

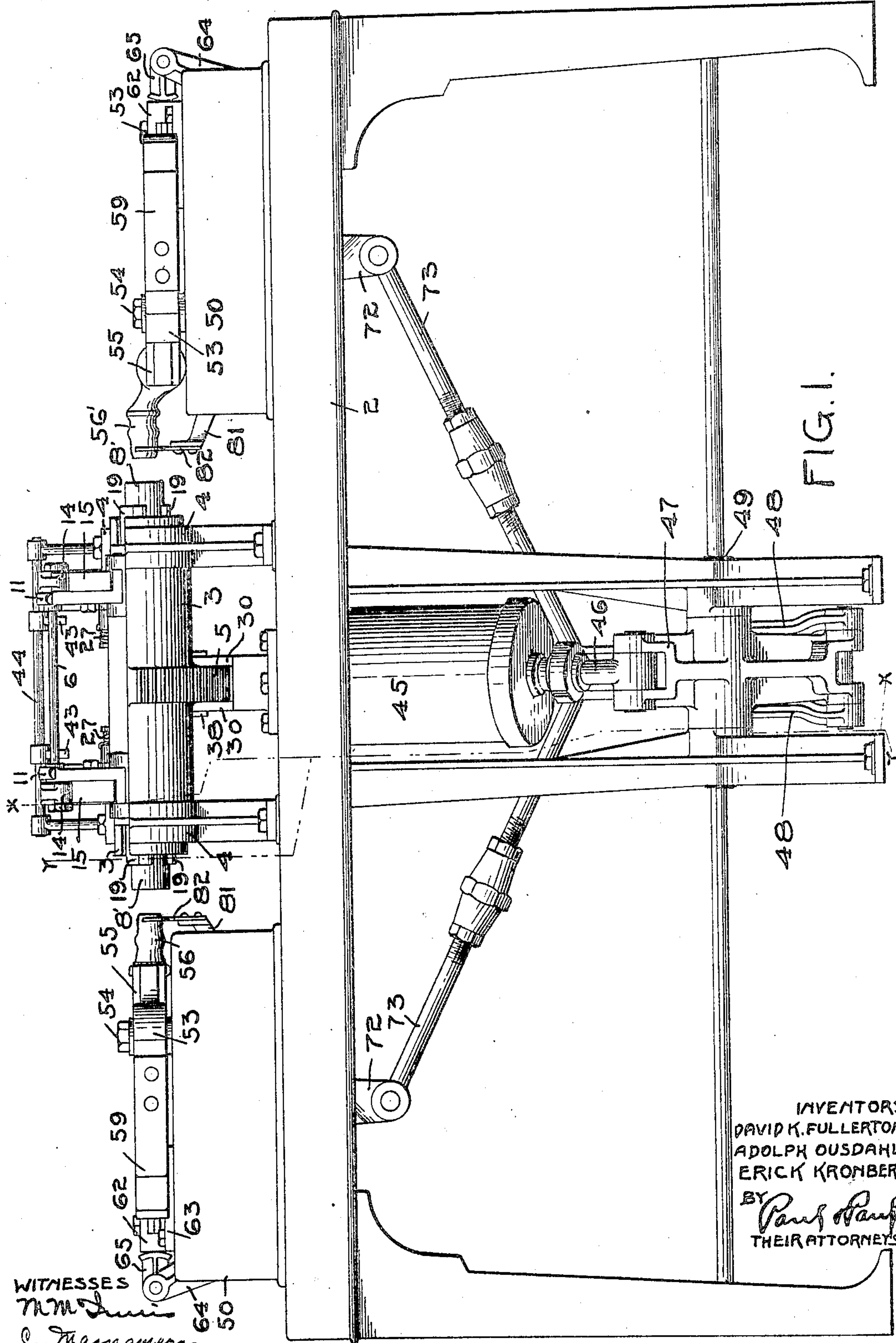
No. 807,738.

PATENTED DEC. 19, 1905.

D. K. FULLERTON, A. OUSDAHL & E. KRONBERG.
MACHINE FOR INSERTING COUPLINGS AND NIPPLES INTO HOSE.

APPLICATION FILED JUNE 29, 1905.

5 SHEETS—SHEET 1.



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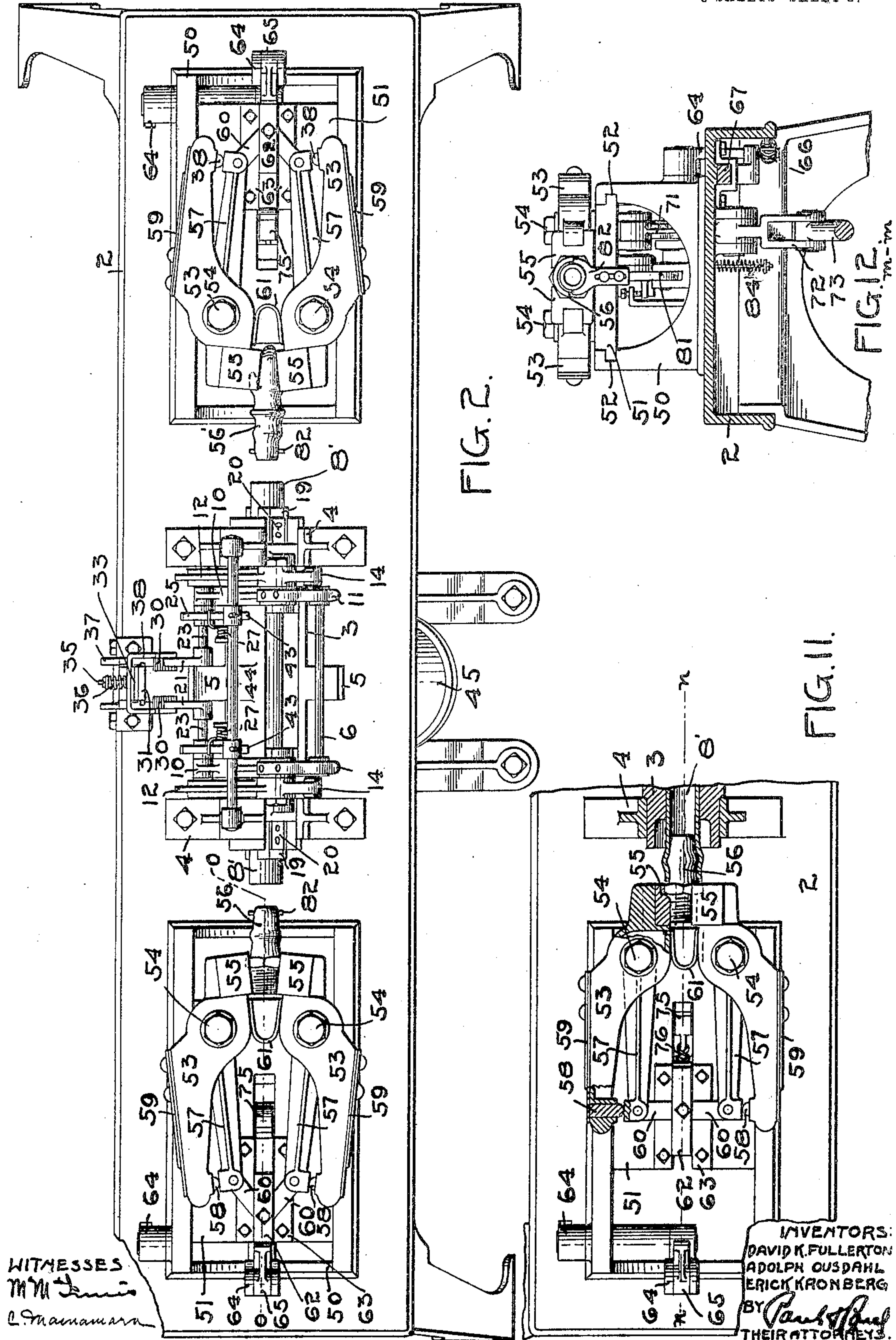
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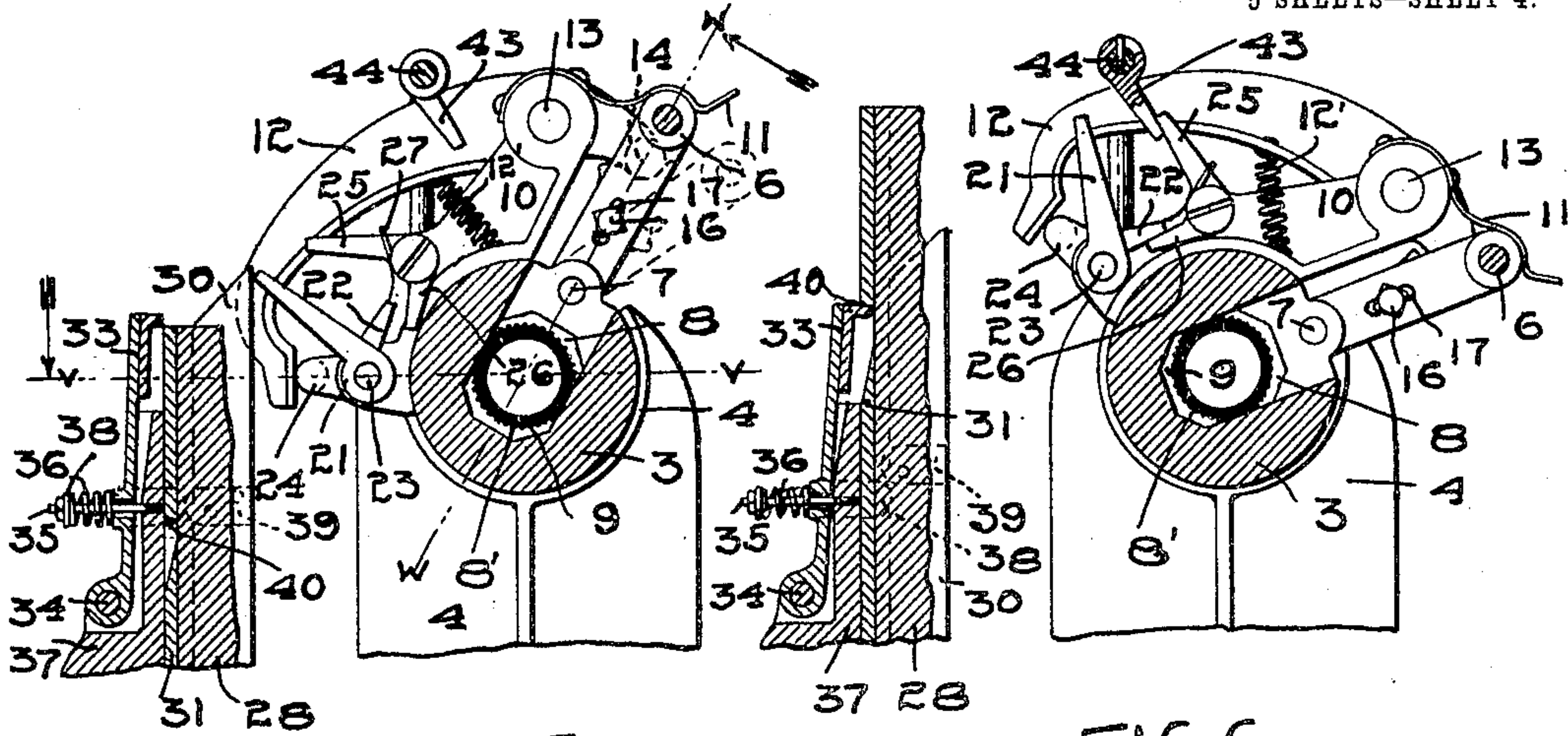


FIG. 5
Z-Z

FIG. 6
Z-Z

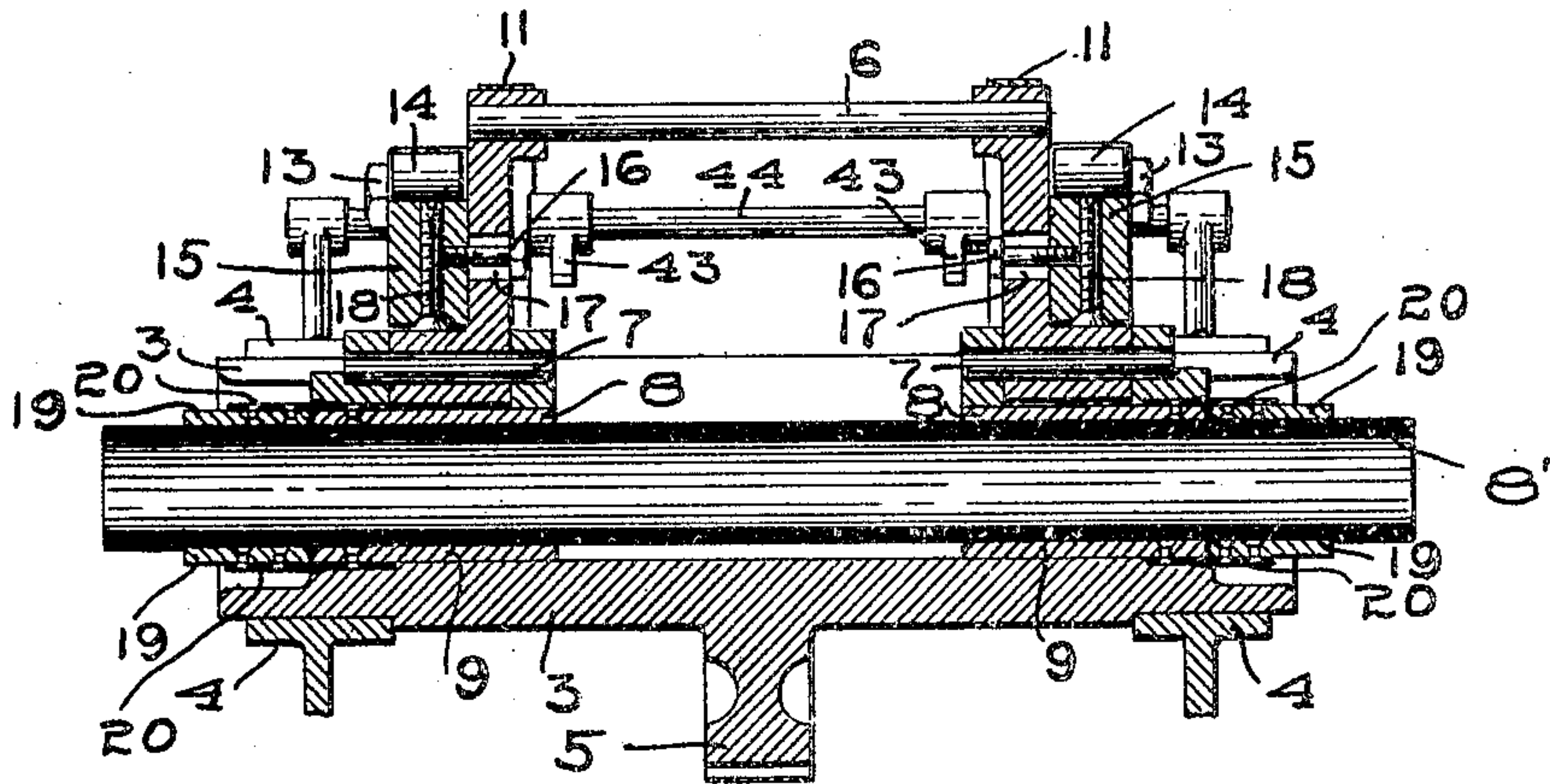


FIG. 7.
W-W

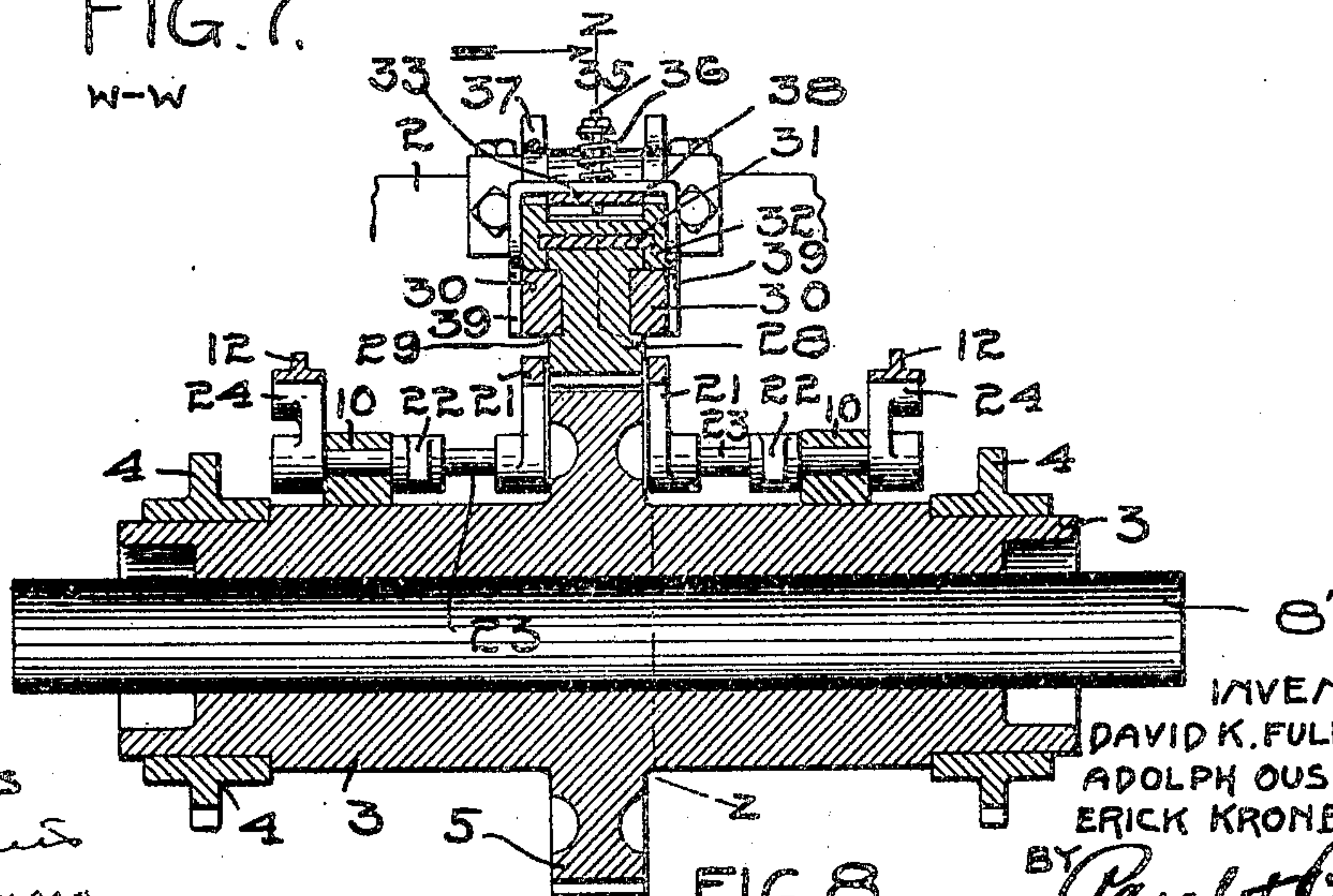


FIG. 8
V-V

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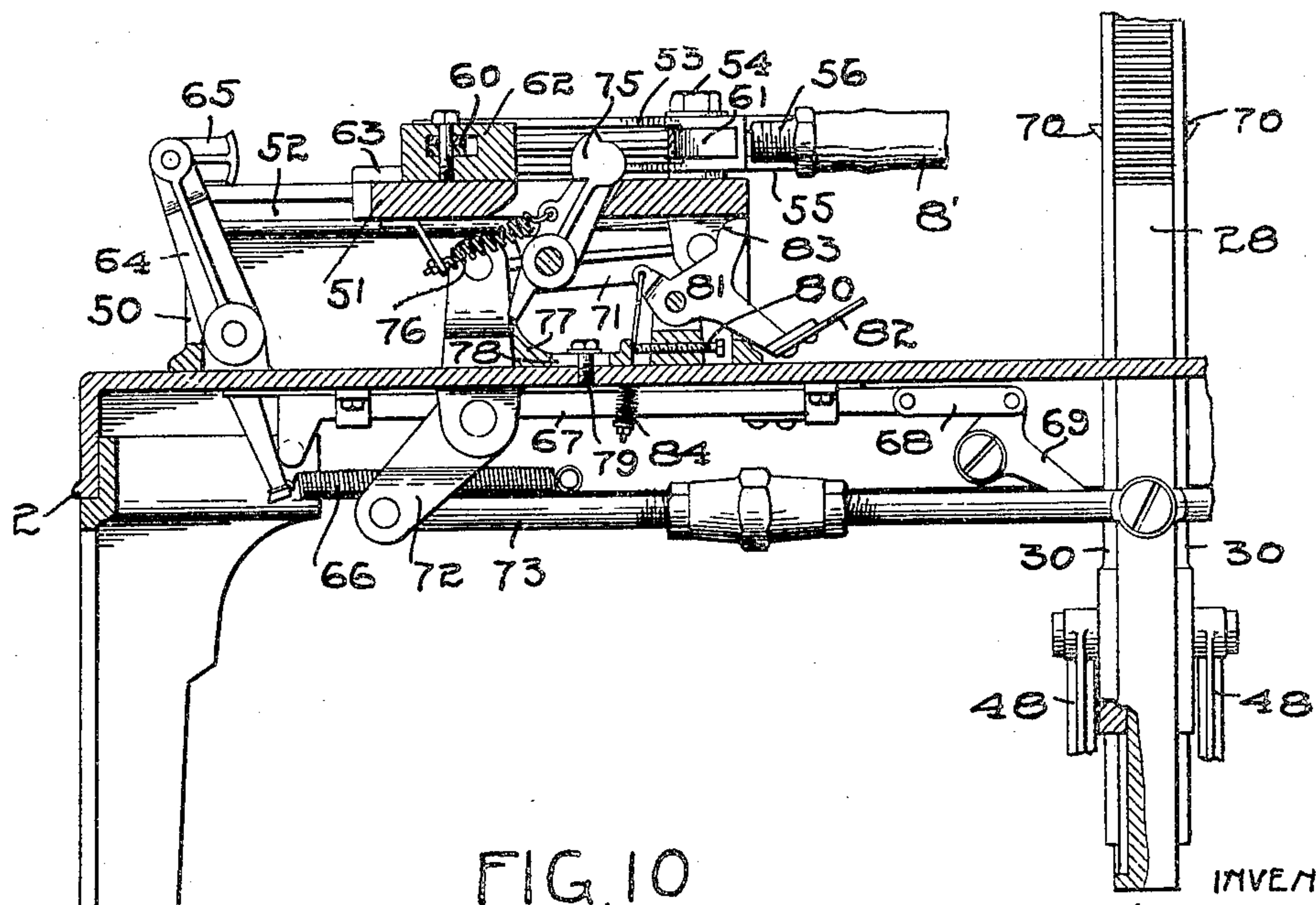
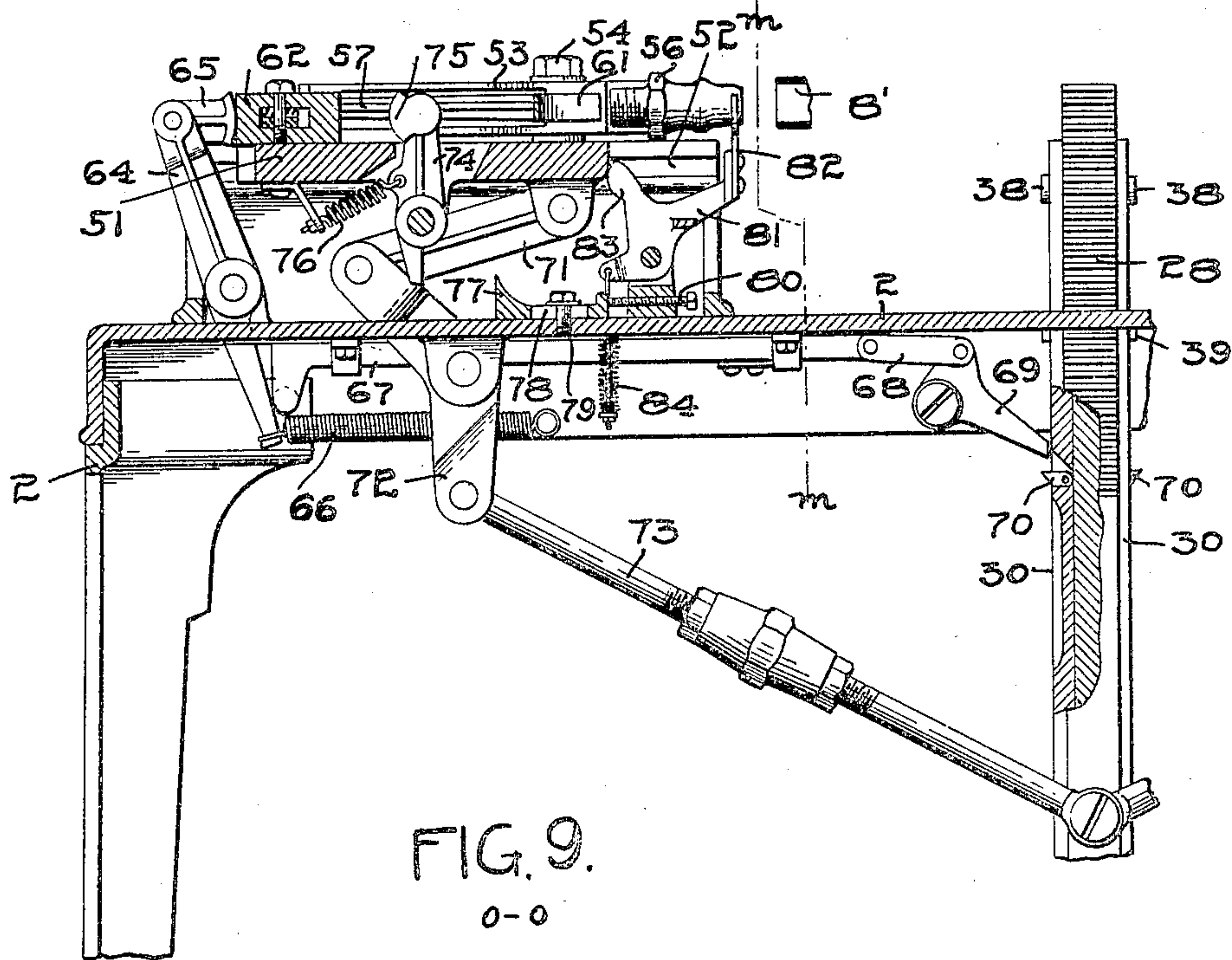
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR INSERTING COUPLINGS AND NIPPLES INTO HOSE.

No. 807,738.

Specification of Letters Patent.

Patented Dec. 19, 1905.

Application filed June 29, 1905. Serial No. 267,530.

To all whom it may concern:

Be it known that we, DAVID K. FULLERTON, ADOLPH OUSDAHL, and ERICK KRONBERG, of Brainerd, Crow Wing county, Minnesota, have invented certain new and useful Improvements in Machines for Inserting Couplings and Nipples into Hose, of which the following is a specification.

The object of our invention is to provide a machine for automatically and expeditiously inserting couplings and nipples into the short lengths of hose used between the cars in an air-brake system.

The invention consists generally in inserting a nipple and coupling simultaneously into the ends of a hose.

Further, the invention consists in imparting a rotary movement to the hose during the operation of fitting a coupling and nipple therein.

Further, the invention consists in improved means for clamping the hose.

Further, the invention consists in means for locking the coupling and nipple during the operation of inserting them into the ends of the rotating hose.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a front elevation of a machine embodying our invention. Fig. 2 is a plan view of the same. Fig. 3 is a vertical sectional view on the line xx of Fig. 1. Fig. 4 is a similar view on the line yy of Fig. 1. Fig. 5 is a detail sectional view on the line zz of Fig. 8. Fig. 6 is a similar view to Fig. 5, showing the position of the rotating cylinder and the mechanism carried thereby at the limit of their movement in one direction. Fig. 7 is a detail sectional view on the line ww of Fig. 5. Fig. 8 is a detail sectional view on the line vv of Fig. 5. Fig. 9 is a detail sectional view on the line oo of Fig. 2. Fig. 10 is a sectional view on the line nn of Fig. 11. Fig. 11 is a plan view, partially in section, of the nipple-gripping jaws. Fig. 12 is a sectional view on the line mm of Fig. 9.

In the drawings, 2 represents a suitable frame whereon the operating mechanism is mounted.

3 is a cylindrical casting journaled at each end in brackets 4, arranged on top of the frame

2 near the middle thereof. The cylinder is open at each end and is provided with a centrally-arranged gear 5, which is preferably cast integral with the cylinder. (See Fig. 5.)

6 is a yoke provided at each end with pivot-pins 7, wherein jaws 8 having corrugated faces are pivoted and adapted to bear upon the surface of a rubber hose 8' inserted into the cylinder and grip the same during the operation of inserting the coupling and nipple into the hose. Similar jaws 9 are provided at each end of the cylinder 3 to bear on the under surface of the hose and aid in holding it securely. Brackets 10 are secured on the surface of the cylinder near each end thereof and have springs 11, which engage the ends of the yoke 6 to hold it in place, as indicated in Fig. 5. The yoke, however, can be readily disengaged from these springs by pulling it down to the position indicated by dotted lines in Fig. 5. Arms 12 are pivoted at 13 in the brackets 10 and have ends 14, which bear upon blocks 15, adjustably secured to the yoke 6 by bolts 16, extending through slots 17 in the ends of said yoke and into said blocks. Screws 18 are vertically arranged in said blocks and have lower ends to bear on the ends of the yoke. The upper ends of the screws 18 are slotted to allow the use of a screw-driver to turn the screws and adjust the blocks vertically, and thereby regulate the tension on the hose when the clamping pressure is applied to the jaws. We prefer to provide jaws 19 at each end of the cylinder in line with the jaws 8 and 9 and connected therewith, respectively, by springs 20. These jaws 19 inclose the ends of the rubber hose and allow them to expand when the nipple and coupling are thrust therein. As soon as the expansive force is released the springs 20 will return the jaws to their normal position. (See Fig. 5.)

Mounted upon the brackets 10 is a dog 21, having a finger 22 extending substantially at right angles therefrom and secured on a pivot 23, which also carries an arm 24. (See Figs. 3 and 4.) Dogs 25, having arms 26 and 27, are provided near the dog 21 for the purpose hereinafter described.

A vertically-movable rack-bar 28 has teeth to engage the teeth of the gear 5 and is provided on each side with recesses 29, wherein vertically-movable bars 30 are arranged. (See Figs. 5, 6, and 8.) The rack-bar 28 has a plate 31 on its rear face that is adapted to slide vertically with said bar in guides 32.

The dogs 21 project into the path of the vertically-moving bars 30 to be actuated thereby, and the movement of the dogs 21 will impart a corresponding movement to the arms 24, which engaging the arms 12 will rock them on their pivots and force the jaws 8 down upon the hose and clamp the same securely in the cylinder. (See Figs. 5 and 6.) During the initial upward movement of the bars 30 the rack-bar will be locked by means of a hook device 33, pivoted at 34 and engaging the top of the bar and held in engagement therewith by means of a pin 35, provided with a spring 36 and mounted in a bracket 37. (See Figs. 5 and 6.) A yoke 38 is carried by the pin 35 and has ends in the path of lugs 39 on the bars 30. When, therefore, these bars are raised a predetermined distance, the lugs 39 will contact with said yoke and press the hook 33 away from the rack-bar against the tension of the spring 36. After the lugs have passed the yoke the spring 36 will return the hook 33 to its normal position and cause it to enter a notch 40 in the rack-bar and support the said bar in its raised position. The disengagement of the hook 33 from the rack-bar will be timed to occur just before the shoulders 41 provided on the bars 30 engage similar shoulders 42 on the rack-bar to lift it vertically. The hose having been locked in the cylinder by the initial upward movement of the bars 30, the said cylinder will be rotated partially upon the engagement of the rack-bar with the gear 5, the movement of said cylinder being from the position indicated in Fig. 5 to that shown in Fig. 6. During this oscillation of the cylinder the dogs 25 will pass beneath pawls 43, which have a limited movement on a rod 44 and swing sufficiently to allow the dogs 25 to pass beneath them in one direction, but engage the said dogs and tilt the same upon the return movement of the cylinder. Fingers 26 normally lie beneath the dogs 25, and consequently when the dogs 25 engage the pawls 43 and are oscillated thereby a corresponding movement will be imparted to the dogs 21 and the arms 24 to release the arms 12 and allow their springs 12' to return them to their normal position and relieve the pressure on the section of hose.

To reciprocate the bars 28 and 30 we prefer to provide an air-cylinder 45, having its piston-rod 46 connected with one end of an oscillating bar 47, whose opposite end has link connections 48 with the bars 30, the bar 47 being supported intermediate to its ends on the shaft 49.

The manner of admitting air to the cylinder and controlling the pressure thereof forms no part of our present invention and need not be described in detail herein.

In the foregoing part of the specification we have described the mechanism for clamping the hose and imparting a rotary movement thereto. We will now proceed to de-

scribe the mechanism for clamping the nipple 56 and coupling 56' and inserting them into the ends of the hose during the rotary movement thereof. The mechanism for clamping the coupling and advancing it into the hose is substantially the same as the mechanism for operating the nipple, and except in the general view, Fig. 1, we have thought it unnecessary to illustrate and describe more than one of these mechanisms.

Upon each end of the frame 2 we provide casings 50, and referring particularly to the nipple-operating mechanism, 51 represents a carriage arranged to slide horizontally in guides 52 within the said casing and carrying arms 53, pivoted at 54 and provided with jaws 55, between which the nipple 56 is gripped and held. Levers 57 are loosely mounted on the pivots 54 and have ends adapted to engage pins 58, carried by the arms 53 and held toward the levers 57 with a yielding pressure by springs 59. The levers 57 are pivotally connected with one another at one end by toggle-links 60. When these links are straightened, the levers will be separated to force the jaws 55 together, and when the toggle-joint is broken the arms 53 will be oscillated by means of a spring 61 and the jaws separated and the levers 57 swung toward each other. (See Figs. 2 and 11.) The links 60 are pivoted in a block 62, that is slidable on the carriage 51 between guides 63. A lever 64 is pivoted on the machine-frame and provided at its upper end with a head 65 to engage the block 62 and straighten the toggle-links. The lower end of the lever 64 projects through the top of the machine-frame and is attached to a spring 66, which normally holds the said lever in a retracted position. A reciprocating rod 67 is mounted in guides in said frame and engages the lower end of the lever 64 to oscillate the same. A rod 67 has a link connection 68 with a bell-crank 69, having an arm which lies in the path of the dog 70 on the contiguous vertically-reciprocating bar 30. When, therefore, this bar is raised, the bell-crank 69 will be oscillated to project the rod 67 against the lever 64 and oscillate the same to straighten the toggle and close the nipple-clamping jaws. The carriage 51 has a link connection 71 with a bell-crank lever 72, pivoted on the machine-frame and connected by a rod 73 with the vertically-movable rack-bar 28. When this rack-bar ascends, the lever 72 will be oscillated and the carriage moved toward the end of the hose, which simultaneously is given a rotary movement and is held securely to receive the approaching nipple. A lever 74 is mounted on the said carriage and has a head 75 to engage the toggle-links and break the joint. A spring 76 holds the said lever toward said toggle-links with a yielding tension, and a stop 77, provided on the frame of the machine, is adapted to engage the lower end of said lever

and swing the same on its pivot and put the spring 76 under sufficient tension to cause the unlocking or breaking of the toggle-joint when the lever 74 returns to its normal position. (See Figs. 9 and 10.) The stop 77, by means of a slot 78 and bolts 79, is adjustable to allow the operation of the lever 74 to be properly timed. A set-screw 80 engages the block 77 and permits the convenient adjustment of the same. The lever 81 is provided with a fork 82 to support one end of the nipple. An arm 83 on said lever projects into the path of the carriage 51 and is yieldingly held by a spring 84. As soon as the carriage begins its horizontal movement the lever 81 will be oscillated and the fork 82 swung down away from the nipple to allow its end to be inserted into the hose. As soon as the carriage returns to its normal position the spring 84 will lift the lever 81. (See Figs. 9 and 10.)

The following is a brief description of the operation of the machine: The yoke is first removed to expose the socket in the cylinder and a section of rubber hose placed in the socket. The yoke is then inserted and swung up beneath the springs 11, and air is then admitted to the cylinder and the upward movement of the bars 30 will begin, and during their initial movement the jaws carried by the yoke will clamp the hose and be securely locked in their clamped position by the arms 12. As soon as the hose is clamped the rack-bar will engage the gear 5 and the rotary movement of the cylinder will begin. As soon as the rack-bar begins its upward movement the carriages supporting the nipple and coupling will be moved toward the ends of the hose, the nipple and coupling having been previously clamped on said carriages by mechanism operated upon the initial movement of the bars 30. The nipple and coupling will enter the ends of the hose during its rotary movement and will be snugly fitted therein by the time the hose and cylinder have reached the limit of their movement. As the cylinder returns to its normal position the arms 12 will be unlocked and the yoke released to allow the removal of the hose from the cylinder.

We claim as our invention—

1. The combination, with means for clamping and rotating a section of hose, of means for simultaneously inserting a nipple and coupling into the ends of said hose during its rotary movement.
2. The combination, with means for clamping a hose and imparting a rotary movement thereto, of means for inserting a nipple into the end of said hose during such movement.
3. The combination, with a cylinder, of means for clamping a section of hose therein, means for imparting a rotary movement to said cylinder, and means for simultaneously inserting a coupling and nipple into the ends of said hose during its rotary movement.
4. The combination, with a cylinder adapted

ed to receive a section of hose and provided with clamping-jaws, of means for locking said jaws in engagement with said hose, means for imparting a rotary movement to said cylinder and hose, means for inserting a nipple into the end of said hose during its rotary movement, substantially as described.

5. The combination, with a cylinder adapted to receive a section of rubber hose, of jaws mounted in said cylinder, said jaws being provided with spring-pressed extensions to inclose the end of the hose and allow the same to be expanded.

6. The combination, with a cylinder having a socket to receive a section of hose, of a removable yoke provided with jaws adapted to fit into said socket and clamp said hose therein, pivoted arms arranged to engage said yoke and lock said jaws in their clamped position, and means for inserting a nipple and coupling into the ends of said hose, substantially as described.

7. The combination, with a cylinder provided with a gear and adapted to receive a section of hose, of clamping-jaws, arms arranged to lock the same in engagement with said hose, vertically-movable bars, mechanism operated by the initial upward movement of said bars for operating said arms to lock said jaws, a vertically-movable rack-bar arranged to engage said gear and actuated by the final movement of said bars for imparting a partial rotary movement to said cylinder, and mechanism for inserting a nipple and coupling into the ends of the hose during such movement, substantially as described.

8. The combination, with a cylinder provided with a gear and adapted to receive a section of hose, of clamping-jaws, arms arranged to lock said jaws in engagement with said hose, reciprocating bars, mechanism arranged to actuate said arms and lock said jaws during the final movement of said bars, a rack-bar arranged to be operated during the final movement of said bars to engage said gear and impart a partial rotary movement to said cylinder, means for inserting a nipple into the end of said hose during its rotary movement, and mechanism for unlocking said arms and releasing said jaws during the return movement of said cylinder, substantially as described.

9. The combination, with a cylinder adapted to receive a section of hose, of jaws arranged to clamp the hose in said cylinder, mechanism for locking said jaws in their clamping position, reciprocating bars arranged to actuate said locking mechanism, a fluid-pressure cylinder having its piston connected with said bars, and means for inserting a nipple and coupling into the ends of said hose, substantially as described.

10. The combination, with means for clamping and rotating a section of hose, of reciprocating carriages provided at each end of

said clamping means, jaws mounted on said carriages and adapted to clamp a coupling and a nipple, and mechanism for moving said carriages toward said hose-clamping means to
 5 insert said coupling and nipple into the ends of the hose during its rotary movement, substantially as described.

11. The combination, with means for supporting and clamping a section of hose, of reciprocating carriages, jaws mounted thereon and adapted to clamp a coupling and a nipple, a toggle mechanism for locking said jaws in their clamped position, means for moving
 10 said carriages toward said hose-clamping means and inserting the coupling and nipple into the ends of said hose, and means for releasing said toggle mechanism to unlock said coupling and nipple-clamping jaws during the final movement of said carriages.

12. The combination, with means for clamping and rotating a section of rubber hose, of reciprocating carriages provided at each end of said clamping means, jaws mounted on said carriages, means actuated by the operation of
 25 said hose-clamping means for operating said jaws, and mechanism operated by said hose-rotating means for moving said carriages toward each other to insert the coupling and nipple into the ends of the hose, substantially
 30 as described.

13. The combination, with a cylinder, of means for clamping a section of hose therein, means for imparting a rotary movement to said cylinder and means for inserting a coupling into the end of said hose during its rotary
 35 movement.

14. The combination, with jaws having yielding extensions adapted to inclose the end of a hose and allow same to be expanded, and
 40 means for inserting a coupling into said end, substantially as described.

15. The combination, with means for clamping a section of flexible hose and imparting a rotary movement thereto, of yielding extensions provided on said clamping means, and
 45 means for inserting a coupling into the end of the hose inclosed by said extensions, substantially as described.

16. The combination, with a cylinder provided with a gear and adapted to receive a section of hose, of means for locking the hose in said cylinder, a rack-bar arranged to engage
 50 said gear and impart a rotary movement to said cylinder, and mechanism for inserting a coupling into the end of the hose during said movement, substantially as described.

17. The combination, with a cylinder provided with a gear and adapted to receive a section of hose, of means for locking the hose in
 60 said cylinder, a rack-bar arranged to engage said gear and impart a rotary movement to said cylinder, mechanism for inserting a coupling into the end of the hose during the rotary movement of said cylinder, and means for un-

locking or releasing the hose during its return
 65 movement, substantially as described.

18. The combination, with a cylinder having a socket to receive a section of hose, of a removable yoke having means to enter said socket and clamp the hose therein, means for imparting
 70 a partial rotary movement to said cylinder, and means for inserting a coupling into the end of said hose during such rotary movement, substantially as described.

19. The combination, with a support adapted to receive a section of hose and provided with a gear, of a hose-clamping means, movable bars, mechanism operated by the initial movement of said bars to actuate said clamping means and lock said hose, a rack-bar actuated by the
 75 final movement of said first-named bars to engage said gear and impart a partial rotary movement to said support, and mechanism for inserting a coupling into the end of the hose during such movement, substantially as
 80 85 described.

20. The combination, with jaws arranged to clamp a section of hose, of mechanism for locking said jaws in their clamping position, means for actuating said locking mechanism, an air-
 90 cylinder connected with said actuating means, means operated by the final movement of said actuating means for imparting a partial rotary movement to said jaws, and means for inserting a coupling into the end of the hose during
 95 such movement, substantially as described.

21. The combination, with means for clamping and rotating a section of hose, of a reciprocating carriage, a coupling-clamping means mounted on said carriage, and mechanism for
 100 moving said carriage toward said hose-clamping means to insert said coupling into the end of the hose, substantially as described.

22. The combination, with a hose-support and a coupling-support, of means for rotating
 105 one of said supports, and means for moving one of said supports toward the other one to insert the coupling into the hose and a fluid-pressure-actuated mechanism for operating said supports successively, substantially as de-
 110 scribed.

23. The combination, with a hose-support, and nipple and coupling supports provided upon opposite sides thereof, of means for rotating said hose-support, and means for moving
 115 said nipple and coupling supports toward said hose-support to insert the nipple and coupling into the ends of the hose, substantially as described.

In witness whereof we have hereunto set our
 120 hands this 21st day of June, 1905.

DAVID K. FULLERTON.
 ADOLPH OUSDAHL.
 ERICK KRONBERG.

Witnesses:

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 WM. W. SMYTH,
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