

No. 708,747.

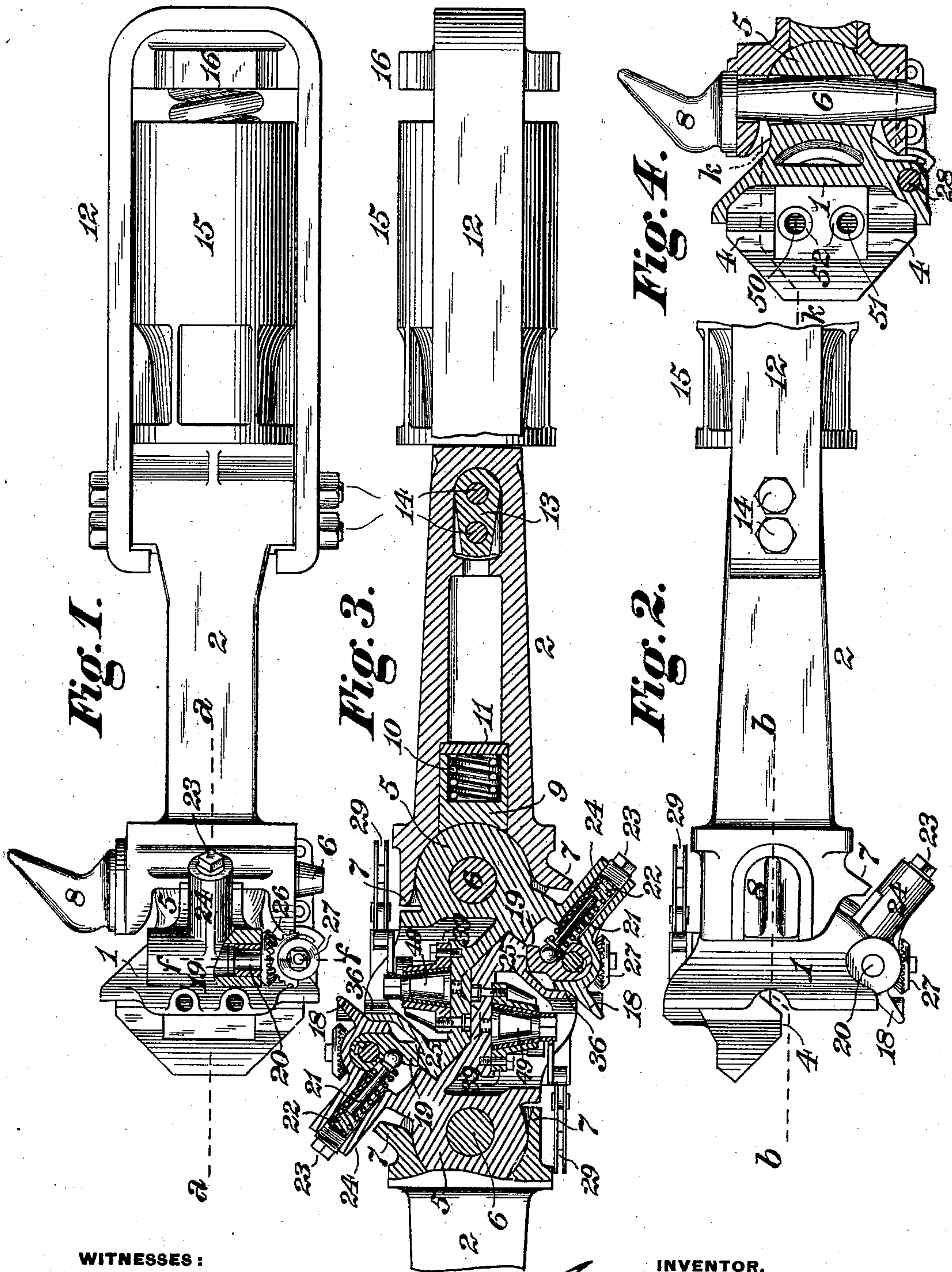
Patented Sept. 9, 1902.

G. WESTINGHOUSE.
CAR COUPLING.

(Application filed Mar. 25, 1901.)

(No Model.)

6 Sheets—Sheet 1.



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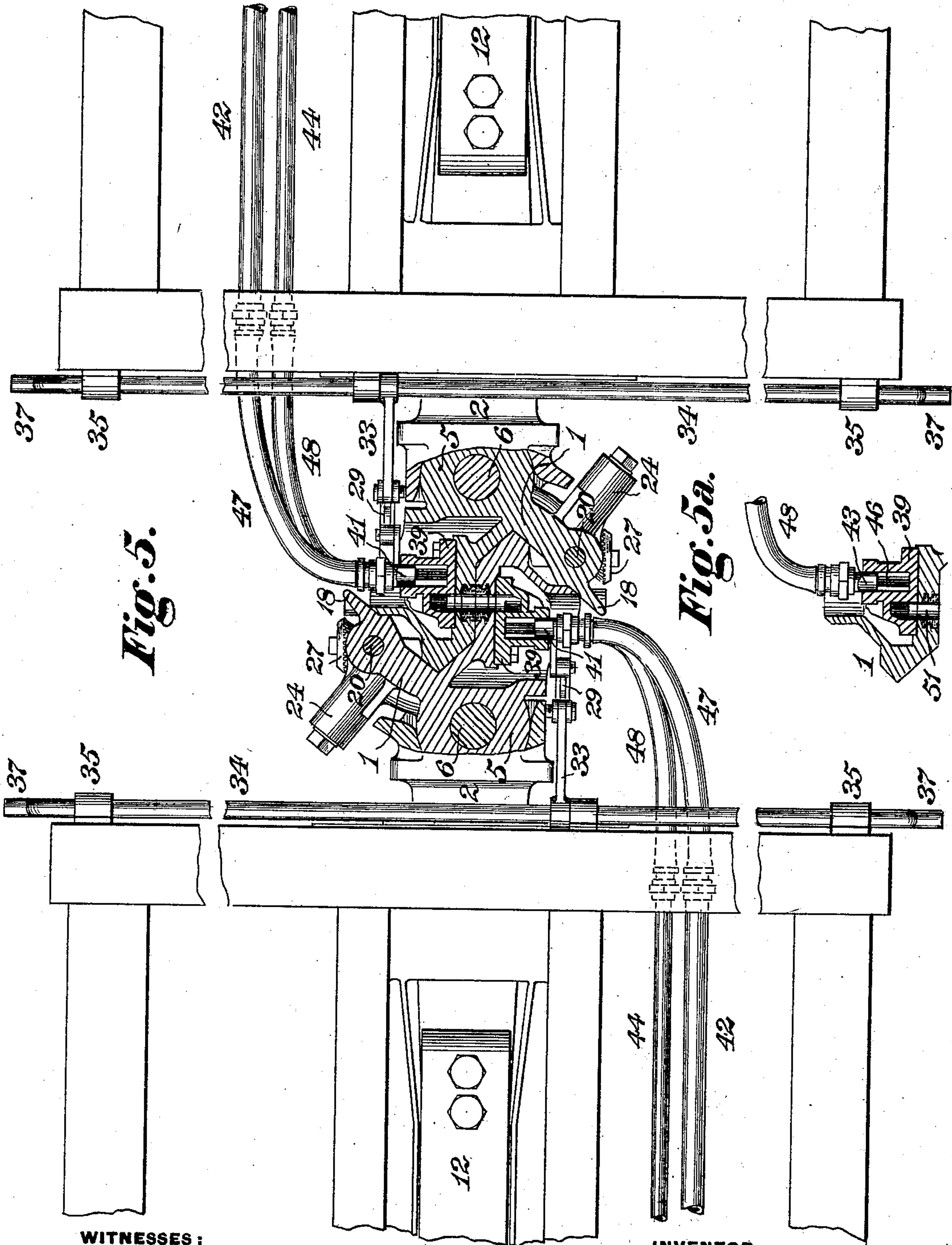
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6 Sheets—Sheet 2.



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(Application filed Mar. 25, 1901.)

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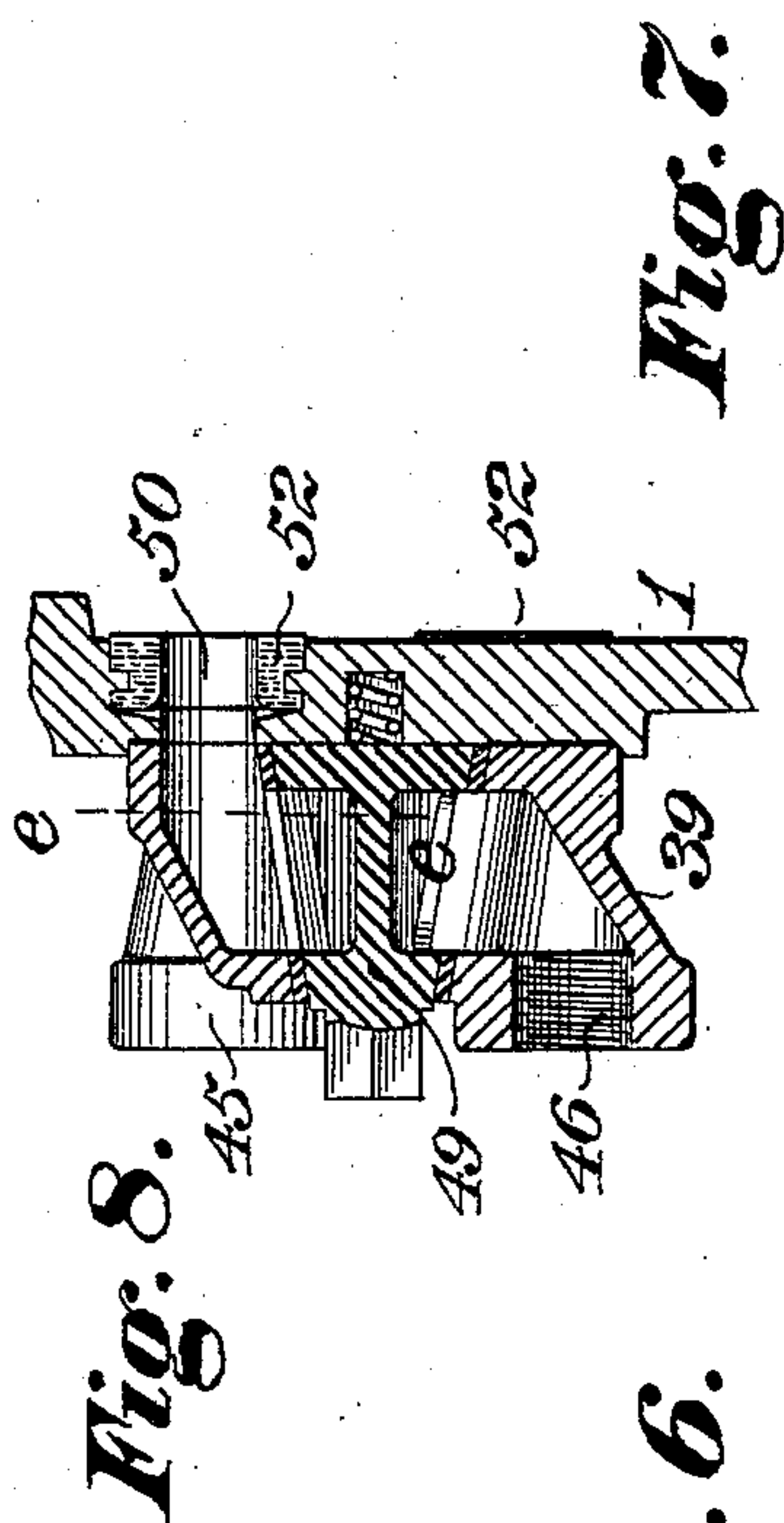


Fig. 7.

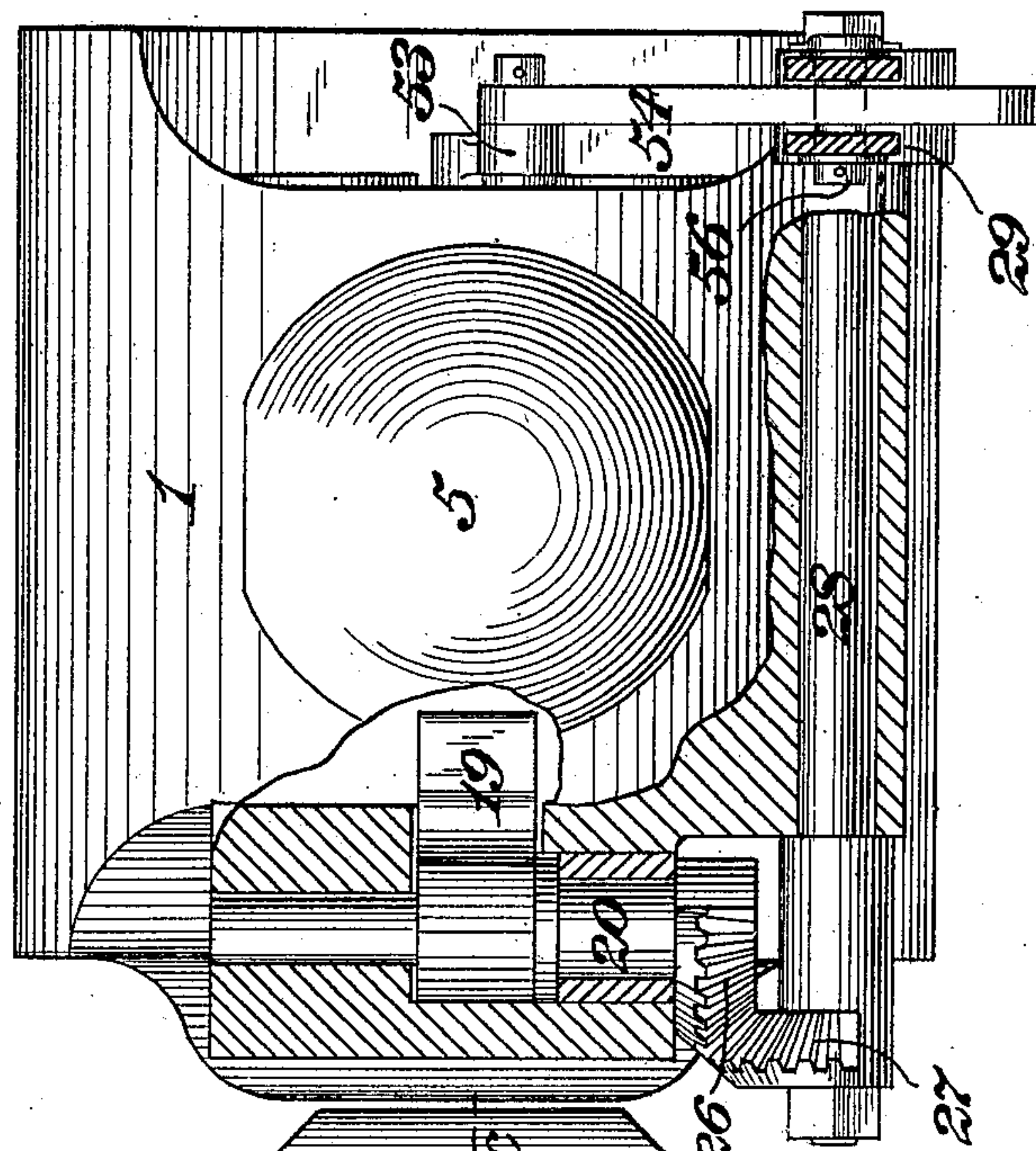
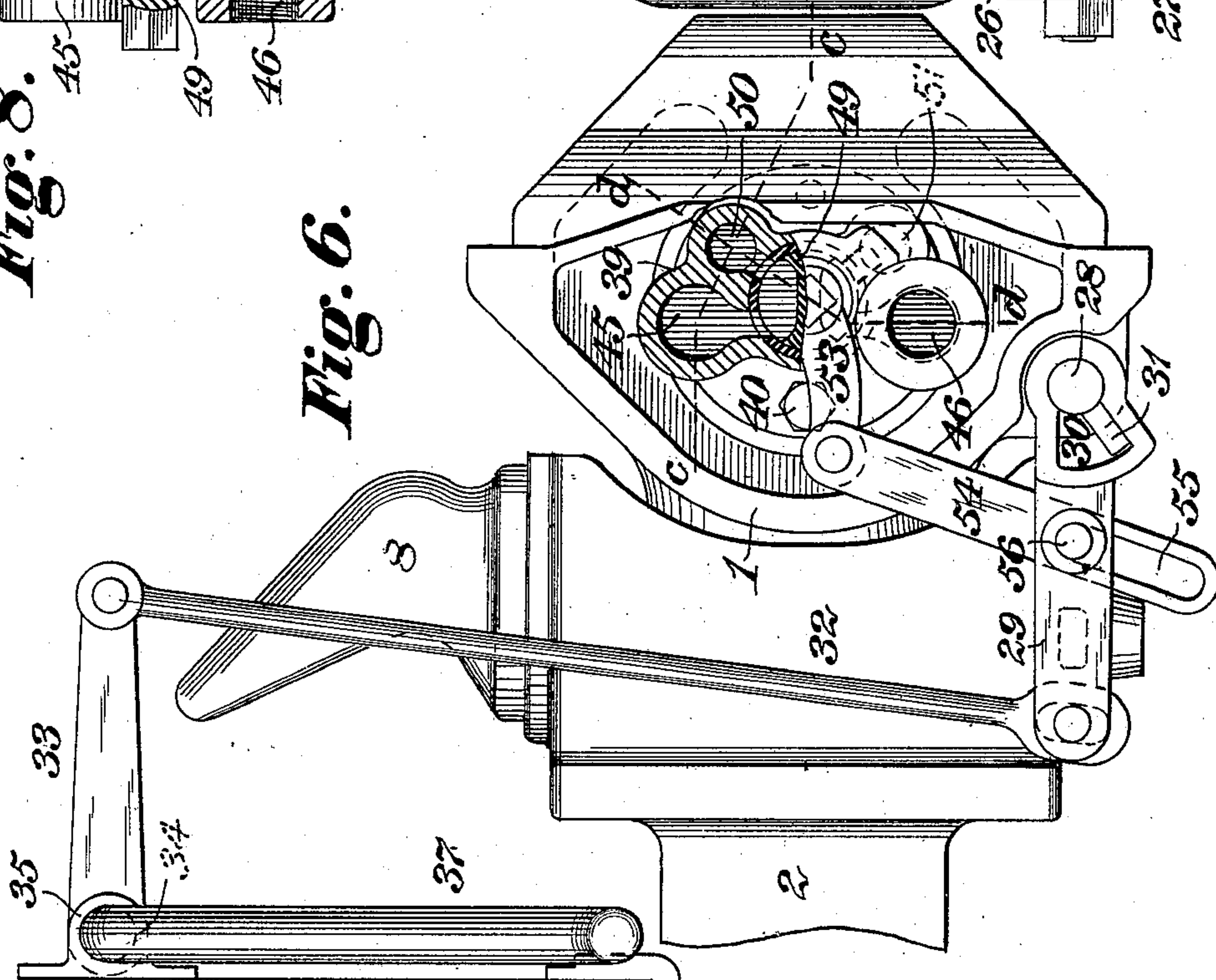


Fig. 6.



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(No Model.)

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Fig. 9.

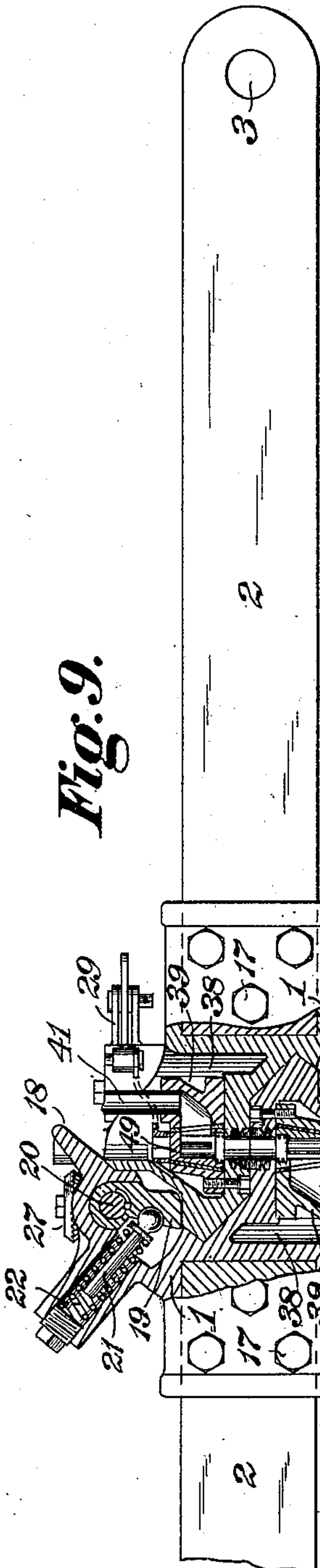


Fig. 10.

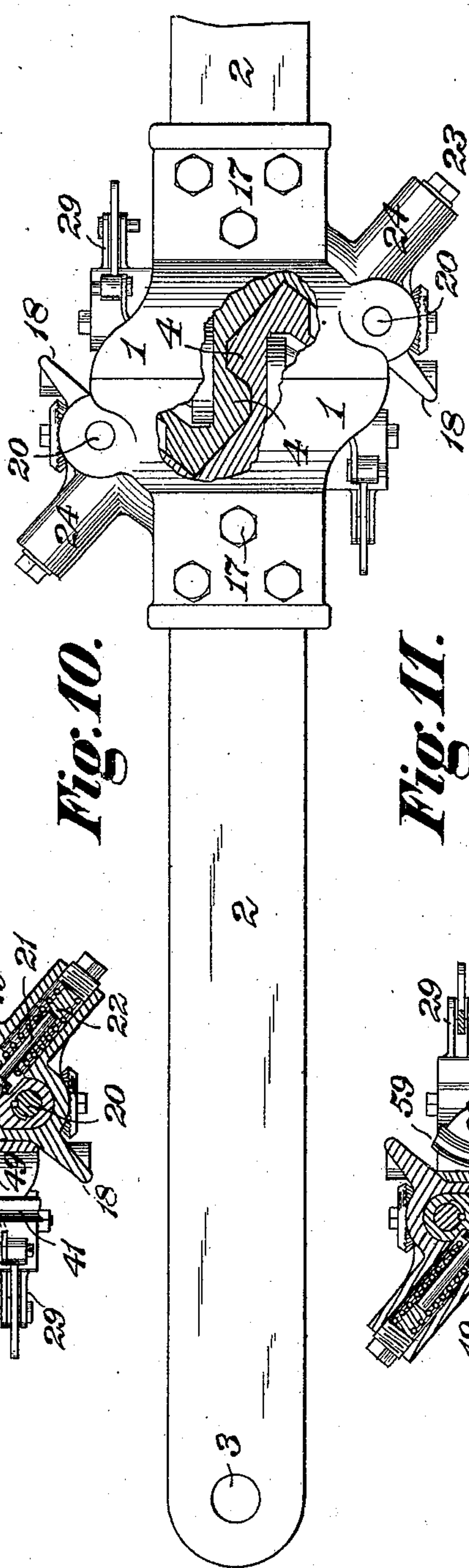
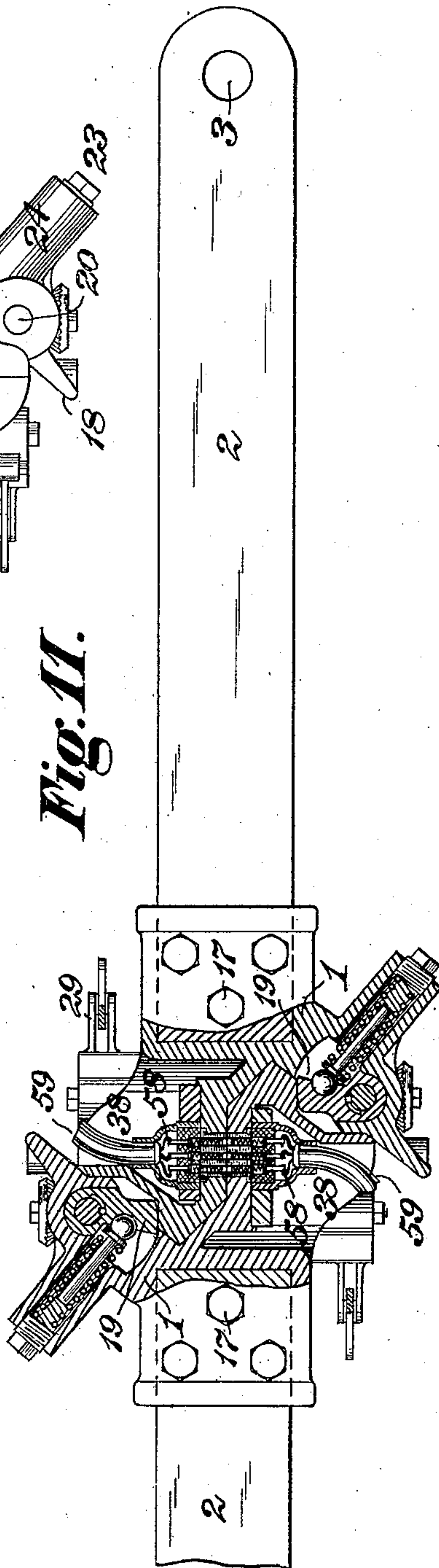


Fig. 11.



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Fig. 13.

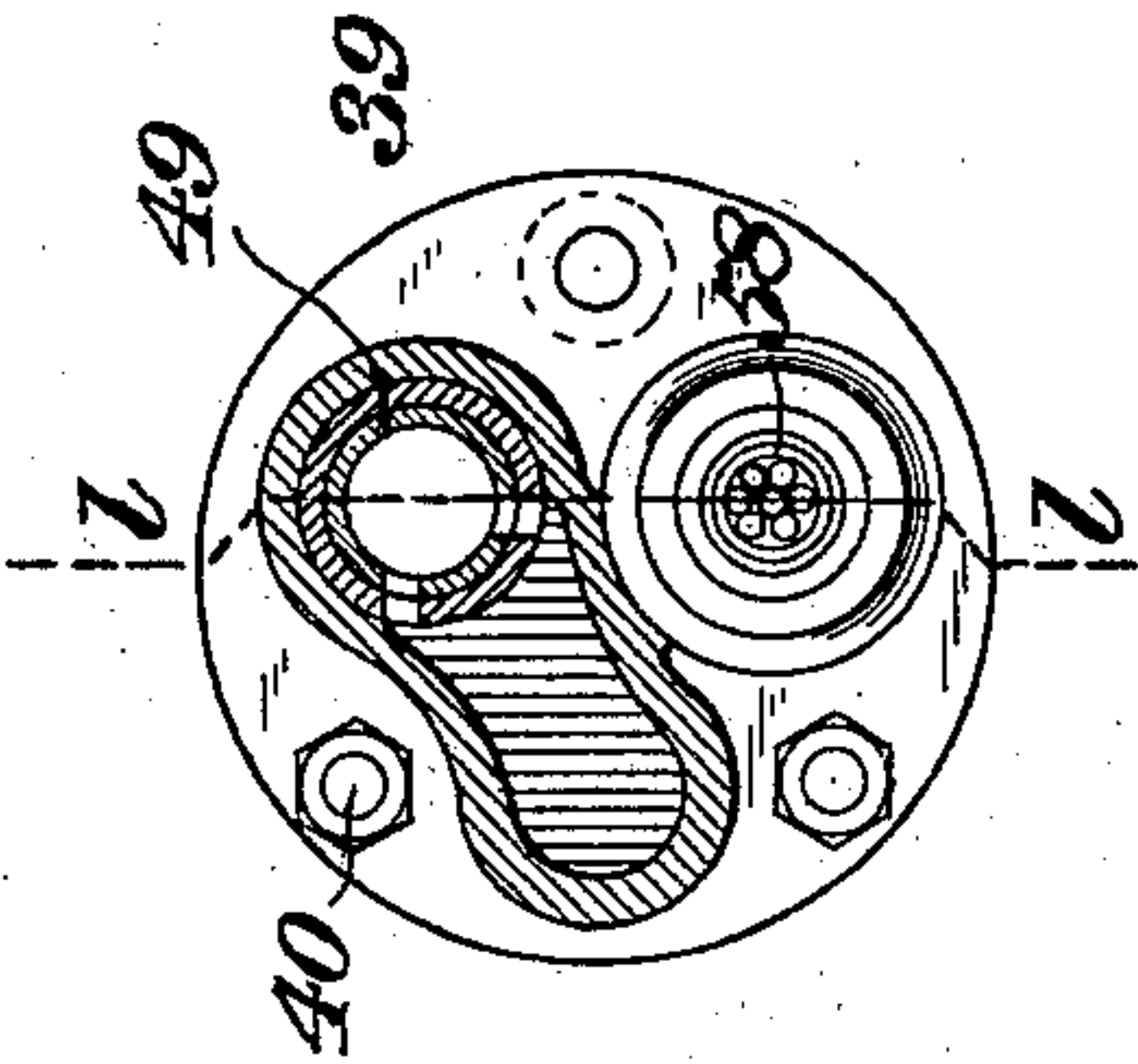


Fig. 14.

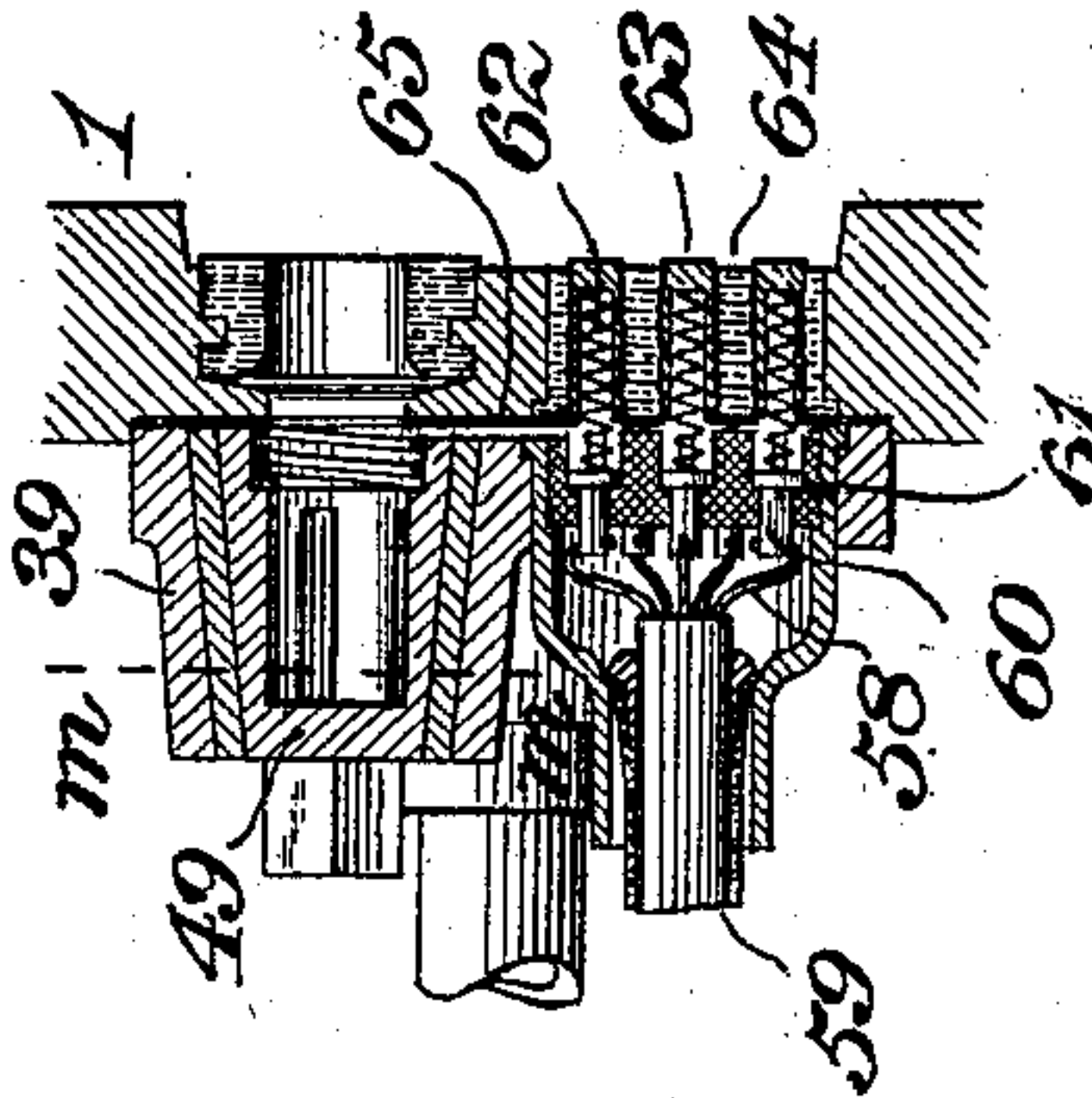
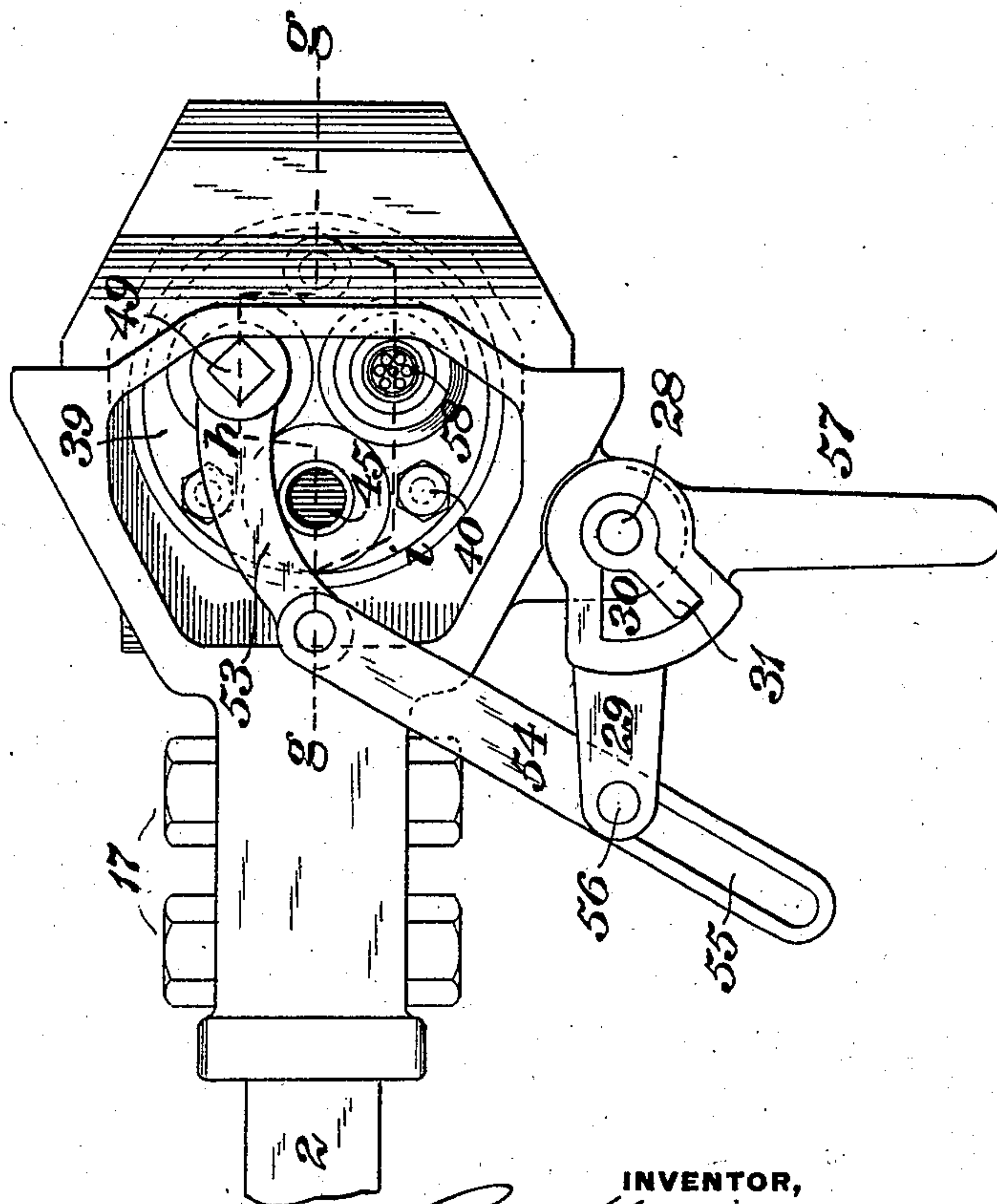


Fig. 12.



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6 Sheets—Sheet 6.

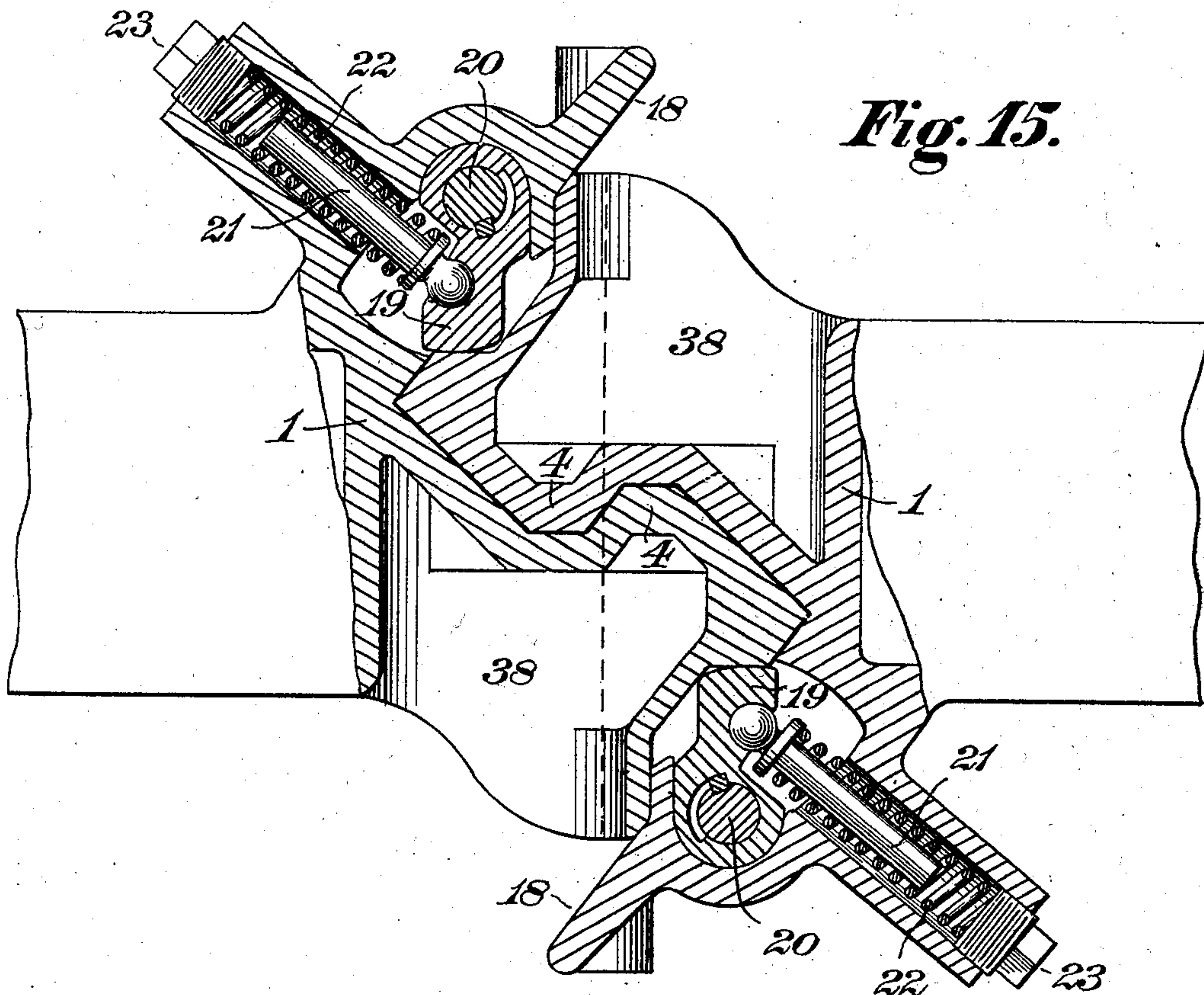


Fig. 15.

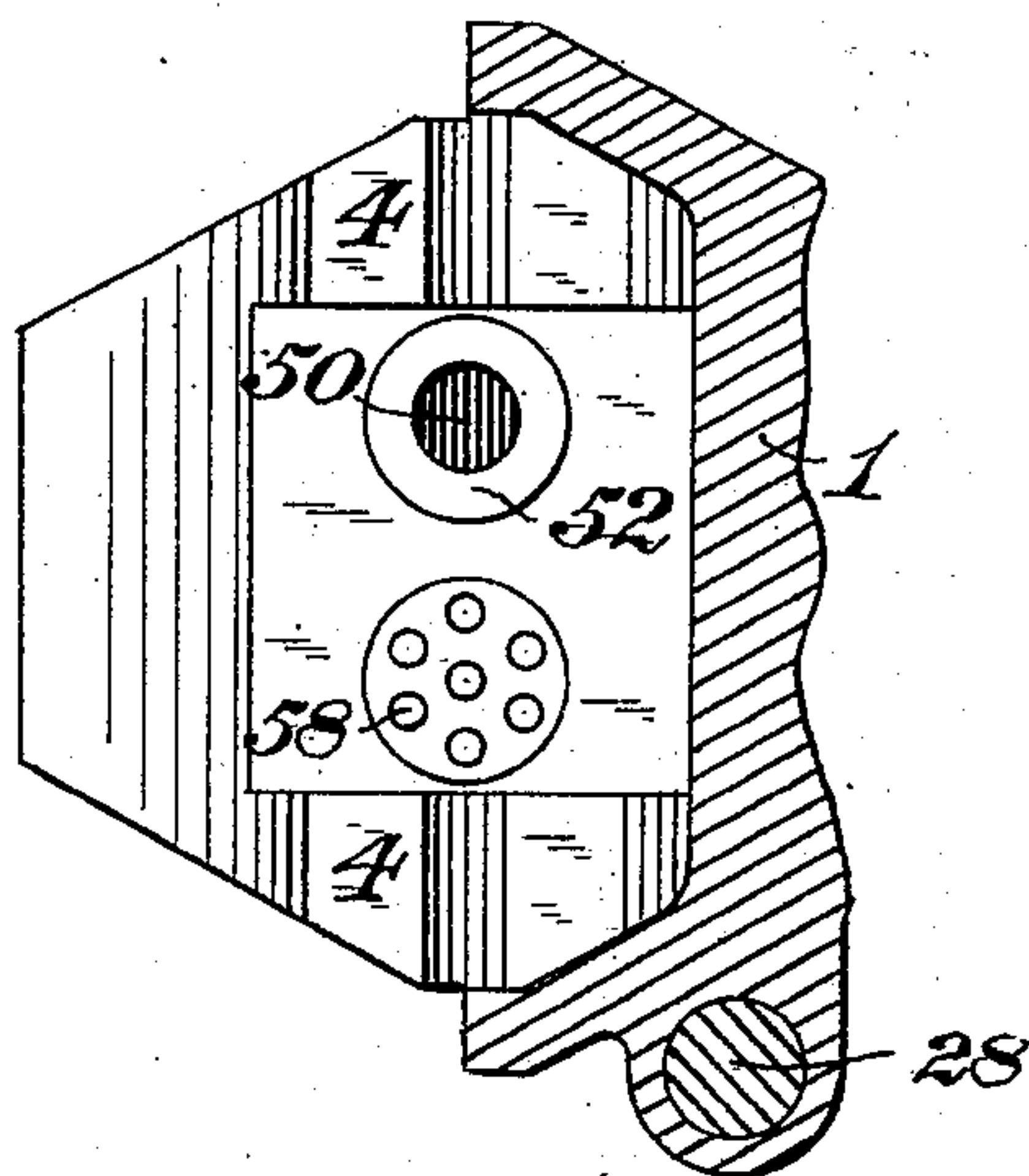


Fig. 16.

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UNITED STATES PATENT OFFICE.

GEORGE WESTINGHOUSE, OF PITTSBURG, PENNSYLVANIA.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 708,747, dated September 9, 1902.

Application filed March 25, 1901. Serial No. 52,669. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WESTINGHOUSE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Car-Couplings, of which improvement the following is a specification.

My present invention relates to couplings for the connection of railroad-vehicles; and its object is to provide an appliance for automatically coupling railroad-vehicles for the purpose of draft, with which there may be combined means for coincidently and automatically coupling lines of fluid-pressure pipes for the operation of brake and steam-heating apparatus, &c., or for coupling electric conductors for the conveyance of electricity for light, power, and braking purposes and for signaling, or both of such means.

To this end my invention, generally stated, consists in certain novel devices and combinations comprehending a coupler-head pivotally connected with a car-frame and adapted by movement about a pivot to be automatically engaged with a counterpart on another vehicle, a lock for retaining said coupler-head in engagement with its counterpart, one or more fluid-pressure conduits in the head, each having a properly-packed end adapted to make a fluid-tight joint with that of a conduit in a counterpart head when the two heads are coupled, a cock for controlling said conduit or conduits, means operable without going between and below cars for operating the cock and releasing the lock, and one or more electric conductors in the head, each having a terminal adapted to make contact with the terminal of an electric conductor in a counterpart head when the two heads are coupled.

The improvement claimed is hereinafter fully set forth.

Under an act of Congress the railroads of the United States have been required to equip their trains with automatic car-couplers of such construction that the operations of coupling and uncoupling can be performed by employees without going between and below the cars for this purpose. The same act provides that cars for freight traffic shall also be equipped with automatic power-brakes capable of being operated from the locomotive

upon all the cars of the train. The system of brakes which is in practically universal use and which is known as the "quick-action automatic air-brake" ordinarily involves the use of manually-operated couplings to make the connection of the train-pipes from car to car and also requires a stop-cock under each end of each car, which must be closed before disconnecting the air-brake coupling and opened after connecting it. The same conditions obtain with the lines of pipe used for signaling and for steam-heating.

The couplings used in standard practice are known as the "vertical-plane" type, and their engaging members or "knuckles" are held in connection by a lock which can be operated by a transverse bar actuated from the side of the car; but with a large majority of those now in use the knuckle is frequently required to be operated by hand, which to a greater or less extent involves risk to the trainmen. With respect to the automatic brakes, however, the systems now in use absolutely necessitate the presence of an employee between and beneath the cars for the purpose of manipulating the two stop-cocks and of coupling and uncoupling the sections of hose, so that the risk to employees is for this reason even greater than it was before the passage of the act above referred to.

My invention enables the legal requirements to be fully complied with under the employment of an appliance which satisfactorily meets the conditions of practical railroad service and which, further, attains the substantially beneficial and advantageous results of wholly eliminating the dangerous risks to which trainmen have been and are necessarily subjected in the use of the devices heretofore employed in coupling cars and pipe-lines thereon and of effecting a considerable saving of time in the operations of coupling and uncoupling.

In the accompanying drawings, Figure 1 is a side view in elevation of a car-coupling, illustrating an embodiment of my invention; Fig. 2, a plan or top view of the same; Fig. 3, a horizontal section through the same and a connected coupling on the line *a a* of Fig. 1; Fig. 4, a vertical section on the line *b b* of Fig. 2; Fig. 5, a plan view of the end portions of two cars coupled by my invention, with the

couplings in horizontal section on the line *c c* of Fig. 6; Fig. 5^a, a horizontal section through a cock-casing, showing a pipe connection; Fig. 6, a side view, on an enlarged scale, of a coupling, partly in section, on the line *e e* of Fig. 8; Fig. 7, an inner end view, on the same scale, of a coupler-head, partly in section, on the line *f f* of Fig. 1; Fig. 8, a vertical section through the cock-casing and a portion of the coupler-head on the line *d d* of Fig. 6; Fig. 9, a plan view, partly in section, on the line *g h g* of Fig. 12, of a modified form of coupling designed more particularly for use on elevated railroads or others having curves of comparatively short radius; Fig. 10, a similar view of the same, partly in section, on the line *k k* of Fig. 4; Fig. 11, a similar view of the same, partly in section, on the line *g i g* of Fig. 12; Fig. 12, a side view in elevation of the same; Fig. 13, a view in elevation of the cock-casing, partly in section, on the line *m m* of Fig. 14; Fig. 14, a partial vertical transverse section on the line *l l* of Fig. 13; Fig. 15, a horizontal section, on an enlarged scale, on the line *k k* of Fig. 4, certain members being omitted to promote clearness of illustration; and Fig. 16, a vertical central section, on a similar scale, on the line *b b* of Fig. 2.

In the practice of my invention I provide a coupler-head 1, which is cast in the desired form, so as to involve a minimum amount of machine-work, and is pivotally connected with the frame of the car or other railroad-vehicle on which it is applied so as to be movable to engage with or disengage from a counterpart coupler-head on another car. The pivotal connection must be such as to provide capability of movement in every direction without interfering with close contact of the engaging members in lieu of the freedom of movement of one engaging member on the other, which is allowed in ordinary couplers for this purpose. The pivotal connection is ordinarily made between the coupler-head 1 and an immediately-adjointing coupler-shank or draw-bar 2, as in the construction shown in Figs. 1 to 8, inclusive; but for application on elevated railroads or others having curves of comparatively short radius the coupler-head and draw-bar may, as shown in Figs. 9 to 12, inclusive, be rigidly connected and the draw-bar 2 be extended and provided with a draft and buffing apparatus of any suitable known type, and also provided at its inner end with a pivotal connection at or near the king-bolt of the truck—as, for example, by an eye 3 for the reception of the king-bolt, through which the connected coupler-head and draw-bar may be pivoted to the car-frame.

The engagement of the coupler-head 1 with a counterpart head on another car is effected by means of vertical coupling hooks or teeth 4, projecting in line one with the other from the upper and lower portions of the outer end of the coupler-head and having oppositely-inclined faces which abut

closely against the corresponding faces of the coupling-hooks of another coupler-head when the two coupler-heads are connected and locked together. The coupler-hooks 4, which are shown most clearly in Figs. 2, 4, 10, 15, and 16, perform the same connecting function as the pivoted knuckles of the ordinary vertical-plane couplers, and, as in the case of said couplers, are maintained in engagement by locks on the coupler-heads to be presently described. The inclined faces of the coupling-hooks provide for the close and correct engagement of the coupler-heads when brought together in coupling cars and for the separation of the coupler-heads by lateral movement thereof when the locks are released for the purpose of uncoupling the cars, and to accomplish this purpose the angles of the engaging faces and of the outer contact or guiding faces of the coupler-heads are approximately equal, as clearly shown in Figs. 10 and 15. In order to insure the engagement of the two coupler-heads when out of line to any substantial extent, as when the cars to be coupled are on a curve of comparatively short radius, vertical guides 18, having inclined faces, are formed upon the coupler-heads opposite to the hooks or teeth 4, each guide being adapted to make contact with a bearing-face 36 on the counterpart head and through such contact to move the coupler-heads laterally into engagement. When two coupler-heads are locked together, no substantial movement is permitted between their abutting surfaces, and such lateral movement as is requisite for coupling and uncoupling and for passing curves is provided for by a pivotal connection of the coupler-head with the draft-gear and car-frame. In the instance exemplified in Figs. 1 to 8, inclusive, this pivotal connection is of the ball-and-socket type and permits both vertical and lateral movement of the coupler-head. A ball or substantially spherical projection 5 is cast upon the inner end of the coupler-head 1 and fits in a corresponding recess in the outer end of the coupler-shank or draw-bar 2. A connecting-pin 6 passes through eyes in the draw-bar and through a central passage in the ball and holds the coupler-head and draw-bar securely together. The pin 6 may be inwardly tapered or reduced in diameter from its middle portion to its ends, as shown in Fig. 4, so as to thereby permit vertical movement of the ball and coupler-head upon it, or may correspondingly have a ball or swell formed on its central portion fitting a corresponding recess in the ball 5, and the lateral movement of the ball and coupler-head is limited to a determined normal degree by stops 7 on the outer end of the draw-bar, which abut against corresponding faces on the coupler-head. In order to admit of the use of a link-coupling in cases of emergency, a hook 8 may, as shown, be formed upon the upper end of the connecting-pin 6.

For the purpose of preventing unduly free

movement of the ball-and-socket joint it is subjected to a determined constant frictional resistance by means of a follower 9, which fits in a recess in the outer end of the draw-bar and abuts by a curved face on the ball 5, against which it is pressed by a helical spring 10, abutting against a bearing-plate 11, which fits against shoulders in the recess of the draw-bar. It will be seen that the frictional resistance to lateral movement which is thus provided tends to prevent oscillation of the cars and that, as a matter of fact, the device as a whole provides what is commonly known as a "close" coupling—that is, a coupling without play or lost motion—and therefore when draft apparatus of great resistance, such as the frictional draft apparatus, is employed it is the substantial equivalent of the ordinary coupling with a friction-spring buffing apparatus such as is used on passenger-cars and the object of which is to prevent the oscillation of the cars.

As shown in Figs. 1, 2, and 3, the draw-bar 2 is pivotally connected at its inner end to a draft yoke or strap 12 through the intermediation of a pivot-block 13, having segmental bearings on its ends, and connecting-bolts 14. This construction, which forms the subject-matter of Letters Patent of the United States No. 687,467, granted and issued to me under date of November 26, 1901, does not constitute part of my present invention and the draw-bar and draft-strap may be connected in any other suitable and preferred manner. The draft-strap is shown as carrying a housing or casing 15, which forms part of a friction-draft gear of the type set forth in Letters Patent of the United States No. 629,943, granted and issued to me under date of August 1, 1899. Draft and buffing strains are imparted to suitable front and rear draw-bar stops, fixed to the car-frame by the front end of the housing 15 and by a follower 16 at the rear end thereof, the coupler-head being thus connected to the car-frame through the intermediation of a yielding resistance mechanism, as in present practice with draft and buffing apparatus. The specific construction of draft and buffing apparatus employed does not, however, form part of my present invention and any other suitable and preferred form may be substituted in the discretion of those skilled in the art.

In the construction shown in Figs. 9 to 12, inclusive, which is more particularly designed for service in connection with draw-gear of the type employed on elevated railroads on which there are curves of comparatively short radius, the coupler-head 1 and draw-bar 2 are rigidly connected by bolts 17, and the draw-bar is extended sufficiently to reach the king-bolt of the adjacent truck of the car, to which it is pivotally connected through an eye 3 adjacent to its inner end, which fits around the king-bolt. It will be understood that the necessary movements of the coupler-head are effected about the axis of the king-bolt and

also that a draft and buffing apparatus is interposed between the coupler-head and the king-bolt connection in any suitable and preferred manner, as is known in the practice of this type of draw-bar. Each coupler-head is held in engagement with a counterpart coupler-head on another car when coupled thereto by an automatic locking device which serves to prevent the separation of the two coupler-heads and to force and clamp their abutting surfaces tightly together. The locking device which has been selected for illustration and which is well suited for the purpose consists of a locking-arm 19, which is fitted with the capacity of play or independent relative movement upon a vertical locking-shaft 20, which is journaled in bearings on one side of the coupler-head, a spring-bolt 21, having a spherical head, fitting in a recess in one side of the locking-arm, and a spring 22, abutting against a shoulder on the spring-bolt and against an adjustable cap 23, which is connected to the outer end of a socket 24, which incloses the spring-bolt and spring. The face of the locking-arm 19, which is adapted to abut against a bearing-face 25 on the counterpart coupler-head, is eccentric to the axis of the locking-shaft 20, and the spring 22 constantly tends to force the locking-arm to the outer limit of its traverse and to clamp its eccentric face against the bearing-face of the counterpart coupler-head when the two heads are brought into engagement. It will be noted that the effect of strain upon the draw-bar tends to hold the locking-arm in its locking position. A segmental bevel-pinion 26, fixed upon the lower end of the locking-shaft 20, engages a corresponding pinion 27 on an operating-shaft 28, journaled in the lower portion of the coupler-head, said shaft carrying an arm or pair of parallel arms 29, which arms are connected to it with the capacity of a limited degree of independent relative movement for a purpose to be hereinafter explained. (See Figs. 6, 7, and 12.) To this end segmental recesses 30 are formed in the arms 29, and the end walls of said recesses are adapted to be acted upon by a short arm or projection 31, fixed to the shaft 28 and fitting freely in the recesses 30. The arms 29 are coupled by a link 32 to an arm 33 on a transverse unlocking-shaft 34, journaled in bearings 35 on the adjacent end of the car-frame and having operating crank arms or handles 37, which are accessible from the sides of the car on its ends. My invention also provides means located in the coupler-head for automatically coupling one or more lines of fluid-pressure pipes, as the train-pipes of the automatic air-brake apparatus, the train-signal-line pipes, and the steam-heating pipes, and for closing communication through said pipes preparatory to uncoupling cars and opening communication through them when cars are coupled. To this end a lateral recess or open space 38 is formed in each coupler-head, said recesses extending from the body of metal on which the coup-

ling-hooks 4 are formed to the outer side of the coupler-head, and a shell or casing 39 is inserted in said recess and secured to the coupler-head by bolts 40, the casing being thus inclosed within and protected from injury by the walls of the recess 38. Pipe-sections (one or more)—as, for example, a section 41 for connection with the train-pipe 42 of an automatic air-brake apparatus and a section 43 for connection with a train-signal-line pipe 44—are secured to nozzles or passages 45 and 46, respectively leading into the case 39. The pipe-sections 41 and 43 are connected with the train-pipe and the signal-line pipe, respectively, by sections of flexible hose 47 and 48 and ordinary union-couplings, so as to admit of the movements of the coupler-heads without involving breakage or leakage of joints. A stop-cock 49, which is shown as of the plug type, is fitted truly in a suitable bore or bushing in the casing 39 and controls communication between the train-pipe passage 45 and a passage 50 and between the train-signal-pipe passage 46 and a passage 51. The passages 50 and 51 open at their outer ends on a portion of the face of the coupler-head which abuts against a corresponding face on a counterpart coupler-head, and their joints with the corresponding passages on the counterpart coupler-head are made tight by soft-rubber gaskets 52. The stop-cock 49 is provided with connections through which it may be operated elsewhere than from a danger-point—that is, otherwise than by a trainman going between and below the cars. In the instance shown the stop-cock is so connected with the transverse unlocking-shaft 34 as to be opened and closed as required in its known relation to the operations of coupling and uncoupling cars by the movements of said shaft which are made by the trainman for effecting said operations. To this end an arm 53 is secured upon the stop-cock 49 and is coupled to one end of a link 54, having a longitudinal slot 55 adjoining its opposite end. A pin 56, fixed upon the arms 29 of the lock-operating shaft 28, before described, is fitted to slide freely in the slot 55. In order to release the locking-arms 19 from their bearing on the faces 25, which is necessary when cars are to be uncoupled, the handles 37 of the transverse shaft 34 are raised and carry with them the connected arms 29 of the shaft 28, thereby partially rotating said shaft and the locking-shaft 20 and withdrawing the locking-arms from contact with the coupler-head faces on which they abut when the cars are coupled. In this movement the pins 56 raise the links 54 and arms 53 and close the cocks 49 and the several members are in proper position to permit the cars to be separated. When the handles 37 are lowered, the slots 30 and 35 allow the shafts 28 and 30 to be rotated sufficiently far to permit the locking-arms 19 to be returned to normal position in readiness for coupling without opening the stop-cocks 49, and after the cars are coupled said cocks are opened by

a further downward movement of the handles 37, in which the pins 56 act on the lower ends of the slots 55 and, through the links 54 and arms 53, turn the cocks into open position. The lost motion provided between the arms 29 and shaft 28 can be equally well provided for by allowing a corresponding amount of lost motion between the lock 19 and the key on the shaft 20, by which the lock is moved. It will be noted that the construction is such that the locks of the coupler-heads of both cars are required to be disengaged before the cars can be separated, thus providing a double lock against the separation of the coupling and insuring that the stop-cocks of both cars shall be closed before such separation takes place, and consequently preventing the escape of any fluid from the pipes. The locks may be set in the unlocking position when cars are to be shunted, and when the locks are in the normal position injury to any of the parts when cars are run together with great force is guarded against by the play or lost motion allowed to the locking-arms 19 on their shafts 20, which permits them to move sufficiently far for the coupling-hooks to engage without moving the operating mechanism, which is thus relieved from liability to breakage. The lock and stop-cock may be operated otherwise than through the transverse shaft 34, if preferred, and in Fig. 12 the shaft 28 is shown as provided with an arm 57, from which a connection may be made to a handle or lever located at any desired point for operation.

Figs. 11 to 14, inclusive, illustrate means which are provided for effecting the automatic coupling and uncoupling of conductors through which electric currents are transmitted from car to car for the transmission of electricity for light, power, brake, and signaling purposes. Electric conductors 58 (one or more, seven being shown in the drawings) are led through a suitable flexible casing 59 to a connection with stems 60, which are embedded in a block of hard rubber or other suitable insulating material 61, secured in the casing 39. The stems 60 are connected by springs 62 with terminals 63, which are fixed in a block of insulating material, as soft rubber 64, secured in the coupler-head 1. The terminals 63 project slightly beyond a portion of the face of the coupler-head which abuts against a corresponding face on a counterpart coupler-head, and when the two coupler-heads are brought into engagement in coupling cars they are maintained in close contact with the corresponding terminals of the counterpart coupler-head by the outward pressure of the springs 62 and by fluid-pressure from the brake-pipe, which is led between the blocks 61 and 64 through a passage 65, extending from the cock 49 to the back of the block 64.

While the coupler-head has been herein set forth as pivotally connected with the car-frame, such means of providing for its neces-

sary movement relatively thereto being that which is ordinarily most desirably adapted to meet the requirements of practical service, it will be apparent that other means of flexibly connecting the coupler-head and car-frame—as, for example, by connections having a sufficient degree of elasticity to permit the required lateral movement—may, if desired, be substituted for the specific form of flexible connection described and shown without departure from the spirit of my invention, and I do not, therefore, limit myself to the employment of a pivot pin or bolt as a connecting member.

It will be seen that my invention provides a car-coupling having even better facilities of automatic connection and separation than those of the present standard vertical-plane type and which further contains in its own structure means for fulfilling all practical requirements in the automatic connection and separation of fluid-pressure pipes and electric conductors and the opening and closure in proper relation to the operations of coupling and uncoupling cars of the cocks which control the fluid-pressure pipes. All the above operations are performed without necessitating the presence of employees between cars, and the consequent danger of serious and fatal injury to employees experienced with prior constructions is not only fully eliminated, but an important advantage in the saving of time in coupling and uncoupling cars, pipes, and electric conductors is also attained.

I claim as my invention and desire to secure by Letters Patent—

1. In an automatic car-coupling, the combination of a coupler-head, flexibly connected with a car-frame, and adapted, by movement about a pivot, to be automatically engaged with a counterpart on another vehicle, and means for permitting vertical movement of the coupler-head, a lock, automatically operable in and by the engagement of the coupler-head with a counterpart, for retaining said coupler-head in substantially rigid engagement with its counterpart.

2. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and having a fixed vertical coupling member adapted to be engaged with and disengaged from a corresponding member on a counterpart head, by lateral movement, means for permitting vertical movement of the coupler-head, and a lock, automatically operable in and by the engagement of the coupler-head with a counterpart, for retaining said coupling member in engagement with that of a counterpart coupler-head.

3. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, a vertical coupling member fixed thereon, and having an engaging face inclined to the line of draft and adapted to be brought into contact with the corresponding engaging face of a vertical coupling member

fixed on a counterpart head, by lateral movement, means for permitting vertical movement of the coupler-head, and a lock for retaining said coupling member in engagement with that of the counterpart head.

4. In an automatic car-coupler, the combination of a coupler-head flexibly connected with a car-frame, a vertical coupling member fixed thereon, and having faces which are oppositely inclined to the line of draft and adapted to be brought into contact with corresponding oppositely-inclined faces of a vertical coupling member fixed on a counterpart head, by lateral movement, means for permitting vertical movement of the coupler-head, and a lock for retaining said coupling member in engagement with that of the counterpart head.

5. In an automatic car-coupler, the combination of a coupler-head flexibly connected with a car-frame, a vertical coupling member fixed thereon and adapted to be engaged with and disengaged from a corresponding member on a counterpart head, means for permitting both vertical and lateral movement of the coupler-head, a guide opposite said coupling member, for moving a counterpart head into engagement, and a lock, automatically operable in and by the engagement of the coupling member with that of a counterpart head, for retaining said coupling member in engagement with that of said counterpart coupler-head.

6. In an automatic car-coupling, the combination of a coupler-head having a fixed vertical coupling member adapted to be engaged with and disengaged from a corresponding member on a counterpart head, by lateral movement, means for permitting vertical movement of the coupler-head, and a lock fitted on the coupler-head in position to abut against a bearing-surface on a counterpart head and automatically operable in and by the engagement of the coupling member with that of a counterpart head, to hold the coupling members in close contact when the two heads are coupled.

7. In an automatic car-coupling, the combination of a coupler-head having a fixed vertical coupling member adapted to be engaged with and disengaged from a corresponding member on a counterpart head, by lateral movement, and a lock pivoted on the coupler-head and having a face, eccentric to its pivot, which is adapted to abut against a bearing-surface on a counterpart head when the two heads are coupled.

8. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, means for permitting vertical movement of the coupler-head, a lock for retaining said coupler-head in engagement with its counterpart, and a fluid-conduit in the head having a properly-packed end adapted to make a fluid-tight

joint with that of a fluid-conduit on a counterpart head when the two heads are coupled.

9. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, means for permitting vertical movement of the coupler-head, a lock for retaining said coupler-head in engagement with its counterpart, and an electric conductor in the head, having a terminal adapted to make contact with the terminal of an electric conductor in a counterpart head when the two heads are coupled.

10. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, means for permitting vertical movement of the coupler-head, a lock for retaining said coupler-head in engagement with its counterpart, a fluid-conduit in the head having a properly-packed end adapted to make a fluid-tight joint with that of a fluid-conduit on a counterpart head when the two heads are coupled, and a cock fitted in the coupler-head and controlling the fluid-conduit.

11. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, a lock for retaining said coupler-head in engagement with its counterpart, a fluid-conduit in the head having a properly-packed end adapted to make a fluid-tight joint with that of a fluid-conduit on a counterpart head when the two heads are coupled, a cock fitted in the coupler-head and controlling the fluid-conduit, and means for releasing the lock and operating the cock which are operable at a distance from the coupler-head sufficient to obviate necessity of going between and below cars.

12. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, a lock for retaining said coupler-head in engagement with its counterpart, a fluid-conduit in the head having a properly-packed end adapted to make a fluid-tight joint with that of a fluid-conduit on a counterpart head when the two heads are coupled, a cock fitted in the coupler-head and controlling the fluid-conduit, and means, operable from the side of a car, for releasing the lock and operating the cock.

13. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, means for permitting vertical movement of the coupler-head, a lock for retaining said coupler-head in engagement with its counterpart, a plurality

of fluid-conduits in the head, each having a properly-packed end adapted to make a fluid-tight joint with that of a fluid-conduit on a counterpart head when the two heads are coupled, and a cock fitted in the coupler-head and controlling the several fluid-conduits.

14. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, a lock for retaining said coupler-head in engagement with its counterpart, a fluid-conduit in the head having a properly-packed end adapted to make a fluid-tight joint with that of a fluid-conduit on a counterpart head when the two heads are coupled, a cock fitted in the coupler-head and controlling the fluid-conduit, an unlocking-shaft journaled transversely on a car-frame and operable from the side of the car, and intermediate connections for releasing the lock and operating the cock by movement of the unlocking-shaft.

15. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, a lock for retaining said coupler-head in engagement with its counterpart, a fluid-conduit in the head having a properly-packed end adapted to make a fluid-tight joint with that of a fluid-conduit on a counterpart head when the two heads are coupled, a cock fitted in the coupler-head and controlling the fluid-conduit, an electric conductor in the head, having a terminal adapted to make contact with the terminal of an electric conductor in a counterpart head when the two heads are coupled, and means for releasing the lock and operating the cock which are operable at a distance from the coupler-head sufficient to obviate necessity of going between and below cars.

16. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and having a vertical coupling member, adapted to be engaged with and disengaged from a corresponding member on a counterpart head, by lateral movement, a lock fitted in the coupler-head and adapted to maintain its coupling member in engagement with that of a counterpart head, a fluid-conduit section having a packed end on a face of the head which is adapted to abut against, and make a fluid-tight joint with, the end of a fluid-conduit on a counterpart head, a shell or casing fixed to the coupler-head, within a recess by the walls of which it is protected, a second fluid-conduit section, opening into said casing and flexibly connected to a pipe-line on the car, a cock fitting in the casing and controlling communication between the fluid-conduit sections, and means for releasing the lock and operating the cock.

17. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and having a fixed vertical

coupling member, adapted to be engaged with and disengaged from a corresponding member on a counterpart head, by lateral movement, means for permitting vertical movement of the coupler-head, a lock fitted in the coupler-head and adapted to maintain its coupling member in engagement with that of a counterpart head, an electric conductor in the head, having a terminal adapted to make contact with the terminal of an electric conductor in a counterpart head when the two heads are coupled, and flexibly connected to an electric conductor on the car, and means for releasing the lock for uncoupling the heads and electric conductors.

18. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, a lock for retaining said coupler-head in engagement with its counterpart, a fluid-conduit in the head having a properly-packed end adapted to make a fluid-tight joint with that of a fluid-conduit on a counterpart head when the two heads are coupled, a cock fitted in the coupler-head and controlling the fluid-conduit, an operating-shaft journaled in the head, connections through which movement is imparted from said shaft to the lock, and vice versa, and connections from the operating-shaft to the cock, provided with means for permitting a determined degree of traverse of the operating-shaft and lock without imparting movement to the cock.

19. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, a locking-arm, fitted with the capacity of a limited degree of independent movement on a shaft journaled in the coupler-head, and adapted to retain said head in engagement with its counterpart, a fluid-conduit in the head having a properly-packed end adapted to make a fluid-tight joint with that of a fluid-conduit on a counterpart head, a cock fitted in the coupler-head and controlling the fluid-conduit, an operating-shaft journaled in the head,

connections through which movement is imparted from said shaft to the locking-arm, and vice versa, and connections from the operating-shaft to the cock, provided with means for permitting a determined degree of traverse of the operating-shaft and locking-arm without imparting movement to the cock.

20. In an automatic car-coupling, the combination of a coupler-head flexibly connected with a car-frame, and adapted, by lateral movement, to be automatically engaged with a counterpart on another vehicle, a lock for retaining said coupler-head in engagement with its counterpart, a fluid-conduit in the head having a properly-packed end adapted to make a fluid-tight joint with that of a fluid-conduit on a counterpart head when the two heads are coupled, a cock fitted in the coupler-head and controlling the fluid-conduit, an operating-shaft journaled in the head, connections through which movement is imparted from said shaft to the lock and vice versa, a connecting-arm fitting freely on said shaft and having a segmental recess adjoining its hub, an arm fixed to said shaft and adapted to abut against the ends of said recess, an arm fixed to the cock, a link coupled to said arm and having a longitudinal slot adjoining its opposite end, and a pin fixed to the connecting-arm and traversing in the slot of the link.

21. In an automatic car-coupling, the combination of a coupler-head having a fixed vertical coupling member adapted to be engaged with and disengaged from a corresponding member on a counterpart head, by lateral movement, a ball or spherical projection on the inner end of the coupler-head, having a vertical central passage, a draw-bar or coupler-shank having a recess in its outer end which receives the ball of the coupler-head, and a connecting-pin extending through the walls of the socket and the passage of the ball and being reduced in diameter from its middle portion, which substantially fits said passage, to each of its ends.

GEO. WESTINGHOUSE.

Witnesses:

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