

No. 840,382.

PATENTED JAN. 1, 1907.

J. H. SCHLAFLY.
EAVES TROUGH FORMING MACHINE.

APPLICATION FILED JUNE 14, 1906.

2 SHEETS—SHEET 1.

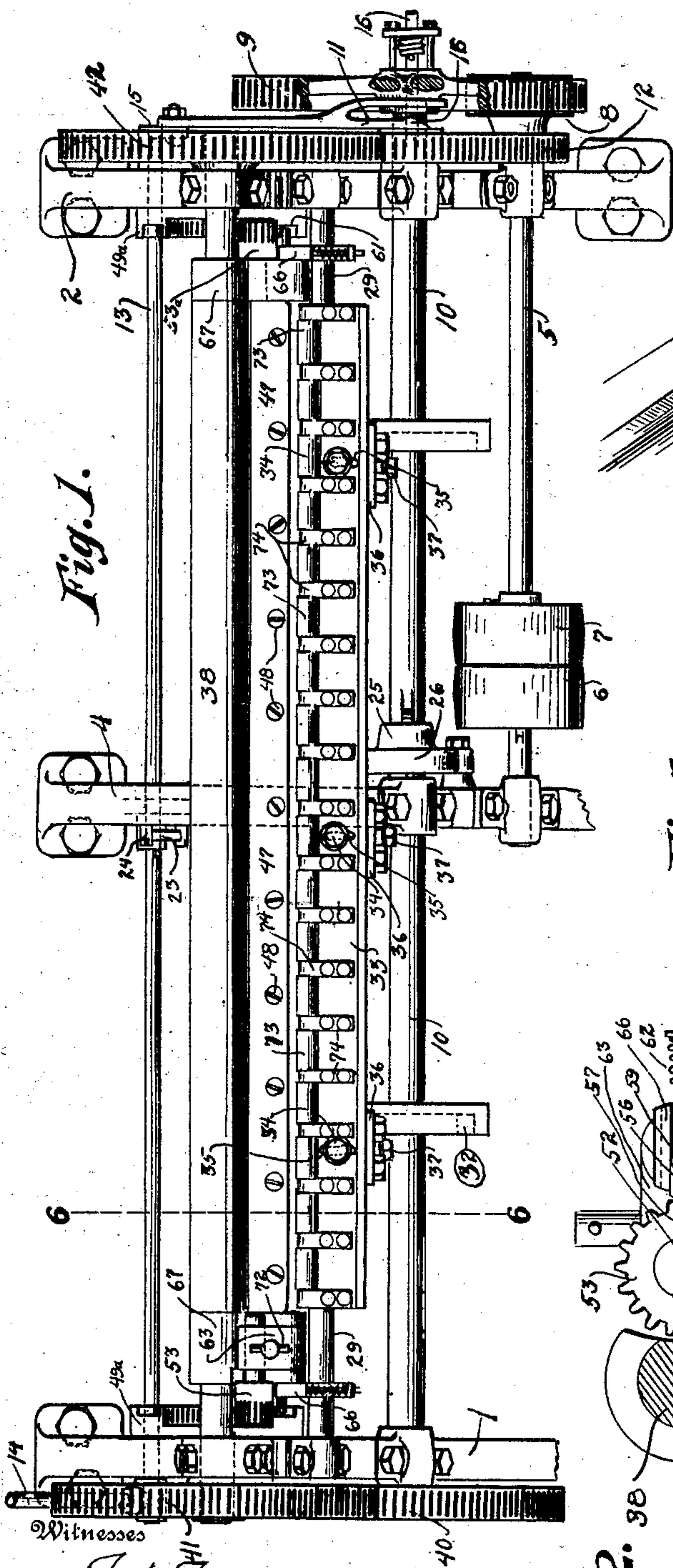


Fig. 1.

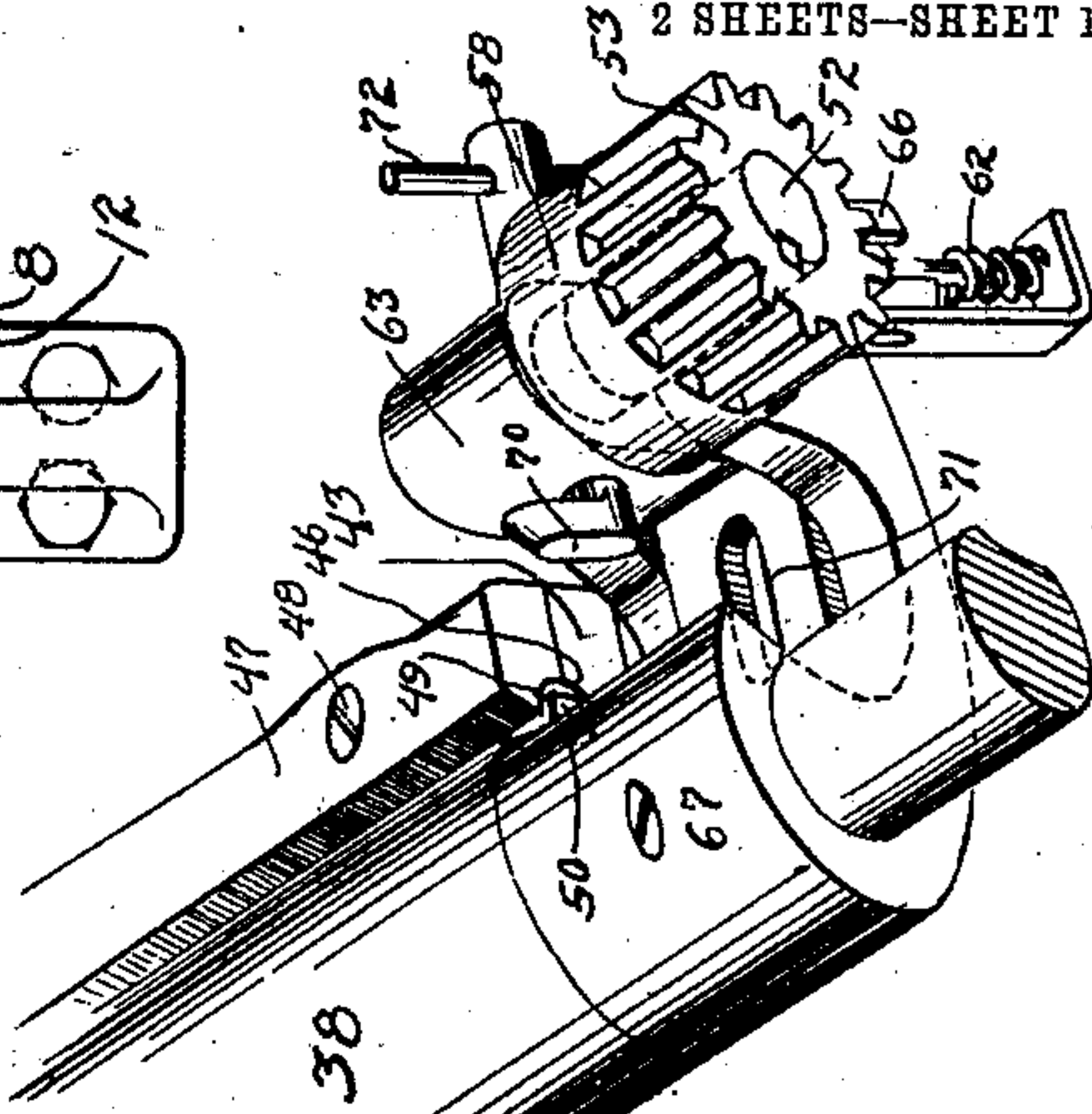


Fig. 2.

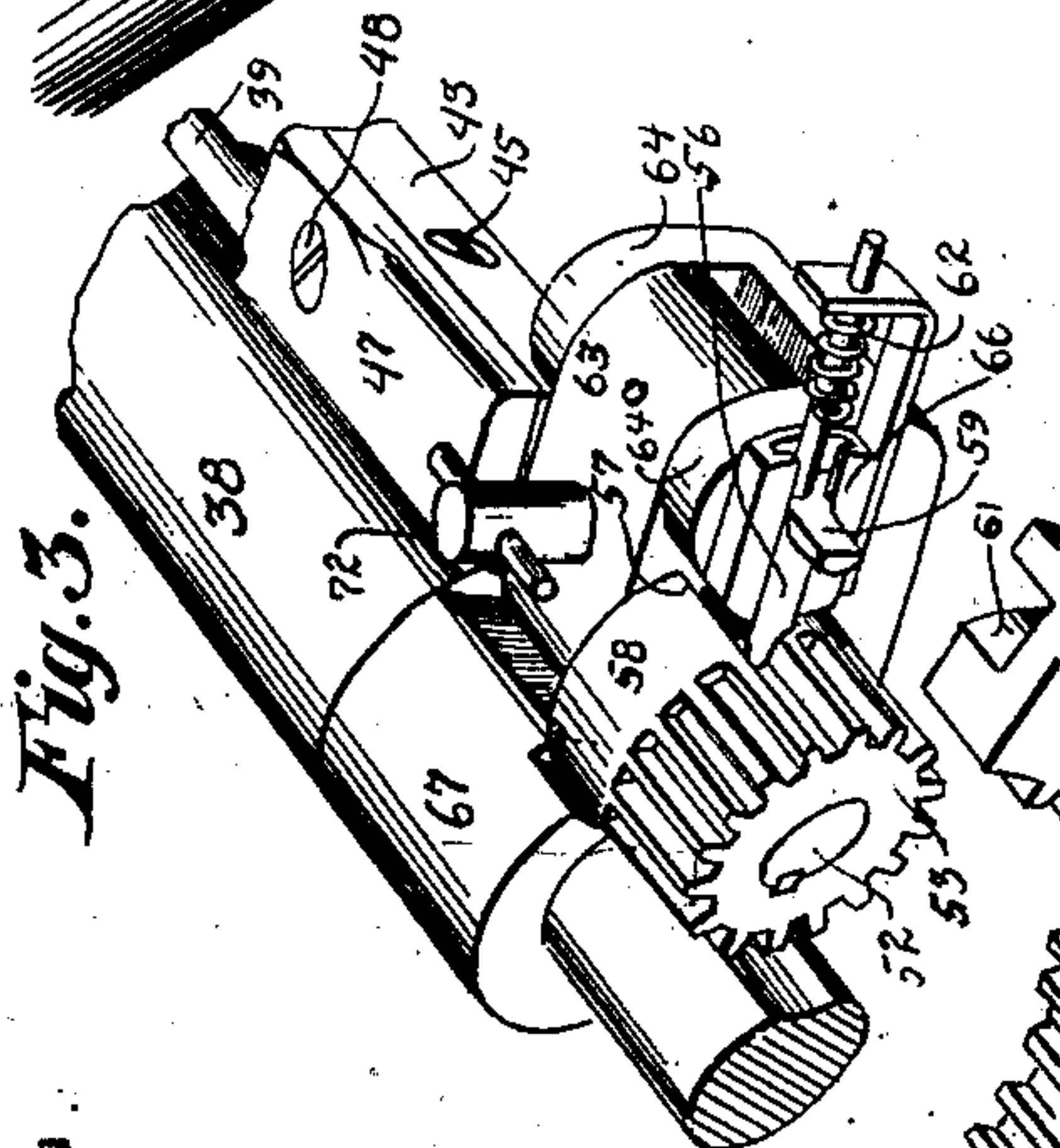


Fig. 3.

Fig. 4.

Inventor

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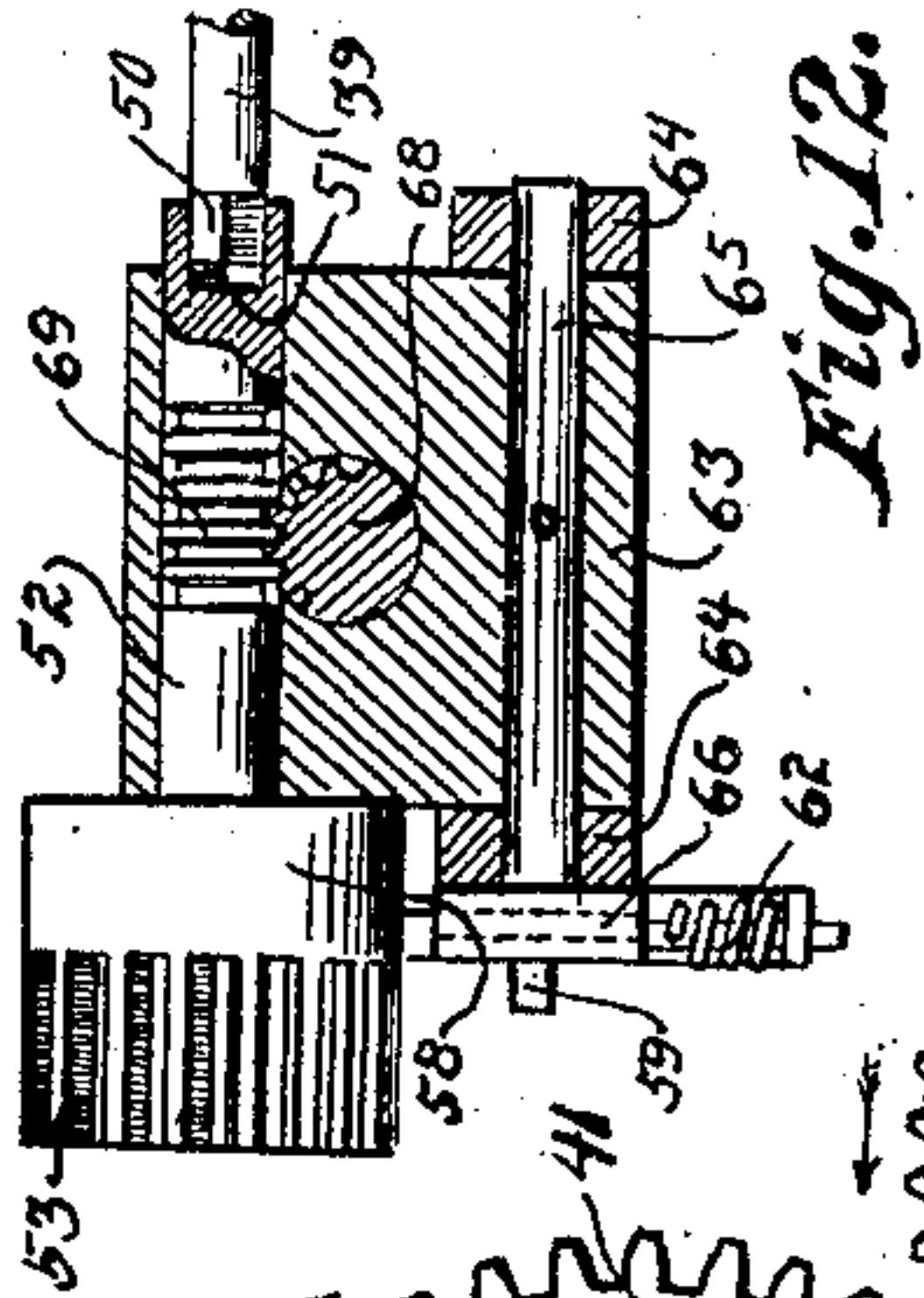


Fig. 12.

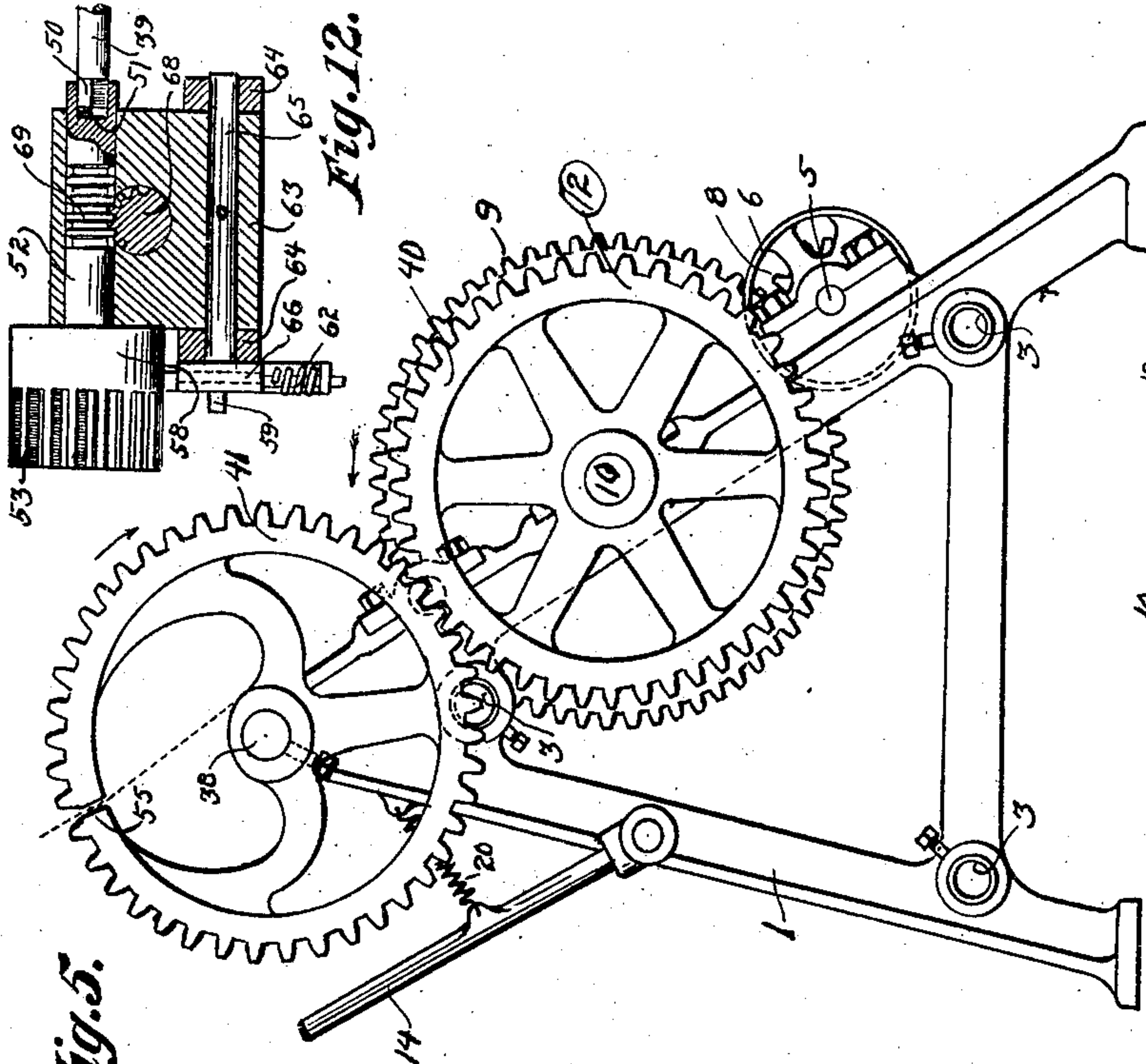


Fig. 5.

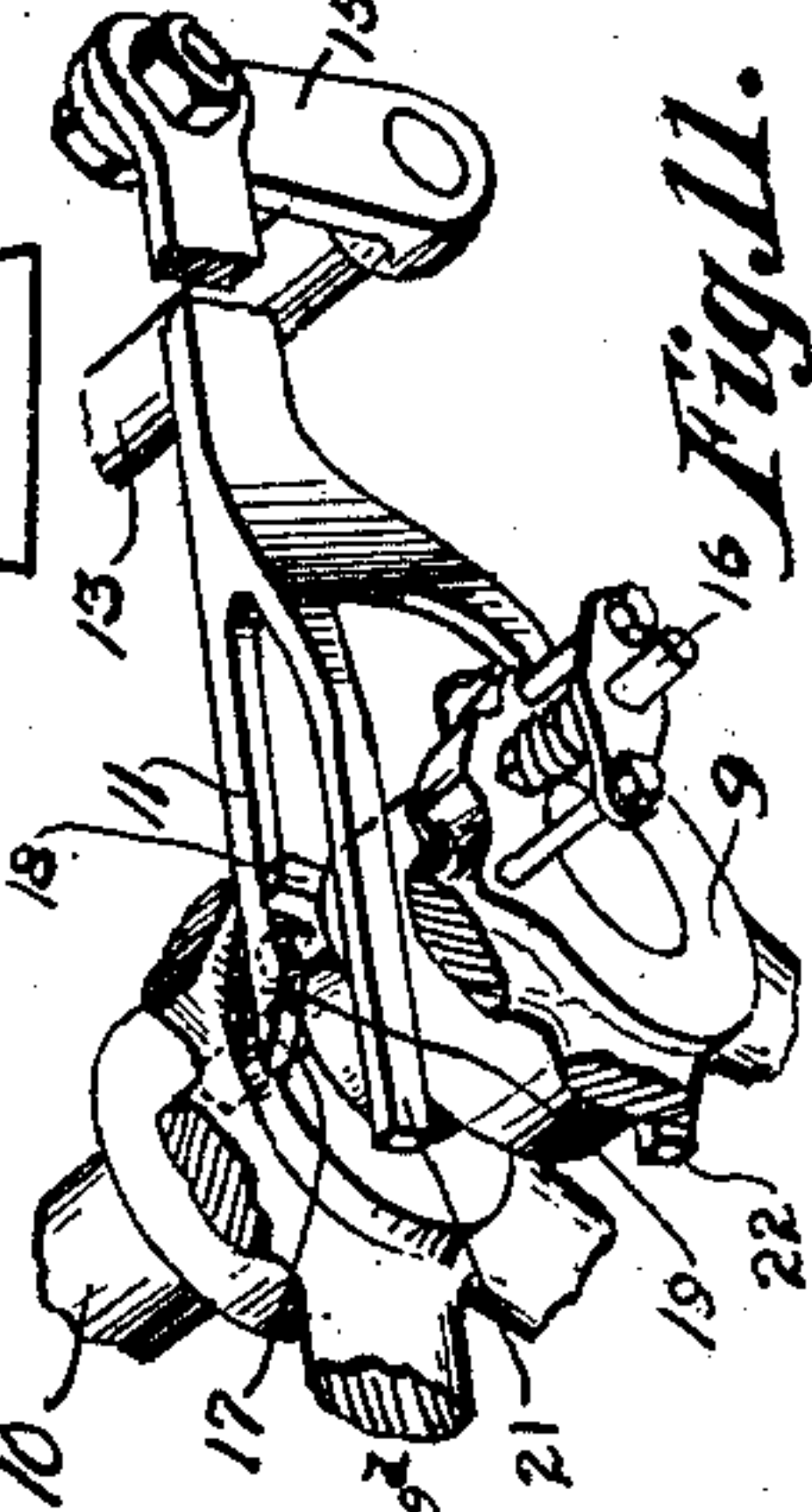


Fig. 11.

Fig. 10.

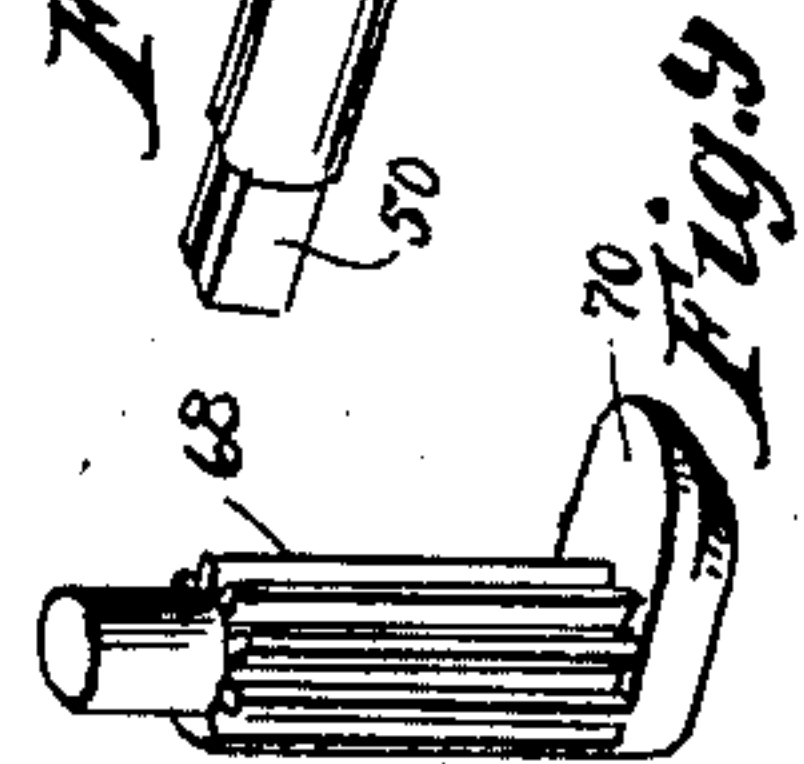


Fig. 9.

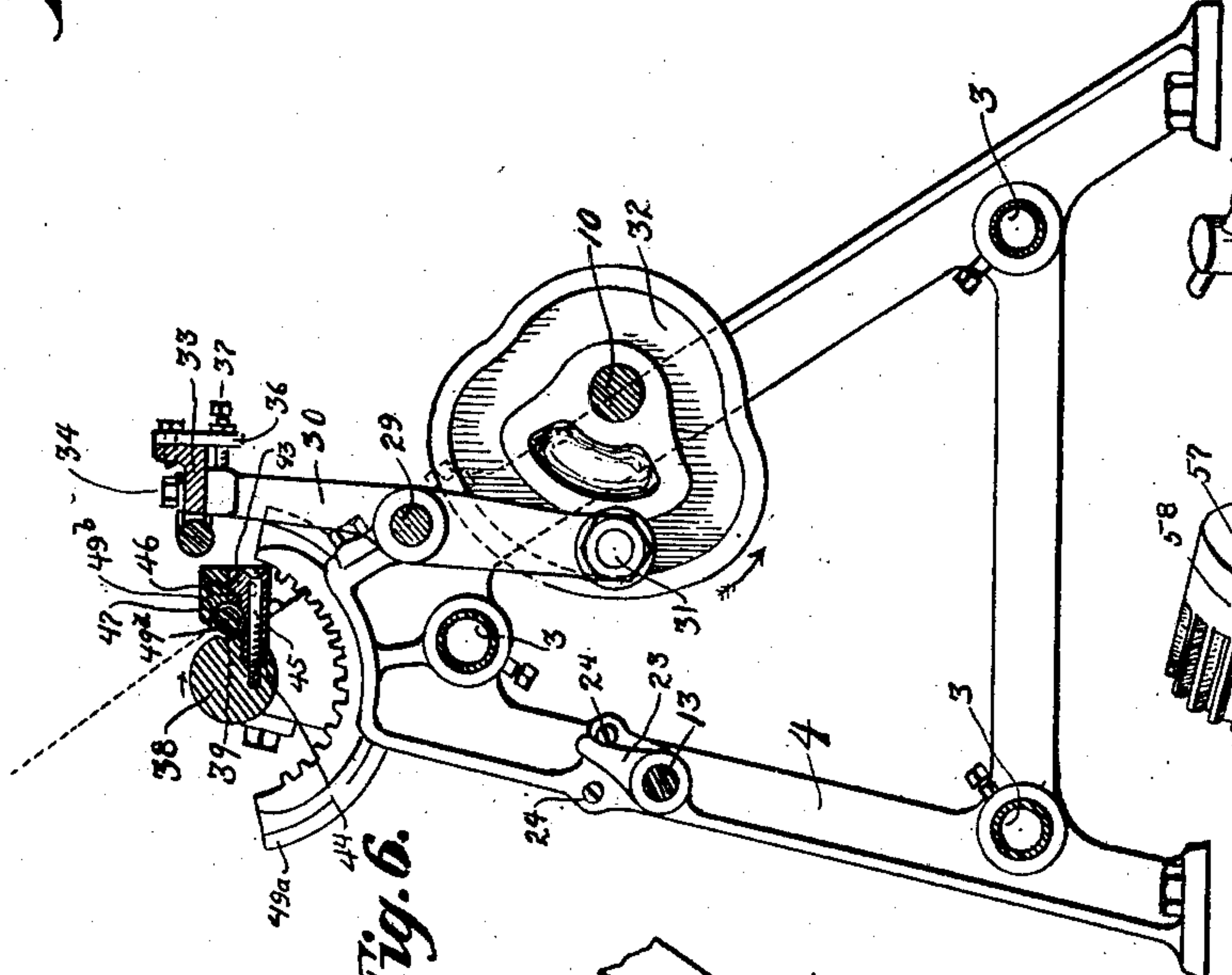


Fig. 6.

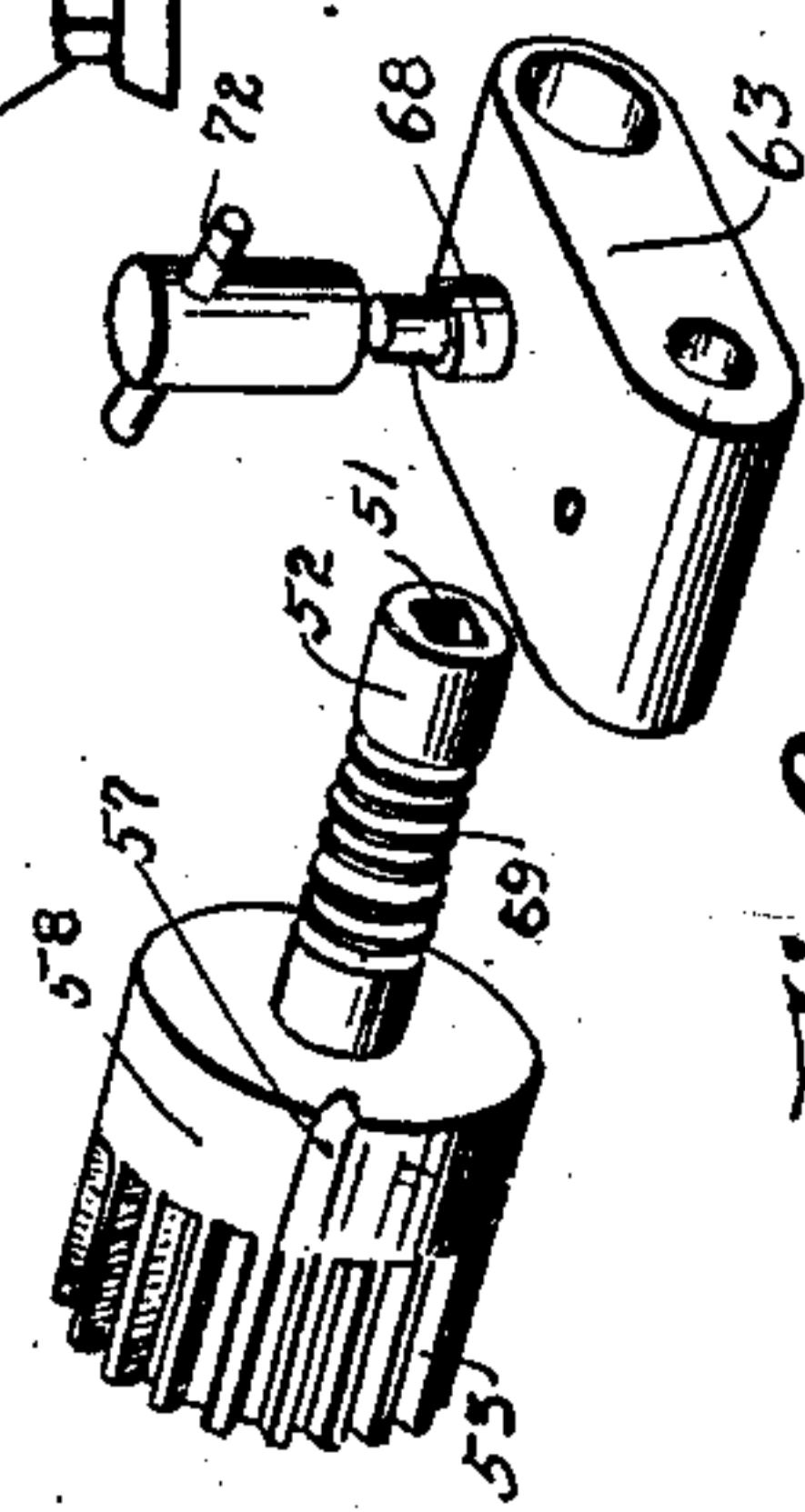


Fig. 8.

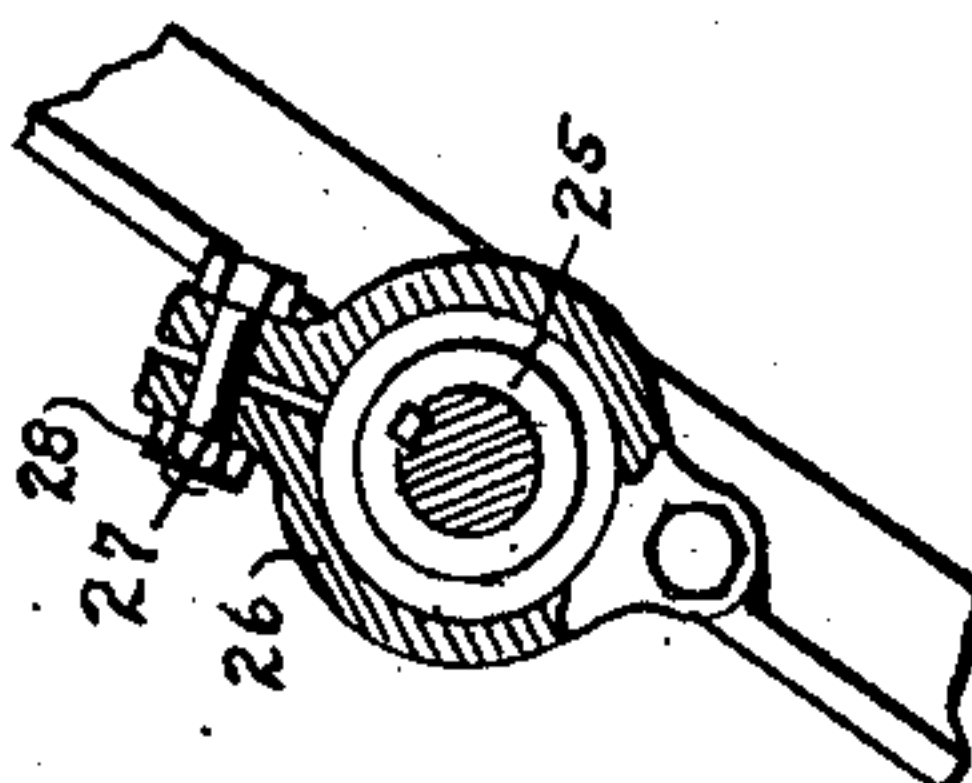


Fig. 7.

Witnesses

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UNITED STATES PATENT OFFICE.

JULIUS H. SCHLAFLY, OF CANTON, OHIO, ASSIGNOR TO THE BERGER MANUFACTURING COMPANY, OF CANTON, OHIO, A CORPORATION OF OHIO.

EAVES-TROUGH-FORMING MACHINE.

No. 840,382.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed June 14, 1906. Serial No. 321,660.

To all whom it may concern:

Be it known that I, JULIUS H. SCHLAFLY, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Eaves-Trough-Forming Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the figures of reference marked thereon, in which—

Figure 1 is a plan view showing parts broken away. Fig. 2 is a view showing the relative arrangement of the beading-rod pinion, its actuating-segment, and showing a section of the trough-forming mandrel. Fig. 3 is a view showing a portion of the trough-forming mandrel, also a portion of the beading rod, the bead-rod-actuating pinion in a connected position with reference to the bead-rod and the housing brought into an operative position, also showing a portion of the beading-rod pinion-actuating segment. Fig. 4 is a similar view, except that the housing and its different parts are swung out of operative position and in a position whereby the finished trough can be removed from the mandrel and beading-rod. Fig. 5 is a view of the operating end of the machine, which is the left-hand end of Fig. 1. Fig. 6 is a transverse section on line 6 6, Fig. 1, looking toward the right-hand end of said Fig. 1. Fig. 7 is a transverse section of the friction-band and a transverse section of the cam-shaft, showing an end view of the collar. Fig. 8 is a detached perspective view of the beading-rod pinion and the beading-rod-connecting shaft, also showing the housing detached. Fig. 9 is a detached view of the beading-rod pinion and beading-rod-connecting shaft-actuating bar and housing-clamping toe. Fig. 10 is a detached view of a portion of the beading-shaft, showing the angular connecting end. Fig. 11 is a perspective view showing the clutch mechanism. Fig. 12 is a sectional view of the housing, showing a transverse section of the beading-rod-connecting shaft-actuating bar in mesh with the beading-rod-connecting shaft.

The present invention has relation to eaves-trough-forming machines; and it consists in the novel arrangement hereinafter

described, and particularly pointed out in the claims.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

In the accompanying drawings, 1 and 2 represent the end members of the frame, which members may be substantially of the form shown in Fig. 5, which end members are tied together by means of the longitudinal pipes 3. However, I do not desire to be confined to any particular manner of tying the end members, as the only object is in holding them in proper spaced relation to each other, and any mechanical means may be employed to accomplish this object.

The center member 4 of the frame is substantially of the form shown and is also held in place by the longitudinal pipes 3, which pipes are passed through suitable apertures formed in the end members and the center member.

The power-shaft 5 is properly journaled at its ends in suitable bearings located upon one of the end members and the center member of the frame, which power-shaft is provided with the tight and loose pulleys 6 and 7, said pulleys being of the ordinary construction. Upon the power-shaft 5 is mounted the pinion 8, which pinion meshes with the gear-wheel 9, which gear-wheel is loosely mounted upon the cam-shaft 10 and is thrown into and out of action with reference to the cam-shaft by means of the one-revolution clutch 11, which clutch brings the gear-wheel 12 into action, which gear-wheel is securely mounted upon the cam-shaft 10. The clutch herein shown is conventional and does not form any part of the present invention except that a one-revolution clutch of some kind is necessary, and the clutch is thrown into and out of action by means of the clutch-shaft 13, which clutch-shaft is operated by means of the lever 14.

The operation of the clutch is substantially as follows: When the clutch is idle or inactive, parts are in the position shown in Fig. 11; but when it is desired to bring the clutch into operative action the lever 14 is moved downward, which rocks the clutch-shaft 13 and moves the clutch-arm 11 by means of the link 15, and thereby permitting the spring-actuated clutch-pin 16 to engage the

aperture 17, which aperture is formed in the hub of the gear-wheel 12, thereby causing said gear-wheel to rotate the cam-shaft 10. The clutch-pin 16 is provided with the lug 18, which lug is so situated that as the clutch-pin comes into engagement with the beveled head 19 it will move the clutch-pin endwise and disengage it from its aperture and free the wheel 9, so that said wheel is free to rotate loosely upon the clutch-shaft 10. For the purpose of automatically bringing the clutch-arm 11 back into its normal position the spring 20 is employed, which spring automatically lifts the lever 14 after it has been depressed.

For the purpose of holding the clutch-arm 11 in proper position the guide-arms 21 and 22 are provided, which arms ride upon the hub of the wheel 9.

For the purpose of limiting the movement of the lever 14 the clutch-shaft 10 is provided with the fixed arm 23, which arm is extended upward between the stop-pins 24, which stop-pins limit the movement of the clutch mechanism.

For the purpose of giving the cam-shaft the proper friction to stop the machine proper when the clutch is released the cam-shaft is provided with the collar 25, upon which collar is mounted the split flanged collar 26, which is frictionally held by means of the bolt 27 and of course the amount of friction being regulated by the adjustment of the nut 28. In the end and center members of the machine proper is journaled the rock-shaft 29, which rock-shaft extends the entire length of the machine, or substantially so, and upon which rock-shaft are securely attached the cam-actuated levers 30, which cam-actuated levers are extended above and below the rock-shaft 29, as best illustrated in Fig. 6. The bottom or lower ends of the levers 30 are provided with suitable pins 31, which pins should be provided with antifric-tion-rollers and arranged so as to fit the cam-grooves 32, said cam-grooves being of such a shape that they will properly time the movements of the levers 30 for the purpose hereinafter described. To the top or upper ends of the levers 30 is adjustably attached the presser-bar 33 by means of the lug-bolts 34, which lug-bolts are passed through the slots 35.

Upon the rear edge of the presser-bar 33 are attached the plates 36, which plates carry the setting-bolts 37, which setting-bolts are screw-threaded and are moved longitudinally back and forth until they are brought into such a position that their inner ends will come in contact with the upper rear face of the levers 30, after which the presser-bar is securely and firmly connected by means of the lug-bolts 34.

To the end members 1 and 2 is properly journaled the trough-forming mandrel 38, which mandrel is formed of such a size that

an eaves-trough of a predetermined size will be properly formed.

It is well understood that in the formation of eaves-trough they are to be provided upon one of their longitudinal edges with a suitable bead, and in order that an eaves-trough and its bead can be formed at one operation the beading-rod 39 is provided.

At the operating end of the cam-shaft 10 is mounted the gear-wheel 40, which communicates rotary motion to the gear-wheel 41, which gear-wheel 41 is securely attached to the mandrel 38. The gear-wheel 40 corresponds in size with the gear-wheel 12, secured to the opposite end of the cam-shaft 10, said gear-wheel 12 being for the purpose of communicating rotary motion to the gear-wheel 42, which gear-wheel is securely fixed to the opposite end of the mandrel 38, thereby providing a means for driving the mandrel 38 at both ends.

The purpose of driving the mandrel at both ends is to prevent any twisting of the mandrel, and owing to the fact that the gearing is the same at each end of the machine so far as the mandrel and the cam-shaft is concerned both the mandrel and the cam-shaft will be driven with equal force at each of their ends. To the mandrel 38 is securely attached the plate or bar 43, which plate or bar is seated in the groove 44 and securely held by means of suitable screws or lug-bolts 45 or their equivalents. The plate or bar 43 is provided with a semicircular groove 46. Upon the top or upper side of the plate or bar 43 is located the bar 47. Said bars 43 and 47 are held in proper relationship with reference to each other by means of suitable screws or their equivalents 48. The bar 47 is provided with the groove 49^b, which groove, together with the groove 44, produces, when the bars are placed in the position illustrated in Fig. 6, an open recess or chamber, in which recess or chamber is located the beading-rod 39, said beading-rod being formed of a diameter somewhat less than the diameter of a partial circle inclosed by the walls of the grooves formed in the bars 43 and 47, so that the beading-rod 39 is free to turn axially and at the same time provide room to receive between the walls of the grooves in the bars and the periphery of the beading-rod the thickness of the metal from which the bead of the eaves-trough is made.

It will be understood that in order to form a bead the beading-rod must have an axially movement or rotation, and in order to produce this axially movement or rotation the toothed segments 49^a are provided, which toothed segments 49^a are fixed to the end members 1 and 2 of the frame and are held in fixed relationship therewith by any suitable means.

The beading-rod 39 is provided with the angled end 50, which angled end is for the

purpose of engagement with the angled socket 51, formed in the end of the beading-rod-actuating shaft 52. Upon the beading-rod-actuating shaft 52 is securely mounted the pinion 53, which pinion meshes with one of the toothed segments 49^a, and when rotary motion is imparted to the mandrel 38 by means of the gear-wheels above described a planetary movement will be imparted to the beading-rod 39, which planetary movement carries the pinion 53 over and in engagement with one of the toothed segments 49^a, thereby imparting an axially movement to the beading-rod simultaneously with its planetary movement around the mandrel 38. The toothed segment 49^a and the pinion 53 being so formed or geared that a single planetary movement of the beading-rod around the mandrel will impart but one complete axially rotation of the beading-rod, by which arrangement the beading-rod is always brought into the proper position to expose the groove 49^b, which groove is for the purpose of receiving one of the longitudinal edges of the sheet from which the eaves-trough is to be formed.

In the formation of eaves - trough the sheets must be cut into strips of sufficient width to produce a proper-formed eaves-trough, and in order that the strips can be slid into position for engagement with the beading-rod the gear-wheel 41 is provided with the slit 55, which slit allows the sheet of metal to be moved endwise between the adjacent faces of the slit formed in the toothed ring or periphery of the gear-wheel 41. The sheet metal when placed in position to be acted upon is in the position illustrated in dotted lines, Fig. 6, and after a sheet has been placed in the position illustrated the lever 14 is moved down, which downward movement brings the clutch into engagement with the cam-shaft 10, and the entire machine is brought into action, the initiatory movement of the mandrel does not impart axially movement to the beading-rod owing to the fact that the pinion 53 is out of engagement with its toothed segment 49^a, and the pinion held against rotary movement by means of the sliding detent 56, which sliding detent engages with the groove 57, which groove is continued through the entire width of the pinion 53, including the integral and non-toothed portion 58. The detent 56 is provided with the head 59, which head is so located that as the mandrel continues to rotate it will pass into the groove 60, formed in the inner face of one of the toothed segments 49^a.

At the entrance of the groove 60 there is provided a cam-shaped wall 61, which cam-shaped wall is so formed that it will move the detent outward and disengage it from the groove 57, at which time the pinion is free to rotate when brought into engagement with

its toothed segment 49^a, and when a complete revolution of the pinion 53 has been made it will have passed beyond its toothed segment 49^a and the groove 57 brought into such a position that the detent will register with said groove and be forced into the groove by means of the spring 62, and thereby lock the pinion against rotation and stop it at a point when the beading-rod 39 has been brought into the position illustrated in Fig. 6, which is the position required for inserting a sheet of metal from which an eaves-trough is to be made.

The beading-rod-actuating shaft is journaled in the housing 63, which housing is pivotally attached to the flanges 64 by means of the pin or bolt 65, which pin or bolt forms a hinged connection for the housing 63. The pin or bolt is provided with the grooved head 66, which grooved head forms a guide for the movement of the detent 56. The flanges 64 are formed integral with the head 67, which head is secured to the mandrel 38 in any convenient and well-known manner.

It is well understood that after an eaves-trough has been properly formed it is necessary to remove it from the mandrel and its beading-rod, and in order that this may be done the housing 63, together with all the different parts carried thereby, is moved or turned upon its bolt or pin 65 into the position illustrated in Fig. 4, and when in that position it is out of the way and the finished eaves-trough can be removed and a new sheet placed in position to form an eaves-trough, as above described. After the sheet has been brought into position the housing 63 is placed in the position illustrated in Fig. 3 and the beading-rod-actuating shaft moved longitudinally by means of the ribbed or toothed bar 68, which toothed bar meshes with the annular grooves and ridges 69, formed upon the shaft 52. The toothed bar 68 is provided with the toe 70, which toe is free to pass through the slot 71 when in the position illustrated in Fig. 4, and after the toe has fully passed through the slot the ribbed or toothed bar 68 is rotated by means of the handle 72, the rotation of which locks the housing and moves the bead-actuating shaft 52 endwise and connects said shaft to the beading-rod by means of its angled socket 51 and the angled extensions 50, and when said parts are so connected the machine proper is in position and condition to form an eaves-trough.

It will be understood that during the time an eaves-trough is being formed the sheet should be held in close contact with the mandrel 38, and in order to so hold the sheet of metal the presser-bar 33 is provided and is attached to the cam-actuated levers 30, and for the purpose of reducing the friction a series of antifriction-rollers 73 are provided and are located upon the forward edge of the

presser-bar 33 and held in proper position by means of the straps 74, which straps constitute journals for the rollers. The cam-grooves 32 are so formed that the presser-bar will be thrown into the position illustrated in Fig. 6 at the time a sheet is to be introduced, but by the action of the cams after the beading-rod and its plates have been carried out of the way of the presser-bar said presser-bar is moved toward the mandrel and the anti-friction-rollers carried by the presser-bar brought into proper contact with the sheet of metal.

For the purpose of preventing the beading-rod 39 from twisting the pinion 53^a is connected to the opposite end of the rod from that to which the pinion 53 is detachably connected, and of course a toothed segment 49^a is to be employed, said toothed segments being located at opposite ends of the machine.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for forming eaves-trough, the combination of a suitable frame, an eaves-trough-forming mandrel, journaled in the frame, grooved plates connected to and rotatable with the mandrel, a beading-rod located in the grooves of the plates and the beading-rod provided with a groove, and means for axially rotating the beading-rod and means for rotating the beading-rod around the trough-forming mandrel, substantially as and for the purpose specified.

2. In a machine for forming eaves-trough the combination, of a suitable frame, an eaves-trough-forming mandrel journaled therein, a beading-rod rotatable with the mandrel, said beading-rod provided with an angled extension, a longitudinally-movable shaft provided with a socket adapted to engage the angled end of the beading-rod, a pinion mounted upon said shaft, and a toothed segment adapted to mesh with the pinion mounted upon the longitudinally-movable shaft.

3. In an eaves-trough-forming machine, the combination of a frame, an eaves-trough-forming mandrel journaled in the frame, a beading-rod held in fixed spaced relation to the mandrel and rotatable around the mandrel and rotatable axially, and means for imparting movement around the mandrel, and axial movement to said beading-rod with its movement around the mandrel, substantially as and for the purpose specified.

4. In a machine for forming eaves-trough, a frame, an eaves-trough-forming mandrel journaled therein, gear-wheels secured to the mandrel, one of said gear-wheels provided with a slit, a beading-rod adapted to rotate axially and around the mandrel, substantially as and for the purpose specified.

5. In a machine for forming eaves-trough,

the combination of a frame, an eaves-trough-forming mandrel journaled in the frame, a beading-rod provided with a groove throughout its bead-forming length, said beading-rod rotatable around and with the mandrel, a shaft provided with a pinion, said shaft journaled in a hinged housing, means for connecting the beading-rod to axially rotate with the shaft, and means for rotating the shaft.

6. In a machine for forming eaves-trough, the combination of a frame, an eaves-trough-forming mandrel journaled in the frame, a beading-rod provided with a groove throughout its bead-forming length, said beading-rod rotatable around the mandrel, a shaft provided with a pinion, said shaft journaled in a hinged housing, means for connecting the beading-rod to axially rotate with the shaft, means for rotating the shaft, and means for longitudinally moving the shaft.

7. In a machine for forming eaves-trough, the combination of a suitable frame, an eaves-trough-forming mandrel journaled therein, a beading-rod carried by the mandrel, and rotatable therewith and around said mandrel, and means for imparting axially movement to the beading-rod, levers having adjustably connected thereto a presser-bar, said presser-bar provided with anti-friction-rollers, and means for actuating the levers and presser-bar in timed relation with the rotation of the mandrel.

8. In a machine for forming eaves-trough, the combination of a frame, a mandrel journaled therein, a beading-rod rotatable around the mandrel and axially, a presser-bar, cam-actuated levers, and means for rotating the cams.

9. In a machine for forming eaves-trough, the combination of a frame, a mandrel journaled therein, a beading-rod rotatable around the mandrel and axially rotatable, a presser-bar, cam-actuated levers, means for actuating the cams, and clutch mechanism and means for actuating the clutch mechanism.

10. In a machine for forming eaves-trough, the combination of a suitable frame, an eaves-trough-forming mandrel journaled therein, a beading-rod, bars provided with grooves adapted to surround a portion of the periphery of the beading-rod, said bars secured together, and carried by the eaves-trough-forming mandrel, a shaft journaled in a hinged housing, and located at one end of the beading-rod and adapted to be connected and disconnected to and from the beading-rod, a pinion provided with a smooth peripheral portion, a groove formed in the smooth peripheral portion and a detent adapted to lock the pinion against rotation and means for actuating the detent.

11. In a machine for forming eaves-trough, the combination of a suitable frame, an eaves-trough-forming mandrel journaled in

the frame, a beading-rod, means for axially rotating the beading-rod, and means for limiting the beading-rod to one revolution, with one movement of the eaves-trough-forming mandrel, and means for rotating the mandrel.

12. In a machine for forming eaves-trough, the combination of a suitable frame, an eaves-trough-forming mandrel journaled therein, a beading-rod provided with a groove, means for axially rotating the beading-rod, means for disconnecting the axial rotation of the beading-rod, and means for limiting the beading-rod to a single revolution with one revolution of the eaves-trough-forming mandrel, a presser-bar, cam-actuated levers and the presser-bar adjustably connected to the cam-actuated levers, and antifriction-rollers carried by and movable with the presser-bar.

13. In an eaves-trough-forming machine, the combination of a suitable frame, a mandrel journaled therein, and provided with a flanged head, a pivoted housing carried by the flanged head, and having journaled therein a shaft, a beading-rod, adapted to rotate with the rotation of the eaves-trough-forming mandrel, a ribbed bar journaled in the housing said ribbed bar adapted to actuate longitudinally the shaft journaled in the housing, and means for connecting the shaft journaled in the housing with the beading-rod.

14. In an eaves-trough-forming machine, the combination of a suitable frame, a mandrel journaled therein and provided with a flanged head, a pivoted housing carried by the flanged head and having journaled therein a shaft, a beading-rod adapted to rotate around the eaves-trough-forming mandrel, a ribbed bar journaled in the housing, said ribbed bar adapted to longitudinally actuate and the shaft journaled in the hinged housing, means for connecting the shaft journaled in the housing with the beading-rod, and means for locking the housing in position to hold the shaft in axially alinement with the beading-rod.

15. In a machine for forming eaves-trough, the combination of a suitable frame, an eaves-trough-forming mandrel journaled in the flange, a power-shaft provided with a driving-pinion, a cam-shaft and cams mounted thereon, gear-wheels mounted upon the shaft, a clutch located upon the cam-shaft, means for connecting the clutch members, said cams rotatable with the cam-shaft, levers actuated by the cams, a presser-bar adjustably attached to the free ends of the cam-actuated levers, said presser-bars provided with antifriction-rollers, an axially-rotatable beading-rod carried by and rotatable with

the eaves-trough-forming mandrel, and a gear-wheel provided with a sheet-receiving slit.

16. In a machine for forming eaves-trough, the combination of a frame, an eaves-trough-forming mandrel journaled therein, and a beading-rod, carried by the mandrel, means for rotating the eaves-trough-forming mandrel and means for imparting one rotation of the beading-rod with one distinct movement of the eaves-trough-forming mandrel, substantially as and for the purpose specified.

17. In a machine for forming eaves-trough, the combination of a suitable frame, an eaves-trough-forming mandrel journaled therein, a grooved beading-rod located parallel with the eaves-trough-forming mandrel, and adapted to be rotated axially and means for limiting the rotation of the mandrel and beading-rod, substantially as and for the purpose specified.

18. In a machine for forming eaves-trough, the combination of a suitable frame, an eaves-trough-forming mandrel journaled therein, a beading-rod carried by the mandrel, and rotatable axially, and with the mandrel, and means whereby the trough is held against the mandrel during the rotation of the mandrel, substantially as and for the purpose specified.

19. In an eaves-trough-forming machine, a suitable frame an eaves-trough-forming mandrel, and a grooved beading-rod located parallel to each other, mechanism to rotate the eaves-trough-forming mandrel and the beading-rod, and means for pressing the eaves-trough during the partial rotation of the mandrel, substantially as and for the purpose specified.

20. In an eaves-trough-forming machine, the combination of a suitable frame, an eaves-trough-forming mandrel journaled in the frame, a grooved beading-rod located parallel with the forming-mandrel, grooved bars adapted to hold the beading-rod, said bars carried by the mandrel, a pivoted housing, a shaft adapted to move longitudinally in the housing, a pinion provided with an integral smooth-faced portion and a groove continued through the smooth-faced portion of the pinion, a detent adapted to engage with the pinion, said detent provided with a head, a grooved toothed segment and the head of the detent adapted to engage the tooth of the segment and actuate the detent.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JULIUS H. SCHLAFLY.

Witnesses:

A. T. EULARD,
H. L. MCKENZIE.