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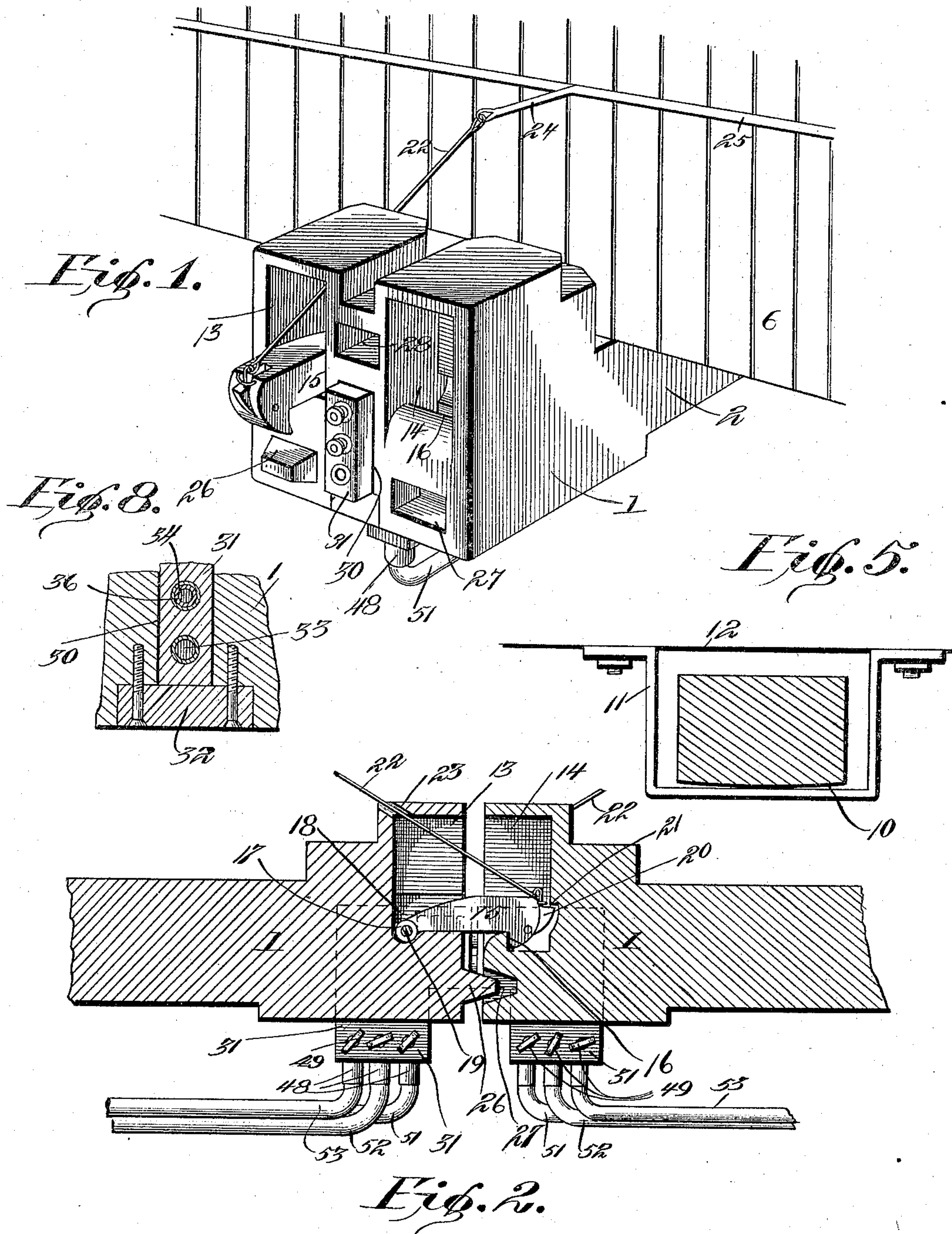
Patented Dec. 5, 1899.

J. P. SHAFER.
CAR AND PIPE COUPLING.

(Application filed June 8, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
Clarence H. Walker By his Attorneys,
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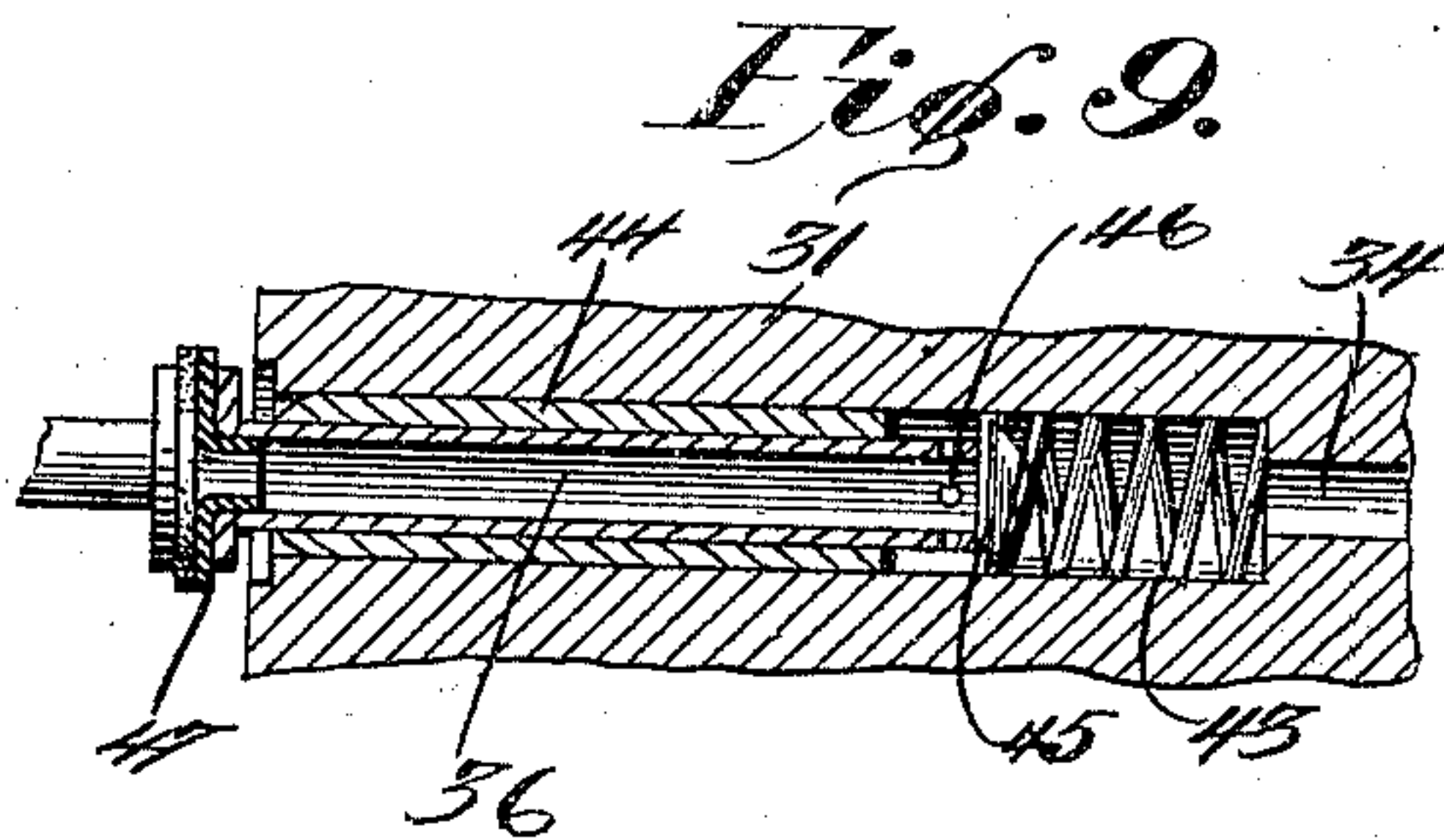
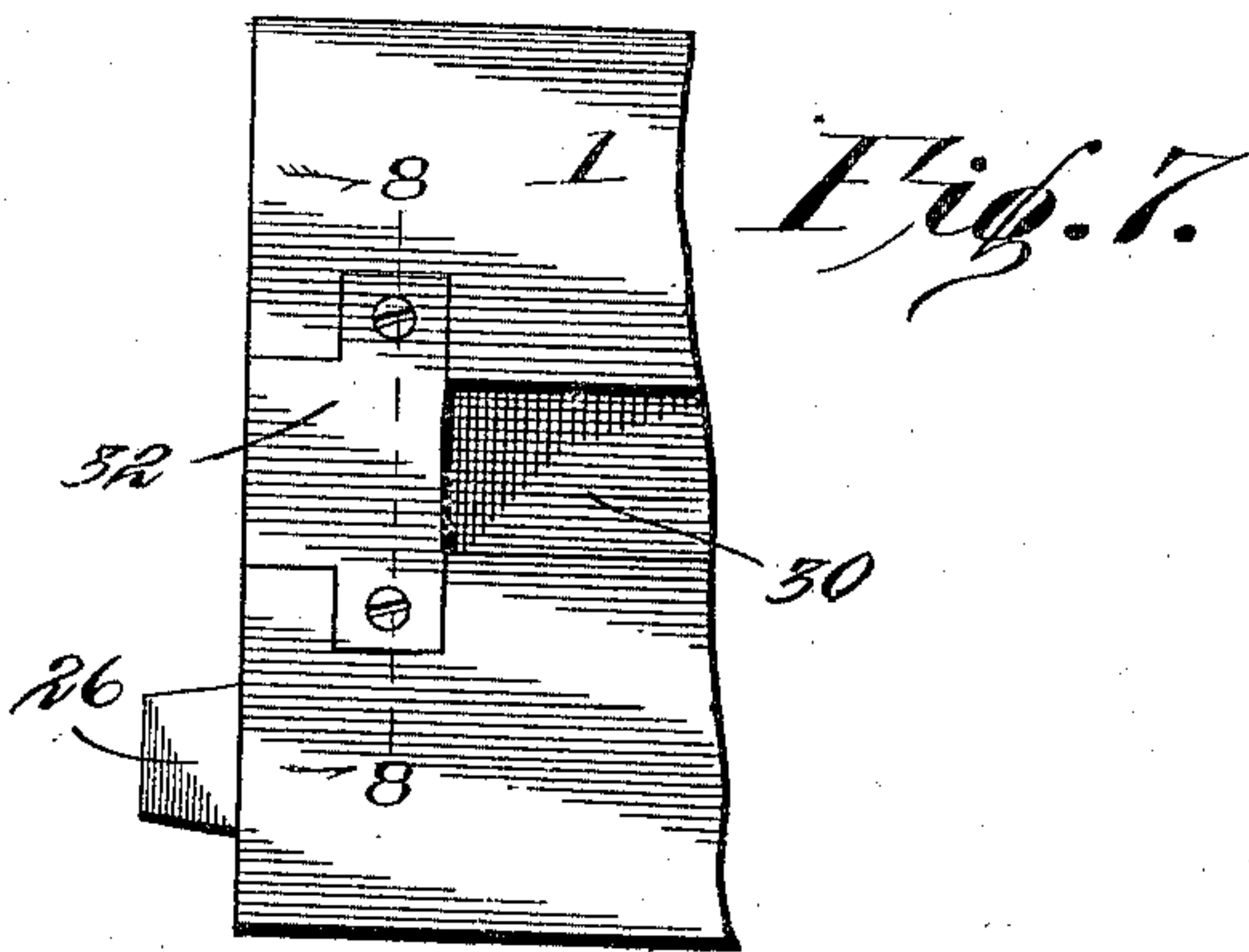
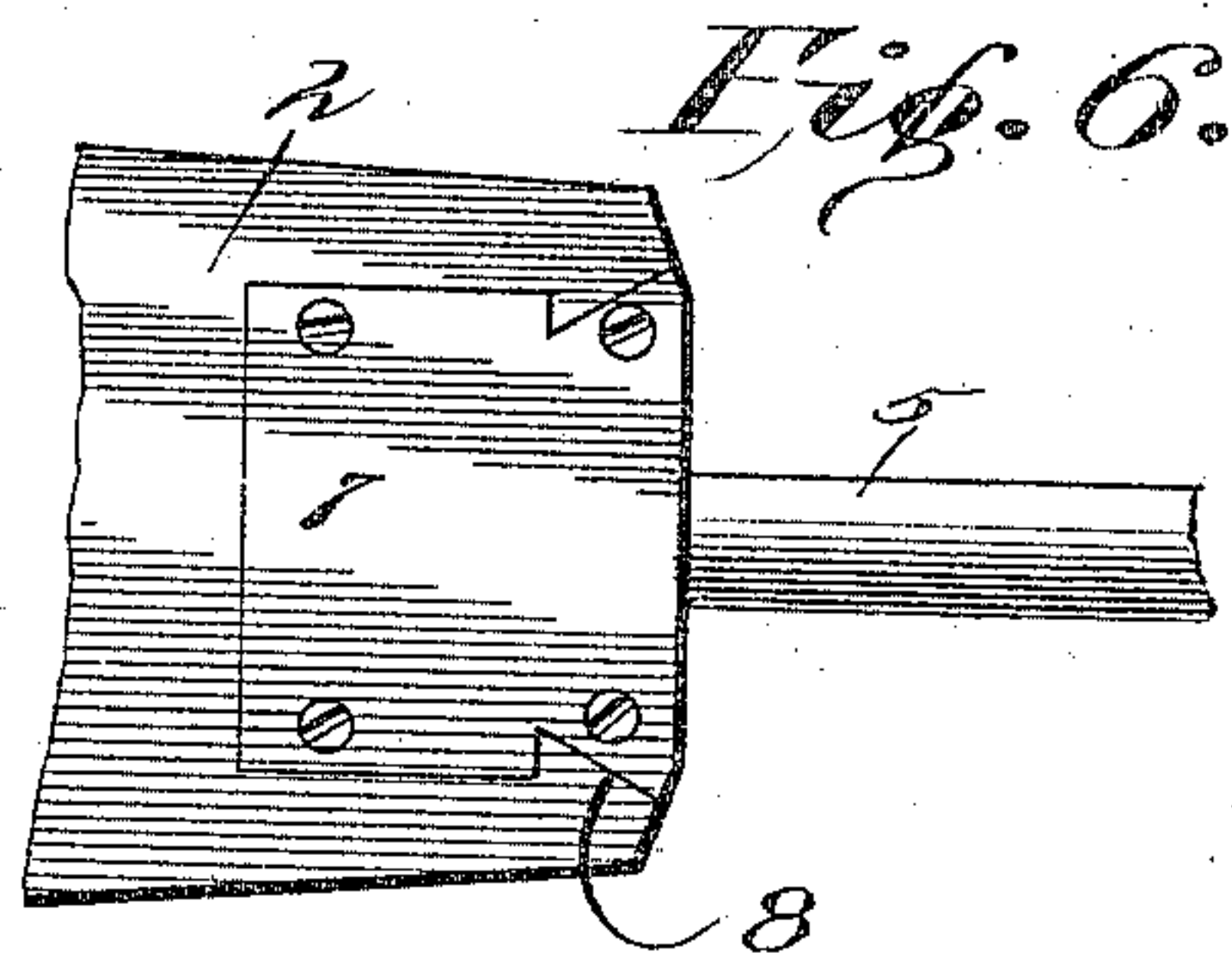
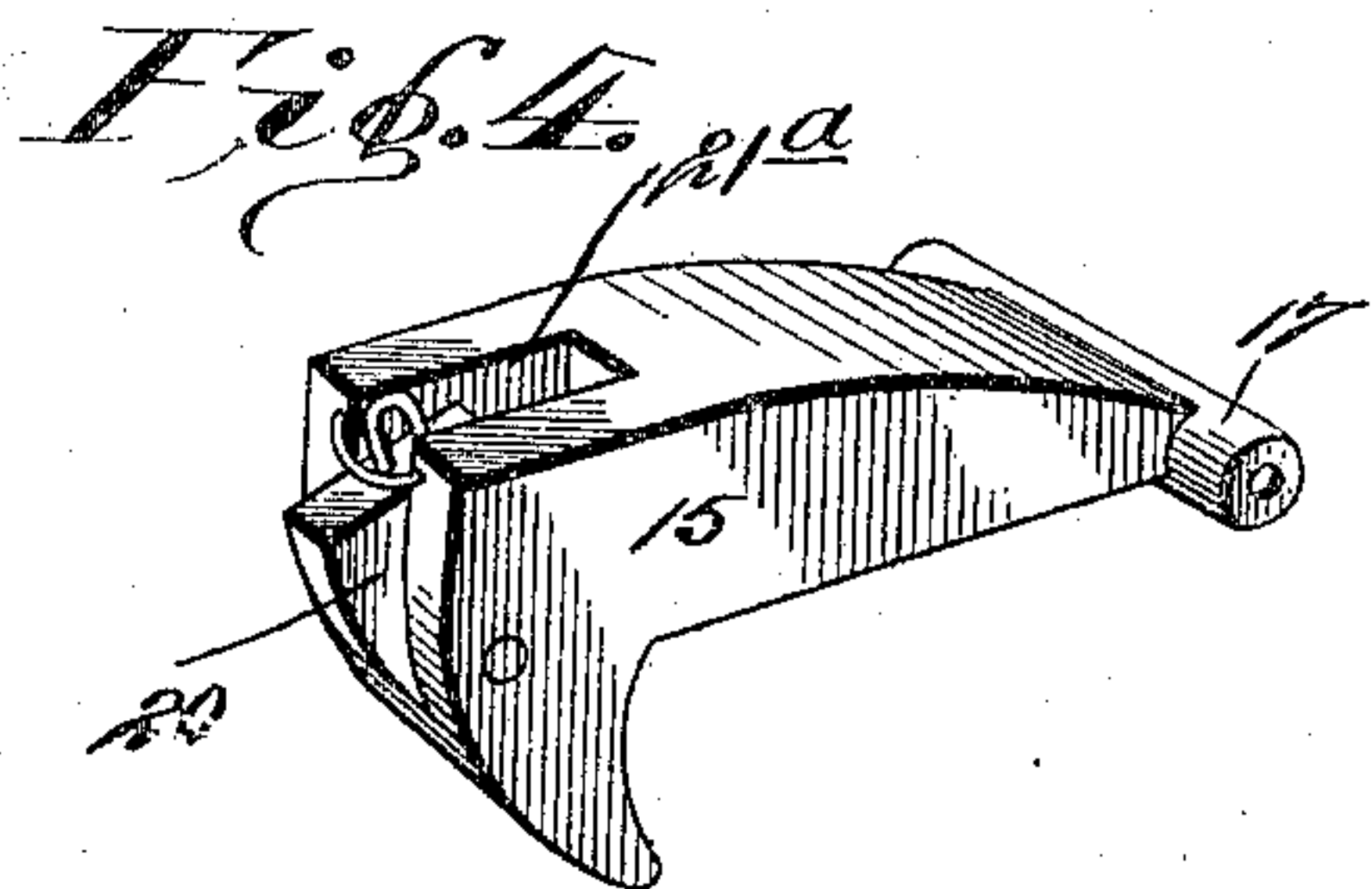
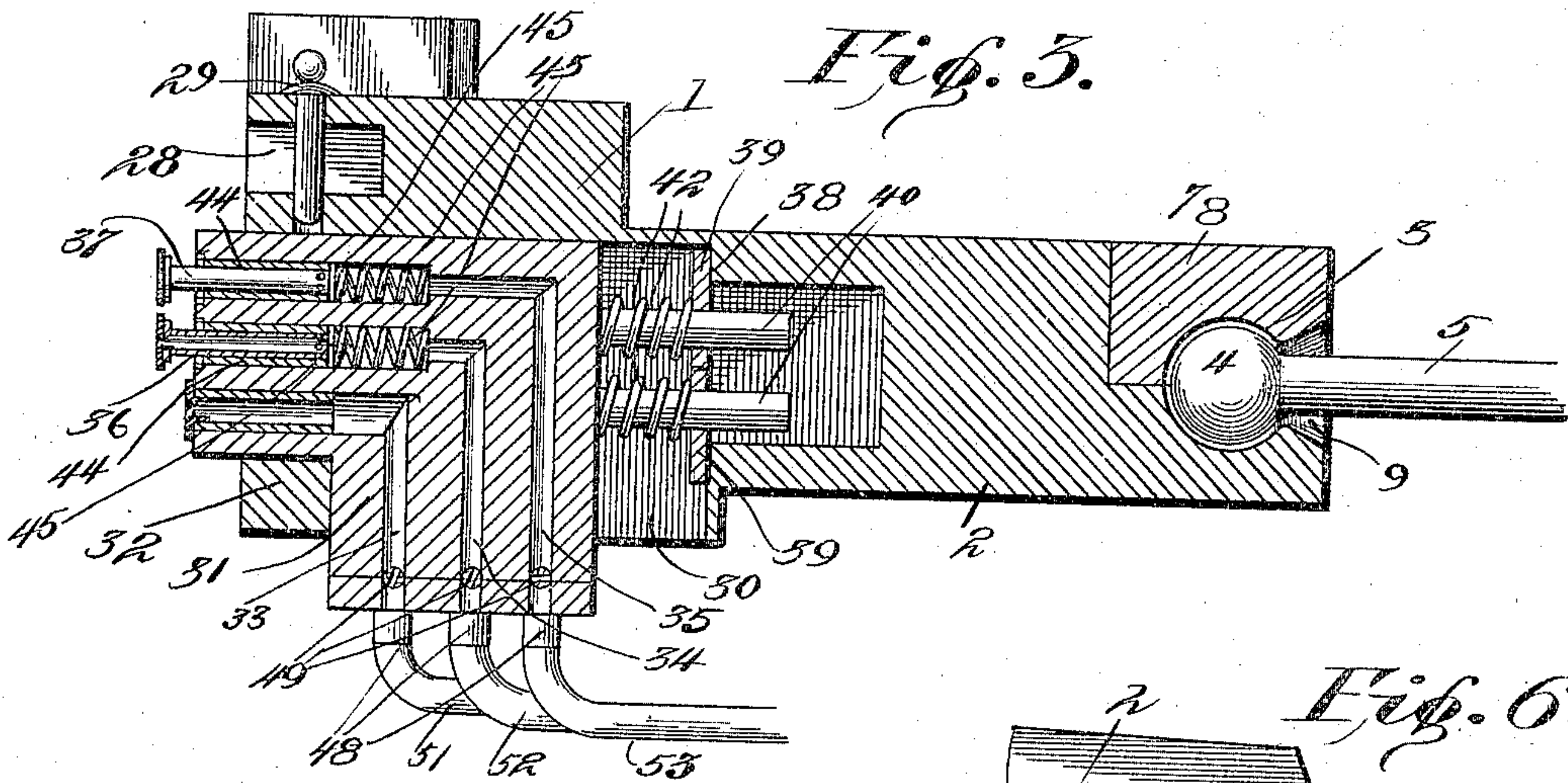
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UNITED STATES PATENT OFFICE.

JACOB P. SHAFER, OF TERRA ALTA, WEST VIRGINIA.

CAR AND PIPE COUPLING.

SPECIFICATION forming part of Letters Patent No. 638,403, dated December 5, 1899.

Application filed June 8, 1899. Serial No. 719,828. (No model.)

To all whom it may concern:

Be it known that I, JACOB P. SHAFER, a citizen of the United States, residing at Terra Alta, in the county of Preston and State of West Virginia, have invented a new and useful Car and Pipe Coupling, of which the following is a specification.

The invention relates to improvements in car and pipe couplings.

The object of the present invention is to improve the construction of car and pipe couplings and to provide a simple and comparatively inexpensive one which will possess great strength and durability and which will enable cars and the pipes thereof to be coupled simultaneously and automatically.

A further object of the invention is to enable the draw-heads to be rigidly interlocked or fastened together to prevent any vibration or movement of the draw-heads on each other from affecting the coupling of pipes and to enable the draw-heads to have the necessary movements or play independent of the cars.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a perspective view of a combined car and pipe coupling constructed in accordance with this invention. Fig. 2 is a longitudinal sectional view illustrating the manner of coupling the draw-heads. Fig. 3 is a central longitudinal sectional view illustrating the construction of the pipe-coupling devices. Fig. 4 is a detail perspective view of the pivoted hook. Fig. 5 is a transverse sectional view illustrating the manner of supporting the draw-head. Figs. 6 and 7 are detail views of portions of the draw-head. Fig. 8 is a detail transverse sectional view on line 8 8 of Fig. 7. Fig. 9 is an enlarged detail sectional view illustrating the construction of the automatic valves of the pipe-coupling.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a draw-head having a short shank 2, provided at its rear end with a socket 3 for the reception of a ball 4 of a draft-rod 5, whereby the draw-head is connected to the

draft mechanism of a car by a joint which will permit a vertical, horizontal, or lateral and a twisting or rotary movement of the draw-head. The draft-rod may be of any desired construction and may be connected to a car 6 in any suitable manner, and the practically universal connection between the short shank of the draw-head and the draft mechanism is designed for the purpose of enabling two draw-heads to be rigidly coupled together to afford a positive coupling for the pipes of a train and at the same time to have the necessary play or movement independent of the car to yield to the vibration and movements of the same. This connection will permit the cars to rock and vibrate without twisting the draw-heads or moving the same on each other to any appreciable extent. The ball is detachably secured within the socket of the shank of the draw-head by a removable block 7, detachably secured within a recess of the shank 2 by screws, bolts, or other suitable fastening devices and provided with a dove-tailed rear portion 8, as clearly illustrated in Fig. 6 of the accompanying drawings. The rear end of the shank 2 is provided with a flaring opening 9, forming a throat or entrance to the socket and receiving the stem or neck portion adjacent to the ball and permitting the same to have a limited movement. By varying the size of the flaring opening 9 the amount of the movement of the draw-head may be varied, as will readily appear.

The lower face 10 of the shank of the draw-head is rounded, as illustrated in Fig. 5 of the accompanying drawings, and is supported by a stirrup-iron or hanger 11, designed to be secured to a block 12 or other suitable support and to be arranged beneath the car 6. The rounded lower face of the shank facilitates the rocking or twisting movement of the draw-head, and a car may sway or rock without communicating such movement to the draw-heads. The stirrup or hanger is of sufficient size to permit the necessary vertical and lateral play, and the ball-and-socket joint will enable the draw-head to be raised and lowered to couple cars having draw-heads at different elevations.

The draw-head is provided at opposite sides of its center with cavities 13 and 14, arranged, as clearly illustrated in Fig. 1 of the accom-

panying drawings, and located at the upper portion of the draw-head. The cavity 13 receives the shank of a coupling-hook 15, and the other cavity 14 is provided at its bottom with a fixed catch or shoulder 16, arranged to be engaged by the pivoted coupling-hook of a corresponding draw-head, as clearly illustrated in Fig. 2 of the accompanying drawings. The pivoted coupling-hook 15, which is adapted to swing upward and downward, is provided at its inner end with an integral transverse pivot 17, projecting laterally from opposite sides of the hook and forming trunnions, which are arranged in bearing grooves or recesses 18, formed in the walls of the cavity 13. The bearing grooves or recesses 18 are substantially L-shaped, being provided with horizontal branches or entrance portions and vertical bearing portions, and the trunnions are securely retained therein by a fastening device 19, which passes through a perforation of the pivot 17 and which is secured within a transverse perforation of the draw-head. The coupling hook or shank may be readily detached from the draw-head by withdrawing the fastening device 19 and lifting the trunnions out of the bearing-recesses.

When the coupling is in engagement with the fixed catch or shoulder 16, it is locked in such position by a pivoted catch 20, mounted on the coupling-hook and arranged to engage a horizontal shoulder 21, located at the back of the cavity 14. The draw-head is beveled at the bottom of the cavity 14 in advance of the shoulder 16, and the outer face of the engaging portion of the coupling-hook is rounded or beveled and is adapted when two draw-heads come together to ride up the beveled portion of the fixed catch 16 and engage the latter automatically. The outer portion of the coupling-hook is provided with a slot or bifurcation 21^a, in which is mounted the pivoted gravity-catch 20, having a beveled or rounded outer edge and a straight horizontal upper edge, adapted to engage the shoulder 21 of the rear wall of the cavity 14. The pivoted catch 20 is adapted to swing inward and outward, and its engagement with the shoulder 21 is automatic, and it is withdrawn from such engagement by a wire 22 or other suitable connection which extends through a slot or opening 23 of the draw-head. The slot or opening 23 is located at the top of the draw-head at the upper end of the rear wall of the cavity 13, and the connection 22 has its upper end attached to an arm 24 of a transverse rock-shaft 25, journaled in suitable bearings and extending across the end of the car, as clearly shown in Fig. 1 of the drawings. When the rock-shaft is rotated, the connection 22 first draws the pivoted catch inward to disengage it from the shoulder 21, and it then swings the uncoupling-hook upward out of engagement with the fixed catch or shoulder 16. Instead of employing a transverse shaft 25 any other suitable uncoupling mechanism may be used, and the shaft may

be connected with the top of the car to enable the operation of uncoupling to be performed from that point, and any suitable uncoupling mechanism may be used for effecting the uncoupling operation from the platform of a coach.

The draw-head is provided at a point below the coupling-hook 15 with a rigid arm or projection 26, and it has a socket 27 located at its opposite side at a point beneath the cavity 14. When two cars are coupled, the projections 26 engage the corresponding sockets, and the draw-heads are thereby held against movement on each other, and the coupling-hooks are thereby relieved of much strain. As a pair of coupling-hooks is employed, it will be apparent that the car-coupling possesses great strength and durability and is enabled to withstand heavy strains.

The draw-head is provided between the upper portion of the cavities 13 and 14 with a longitudinal link-cavity 28, and it has a coupling-pin perforation intersecting the same and receiving a coupling-pin 29, whereby the draw-head is adapted to couple with cars having a different form of draw-head.

The draw-head is provided with a central longitudinal opening 30, located beneath and extending in rear of the link-cavity and receiving a spring-actuated yieldingly-mounted block or plate 31, which carries the pipe-couplings, as clearly shown in Fig. 3 of the drawings. The movable spring-pressed block or plate, which is substantially L-shaped, has a horizontal arm extending through the front portion of the longitudinal opening 30, and it is provided with a depending vertical portion which extends through the rear portion of the longitudinal opening 30, and the said block or plate is secured within the longitudinal opening of the draw-head by a removable substantially T-shaped plate 32, mounted in a recess of the bottom of the draw-head and extending across the longitudinal opening at the front of the same, as clearly shown in Fig. 8 of the drawings. The arms of the T-shaped bottom plate 32 project beyond the walls of the longitudinal opening 30 and are perforated for the reception of suitable fastening devices, whereby the plate 32 is firmly held in place.

The block or plate 31 is provided with substantially L-shaped bores or passages 33, 34, and 35, having their horizontal portions arranged in a vertical series and disposed centrally of the draw-head, whereby they will register with those of another draw-head when coupled to either end of a car. The passages 33 and 34 are designed to be connected with the train-pipe of a brake mechanism and the signal-pipe of a train, and the other bore or passage 35 is designed to form a passage for steam or hot air for heating the cars. The bores or passages 34 and 35 are provided with automatic valves 36 and 37, the bore or passage 33 being preferably valveless, whereby the brakes will be automatically applied

should a heavy train part in ascending a grade; but a valve may be provided in the bore or passage 33, if desired.

The longitudinal opening 30 of the draw-head is reduced near its rear end to provide a shoulder 38, which forms an abutment for plates 39, disposed on a pair of rearwardly-projecting stems 40, mounted on the plate or block 31. The plates are secured on the stems by a suitable fastening device 41, and they form bearings for coiled springs 42, disposed on the stems and interposed between the plates and the block or plate 31, whereby the latter will be forced outward and will be permitted to be moved inward when two cars come together for coupling. The front end of the block or plate 31 projects beyond the draw-head, and each of the said valves, which are tubular, is adapted to reciprocate and is normally held extended by a coiled spring 43, which is shown engaging the inner end of the valve, but which may be mounted in any other manner. Within the bore or passage is arranged a short tube 44, and the valve, which extends inward beyond the same, is provided at its inner end with an annular flange 45, adapted to abut against the short tube 44, whereby the bore or passage is closed. Near the inner end of the valve is arranged a series of openings 46, which when the valve is moved inward are uncovered, as shown in Fig. 9, and permit air or steam to pass through the bore or passage of one block or plate into a corresponding bore or passage of the block or plate of another draw-head, and as soon as the draw-heads separate the spring 43 operates to close the valve automatically. When the valve is closed, the perforations are carried within the short tube 44, which is suitably secured within the bore or passage. Each valve is provided at its outer end with a flange, and it has an elastic cushion 47 secured to it and supported by the flange, and when the cushions of two valves are pressed against each other they form an air-tight or steam-tight connection.

The depending portion of the block or plate 31 is provided with a series of nipples 48, and it has a series of valves 49, adapted to open and close the bores or passages and extending entirely through the block or plate and provided at opposite sides thereof with suitable heads or handles, whereby they may be operated from either side of a car. These valves may or may not be used, and should any accident happen to the automatic valves they will enable the bores or passages to be readily closed. When two draw-heads come together, the valves 36 and 37 of one draw-head engage those of the other and are forced inward sufficiently to open them, and these valves are held in contact with each other not only by the springs 43, but also by the coiled springs 42, which force the movable plates or blocks outward. The movable plates or blocks are forced inward when the cars are coupled sufficiently to compress the springs

42 slightly, so that they will act upon the valves. The coupling-hooks automatically engage the fixed catches or shoulders 16, and the draw-heads are firmly locked together. The tube or passage 33 is provided at its outer end with a suitable cushion 50, adapted to form an air-tight connection when the cars are coupled. The depending nipples 48 at the bottom of the plate or block are designed to be coupled to the pipes 51, 52, and 53, which convey the air and steam from one end of a train to the other.

The invention has the following advantages: The combined car and pipe coupling, which is simple and comparatively inexpensive in construction, possesses great strength and durability and is capable of coupling automatically and is also adapted to be coupled with cars having other forms of car-couplings. The pipe-coupling devices are located at the center of the draw-head, so that they will register with those of another draw-head when coupled at either end of a car. The draw-heads are firmly locked and held against material movement on each other, and a universal joint is provided at the inner end of the shank of each draw-head, which permits the cars to vibrate and rock without twisting the draw-head. The gravity-catch, which is mounted at the outer end of the coupling-hook, engages a shoulder of the draw-head and effectually prevents the coupling-hook from being accidentally thrown out of engagement with the fixed catch or shoulder by any vibration of the cars. The hanger or stirrup allows free play of the shank of the draw-head, and the said shank is rounded to form a rocking surface or bearing.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is—

1. In a device of the class described, the combination of a draw-head provided at opposite sides with cavities 13 and 14, the cavity 14 being provided at its back with a shoulder, a coupling-hook mounted in the cavity 13, and a pivoted catch mounted on the outer end of the hook and having a beveled lower edge, substantially as described.

2. In a device of the class described, the combination of a draw-head provided at opposite sides with cavities 13 and 14 and having a longitudinal recess located between the said cavities, a hook mounted in one of the cavities, and a block or plate yieldingly mounted in the said recess and provided with bores or passages and having pipe connections with the same, substantially as described.

3. In a device of the class described, the combination of a draw-head provided at opposite sides with cavities and provided with a recess located between the same, a coupling device mounted in one of the cavities, a block

guided in the recess and provided with bores or passages extending from the outer end of the block and terminating at a point in advance of the rear face of the same, pipes connected with the said bores or passages, and a spring arranged within the recess and engaging the rear face of the block, substantially as described.

4. In a device of the class described, the combination of a draw-head provided at opposite sides of its upper portion with cavities 13 and 14 and having at its center the longitudinal opening 30 and the link-cavity 28, said draw-head being provided at its bottom at one side with the socket 27, the lug 26 projecting from the opposite side of the draw-head, a coupling-hook mounted in the cavity 13, and a block guided in the longitudinal recess 30 and provided with pipe-couplings, substantially as described.

5. In a device of the class described, the combination of a draw-head provided with cavities 13 and 14 and having a socket 27, located beneath the cavity 14, said draw-head being provided between its cavities with a link-cavity 28, a lug projecting from the draw-head and arranged beneath the cavity 13, and a hook pivotally mounted in the cavity 13, substantially as described.

6. In a device of the class described, the combination of a draw-head, a block mounted in a recess of the draw-head and having a bore or passage, a short tube arranged within the bore or passage, a tubular valve operating in

the short tube and provided at its rear or inner end with a flange and having openings in advance of the same, and springs engaging the tubular valve and the block, substantially as described.

7. In a device of the class described, the combination of a draw-head having a longitudinal opening, a substantially L-shaped block mounted within the opening of the draw-head and projecting outward therefrom and depending from the bottom of the same, a spring arranged in rear of the block, and pipes connected with the block at the bottom thereof, substantially as described.

8. In a device of the class described, the combination of a draw-head having an opening, a block mounted in the opening of the draw-head, extending in advance of the same and depending from the bottom thereof, said block being provided with bores or passages, automatic valves arranged at the outer ends of the bores or passages, pipes connected with the bottom of the block, and valves located beneath the draw-head and extending entirely through the block and adapted to be operated from either side of a car, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JACOB P. SHAFER.

Witnesses:

I. N. SMITH,
SHUD MESSENGOR.