

W. C. STEWART.

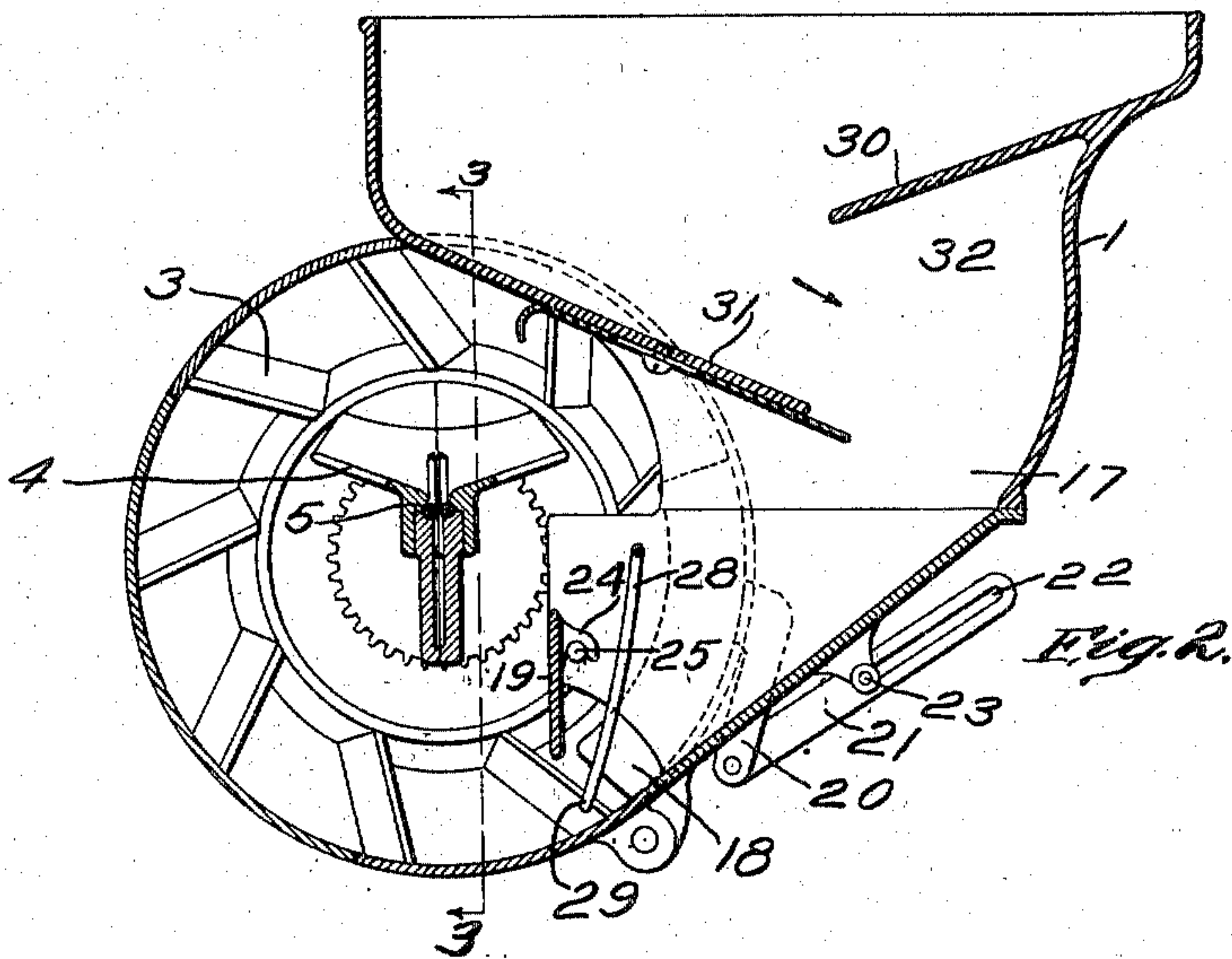
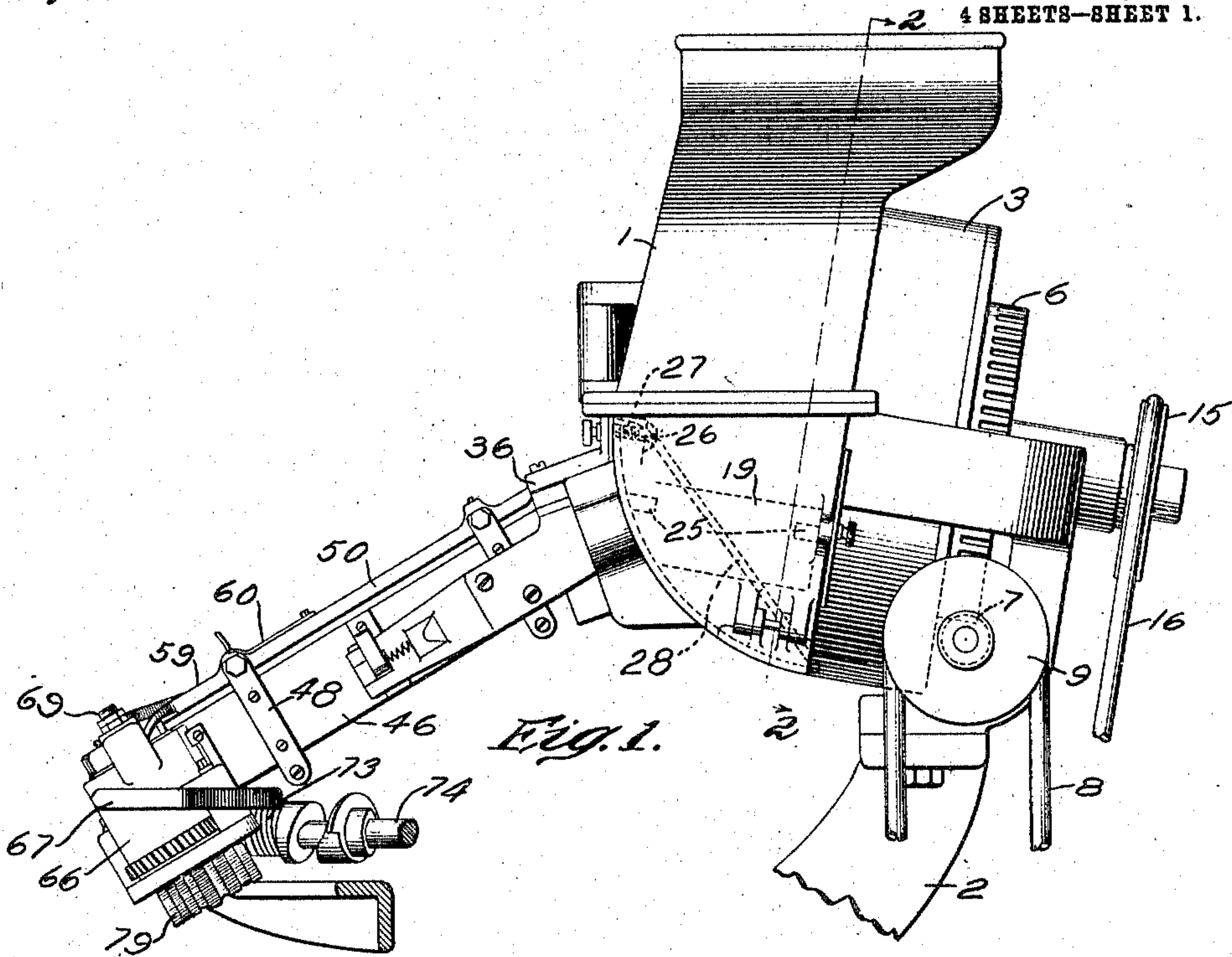
NAIL ASSORTING AND DELIVERING MECHANISM.

APPLICATION FILED DEC. 12, 1908. RENEWED NOV. 22, 1909.

958,039.

Patented May 17, 1910.

4 SHEETS—SHEET 1.



Witnesses:  
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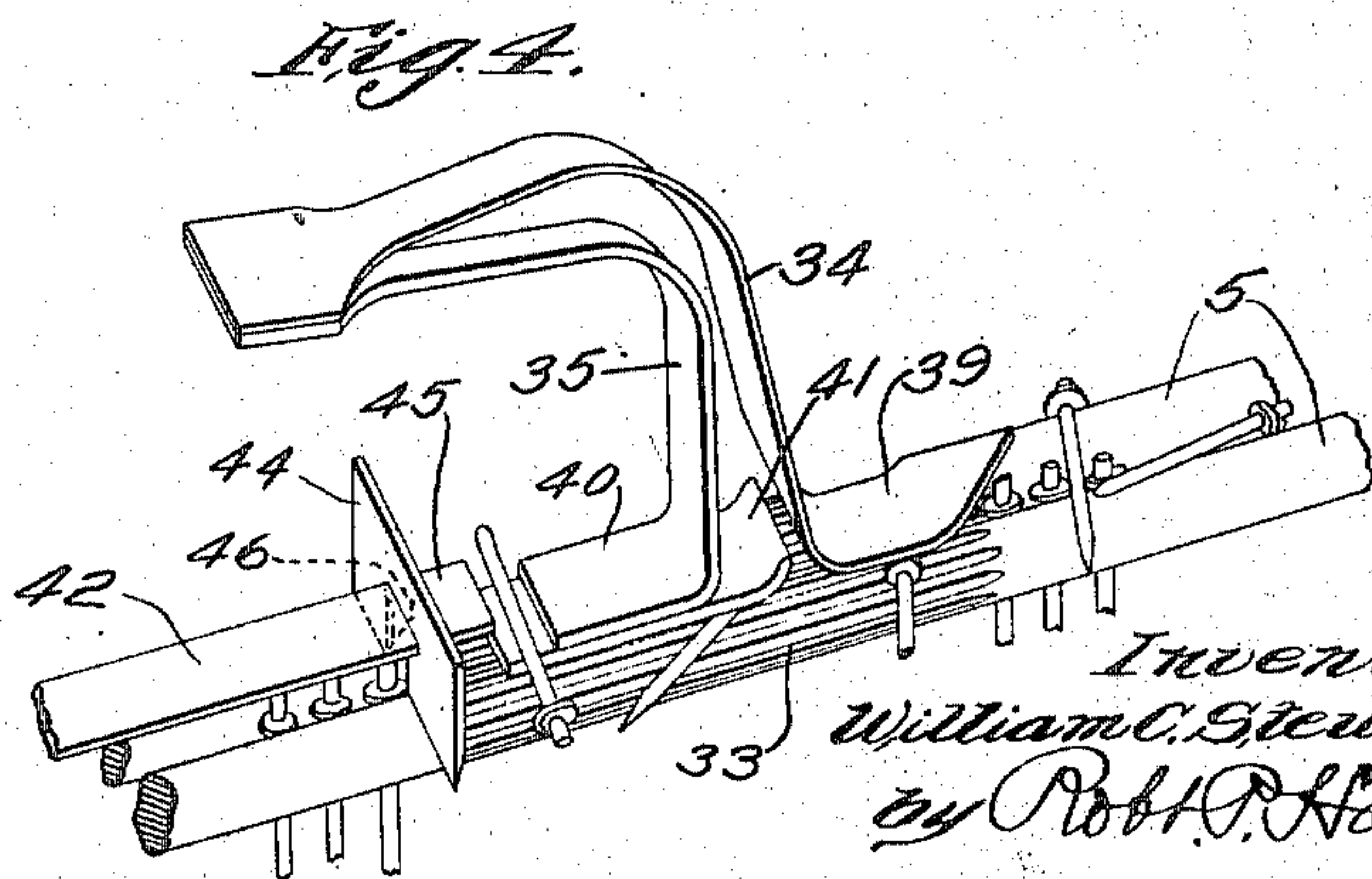
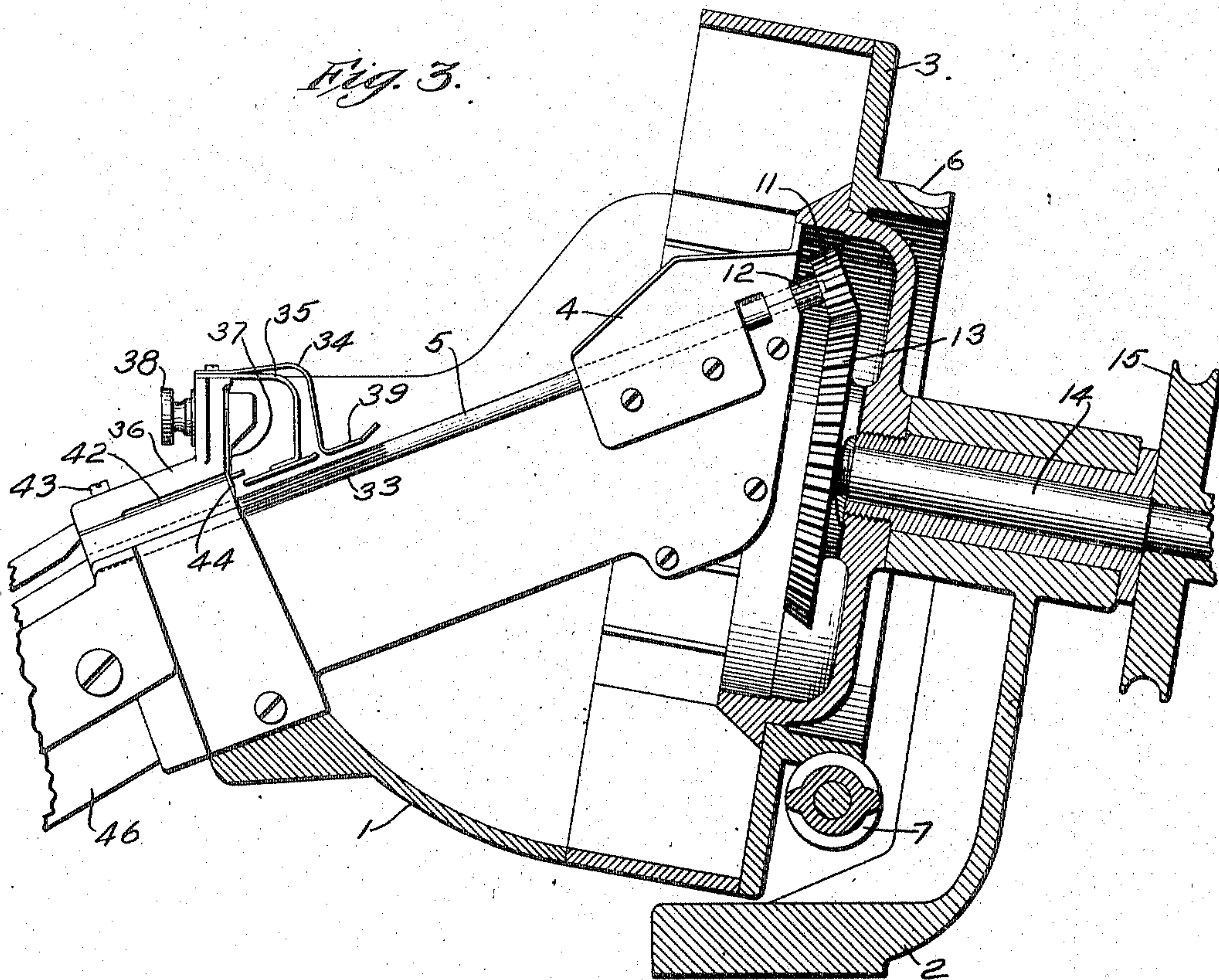
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4 SHEETS—SHEET 2.



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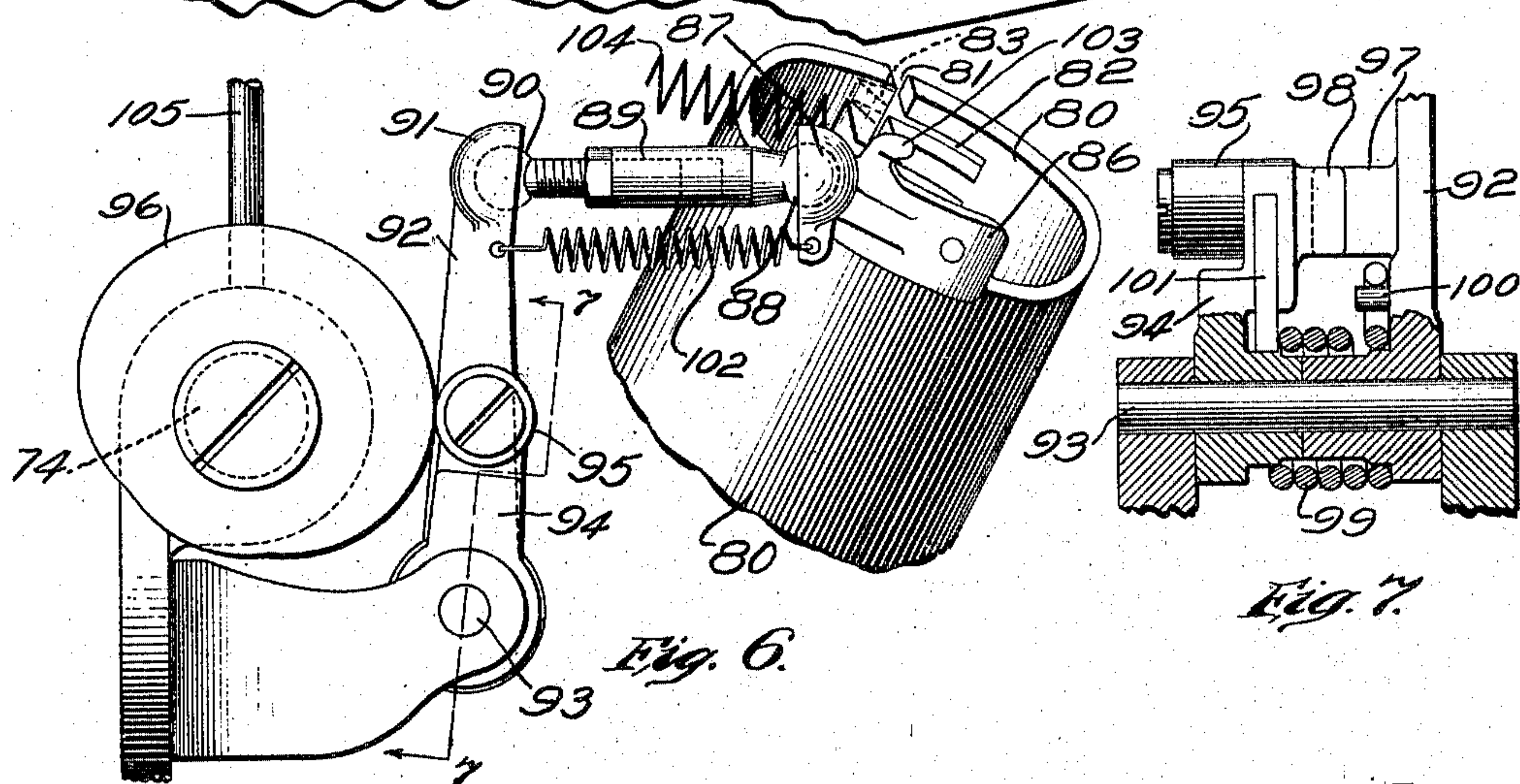
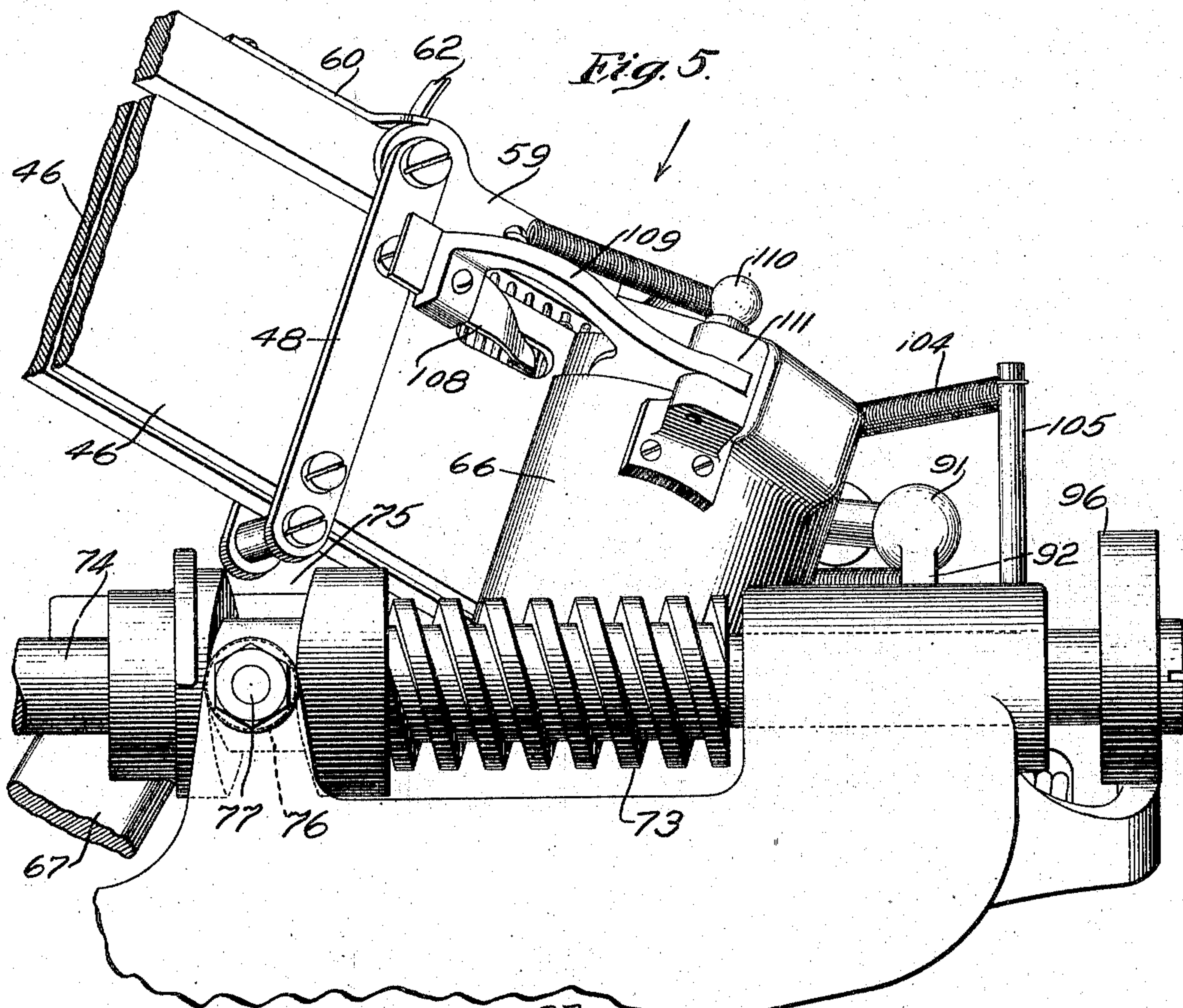


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4 SHEETS—SHEET 3.



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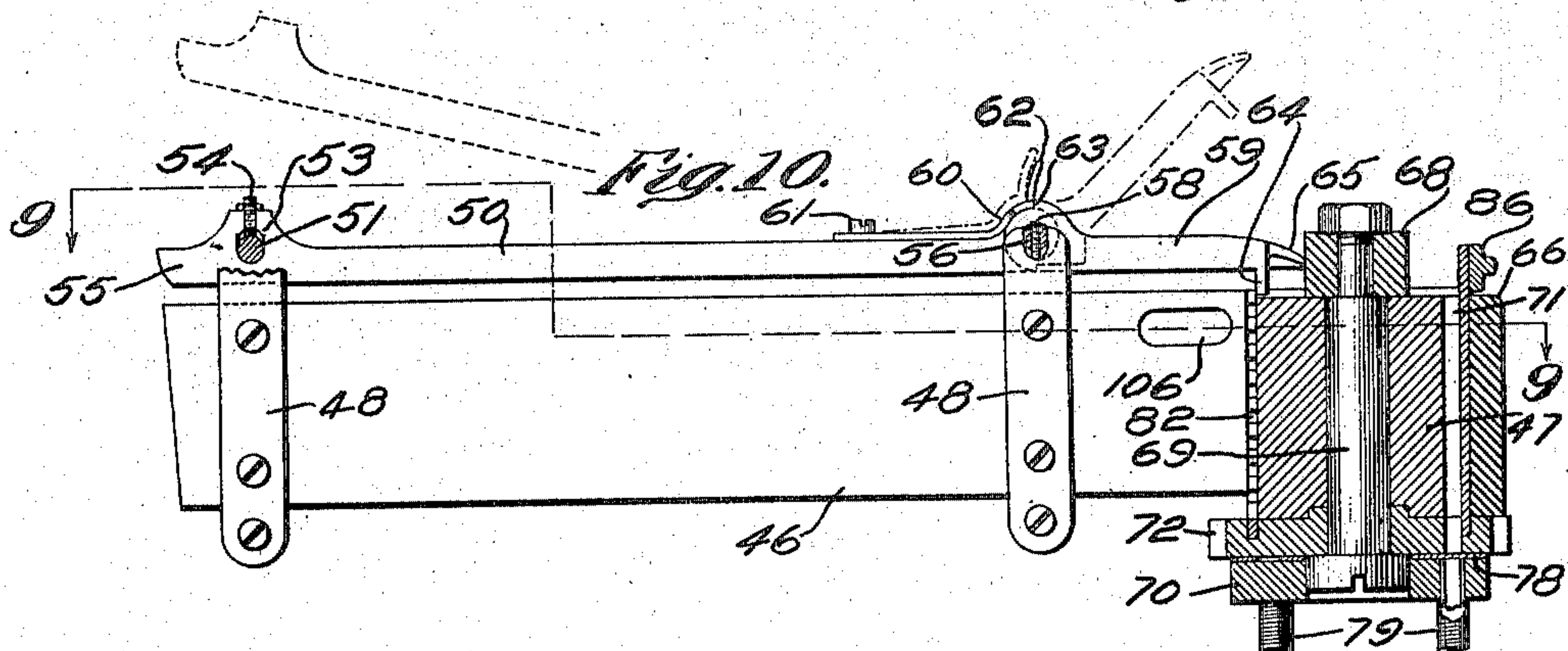
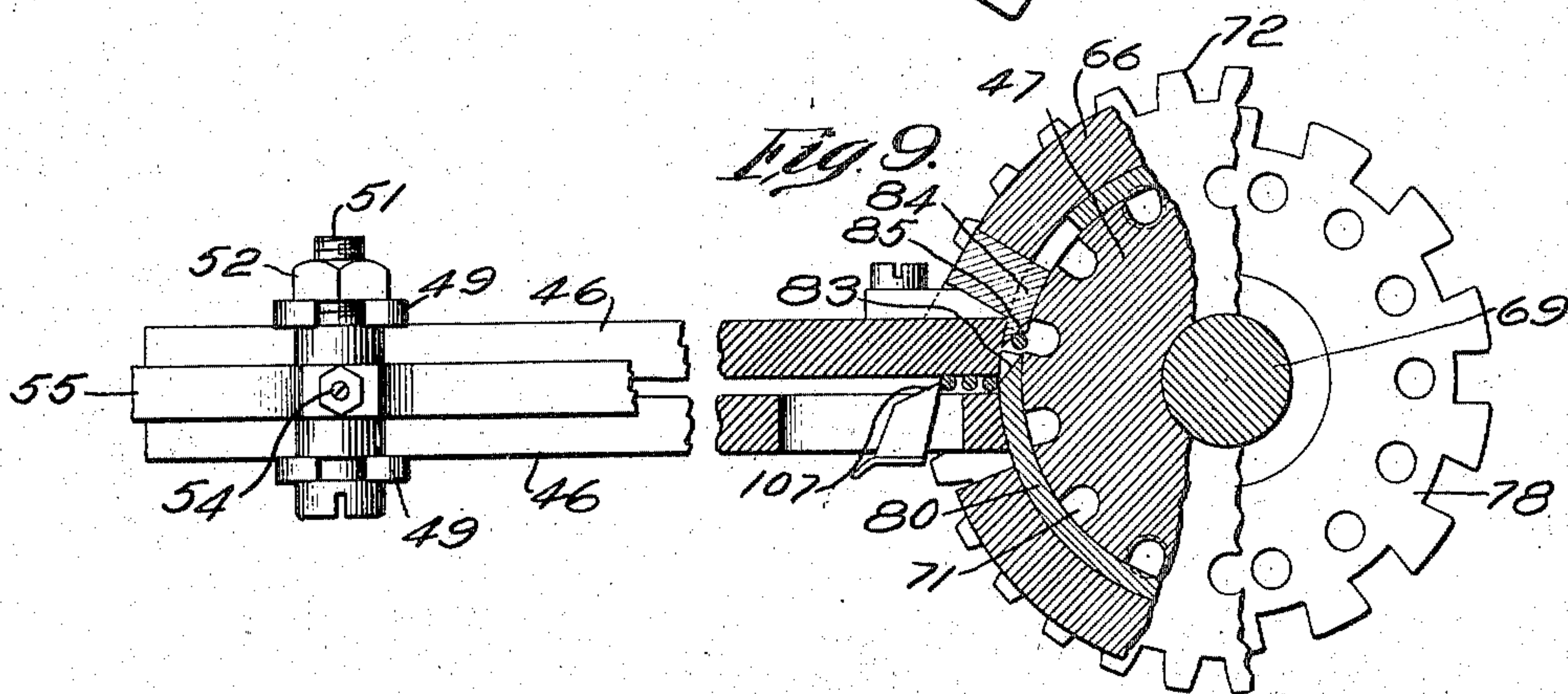
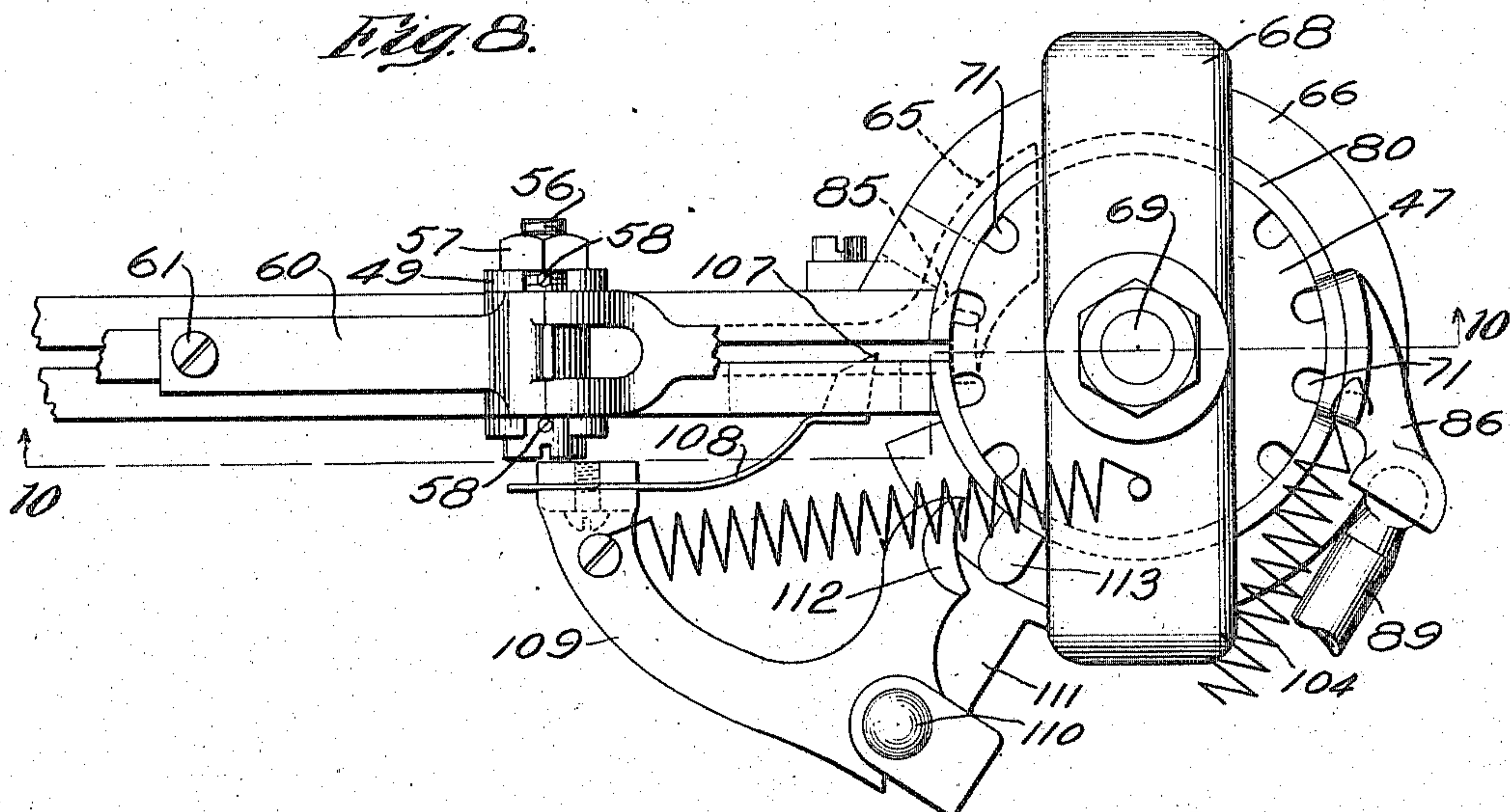


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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

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## NAIL ASSORTING AND DELIVERING MECHANISM.

958,039.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed December 12, 1908, Serial No. 467,180. Renewed November 22, 1909. Serial No. 529,312.

*To all whom it may concern:*

Be it known that I, WILLIAM C. STEWART, a subject of the King of Great Britain, residing at Lynn, in the county of Essex and State of Massachusetts, have invented an Improvement in Nail Assorting and Delivering Mechanisms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The invention to be hereinafter described relates to boot and shoe machines and more especially to the nail assorting and delivering mechanism of the general type set forth in an application for patent filed by me January 3, 1908, Serial No. 409,141, to which reference may be had. In the said prior application, means were shown and described for delivering nails from a hopper to a raceway from which they were delivered singly in predetermined variable numbers to a receiver, and when the receiver had taken its predetermined number of nails from the raceway, its actuating means was automatically stopped, and the nails delivered to a nail distributor.

With these general features of the machine in view, the aims and objects of the present invention will best be understood and made clear from the following description and accompanying drawing disclosing one character of means for putting the invention into practical effect.

In the drawings:—Figure 1 is a side elevation showing the general relations of hopper, raceway, and receiver; Fig. 2 is a section of the hopper on the line 2—2, Fig. 1; Fig. 3 is an enlarged section of the hopper and nail delivering wheel on the line 3—3, Fig. 2, showing the raceway and parts within the hopper in elevation; Fig. 4 is an enlarged detached detail view, showing means for causing improperly positioned nails to be thrown from the raceway; Fig. 5 is an enlarged side elevation, parts being broken away, showing the nail receiver actuating means, part of the raceway, and adjacent parts; Fig. 6 is a view looking from the right of Fig. 5 to show more particularly the nail delivering device and its actuating means; Fig. 7 is a section on line 7—7, Fig. 6; Fig. 8 is a view looking upon the raceway, nail receiver, and adjacent parts in the direction of the arrow, Fig. 5; Fig. 9 is a

section on the line 9—9, Fig. 10, the central portion of the raceway being broken out; and Fig. 10 is a section on the line 10—10, Fig. 8, said line being extended to the end of the raceway, and the scale of said figure being reduced.

Referring to Figs. 1 and 2, the nail hopper 1 is sustained by a suitable bracket 2 projecting from the machine frame and is provided with a nail elevating or delivering wheel 3 carrying buckets for elevating nails supplied thereto and delivering them upon a shelf or table 4 from which they pass to a roller raceway 5 substantially as pointed out in my prior application, Serial No. 409,140, filed January 3, 1908. The nail elevating wheel 3 is preferably driven by means of a worm wheel 6 from a worm 7 which is itself appropriately driven by a belt and pulley 8 and 9, connected to a suitable source of power. The members of the roller raceway 5 are driven by suitable gear connection 11, 12, as pointed out in my prior application, with the bevel gear 13 secured to the shaft 14 and driven by the belt 16 through the pulley 15.

One of the difficulties frequently encountered, in feeding nails in bulk from a hopper, is that the nails become clogged in the nail chute, the passage of which is usually smaller than the receiving part of the hopper, and the weight of the nails dumped into the hopper adds to the difficulty.

In the present form of the invention, the chute 17, Fig. 2, terminates at its lower end in a delivery opening, the extent of which is adjustable by means of a sliding gate 18 and a removable barrier 19, Fig. 2. The gate 18 may be substantially as in my prior application, and is provided with an arm jointed to an actuator 21 having a slot into which extends a set screw 23, whereby, when the gate 18 is adjusted as desired it may be clamped in adjusted position.

The barrier 19 is removably supported at the open end of the chute 17, so that barriers of different sizes may be employed as circumstances dictate. In the illustrated form of the removable barrier it is provided with hangers 24 adapted to engage pins extending from the wall of the chute, said barrier preferably having means, such as the upwardly extending arm 26, adapted to engage a pin 27 to prevent tipping of the barrier on its hangers 24.



Extending into the chute 17 and preferably toward the delivery end thereof is a device 28, Fig. 2, for keeping the nails near the delivery end of the chute from bridging or clogging. Various forms of such device may be devised, that illustrated being in the form of a finger extending through the wall of the chute 17 and having its end 29 projecting through the lower open end of the chute and so disposed as to be struck by the blades or buckets of the elevating wheel 3. This finger may be formed as a spring having one end fixed to the wall of the chute, so that as the elevating wheel revolves, the buckets keep the finger moving and the nails properly agitated.

Extending part way across the hopper 1, and, preferably, some distance above the open end of the chute, are the relatively adjustable sustaining or supporting shelves 30, 31, the edge of one extending toward and preferably overlapping the edge of the other to thereby form a passageway 32 for the nails. From this construction it will be apparent that the weight of the great bulk of nails in the upper portion of the hopper and chute is taken off the nails near the opening of the chute, thus relieving to a large extent the liability to "bridge" or clog and permitting the finger 28 to move the nails freely as the elevating wheel revolves.

Nails delivered to the roller raceway gradually drop with their pointed ends between the rollers, which, as stated in my prior application, are rotated, said nails being then supported by their heads as indicated in Fig. 4. Many of the nails, however, fail to properly position themselves between the rollers of the raceway and must be removed therefrom to the end that they may not interrupt the continuous travel of properly positioned nails down the raceway.

As set forth in my prior application, the members of the roller raceway are provided at some portion of their length with indentations and elevations, as indicated by the corrugations 33, Figs. 3 and 4. Disposed above these corrugations 33 are the clearing members 34, 35, preferably carried by a bracket 36, Fig. 3, which may be held to the wall 37 at the lower portion of the hopper 1, by a set screw 38, or by any other well understood means.

The clearing members 34 and 35 are preferably formed as springs, having their lower end portions turned into substantial parallelism with the axis of the roller raceway and a distance above the same so as to prevent properly positioned nails from being lifted from between the rollers of the raceway, substantially as pointed out in my prior application.

The lower end portion 39 of the clearing member 34 is upturned slightly and trimmed to a point so that any improperly positioned

nail meeting the beveled side of the portion 39 would probably be thrown off the raceway and into the lower portion of the hopper 1.

The lower end portion 40 of the clearing member 35 is separated from the portion 39 of the clearing member 34, so that any improperly positioned nail passing under the clearing member 34 may be forced upward between the two members and discharged from the raceway. The portion 40 of the clearing member 35 is or may be formed with a shoe 41 extending toward the portion 39 of the front clearing member, its end being upturned, as shown, to assist in clearing the raceway of improperly positioned nails. The other end of the shoe 41 extends somewhat beyond the rear end of the end portion 40 to provide a clearing shelf or rest onto which improperly positioned nails may be forced, as will presently appear.

The bracket 36 carries a device which, for identification, may be referred to as a nail stop and director for causing any improperly positioned nails to be stopped from further movement down the raceway and directed out of the path of nails properly positioned and coming down the raceway. One form of this device is shown in Figs. 3 and 4, wherein 42 is a spring secured to the bracket 36 as by the screw 43, Fig. 3, and projecting inside the hopper above the raceway, said spring carrying a stop 44 inside the hopper and a short distance from the end 45 of said spring. The stop 44 is formed as a plate with a passageway 46 for the heads of properly positioned nails, the construction being such that should an improperly or cross-positioned nail pass the clearing members 34 and 35, it will be stopped from further movement down the raceway by the plate 44, and the pressure against said nail by the heads of properly positioned nails coming down the raceway will force the improperly positioned nail upward by acting on its cylindrical body portion and by the lifting action of the portions 33 of the roller raceway, the spring 42 yielding if necessary to permit the end 45 to direct the said nail thus thrown upward onto the shelf formed by the end of the shoe 41, from which is eventually drops into the bottom portion of the hopper.

Properly positioned nails traveling down the roller raceway 5 are presented to the exterior raceway by which they are supported and finally delivered to the nail receiver and by it transmitted in suitable groups to a nail distributor, as pointed out in my prior application. The exterior raceway comprises the side plates 46, Fig. 1, suitably spaced apart, as indicated in Figs. 8, 9 and 10, to support the nails by their heads, as pointed out in said application, the delivery end of said exterior raceway being disposed



adjacent the nail receiver 47 presently to be described. The exterior raceway has secured thereto two or more side arms 48 having bifurcated upper ends 49, Figs. 8, 9 and 10, adapted to support a cover plate 50, said cover plate being adjustable toward and from the exterior raceway so as to accommodate nails, the heads of which may project more or less above the surface of the raceway. Any suitable adjusting means may be employed to connect the cover plate 50 with the exterior raceway, said means in the present form of the invention, and, as shown more clearly in Fig. 10, comprising a bolt 51 which may be clamped in place upon the supports 48 by a nut 52 adjacent the upper portion of the exterior raceway. The cover plate 50 is provided with an elongated slot 53, through which the bolt 51 passes, and an adjusting screw 54 passes through the top portion of the plate 50 and bears on the bolt 51 whereby, after said bolt 51 is secured in desired position, the upper end 55 of the cover plate 50 may be adjusted toward or from the top of the exterior raceway in a manner which will be well understood.

The lower end of the cover plate 50, being that end nearer to the receiver 47, has fixed therein a screw bolt 56 similar to the bolt 51, said bolt thus carried by the cover plate being seated in the bifurcated ends of the lower supports 48. Passing through the screw bolt 56, which may be held in fixed position with respect to support 48 by means of a nut 57, are the adjusting screws 58, one adjacent either end of said bolt and adapted to bear on the lower surface of the bifurcated ends 49 of the lower support 48 whereby, upon manipulation of the adjusting screws 58 after the nut 57 has been loosened, the bolt 56 and, perforce, the lower end of the cover plate 50 may be adjusted toward and from the top of the raceway.

From the construction thus far described, it will be apparent that not only may the cover plate 50 be adjusted in the manner stated, but that it may be swung about either of its supporting bolts as a pivot upon loosening the opposite bolt, so that any nail lodging in the exterior raceway 46 may be readily removed. Pivotal support upon the bolt 56 is a nail retainer 59, Figs. 8 and 10, a spring 60, secured to the cover plate 50 at 61 and having a finger lift 62 normally holding said nail retainer in its lowered or operative position (as indicated in Fig. 10), by engagement with the shoulder 63 on the nail retainer, thus constituting a knife blade joint, the construction being such that upon lifting the end 62 of the spring 60 out of engagement with the shoulder 63, said nail retainer may be raised from full to dotted line position, as indicated in Fig. 10, and when in full line position, it will be retained

there by means of said spring. The nail retainer 59 has a nail stop 64 and a side extension 65, Fig. 8, for purposes to be hereinafter more fully described.

As pointed out in my previous application referred to, the nail receiver is preferably in the form of a cylinder, mounted within a hollow cylindrical support 66, Figs. 8, 9 and 10, which is in turn supported upon a bracket 67 carried by the main supporting frame. The support 66 is provided with a yoke 68 which supports the upper end of a stud or bolt 69, Figs. 8, 9 and 10, upon which the nail receiver 47 is rotatively mounted. The lower end of the stud 69 finds support in the bottom plate 70, and the hollow cylindrical support 66 is provided with an opening in its periphery in which the lower end of the exterior raceway 46 is adapted to rest, said parts being substantially as pointed out in my application to which reference has been made.

The cylindrical nail receiver 47 is provided with a series of nail receiving recesses or chambers 71, said recesses or chambers preferably extending from the periphery of the nail receiver cylinder. Also, as pointed out in the application referred to, the nail receiver 47 is provided with a worm wheel 72 by which said receiver may be rotated through the medium of a worm 73, Fig. 5, mounted on the shaft 74, which may be driven by any suitable means, substantially as pointed out in said prior application. In said prior application, the worm 73 was movable longitudinally on a shaft 74, the said shaft 74 being itself held from longitudinal movement, whereas in the present embodiment of the invention the worm 73 is fixed to the shaft 74 and carries a cam path 75 which is engaged by a roller 76 mounted on a pin 77 carried by the machine frame, Fig. 5, whereby, upon rotation of the shaft 74, as hereinbefore noted, the worm 73 is given a rotary and longitudinal movement first in one and then in the opposite direction. The form of the cam 75 and the characteristics of the worm and worm wheel connection between the shaft 74 and nail receiver 47 are such that, as the worm is rotated in one direction, the concurrent longitudinal movement thereof causes the threads of the worm to turn idly between the teeth of the worm wheel and consequently not rotate the nail receiver; but on longitudinal movement of the worm in the opposite direction the worm wheel and consequently the nail receiver will be actuated at high speed, all substantially as pointed out in my prior application, and for the purposes therein noted, the result being that the nail receiver 47 is given a step-by-step movement rotatively to bring the recesses or chambers 71 successively into position to receive a nail delivered from the raceway 46. The cover plate



78, the bottom plate 70, and the distributing tubes 79, Fig. 10, may be of the form and construction set forth in my previous application. Disposed between the nail receiver 47 and the cylindrical support 66 is the nail feeder or shutter 80, the purpose of which is to feed nails singly from the exterior raceway 46 into the recesses or chambers 71 of the receiver, in a manner now to be explained.

It is well understood by those skilled in the art that the successive feeding of nails into a nail receiver is dependent largely upon the continuous control of the nail from the time it is taken from the raceway until it is finally placed in its position in the receiver, such control also involving the capacity of holding the nail in proper position without tilting.

Having reference more particularly to Figs. 6, 8, 9 and 10, the nail feeder or shutter 80 consists of a part formed substantially as a cylinder and having at one portion a vertical slot 81 formed therein, adapted to receive a nail from the raceway 46. Extending circumferentially into the nail feeder or shutter 80 are a series of slots 82 intersecting the slot 81, Fig. 6, and in the opposite wall of the slot 81, as at 83, are a series of beveled portions. Projecting from the cylindrical supports 66 and extending into the slots 82 of the nail feeder or shutter 80 are a series of fingers 84, the advanced end portions 85 of which are beveled, as indicated in Figs. 8 and 9, said beveled end portions 85 being complementary to the beveled portions 83 in the wall of the slot 81 formed in the nail feeder, the construction being such that if the slot 81 in the nail feeder be placed directly opposite the delivery end of the exterior raceway 46, a single nail may be delivered to said slot 81, as indicated in Fig. 9, and if while carrying said nail, the nail feeder be moved about its axis, the nail will be carried by the nail feeder until it meets the beveled end portions 85 of the fingers 84 which will cause the nail to be moved radially inward and occupy a position in one of the slots or chambers 71 of the receiver 47, one of said slots or chambers being properly positioned at the time.

The length of the cylindrical receiver 47 and of the nail feeder or shutter 80 is preferably such as to accommodate nails of the largest size desired to be used, and the slots 81 and 82 and beveled portions 83 may extend substantially the full length of the cylinder, as may also the series of fingers 84, so that, regardless of the length of the nail, it will be under control throughout its entire extent while being transferred from the raceway 46 to the receiver 47.

In order that the nails may be delivered singly from the raceway 46, substantially in the manner hereinbefore stated, it is de-

sirable that the nail feeder or shutter 80 be given an oscillatory motion about its axis which, as indicated, is coincident with the axis of rotation of the nail receiver 47. Obviously, any suitable means may be employed to give this characteristic oscillatory motion to the nail feeder or shutter 80, the motion of the feeder and the nail receiver being so timed and related as that nails taken from the raceway by the feeder will be carried to one side thereof and there find a recess or chamber 71 of the receiver ready for their reception, the plain wall of the nail feeder during such movement of a nail from the raceway to a recess or chamber 71 affording a rest or stop for the nail in the feeder, as indicated in Fig. 9.

As one means of securing the characteristic action of the nail feeder, the latter is provided with a bracket 86 having a recessed portion 87 to receive the rounded end 88 of an adjustable pitman 89, its other rounded end 90 resting in a suitable socket 91 formed in an arm 92, Fig. 6, loosely mounted upon a stud or shaft 93. Also loosely mounted upon the stud or shaft 93 is an arm 94, Fig. 7, having the roll 95 which bears against a cam 96 secured to the shaft 74. The arm 92 is provided with a projecting lug 97 which bears upon a similar lug 98, Fig. 7, of the arm 94, and a spring 99 surrounding the hubs of the arms 92 and 94 has one end bearing on the arm 92 at 100 and the other end bearing on the arm 94 as at 101, the construction being such that the arm 92 has a yielding connection with its actuator or arm 94 whereby any obstruction to the movement of the nail feeder or shutter 80, as by a bent nail, or other cause, will permit the arm 92 to yield and thereby prevent breakage, as will be well understood.

Disposed between the arm 92 and the nail feeder 80 is a spring 102 acting normally to keep the pitman 89 seated in the arm 92 and bracket 86, and connected to the bracket 86, at 103, is one end of the spring 104, Figs. 5 and 6, the other end being secured at a fixed point, as upon a standard 105, Fig. 5, projecting from the machine frame, said spring 104 normally acting to move the arm 92 to hold the roll 95 against its actuating cam 96.

From the construction thus far described, it will be noted that the nail receiver 47 is given a step-by-step rotative movement through its actuating means to thereby successively present the recesses or chambers 71 to receive nails delivered by the feeder, and that said feeder 80 is given an oscillatory rotative movement about the same axis to take a nail from the end of the raceway 46, carry it to one side of said raceway, and there meet a recess or chamber 71 of the receiver, properly positioned to have the nail delivered thereto by the beveled end portion



of the fingers 84 which push said nail during the forward oscillatory movement of the feeder into said recess or chamber, said pushing action of the fingers 84 extending at intervals from near the head portion to near the end portion of the nail, thus preventing any tilting or improper positioning of the nail at any point during its transfer from the exterior raceway to the nail receiver.

10 In order that there may be no uncertainty in nail delivery from the raceway 46 to the nail feeder, one of the walls 46 of the raceway is slotted, Figs. 8, 9 and 10, as at 106, and into said slot projects the beveled end portion 107 of a spring arm 108 which is carried by an arm 109 pivoted at 110 upon a bracket 111 secured to the support 66, said arm 109 having a toe portion 112 normally held in the path of movement of a lug 113 secured to the nail feeder or shutter 80, as indicated in Fig. 8, whereby as the nail feeder or shutter 80 is oscillated in the manner hereinbefore described, the arm 109 will be moved back and forth on its pivot 110 to cause the end of the spring 107 to feed nails downward toward the end of the raceway 46.

As hereinbefore stated, the nail retainer 59, Fig. 10, is provided with a nail stop 64 and a side extending portion 65, the purpose of which parts will now be apparent, because, as said nails are pushed from the raceway 46 or are delivered to the nail feeder when the latter is in the position indicated in Fig. 8, with the slot 81 opposite the end of the raceway, the head of the nail may extend above the top of the receiver 47, and the nail stop 64 acting upon the head of the nail thus transferred to the nail feeder acts as a continuation of the circumferential wall of the receiver and prevents any tilting or other improper positioning of the nail. As the nails are carried by the receiver 47, the side extension or arm 65 prevents any upward movement thereof due to vibrations or other causes, said side extension 65 covering the nail receiving chambers 71 in the manner indicated by dotted lines in Fig. 8.

In my prior application hereinbefore referred to, means were shown and described for predeterminately varying the number of nails to be delivered to the nail receiver and, when said number of nails have thus been delivered, to stop further action of the machine so that said nails would be delivered as a group into a nail distributor. Such means are also contemplated for use in connection with the nail distributing mechanism hereinbefore described, but description thereof is unnecessary for the reason that it is fully shown and described in my prior application.

The nail feeder or shutter, as hereinbefore described, is one of the important features of the present invention, and while the form of said feeder, as hereinbefore described, has

been found efficient in practice, it is to be understood that the present invention is not restricted thereto, but is generic in this respect, the invention, in its true scope, being definitely set forth in the claims.

What is claimed is:

1. In a nail assorting and delivering mechanism, the combination of a cylindrical nail receiver having nail receiving chambers for holding a series of nails, means for rotating said receiver, a raceway having its delivery end adjacent the receiver, a nail feeder or shutter extending about said receiver and having a nail holding portion and means for oscillating the feeder or shutter about the receiver to move the nail holding portion past the end of the raceway to detach nails from the raceway and deliver them from the raceway to the series of chambers in said cylindrical receiver.

2. In a nail assorting and delivering mechanism, the combination of a cylindrical nail receiver having nail receiving chambers to hold a series of nails, means for rotating the receiver, a raceway having its delivery end adjacent the receiver, a nail feeder or shutter having a nail holding and transferring portion, and means for moving said feeder or shutter in a curved path extending about the receiver to detach a nail from the raceway and carry it to one side thereof and there deliver it to a chamber in the rotatable nail receiver.

3. In a nail assorting and delivering mechanism, the combination of a cylindrical nail receiver having nail receiving chambers to hold a series of nails, means to rotate the receiver to present its chambers for the delivery of nails thereto, a raceway having its delivery end adjacent the receiver, a cylindrical nail feeder for taking nails from the raceway to one side thereof and delivering them singly to the said nail receiving chambers as they are presented by the rotating receiver at a point to one side of the raceway, and means for moving the cylindrical nail feeder in a curved path extending about the nail receiver.

4. In a nail assorting and delivering mechanism, the combination of a cylindrical nail receiver having a series of nail receiving chambers, a raceway having its delivery end adjacent the nail receiver, a nail feeder extending about a portion of said receiver and having a nail holding portion, and means for moving the nail feeder in a path extending about the receiver to take nails from the raceway and deliver them to the receiver.

5. In a nail assorting and delivering mechanism, the combination of a nail receiver having a series of nail receiving chambers, a raceway, means for moving the nail receiver to carry the nail receiving chambers past the end of said raceway, a nail feeder having a nail holding portion adapted to receive



a nail from the raceway, and means for moving the nail feeder in a path extending about the receiver to carry a nail from the raceway to a chamber in the receiver when  
5 said chamber has been moved to a point beyond the end of the raceway.

6. In a nail assorting and delivering mechanism, the combination of a nail receiving cylinder having nail receiving chambers, a  
10 raceway for supplying nails to be delivered to the nail receiving cylinder, a nail feeder or shutter having a nail holding slot, a series of fingers, and means for relatively moving the feeder and fingers for forcing the nail  
15 from the slot of the feeder or shutter into a nail receiving chamber of the receiver.

7. In a nail assorting and delivering mechanism, the combination of a nail receiving cylinder, a cylindrical support extending  
20 about said cylinder, a nail raceway, a nail feeder disposed between the cylindrical support and nail receiving cylinder, and means for moving the feeder in a curved path past the raceway to detach a nail from the race-  
25 way and deliver it to the receiver.

8. In a nail assorting and distributing mechanism, the combination of a receiving cylinder having nail receiving chambers for holding a series of nails, a raceway, a feeder  
30 having a slot for carrying a nail from the raceway to one side thereof and delivering it to a chamber of the receiver, and means for rotating the receiving cylinder and oscillating the feeder in a curved path about the  
35 rotatable cylinder.

9. In a nail assorting and delivering mechanism, a nail receiving cylinder having a series of nail receiving chambers extending inward from the peripheral surface thereof,  
40 a nail feeder having a nail slot or opening, a raceway for supplying nails singly to said slot or opening, mean for moving the nail feeder to carry the nail slot from the delivery end of the raceway circumferentially of  
45 the receiving cylinder, and means acting to transfer the nail carried in said slot to a nail receiving chamber in the receiver after the nail has been taken from the raceway by the feeder.

10. In a nail assorting and delivering mechanism, a cylindrical nail receiver for holding a series of nails, a raceway for supplying nails to be delivered to said receiver,  
50 a nail feeder for taking a nail from the end of the raceway and transferring it to one side of the raceway, means for rotating said cylinder, means for oscillating the feeder in a curved path about the receiver, and means  
55 for transferring the nail from the feeder to the receiver as the feeder is oscillated.

11. In a nail assorting and delivering mechanism, the combination of a nail receiver provided with a series of nail receiving chambers, a raceway for supplying nails  
65 to be delivered to the chambers in the re-

ceiver, a nail feeder movable relative to the receiver and having a nail receiving slot to receive a nail from the end of the raceway, and a series of fingers to act upon the nail substantially throughout its length to trans-  
70 fer the nail from the feeder to the receiver.

12. A nail assorting and delivering mechanism, comprising, in combination, a nail receiver having a series of nail receiving chambers, a raceway to supply nails to be  
75 delivered to the receiver, a nail feeder having an open slot and movable over the surface of the receiver for carrying a nail from the raceway to one side thereof and delivering it to a nail receiving chamber in the re-  
80 ceiver, and a plurality of fingers acting at different points in the length of the nail to transfer the nail from the feeder to said chamber.

13. A nail assorting and delivering mechanism, comprising, in combination, a nail receiver having a series of nail receiving chambers, a raceway to supply nails to be  
85 delivered to the receiver, a nail feeder having an open slot and movable over the surface of the receiver for carrying a nail from the raceway to one side thereof and delivering it to a nail receiving chamber in the re-  
90 ceiver, and a plurality of fingers having beveled or inclined portions acting at different points in the length of the nail to transfer the nail from the feeder to said chamber as the feeder moves the nail away from the  
95 end of the raceway.

14. A nail assorting and delivering mechanism, comprising, in combination, a cylindrical nail receiver having a series of nail receiving chambers, a raceway for supplying  
100 nails to be delivered to said receiver, a cylindrical nail feeder having an open nail receiving slot and movable about the receiver to carry a nail from the raceway, and a series of fingers acting at different points in the length of the nail to transfer it from  
105 the slot in the feeder to a nail receiving chamber as the feeder moves the nail away from the end of the raceway.

15. A nail assorting and delivering mechanism, comprising, in combination, a cylindrical nail receiver having a series of nail  
110 receiving chambers to hold a series of nails, means to deliver the series of nails therefrom as a gang, a raceway for supplying nails to be delivered to said receiver, a nail feeder having an open nail receiving slot  
120 and movable about the receiver to carry a nail from the raceway, a finger having a beveled or inclined portion for acting on the nail to transfer it from the slot in the feeder to a nail receiving chamber as the feeder  
125 moves the nail away from the end of the raceway, and means for moving the receiver to successively present the nail receiving chamber to receive nails from the feeder.

16. A nail assorting and delivering mechanism, comprising, in combination, a nail receiver having a series of nail receiving chambers, a raceway for supplying nails to be delivered to the chambers in the re-



anism, comprising, in combination, a cylindrical nail receiver having a series of nail receiving chambers, a raceway for nails to be delivered to the chambers of the receiver, a cylindrical feeder extending about the receiver and having a nail receiving slot to receive a nail from the end of the raceway, and a series of slots angularly arranged with respect to the nail receiving slot, a series of transferring fingers extending into the series of slots and acting upon different points in the length of the nail to transfer it from the slot in the feeder to a chamber in the receiver.

17. A nail assorting and delivering mechanism, comprising, in combination, a cylindrical nail receiver having a series of nail receiving chambers, a raceway for nails to be delivered to the chambers of the receiver, a cylindrical feeder extending about the receiver and having a nail receiving slot to receive a nail from the end of the raceway, and a series of slots angularly arranged with respect to the nail receiving slot, a series of transferring fingers disposed at one side of the delivery end of the raceway extending into the series of slots and acting upon different points in the length of the nail to transfer it from the slot in the feeder to a chamber in the receiver as said feeder moves the nail away from the end of the raceway.

18. In a nail assorting and delivering mechanism, the combination of a rotatable cylindrical nail receiver having a series of nail receiving chambers to hold a series of nails, a raceway for supplying nails to be delivered to the receiver, a nail feeder, means to move the feeder about the rotatable cylindrical receiver to carry nails from the raceway for delivery to the receiver, and a nail retainer disposed above the raceway and having a nail stop disposed in the path of the nail heads as they move from the raceway into control of the feeder.

19. In a nail assorting and delivering mechanism, the combination of a cylindrical nail receiver having a series of nail receiving chambers, a raceway for supplying nails to be delivered to the receiver, a nail feeder to carry nails from the raceway for delivery to the receiver, and a pivotally mounted nail retainer disposed above the raceway and having a nail stop disposed in the path of the nail heads as they move from the raceway into control of the feeder.

20. In a nail assorting and delivering mechanism, the combination of a nail receiver, a raceway for supplying nails to be delivered to said receiver, a nail feeder to receive nails singly from the raceway and transfer them to the receiver, and a nail retainer pivotally mounted above the raceway and having a part overlying nail receiving portions of the receiver.

21. In a nail assorting and delivering

mechanism, the combination of a nail receiver, a raceway for supplying nails to be delivered to said receiver, a nail feeder to receive nails singly from the raceway and transfer them to the receiver, a nail retainer pivotally mounted above the raceway and having a part overlying nail receiving portions of the receiver, and means for normally holding the retainer in operative position.

22. In a nail assorting and delivering mechanism, the combination of a nail receiver, a raceway for supplying nails to be delivered to said receiver, a cover plate disposed above the raceway, means for connecting the cover plate to the raceway and permitting the end of the cover plate remote from the receiver to be lifted for access to the nails in the raceway, and adjusting screws for positively adjusting the said cover plate toward and from the top of the raceway.

23. In a nail assorting and delivering mechanism, the combination of a roller raceway, nail agitating means on the rollers of the raceway, and a plurality of yieldable cover plates for said rollers disposed above said agitating means.

24. In a nail assorting and delivering mechanism, the combination of a roller raceway, nail agitating means on the rollers of the raceway, and a plurality of yieldable cover plates for said rollers disposed above said agitating means, said cover plates being separated to form an interruption in the cover above the said agitating means.

25. In a nail assorting and delivering mechanism, the combination of a roller raceway, and a cover disposed above a portion of said roller raceway and comprising a plurality of yielding cover plates, said plates being separated from each other to form an interruption in the cover and cause improperly positioned nails to be discharged from the raceway.

26. In a nail assorting and delivering mechanism, the combination of a roller raceway, a plurality of separated yieldable cover plates disposed above a portion of said raceway, and a yielding stopping device for improperly positioned nails disposed adjacent the discharge end of the raceway.

27. In a nail assorting and delivering mechanism, the combination of a roller raceway, a yieldable cover plate disposed above a portion of said raceway, and a yielding stopping device for improperly positioned nails disposed adjacent the discharge end of the raceway, said stopping device having a passageway for the heads of properly positioned nails.

28. In a nail assorting and delivering mechanism, the combination of a roller raceway, a cover plate disposed above a portion of said raceway and provided with a shelf or nail supporting portion, a stopping device



for improperly positioned nails disposed adjacent the delivery end of the roller raceway, and means for directing improperly positioned nails onto said shelf or nail supporting portion.

29. In a nail assorting and delivering mechanism, the combination of a raceway, a hopper for containing nails to be delivered to said raceway and having a nail delivery portion, means for varying the capacity of the delivery portion to suit the size of nails being used, and a plurality of nail supporting shelves extending from the wall of the hopper inward to sustain the weight of the nails above the delivery portion of the hopper and prevent nail bridging or clogging irrespective of the adjustment of the delivery portion.

30. In a nail assorting and delivering mechanism, the combination of a raceway, a hopper for containing nails to be delivered to said raceway and having a nail delivery portion, a plurality of nail supporting shelves extending from the wall of the hopper inward alternately in opposite directions to sustain the weight of the nails above the delivery portion of the hopper and prevent nail bridging or clogging, and means for relatively adjusting the shelves to cause them to overlap more or less to adapt the device for nails of different sizes.

31. In a nail assorting and delivering mechanism, the combination of a raceway, a hopper for nails to be delivered to said raceway having a nail delivery portion, a plurality of nail supporting shelves extending from the wall of the hopper inward and having relatively adjustable overlapping ends to sustain the weight of nails above the delivery portion of the hopper and prevent clogging.

32. In a nail assorting and delivering mechanism, the combination of a raceway, a hopper for nails to be delivered to said raceway and having a contracted nail delivery portion, an agitator extending through the wall of the hopper, fixedly secured thereto, and projecting into the contracted delivery portion of the hopper, and means for moving the agitator to prevent the nails bridging or clogging in the contracted delivery portion of the hopper.

33. In a nail assorting and delivering mechanism, the combination of a hopper for nails having a delivery opening, a raceway, a nail elevating wheel having blades to take nails supplied from the hopper and deliver them to the raceway, and an agitator extend-

ing into the delivery opening of the hopper to prevent bridging or clogging of the nails, said agitator being moved by contact with the nail elevating wheel.

34. In a nail assorting and delivering mechanism, the combination of a hopper for nails having a delivery opening, a raceway, a nail elevating wheel having nail lifting blades to take nails supplied from the hopper and deliver them to the raceway, and an agitator projecting through the wall of the hopper into the delivery opening to prevent bridging or clogging of the nails, said agitator being moved by contact with the blades of the nail elevating wheel.

35. In a nail assorting and delivering mechanism, the combination of a hopper for nails having an adjustable delivery opening, supporting shelves for the nails extending from the wall of the hopper to support the weight of nails above the delivery opening, and an agitator extending through the hopper and into the delivery portion of the hopper to prevent bridging or clogging of the nails.

36. In a nail assorting and delivering mechanism, the combination of a hopper for nails having a delivery opening, supporting shelves for the nails extending from the wall of the hopper to support the weight of nails above the delivery opening, a nail elevating wheel having nail lifting blades for lifting nails supplied by the hopper, and an agitator extending into the delivery portion of the hopper to prevent bridging or clogging of the nails, said agitator being moved by contact with the nail lifting blades of the nail elevating wheel.

37. In a nail assorting and delivering mechanism, the combination of a nail receiver having a series of nail receiving chambers, a raceway for supplying nails for delivery to said receiver, a feeder extending about the receiver and having a nail carrying portion to take a nail from the raceway, move it in a curved path to one side thereof, and there deliver it to a nail receiving chamber of the receiver, and means yieldable by an obstruction to feeder movement for operating said feeder.

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

WILLIAM C. STEWART.

Witnesses:

ROSSELL F. HATCH,  
ARTHUR W. CALVER.