

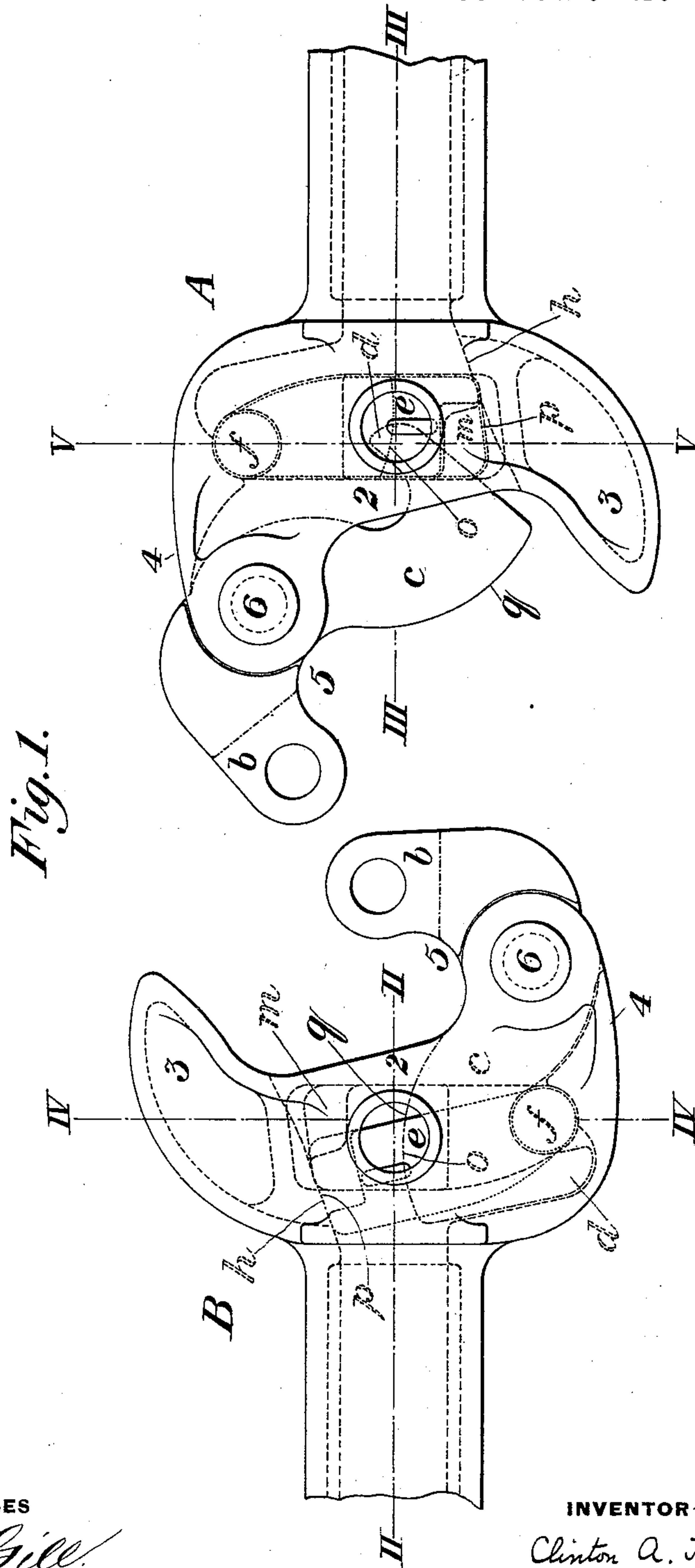
(No Model.)

3 Sheets—Sheet 1.

C. A. TOWER.  
CAR COUPLING.

No. 541,446.

Patented June 18, 1895.



WITNESSES

*A. L. Gill*  
*H. M. Corwin*

INVENTOR

*Clinton A. Tower*  
*by his Attorneys*  
*W. Baxendell & Sons*

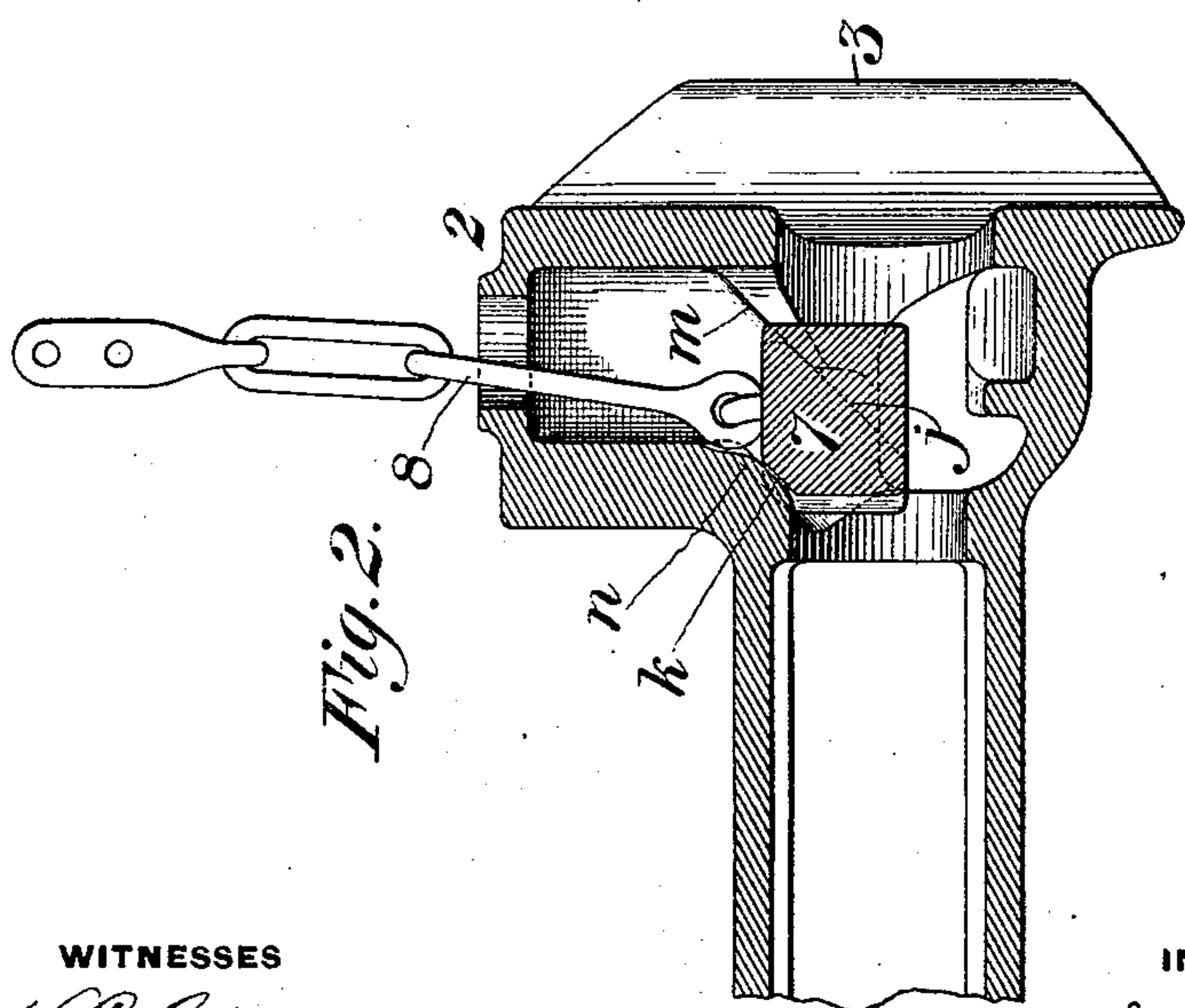
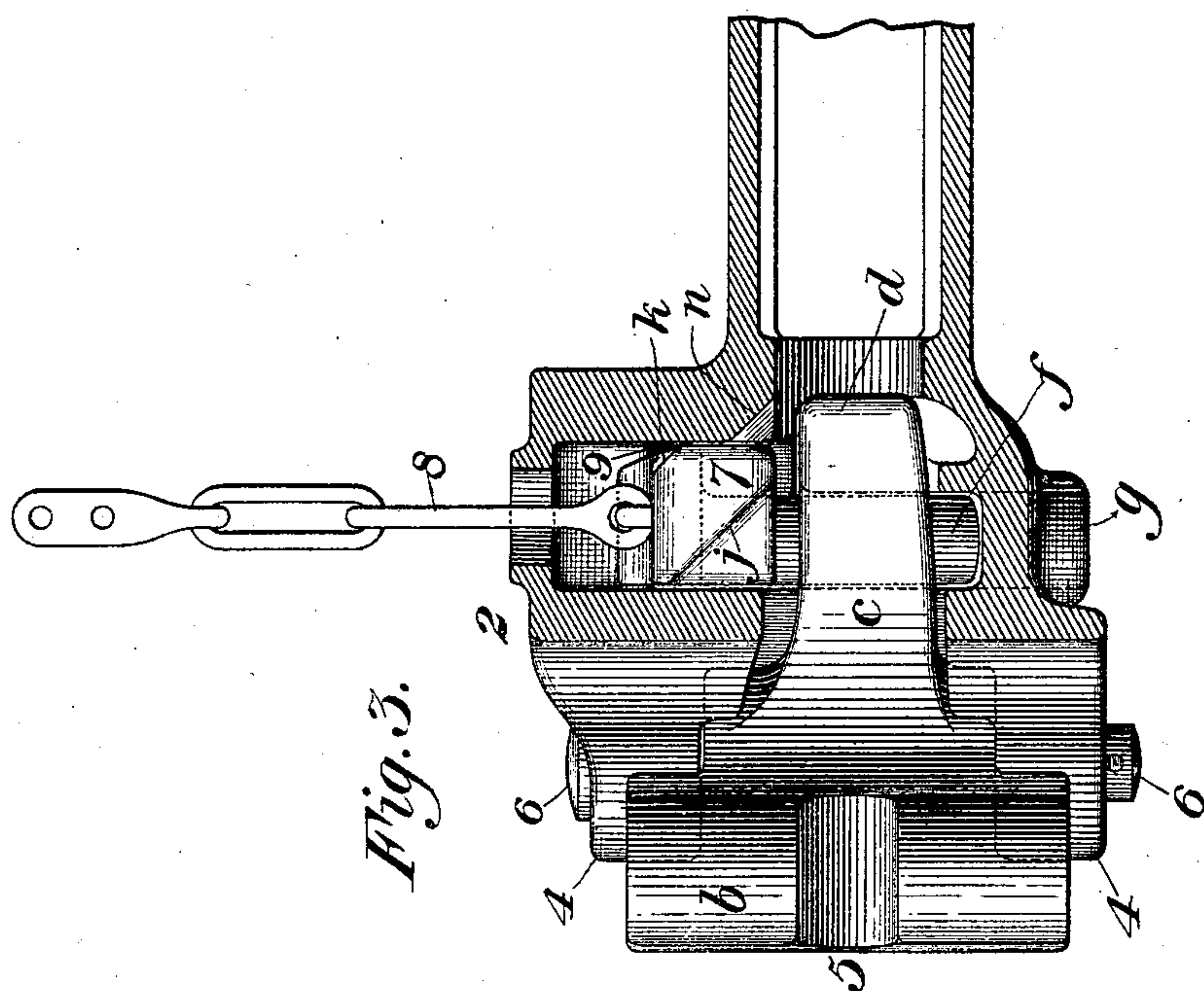
(No Model.)

3 Sheets—Sheet 2.

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CAR COUPLING.

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Patented June 18, 1895.



WITNESSES

*A. L. Gill.*  
*H. M. Corwin*

INVENTOR

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*W. Bassett & Sons.*

(No Model.)

3 Sheets—Sheet 3.

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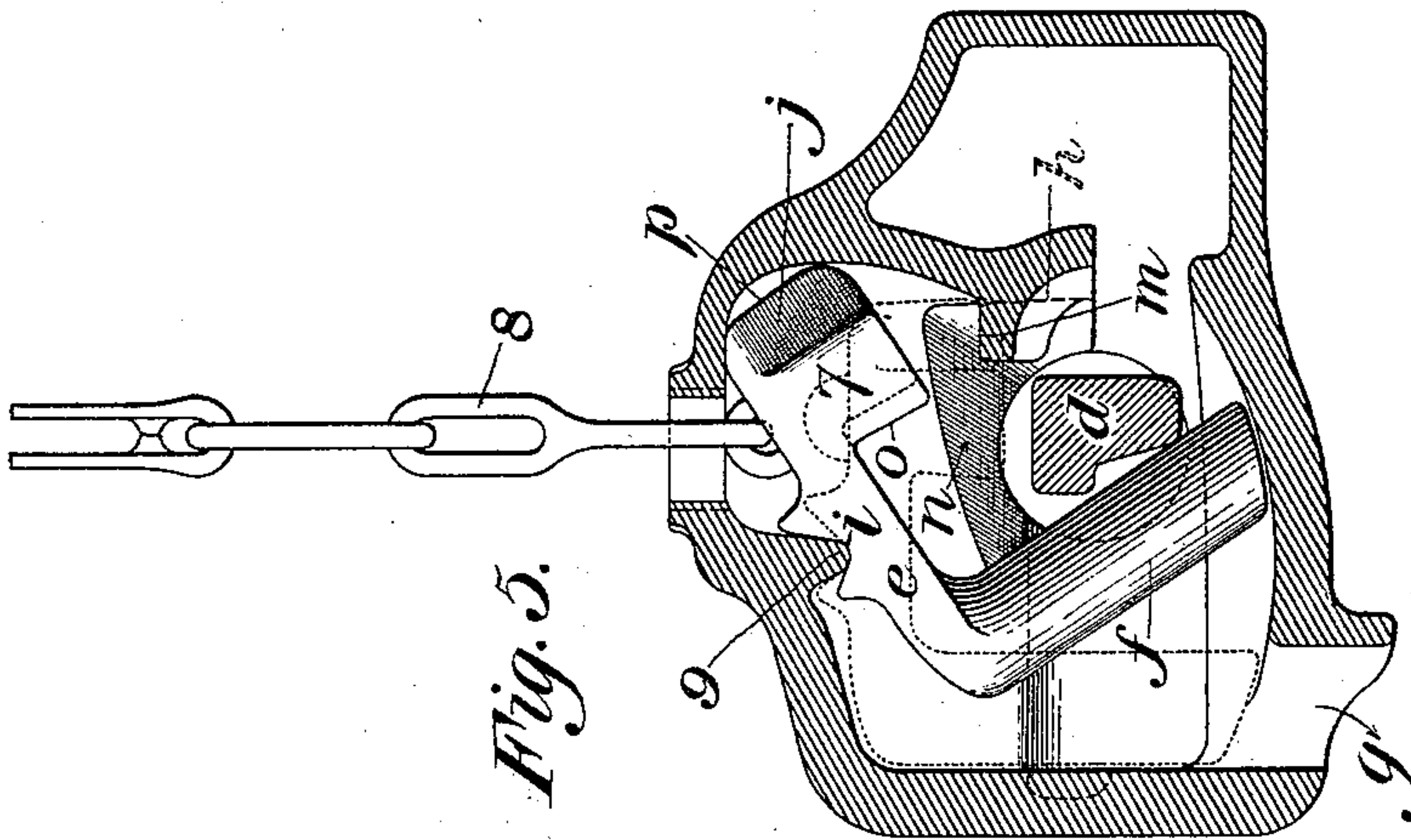


Fig. 5.

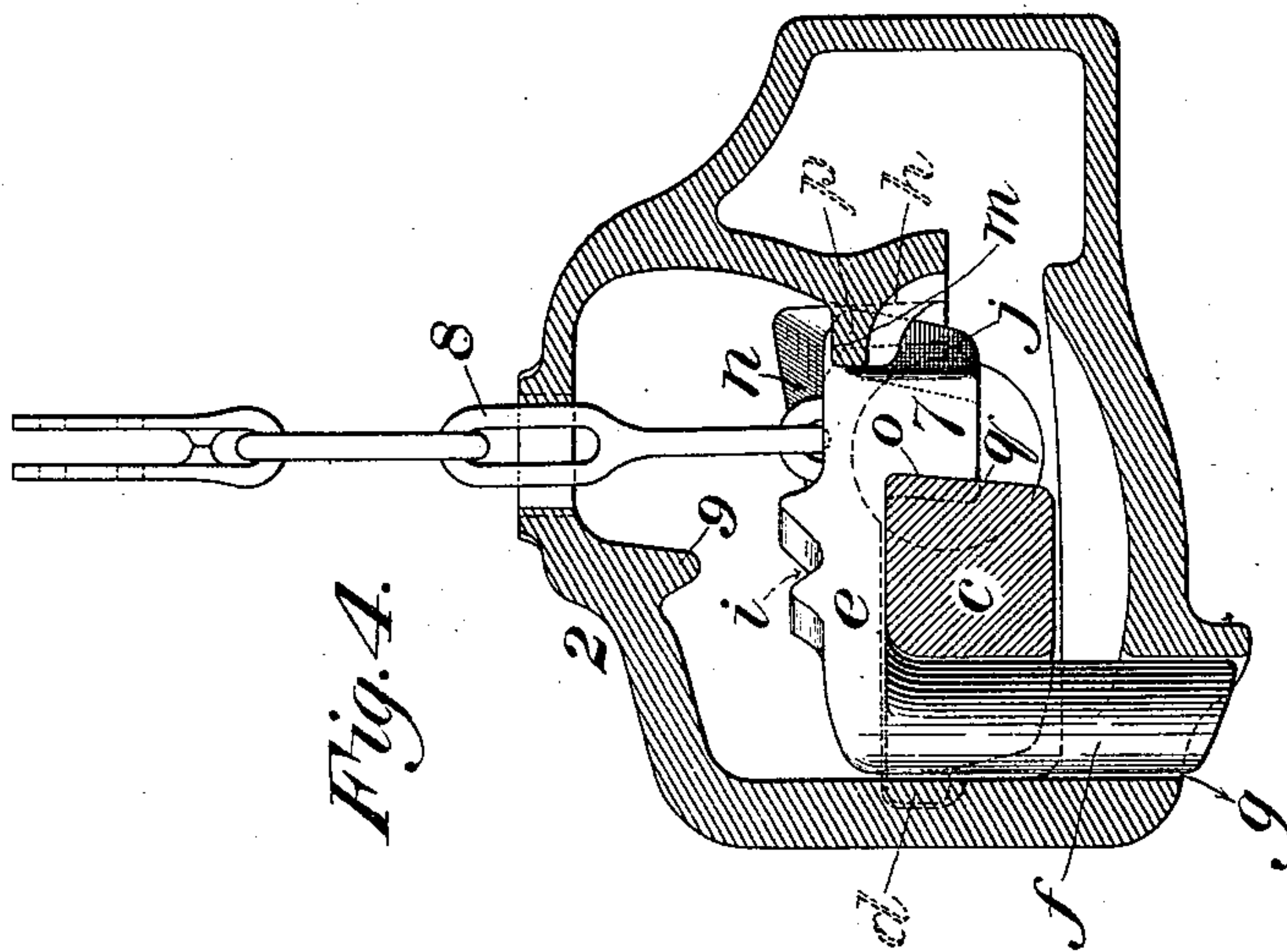


Fig. 4.

WITNESSES

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# UNITED STATES PATENT OFFICE.

CLINTON A. TOWER, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL MALLEABLE CASTINGS COMPANY, OF SAME PLACE.

## CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 541,446, dated June 18, 1895.

Application filed December 22, 1894. Serial No. 532,638. (No model.)

*To all whom it may concern:*

Be it known that I, CLINTON A. TOWER, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful  
5 Improvement in Car-Couplers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view showing two coupler-  
10 heads A B constructed in accordance with my invention and having their parts in proper position to enable them to be coupled together. Fig. 2 is a vertical longitudinal section on the line II II of Fig. 1. Fig. 3 is a  
15 longitudinal section on the line III III of Fig. 1. Figs. 4 and 5 are cross-sections on the lines IV IV and V V, respectively, of Fig. 1.

My invention relates to improvements on the car coupler which I have described and  
20 claimed in United States Letters Patent No. 507,511, granted to me October 24, 1893. As illustrated in the drawings, it also embodies features of construction and operation which are described in United States Letters Patent No. 521,092, granted to me June 5,  
25 1894.

I shall first describe the coupler constructed as set forth in my said Patent No. 507,511, and shall then indicate the nature of the improvement which I have made thereon.  
30

In the drawings, 2 represents the coupler-head which in general may be of usual type. It has two jaws 3 and 4, and is provided with an internal cavity or recess which extends  
35 laterally into the jaw 4 and is adapted to permit the coupling knuckle 5 to swing upon its pivot pin 6. This knuckle is formed with an outer arm *b* and an inner and preferably longer arm or tail *c*, which project substantially at  
40 right angles to each other, and the rear side of the tail is formed with a hook *d*. In order to hold the knuckle in locked position (the position shown in Fig. 4 and at B in Fig. 1), I employ an angled locking and opening  
45 piece set within the coupler-head and shown most clearly on Sheets 2 and 3 of the drawings. The upper and transversely extending member or arm *e* of this angled piece reaches over the tail of the knuckle. Its dependent  
50 block or head 7 is adapted to fit in front of and to lock the knuckle when in closed position, and its dependent arm *f*, which extends

downwardly at the rear of the knuckle and is substantially upright when the knuckle is in locked position, passes through a guide-  
55 hole *g* in the floor of the coupler. When the knuckle is locked, the head 7 of the angled piece fits between the front side of the knuckle-tail and the shoulder *h* on the coupler-head, but when the brakeman raises the  
60 angled piece by a link or lifting rod 8, it is raised above the knuckle and out of its path of motion. When the knuckle is locked, as shown in Figs. 2 and 4, and at B in Fig. 1, the member *e* is above the tail of the knuckle,  
65 the head 7 fits in front of it and bears against the shoulder *h*, and the arm *f* fits within the hole *g* and is within the hook *d* of the tail. The angled piece, being then braced by the  
70 fitting of its arm within the hole and by the bearing of its head against the shoulder, effectually prevents the knuckle from swinging open.

To release the knuckle, and to permit it to be swung into the open position shown at A  
75 in Fig. 1, the brakeman raises the link 8 and thus lifts the angled piece until the end of its head 7 clears the tail of the knuckle and passes above the horizontal path of its motion, as shown in Fig. 3, and by dotted lines in Fig.  
80 5, whereupon the knuckle can be swung open, either by direct action of the hand or by continuing the lifting of the angled piece until a notch *i* on the upward side of its member *e* engages a projecting rib or shoulder 9 on the  
85 coupler-head, whereupon the angled piece will tip radially in a vertical plane in a direction transverse to the length of the draw-bar. Such radial motion of the angled piece, by bringing its rearwardly depending arm  
90 into action upon the rear side of the tail of the knuckle, will move the knuckle outwardly into open position. When the angled piece is released, after the knuckle has been swung open, the end of its arm *f* will drop  
95 upon and will be supported by the floor of the coupler-head, and it will remain in this position, as shown in Fig. 5, until the knuckle is swung back into locked position by the act of coupling or otherwise. The rear side of  
100 the knuckle-tail will then engage the arm *f* and will move the angled piece so as to carry said arm back toward a vertical position, until its lower end comes into register with the



hole *g*, and then the angled piece will drop by gravity, its arm *f* entering the hole, and its head 7 adjusting itself in front of the knuckle-tail and locking the knuckle, as shown in Figs. 2 and 4, and at the coupler-head B in Fig. 1.

The parts above described are shown and claimed in my said patent, and as stated in the specification thereof, the use of said angled piece, which, as a single acting device, accomplishes the double function of rising to free the knuckle and of swinging radially to move it open without the accession of cams or levers, is distinctly new and is of great utility. The simplification of construction and the increased safety and durability of the coupler obtained by means of this single and individual body with its unique attributes while at rest and while in action, and which in the proper order, at the proper time, and in a novel manner performs satisfactorily all the necessary functions of locking, unlocking and opening the knuckle, distinguish the invention of said patent practically from all prior devices.

In my prior patent the path of the angled piece during its initial lifting preliminary to its engagement with the projecting rib or shoulder 9 on the coupler-head, and during its dropping into locked position, is illustrated as being in a single vertical plane, although the claims are not limited thereto.

In my present improvement I form on the under and forward sides of the head 7 of the angled piece a bevel or inclined surface *j* and at the upper and rear corner of the head a parallel bevel or incline *k*. These bevels are so formed as to match and to correspond to parallel beveled surfaces *m* and *n*, which are situate at the sides of the coupler-head and form a short groove or passage within which the head 7 may travel in its upward and downward motions. The consequence is that when the angled piece is lifted for the purpose of unlocking the knuckle, its head does not move in a single vertical plane, but being guided by the beveled surfaces *m* and *n* moves also forward, turning with a radial motion on the axis of the dependent arm *f*. This radial motion continues until the initial lifting of the angled piece has been completed and until its member *e* has been brought into contact with the shoulder 9. In like manner when the angled piece is dropped in the act of locking the knuckle, the engagement of the surface *j* on the head 7 with the surface *m* on the coupler-head causes the member *e* to turn backwardly with a radial motion on the axis of the vertical arm *f* and thus to move its head toward the throat of the coupler. Several important functions are effected by this construction. The fact that the angled piece when lifted must move forward, as well as vertically, and must therefore engage the inclined surface *n* opposes resistance to its free upward motion or jumping when it is jarred or shaken during running of the cars. Accidental displace-

ment of the locking head or block 7 from this cause is thus effectually prevented, but at the same time the locking device acts quite as freely as in the construction of my said patents, when it is lifted by the brakeman to unlock or open the coupler, or is released by him to lock the same. Furthermore, the backward motion of the head into the throat of the coupler as it falls, removes the head farther from the front portion of the coupler and thus lessens the danger of its being injured in coupling with a coupler of the link and pin type. In fact, this construction enables the throat of the coupler to be so formed in practice that the link cannot enter sufficiently far to strike the angled piece at all. The retrocession of the head 7 into the draw-head, by causing it to engage the tail of the knuckle at a point more remote from the pivot pin 6, gives it a better leverage for resisting the pulling strain imparted to it when in use.

As shown in the drawings of my said patent, the angled piece is so constructed and arranged that when in locked position its member *e* does not bear directly upon the top of the tail of the knuckle, but is supported a short distance above the same. I find it preferable, however, and I have so illustrated the construction in the accompanying drawings, to permit the member *e* to rest upon and to be supported by the tail, so that when the knuckle is removed, the angled piece will drop to the floor of the coupler-head, the arm *f* passing freely through the hole *g*. This does not result in any danger of jumping or displacement of the angled piece when the coupler is in use, that being prevented by the inclines above mentioned; and it does result in advantage in that it enables the parts of the coupler to be assembled very easily. Thus, to put the angled piece in place within the coupler-head, one can first insert the dependent arm *f* into the hole *g*, then push the clevis of the lifting chain through the hole in the roof of the coupler, and finally by lifting the chain and pushing the head of the angled piece inward until it comes below the vertical recess in the coupler-head, it can be readily pulled into place.

Another peculiar feature of the coupler herein shown is that the forward side of the tail of the knuckle, instead of being formed in a straight line, as shown in said patent, is an arc of a circle. This brings the middle portion of the tail forward and affords the best form for coupling with another coupler, whether the latter be in opened or closed position. The inner side of the head 7 is curved concavely in order to fit and match with the convex curvature of the knuckle's tail.

As a further security against upward jumping or creeping of the locking block during use, I form the opposite sides *o* and *p* of the head of the angled piece, not in parallel vertical planes, as shown in my said patent, but with downwardly divergent surfaces. The forward side *q* of the tail of the knuckle, at



its place of engagement with the head 7, is inclined inwardly and downwardly in a plane parallel with the surface *o* of the head 7 with which it is adapted to come in locking contact, and correspondingly, the surface *h* of the coupler head, with which the outer side *p* of the head 7 is in contact when the coupler is locked, is also inclined in a plane parallel with said surface *p*. The consequence is that as, during the traction of the railway cars, the tail of the knuckle is pressed forwardly against the inner side of the head 7, the dove-tailed or wedge shape of said head, acting in conjunction with the inclined surfaces *q* and *h*, will restrain the locking block from all tendency to be moved upward by the jarring and shaking of the cars.

The advantages of the several parts of my improvement will be appreciated by those skilled in the use of car couplers; and within the scope of my invention as defined in the following claims, modifications may be made in the form, construction and position of the parts.

Some features of my invention may be used without the others, and may be applied to coupler locks of forms different from the angled piece which I have illustrated.

What I claim, and desire to secure by Letters Patent, is—

1. In a car coupler, the combination with a knuckle, of a lock which is movable vertically from a locking position to a position above the path of motion of the knuckle's tail, in order to effect the locking and unlocking of the knuckle, said coupler having an interior guiding surface or surfaces which the lock engages, along which it is moved and by which when it is moved vertically it is guided in a direction lengthwise of the coupler, whereby jumping or creeping of the lock is prevented; substantially as described.

2. In a car coupler, the combination of a knuckle, a lock which is movable vertically to effect the locking and unlocking of the knuckle, and a guiding surface or surfaces on the inner surface of the coupler-head along which guiding surface or surfaces the lock moves, and by which there is imparted to it a forward motion when it is lifted, and a backward motion when it descends, substantially as described.

3. A coupler having a knuckle and a vertically movable angled piece whose rear arm extends back of the tail of the knuckle, and whose head is adapted to extend in front of the same, said coupler having interior guiding surfaces with which the angled piece engages during its vertical motion and by which

its head is turned radially; substantially as described.

4. In a car coupler, the combination with a knuckle, of a vertically movable lock adapted to fit between the tail of the knuckle and the coupler-head, and to lock the knuckle, said lock being formed with downwardly divergent lateral surfaces to prevent upward jumping or creeping of the lock; substantially as described.

5. A coupler having a knuckle and a vertically movable angled piece whose rear arm extends back of the tail of the knuckle, and whose head is adapted to extend in front of the same, said coupler having interior guiding surfaces with which the angled piece engages during its vertical motion, and by which its head is turned forward radially during the lifting operation; substantially as described.

6. A coupler having a knuckle and a vertically movable angled piece whose rear arm extends back of the tail of the knuckle, and whose head is adapted to extend in front of the same, said angled piece having its rear arm extending through the floor of the coupler and being prevented by the knuckle from dropping when the knuckle is in position, but being free to drop to said floor when the knuckle is removed; substantially as described.

7. A car coupler, having a locking device, and a swinging knuckle, the front side of whose tail has a convex curvature at the place where it engages the lock, the said lock being concavely curved on its inner side to fit and match with the convex curvature of the knuckle; substantially as described.

8. A car coupler having a swinging knuckle, and a locking block or head which, in locking, fits between surfaces on the knuckle-tail and on a shoulder on the coupler-head, said surfaces being formed on divergent planes to restrain upward jumping or creeping of the block or head; substantially as described.

9. A car coupler having a swinging knuckle, and a locking block or head which, in locking, fits between surfaces on the knuckle-tail and on a shoulder on the coupler-head, said surfaces being formed on divergent planes to restrain upward jumping or creeping of the block or head, and said block or head being formed with correspondingly divergent surfaces; substantially as described.

In testimony whereof I have hereunto set my hand.

CLINTON A. TOWER.

Witnesses:

O. K. BROOKS,  
D. W. CALL.