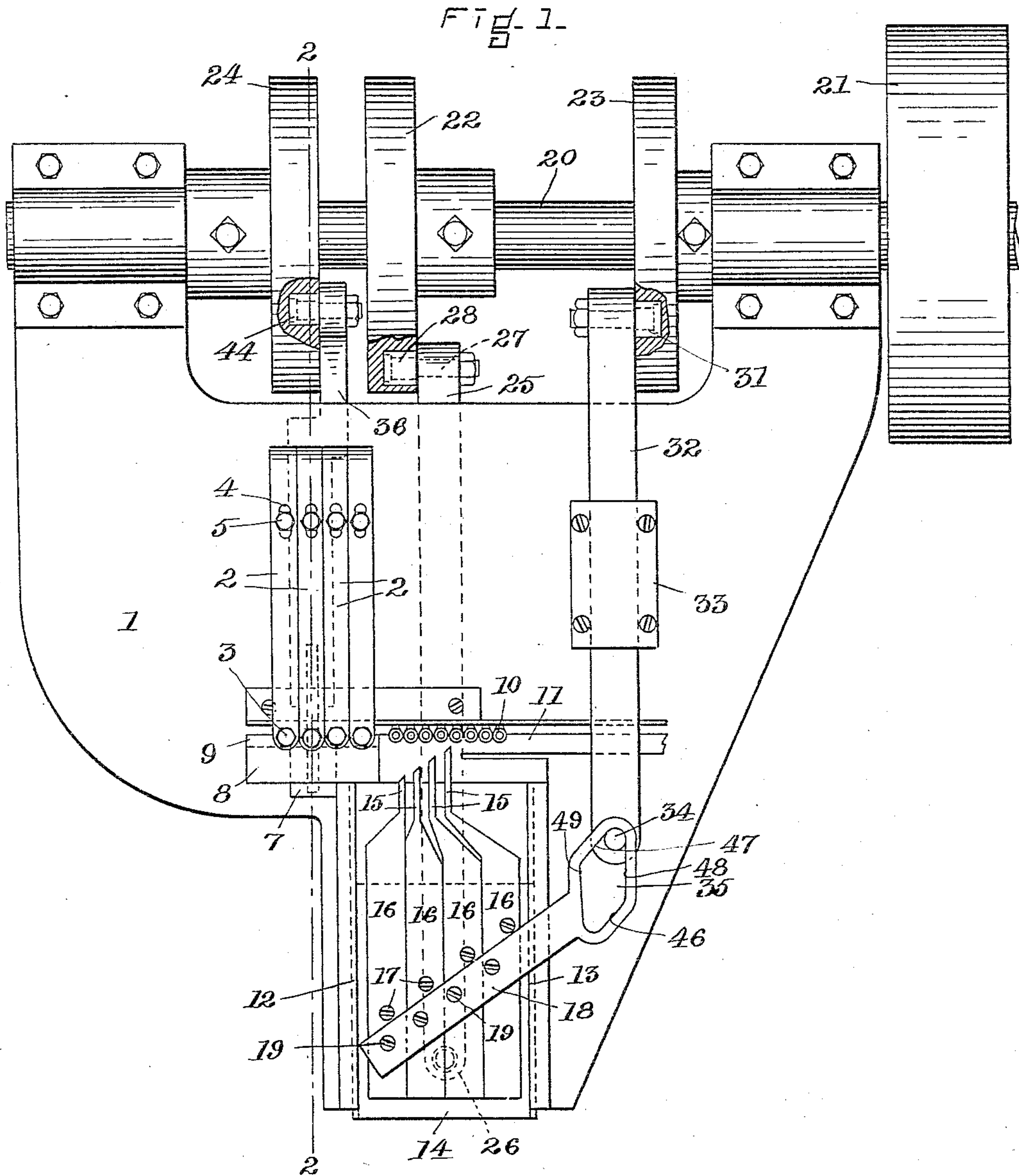


A. W. HARGRAVES.
MACHINE FOR SETTING LACING HOOKS AND THE LIKE.
APPLICATION FILED MAR. 2, 1909.

934,402.

Patented Sept. 14, 1909.

2 SHEETS—SHEET 1.



WITNESSES.

H. L. Robbins
A. C. Ratigan

INVENTOR.

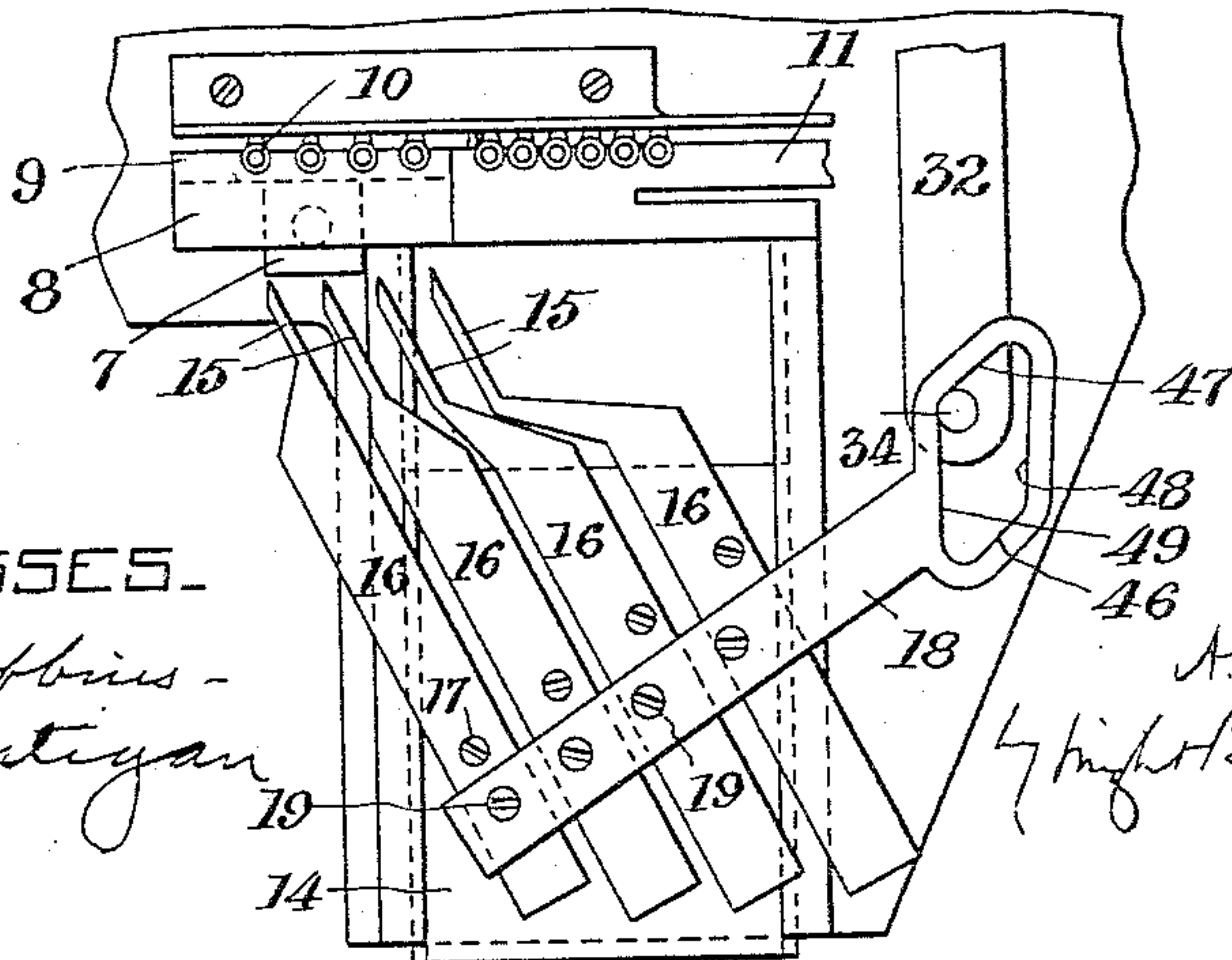
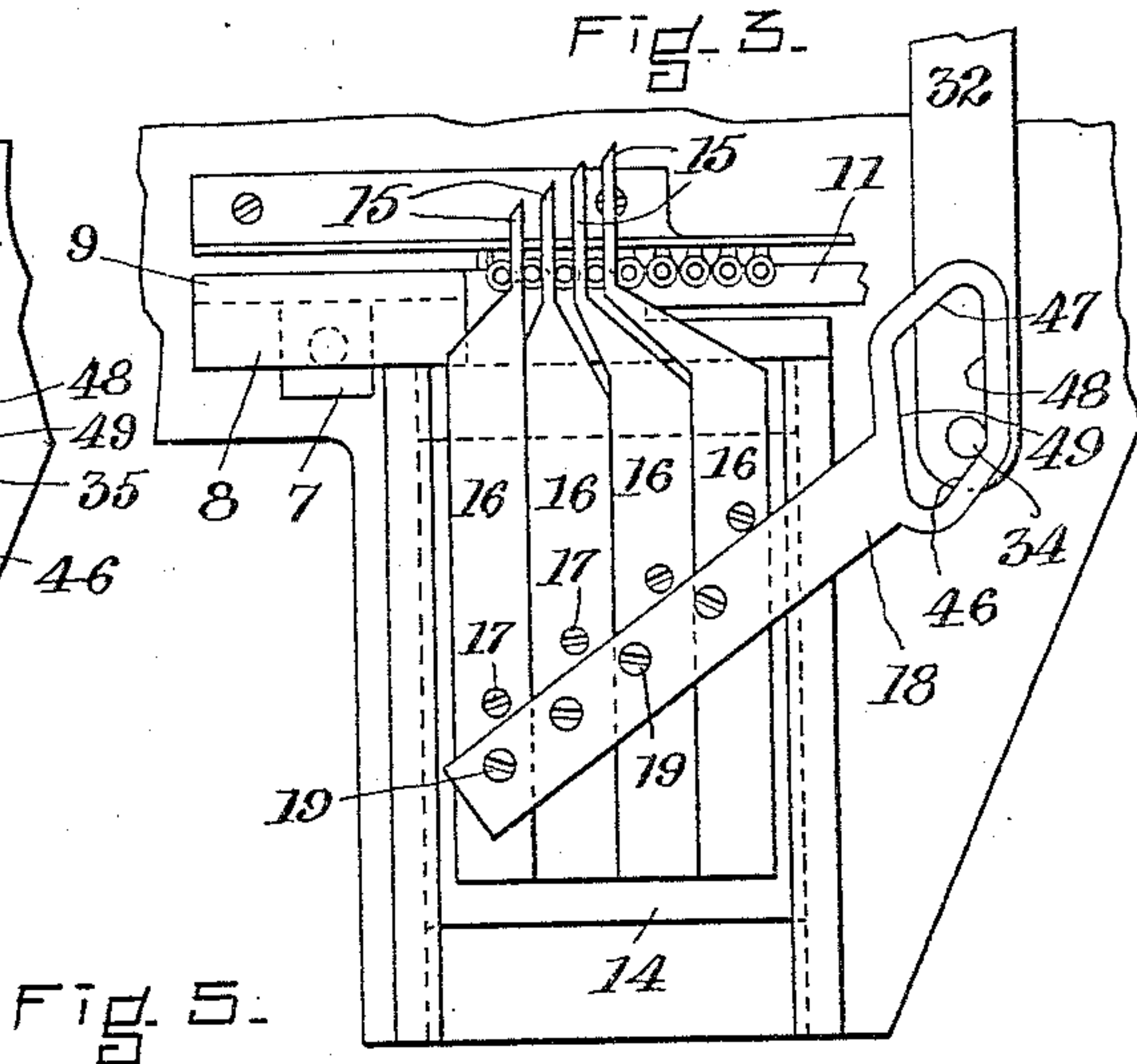
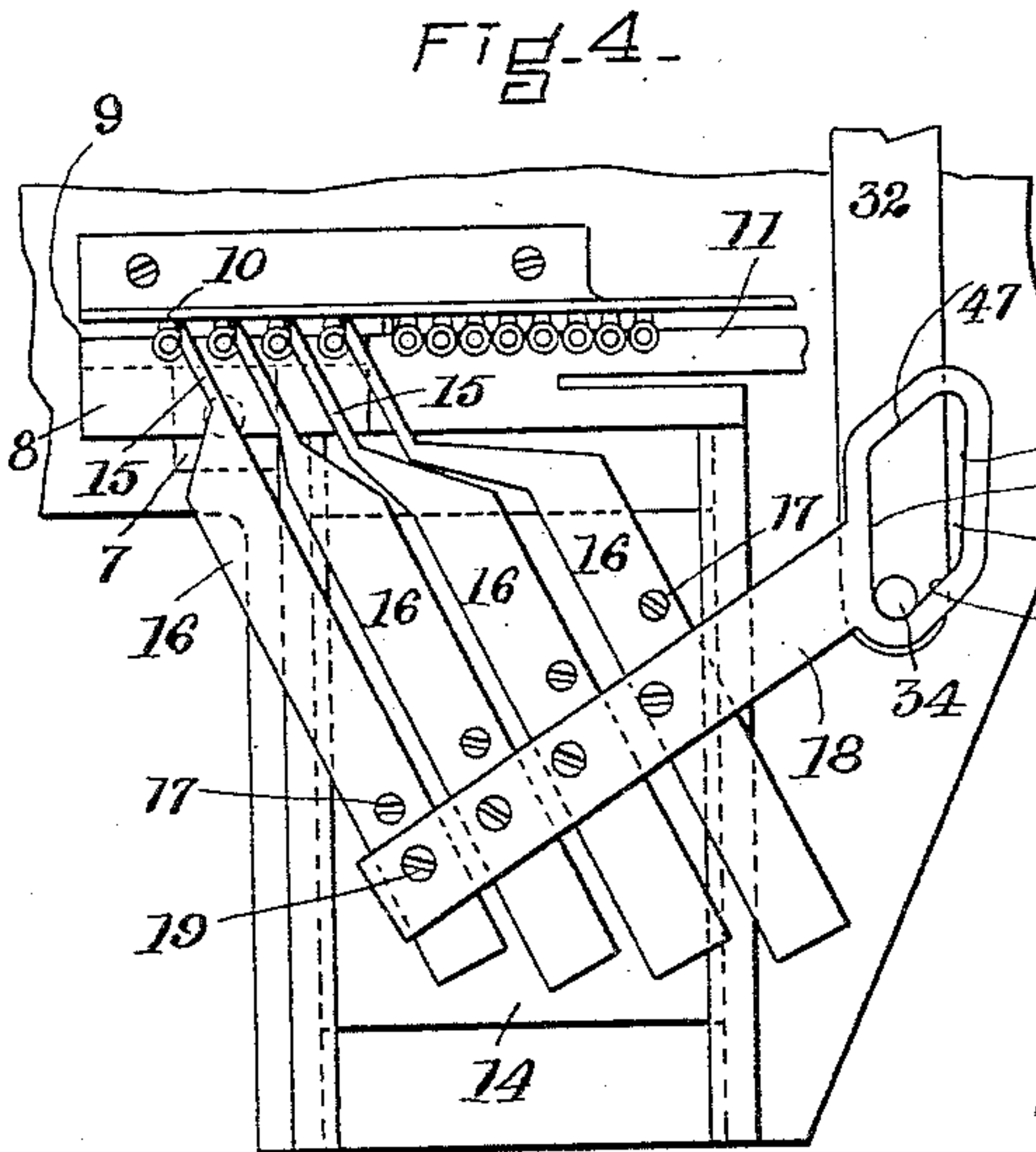
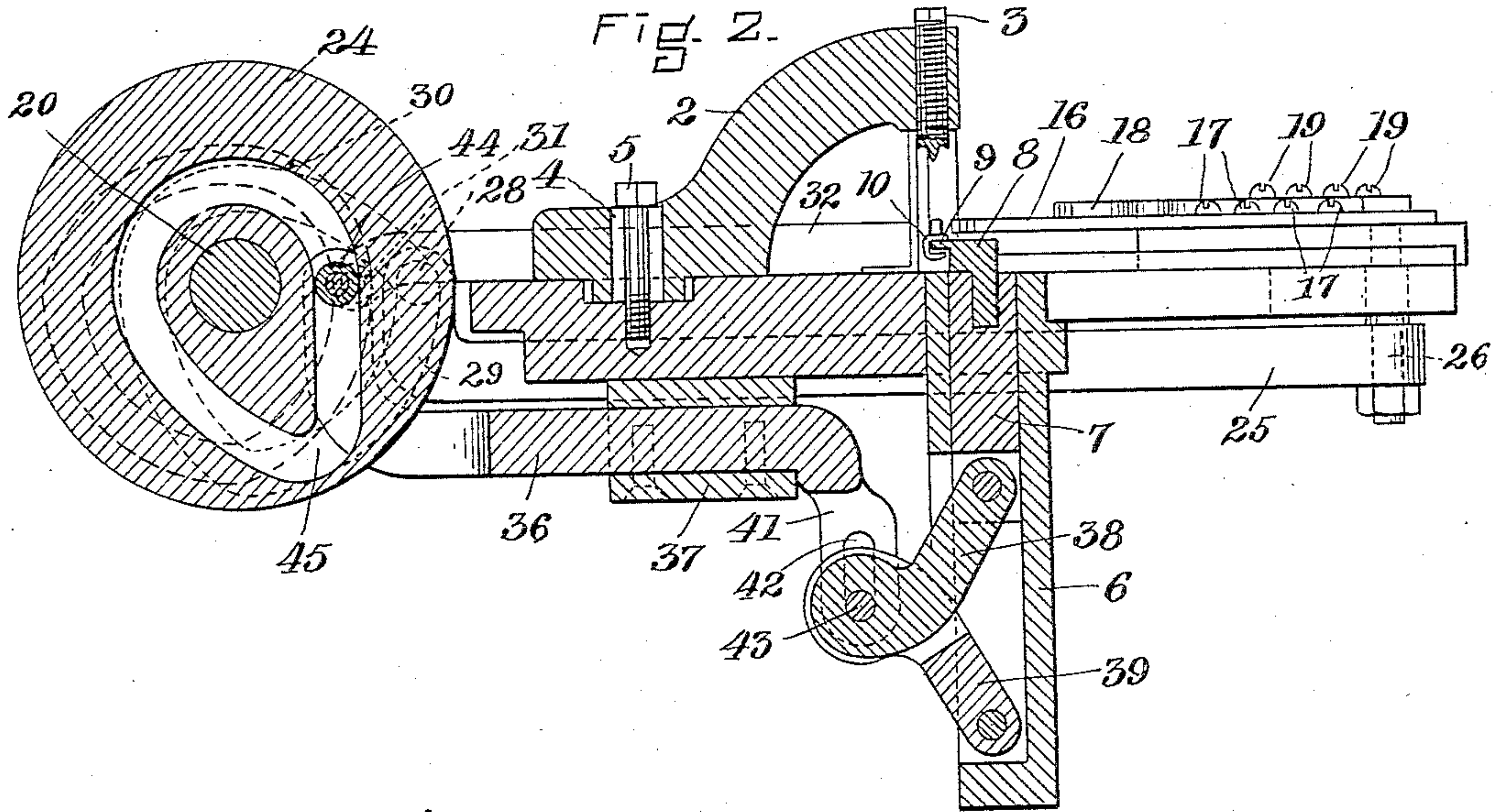
A. W. Hargraves
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UNITED STATES PATENT OFFICE.

ARTHUR W. HARGRAVES, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO LUCIUS F. ARNOLD, OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR SETTING LACING-HOOKS AND THE LIKE.

934,402.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed March 2, 1909. Serial No. 480,824.

To all whom it may concern:

Be it known that I, ARTHUR W. HARGRAVES, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Setting Lacing-Hooks and the Like, of which the following is a specification.

This invention relates to machines for setting lacing hooks, eyelets and articles of like nature in shoes, etc. Its object is to provide a gang machine adapted to take a number of such articles from a single raceway and set them in one operation, subsidiary to which object is that of separating the hooks prior to setting, so that they will be spaced to correspond with the setting dies or anvils, which are arranged in accordance with the spacing which the hooks are to have on the shoe upper. Accordingly, the main feature of the present invention is the spacing transfer, which is adapted to take a number of hooks from the raceway or other container in which they are held in order, and advance them to the setting dies, spreading them so that they will be correctly located with respect to the anvils by which they are clenched.

The invention consists also in the mechanism for carrying the above-noted objects into effect, and in details of construction, which are hereinafter fully set forth and claimed.

Of the accompanying drawings,—Figure 1 represents a plan view of a machine embodying my invention. Fig. 2 represents a longitudinal section of the machine on line 2—2 of Fig. 1. Figs. 3, 4 and 5 represent detail plan views of the feeding device, showing the same in three different positions. In Fig. 3, it is in engagement with the hooks, ready to feed them to the setting device; in Fig. 4, it has thus fed and separated the hooks; and in Fig. 5, it has retracted clear of the setting die. Fig. 6 represents a plan view of a modification.

The same reference characters indicate the same parts in all the figures.

In the drawings, 1 represents a base or table to the top of which are secured brackets 2, each of which carries a setting die or anvil 3. These brackets and anvils are stationary except for the adjustment which is permitted by the slots 4 through which their securing bolts 5 pass. Extending downward

from the table is a vertical guide 6 in which reciprocates a plunger 7 carrying a setting die 8. The latter projects through an aperture in the table and has a lip 9 suitable for holding lacing hooks 10 with their tubular shanks upward. The flange 9 of the die is a shelf, the edge of which conforms to the line in which the lacing hooks are set, and this edge, when the plunger 7 is in normal position, is in line with the plate 11, forming part of a raceway by which the hooks are conducted from a convenient magazine or on which they are previously placed in any suitable way. The anvils 3 are above the die 8 and the hooks are set by elevating this die. In the front of the table is a recess flanked by guideways 12 and 13 in which is contained a slide 14. This slide is movable toward and from the raceway and forms part of the feeder for sliding the hooks from the raceway to the lower die 8. The transferring elements consist of fingers 15 formed on bars 16 which are pivoted by means of studs 17 or other pivotal connections on the plate 14. A bar 18 extends across the finger-carrying bars 16 and is secured to each of the latter by fastening screws 19 or the like.

In the operation of the machine the slide 14, which normally is in the position shown in Fig. 1, is advanced so that the fingers pick off a number of hooks from the series on the raceway, one finger passing beside the tubular shank of each hook. The fingers are then moved toward the left and at the same time separated so that the hooks are advanced to the setting instrumentalities, one hook being under each anvil. The lower die is then lifted until the hook shanks are brought against the anvils and the hooks are set. The mechanism for giving these motions to the machine consists of a shaft 20 driven by any suitable means, as a pulley 21, on which shaft are mounted cams 22 23 and 24. The cam 22 operates the slide 14 through a bar 25 connected with the slide by a pin 26 and bearing on its rear end a stud 27 having a roll 28 contained in a groove 29 of the cam. The cam 23 has a groove 30 which receives a roll 31 carried on the side of one end of a bar 32 which passes through a guide 33 on the upper side of the table and has a stud 34 entering a recess 35 in the bar 18, before described. The third cam 24 operates the setting dies by means of a slide 36 passing through a guide 37 secured to the under side

of the table 1, and connected with toggle levers 38 and 39, the former of which is pivoted to the plunger 7, and the latter to the guide 6. The connection between the slide 5 36 and toggle is through an arm 41 of the slide which has a slot 42 receiving the knuckle pivot 43 of the toggle. The rear end of the slide carries a roll 44 contained in a groove 45 of the cam 24. The grooves 10 of the several cams are so shaped and timed that when the machine is started, the first part of the shaft's rotation carries the slide 14 forward. A dwell of the cam groove 28 then causes the slide to remain stationary, 15 while the cam 23 causes the fingers to feed hooks from the raceway to the plunger beneath the several anvils. A dwell in the cam groove 30 then allows the fingers to remain in their offset and spread condition 20 while the slide retracts. Finally, the cam groove 45, which has a single abrupt offset and is concentric through the greater part of its extent, raises and lowers the plunger 7. While the plunger is being lowered, the slide 25 32 which spreads and closes the fingers, is returned to normal position and the fingers brought back to the position illustrated in Fig. 1.

The end of the bar 18 which contains the 30 recess 35 is formed as a frame having two cam surfaces 46 47 connected by intermediate sides 48 and 49 which are provided to permit the necessary movement of the slide 14 back and forth without displacing the 35 fingers. When the fingers are closed together, the side 48 is parallel to the line of movement of the slide 14 so that this side travels along by the pin 34 without affecting the position of the fingers, until the pin is 40 at the angle of the sides 48 and 46, as shown in Fig. 3. Upon the bar 32 being then moved in the direction of the arrow on Fig. 3, the pin acts on the cam edge 46 and displaces the bar 18 to the right, swinging the 45 finger-carrying bars 16 about their pivots 17. As the pivots are at varying distances from the ends of the fingers, the right-hand pivot being nearest the raceway and the left-hand pivot farthest therefrom, the left-hand 50 finger travels farther than any of the others, and the right-hand finger has the least travel, the intermediate fingers being moved in proportion, so that the hooks engaged by the various fingers are moved variously, but 55 by such amounts that they are evenly spaced. The positions of the pivots and the lengths of the fingers determine the distances through which the hooks are fed, and by suitably designing these features, the hooks 60 may be given any spacing desired, and the machine may be adapted to any class of work. When the fingers are spread, as shown in Fig. 4, the side 49 is parallel to the travel of the slide 14 so that the fingers are 65 not disturbed while the slide retracts. The

retractive movement brings the pin 34 in the angle between the edges 47 and 49 so that the final movement of the bar 32 rearward restores the transverse bar 18 to the normal position and closes the fingers.

It will be understood that that portion of the invention which relates to feeding and spacing the hooks is not necessarily limited to machines adapted to set lacing hooks 75 alone, but may be applied to machines for setting eyelets, rivets, or any other device of similar nature which may be set in gangs. I desire to make it also understood that I do not limit my invention to the number of feeding fingers shown, but propose to use 80 more or less with any provision for adjusting them so as to vary the spacing of the hooks or other articles, that may be desirable.

I claim:—

1. A setting machine comprising a race- 85 way, setting instrumentalities arranged to set a plurality of hooks or the like simultaneously, and positive means for taking from one raceway a number of the articles to be set and spreading them apart in posi- 90 tion to be acted on by said instrumentalities.

2. A setting machine comprising a race- way, setting instrumentalities arranged to set a plurality of hooks or the like simul- 95 taneously, and spacing means having members for engaging a number of the articles to be set and advancing them to the setting instrumentalities.

3. A setting machine comprising a race- way, setting instrumentalities arranged to 100 set a plurality of hooks or the like simultaneously, and spacing means having members for engaging a number of the articles to be set in a positive manner and advancing them to the setting instrumentalities, said 105 spacing means being constructed to spread said articles conformably to the spacing of the setting instrumentalities.

4. A hook-setting machine adapted to set simultaneously a gang of hooks, comprising 110 a plurality of setting dies, a holder for hooks adapted to support the same in line, and a feeder having fingers movable so as to engage a number of hooks simultaneously and transfer the same different distances into cor- 115 rect position relatively to the setting dies.

5. A hook-setting machine adapted to set simultaneously a gang of hooks, comprising a plurality of setting dies, a holder for hooks adapted to support the same in line, a feeder 120 having a number of hook-engaging fingers, means for moving said feeder to engage the fingers with a number of hooks, and means for shifting said fingers so as to transfer the hooks from the holder into position to be 125 acted on by the setting dies, and at the same time spacing the hooks to correspond with the spacing of the dies.

6. A lacing-hook-setting machine having a gang of setting dies or anvils, a plunger 130

movable toward and from said anvils, having a continuous hook-supporting lip adapted to hold hooks in any position and to carry hooks toward the latter to be set thereby, and feeding means constructed and arranged to place hooks upon said plunger and space them correspondingly to the positions of the anvils.

7. A lacing-hook setter comprising a plurality of setting dies or anvils, means for carrying a number of hooks simultaneously to said anvils, and feeding means for placing hooks on said carrying means and spacing them in conformity with the spacing of the anvils.

8. A lacing-hook-setting machine comprising a series of anvils, carrying means for pressing hooks against said anvils to clench the shanks thereof, a guide arranged to conduct a line of hooks to said carrying means, and a feeder having provisions for simultaneously engaging a number of hooks and constructed to move the hooks thus engaged through varying distances to transfer them to said carrying means in position to be engaged with the dies.

9. In a lacing-hook-setting machine, a guideway having provisions to conduct hooks in regular order, a feeder having fingers-reciprocable transversely of said guideway so as to engage a number of hooks simultaneously, and means for moving said fingers in the direction of the guideway through varying distances to remove hooks therefrom and space them to conform with the positions they are to occupy when set.

10. In a lacing-hook-setter, a raceway, a slide reciprocable transversely of said raceway, fingers carried by said slide adapted to pass between adjacent hooks and separate a plurality of them from the remainder of the hooks on the guideway, and means for moving said fingers laterally through varying distances to remove the hooks from the guideway and space the hooks.

11. In a lacing-hook-setting machine, a feeding device consisting of a reciprocable slide, bars pivotally mounted on said slide and having fingers adapted to engage hooks, and means for swinging said bars to displace the fingers and thereby feed hooks.

12. In a lacing-hook setter, a raceway adapted to guide hooks in line, a slide movable toward and from said raceway transversely thereto, a series of bars pivoted upon said slide and having fingers to enter the spaces between a number of adjacent hooks, and means for swinging said bars about their pivots to cause the fingers to feed the hooks from the raceway, the pivots of said bars being at varying distances from the raceway, whereby the fingers are movable through varying distances to space the hooks at the same time that they are thus fed.

13. A lacing-hook-setting machine comprising

a series of setting dies, a raceway for conducting hooks in line to said dies, and a feeder for advancing hooks from the raceway into position to be acted upon by said dies, said feeder having fingers normally separated from one another conformably to the spacing of the hooks on the raceway and being movable through successively varying distances in the direction necessary to transfer hooks from the raceway into position for being acted upon by said dies.

14. A lacing-hook-setting machine comprising a series of setting dies, a raceway for conducting hooks in line to said dies, and a feeder for advancing hooks from the raceway into position to be acted upon by said dies, said feeder comprising a slide movable transversely of the raceway, fingers mounted upon said slide and spaced so as to enter behind a number of the foremost hooks on the raceway, and means for moving said fingers transversely of the movement of the slide through different distances, the finger engaging the foremost hook having the greatest range of movement, and the others having successively diminishing amounts of movement, to advance the hooks thus engaged through the distances necessary to place them in position for simultaneous engagement with the several dies.

15. A lacing-hook-setting machine comprising a series of dies adapted to set a gang of hooks, a guide for holding a supply of hooks in order, a slide movable toward and from said guide, fingers pivotally mounted on said slide, their pivots being at varying distances from the guide, means for moving the slide so as to cause the fingers to pick off at one time a number of hooks, and means for swinging the fingers about their pivots to advance hooks from the guide into position to be acted upon by said setting dies.

16. A lacing-hook-setting machine comprising a base, a series of brackets extending over said base, a setting anvil carried by each of said brackets, a plunger movable in line with said anvils having provisions for engaging said anvils, a raceway for guiding hooks to said plunger, a feeder comprising a plate reciprocable transversely of said raceway of one side of the anvils, feeding fingers mounted on said plate to pick off a number of hooks at one time from the supply thereof on the raceway, said fingers being pivoted to said plate at varying distances from the raceway, and means for swinging said fingers about their pivots toward the plunger to feed hooks from the raceway to the latter, the variations in the locations of the finger pivots causing the fingers to be moved through varying distances whereby to space the hooks in conformity with the setting anvils.

17. In a machine for setting lacing hooks

and the like, a plurality of anvils, a die co-
operating therewith, one single raceway, and
positive transferring means constructed to
take a number of hooks from the single
5 raceway and transfer them to the die, at the
same time spreading the hooks in the die to
correspond with the spacing of the anvils.

In testimony whereof I have affixed my
signature, in presence of two witnesses.

ARTHUR W. HARGRAVES.

Witnesses:

A. C. RATIGAN,
P. W. PEZZETTI.