

(No Model.)

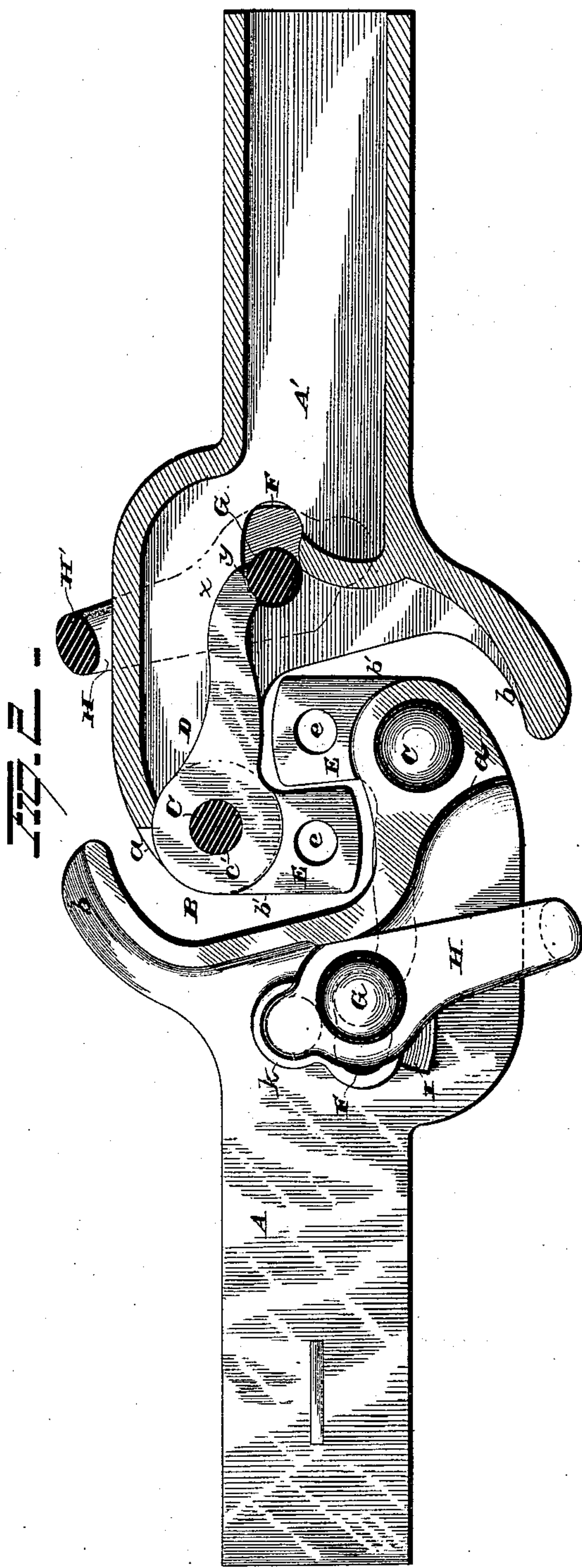
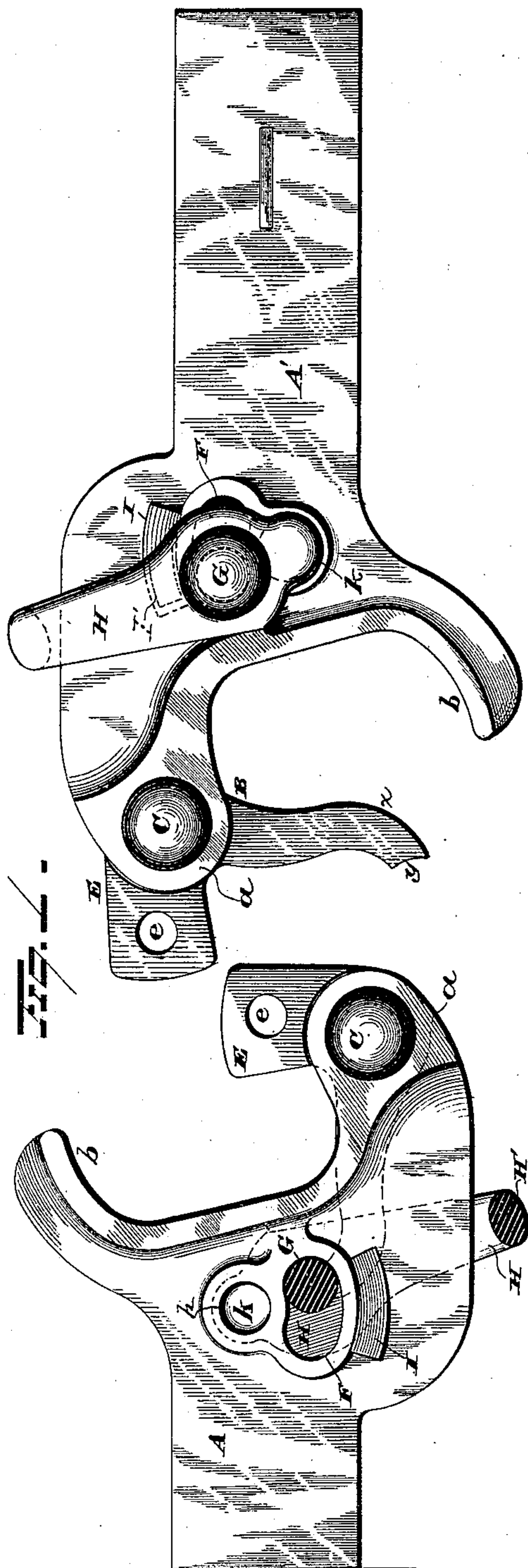
2 Sheets—Sheet 1.

E. N. GIFFORD.

CAR COUPLING.

No. 326,285.

Patented Sept. 15, 1885.



WITNESSES  
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(No Model.)

2 Sheets—Sheet 2.

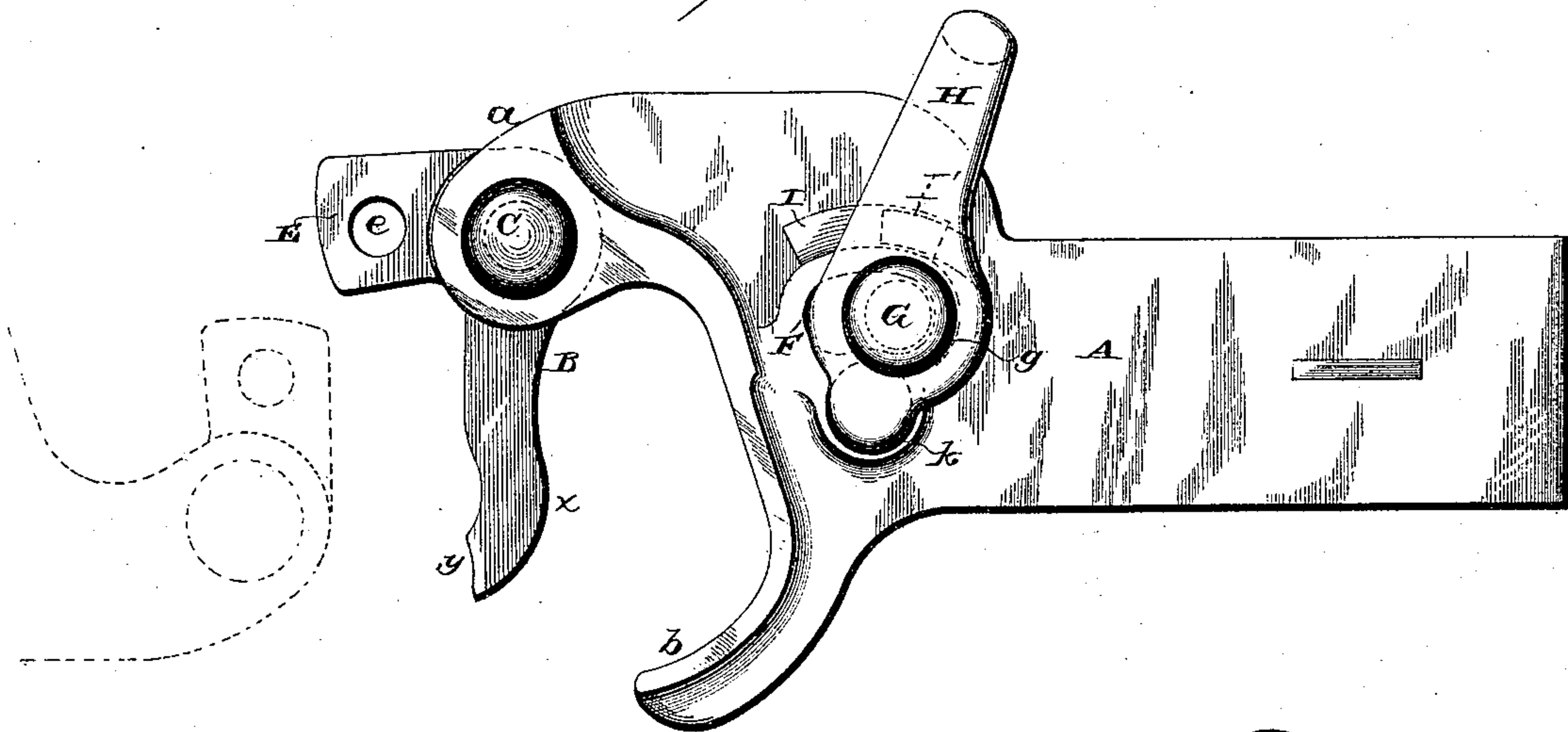
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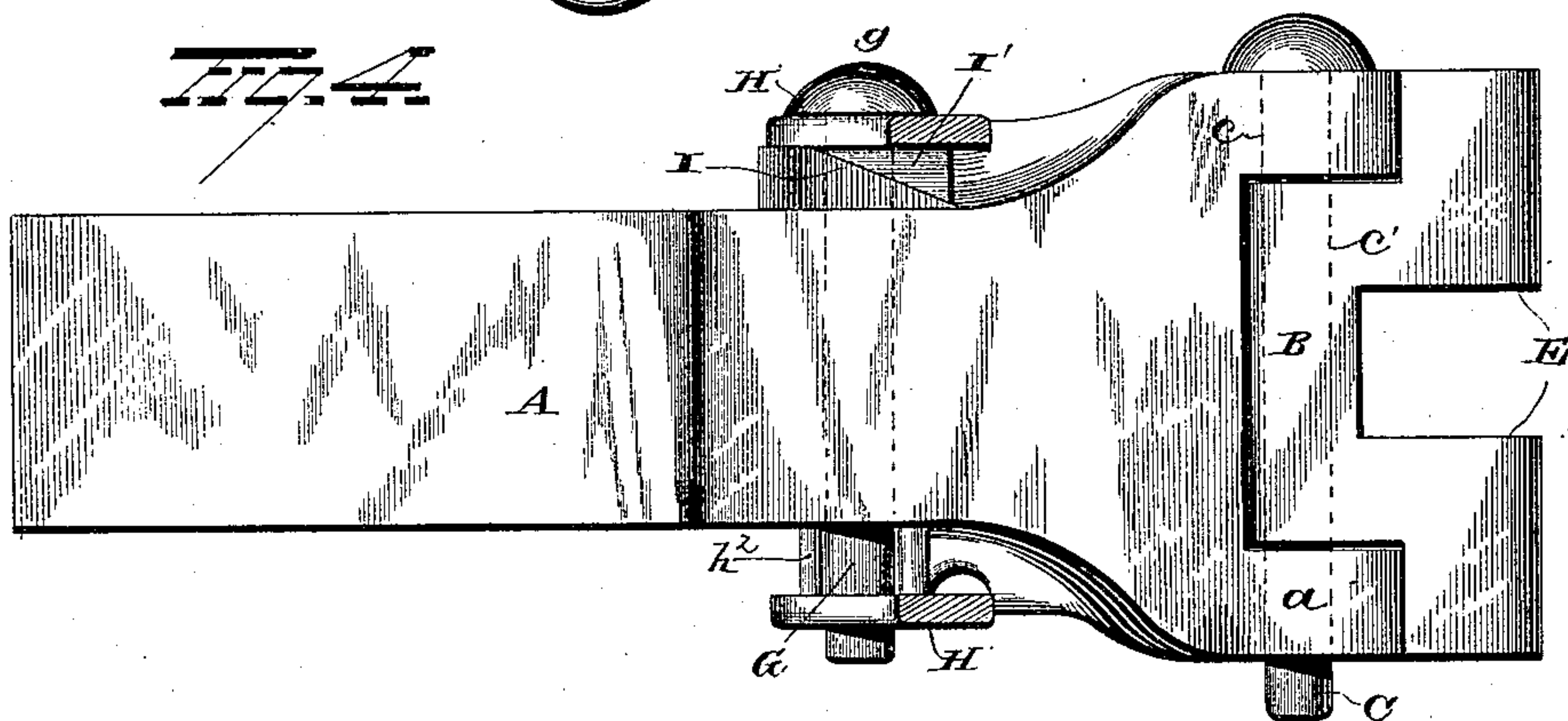
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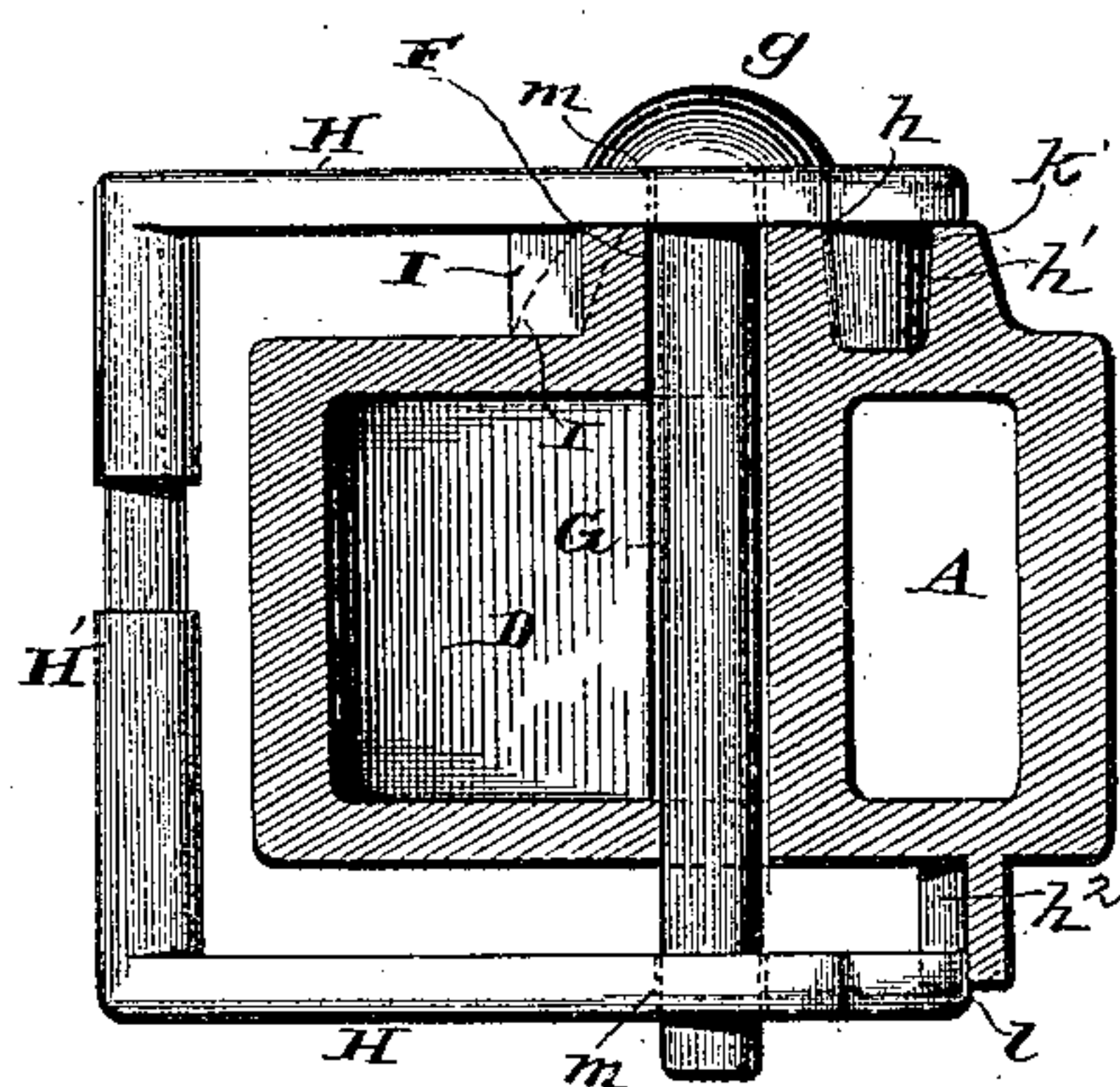
*Fig. 3.*



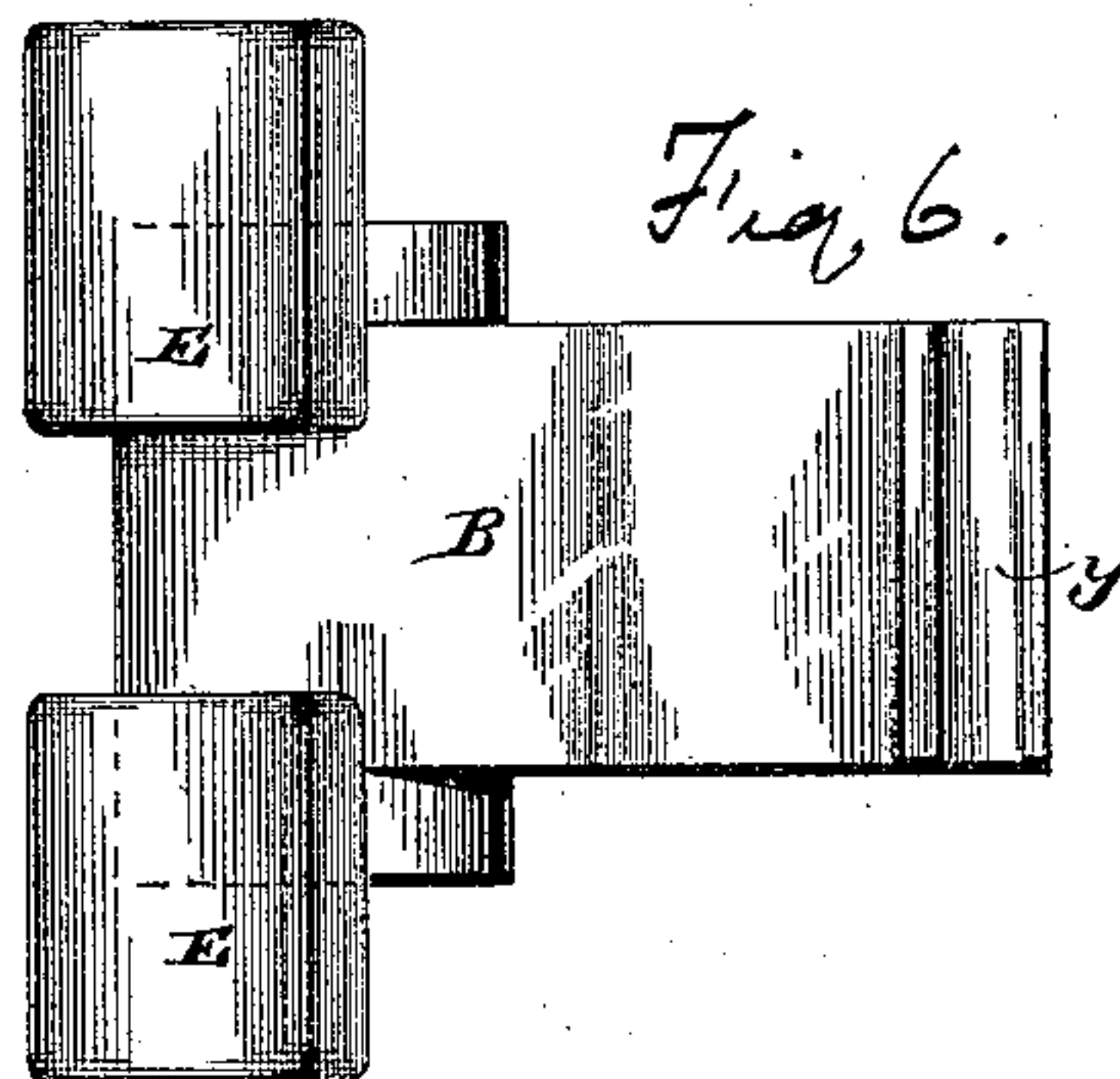
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

EZRA N. GIFFORD, OF CINCINNATI, OHIO, ASSIGNOR TO HIMSELF, WASHINGTON McLEAN, AND JOHN R. McLEAN, OF SAME PLACE.

## CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 326,285, dated September 15, 1885.

Application filed June 25, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, EZRA N. GIFFORD, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and  
5 useful Improvements in Car-Couplers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

10 My invention relates to an improvement in car-couplers.

The object of my present invention is to provide an automatic coupler in which no spring-power shall be employed, and which shall be of  
15 such simple and durable construction as to render it of practical utility in connection with both freight and passenger cars.

A further object is to provide a coupler which may be substituted for the more prominent forms of couplers in present use without  
20 materially changing the means for attaching the draw-head, and which will couple with a car provided with any of the ordinary forms of couplers.

25 With these ends in view my invention consists in a gravity-lock adapted to hold a coupling-hook in locked adjustment and to release the same when under strain or not, without acting against the strain.

30 My invention further consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is  
35 a view of the coupler in position to couple two cars. Fig. 2 shows the same, partly in section, in locked adjustment. Fig. 3 shows the coupler in a position for switching cars, the lock being held in released adjustment. Fig. 4 is  
40 a view of the coupler in side elevation. Fig. 5 is a view in transverse section of the coupler, and Fig. 6 is a detached view of the coupling-hook.

45 A and A' represent two draw-heads of the same size and of similar construction. They consist of heavy hollow castings, and are intended to have sufficient strength to withstand the jamming and strain incident to coupling and starting trains of freight or passenger cars.

Their exact shape is not material; but they 50 are preferably constructed with a major jaw, *a*, and a minor jaw, *b*, which branch out from the body of the draw-head and gradually curve toward each other, as shown. The major jaw *a* projects a short distance beyond the 55 jaw *b* in the form of two heavy branches or lugs, between which the coupling-hook or swinging head B is pivotally secured by a pin, C, extending through vertical perforations *c* in the branches, and through a corresponding 60 perforation, *c'*, in the angle of the hook B. The stem or shank of the hook B is of sufficient length to extend a short distance into the body of the draw-head A or A', a recess, D, being provided in the head and major jaw 65 to admit of its being swung into a position to bring its face *b'* flush with the face of the jaw.

From the base or angle of the hook B two heavy projections, E, extend nearly or quite at right angles to the stem or shank of the 70 hook and form the gripping portion of the hook. The projections E are each provided with a vertical perforation, *e*, which register with each other, and are adapted to receive a coupling-pin of the ordinary link and pin 75 type for securing an ordinary link between the said projections E when it is desired to attach a car provided with such a coupling device thereto.

I am aware that the general construction of 80 the above-described hook or swinging head is old, and make no claim thereto in the present application, except so far as it forms one form of hook well adapted to use in connection 85 with my locking device.

The latter is constructed and operates as follows: An elongated vertical slot, F, is formed through the draw-head at the base of the jaws *a* *b*, and adapted to loosely receive a pin, G. A lever, preferably consisting of two horizon- 90 tal branches, H, united by a vertical bar, H', at the side of the draw-head, is fulcrumed above and below the draw-head at points *k* and *l*, located a short distance to one side of the slot F. The end of the upper horizontal branch 95 of the lever is preferably provided with a depending stud, *h*, which loosely fits in a socket, *h'*, formed in the upper side of the draw-head,



and the end of the lower horizontal branch of said lever is preferably rounded, as shown, and adapted to fit in a concave seat,  $h^2$ , of semi-cylindrical form, located on the under side of the draw-head. The upper and lower branches H of the lever are provided, at the points where they cross the elongated slot F, with perforations  $m$ , adapted to loosely receive the pin G, which rests by the force of gravity with its head  $g$  on the upper branch H.

The lower section, I, of an incline or cam is located on the upper side of the draw-head near the slot F, and on the opposite side thereof from the fulcrum of the lever. The inclined face of the section I rises as it extends away from the face of the draw-head, and has a curve corresponding to the arc of a circle described by the portion of the branch H directly above it. A corresponding inclined section or cam, I', is formed on the under side of the upper branch H, the direction of the incline being reversed. The result of the engagement of the two inclined sections I I', when the lever H H' is swung away from the face of the draw-head, is to elevate the said lever and the pin G. The same movement of the said lever also carries the pin G backwardly out of engagement with the end of the stem or shank of the hook B, and leaves the hook free to turn outwardly. The inclines of the sections I I' are sufficiently steep to allow the force of gravity, acting upon the combined weight of the lever and pin, to return the lever H H' to its depressed or forward adjustment the moment it is released.

In Fig. 1 the two draw-heads are presented as approaching each other to couple. The shank of the hook B occupies a position transversely across the space between the jaws, and the gripping portion of the hook extends toward the opposite car. At first contact the ends of the projections E impinge against the shanks of the opposite hooks and swing them simultaneously back into the recesses D. The curved forms of the shanks, near their ends, as shown at  $x$ , act as cams when they come in contact with the pins G, and force the pins G backwardly out of their way in passing; but this backward motion of the pins G, on account of their connection with the levers H H', will elevate the levers and pins in the manner before explained, and as soon as the ends of the shanks have passed them the pins will, by the force of gravity, resume their former positions opposite the ends  $y$  of the shanks, and thereby lock them securely in position. As the two hooks reciprocally act upon the shank, they gradually swing them into interlocked positions, as shown in Fig. 2, and when the ends of the shanks have passed the pins G their gripping-faces are directly opposed to each other and the coupling is completed.

The construction is such that each of the swinging hooks B has a small amount of play after their shanks have passed the locking-pins G. This admits of the hooks yielding more or less as they come in contact with the

solid portions of the draw-head, and prevents a sudden cracking strain on the shanks and other parts of the hooks and draw-head.

The end  $y$  of the shank of the hook may either be slightly concave, as shown, or it may be perfectly flat. When strain is exerted upon the hooks, as in drawing a long train of cars, the end of the shank presses laterally against the locking-pin G, and, because of the curvature of the slot F corresponding to the arc of a circle described by the portion of the lever H directly above it, forces the said pin into snug contact with the end of the slot. It is evident that the greater this strain the more securely will the pin G be held in its locked position; and it will be further observed that on account of the small extent of bearing-surface between the end  $y$  of the shank and the pin G, and on account of the direction in which the pin moves in disengaging the end of the shank—viz., a direction parallel with the end  $y$ —there will be required but a slight exertion of power on the operating end of the lever H H' to release the pin G from the end  $y$ , even under the greatest strain upon the hook B. This is a matter of very great practical value in uncoupling cars on an upgrade or anywhere under strain, as it does away with the necessity of slackening the draft.

The hand-lever for operating the lever H H' may be of any well-known form in common use, and is not shown in connection herewith.

In switching cars, where it is desirable to prevent them from coupling, the lever H H' is locked in elevated or released adjustment, as shown in Fig. 3.

Since the release of one of the swinging hooks B is sufficient to effect a complete coupling of two cars, it is evident that a car provided with any of the ordinary forms of coupling-hooks may be coupled with and uncoupled from a car provided with one of my improved couplings.

It is evident, also, that numerous changes might be made in the form and construction of the coupling-hook, the shape of the jaws, the means for fulcruming the lever, and shape of the lever itself, and in the location of the cam for operating the lever, without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the construction herein set forth.

I am aware that it is old to lock the coupling-hooks by means of a spring-actuated bar, and that it is not broadly new to lock coupling-hooks by locking-bars located within horizontal slots formed in the draw-bars, and hence I make no claim, broadly, to these constructions; but,

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

1. In a car-coupler, the combination, with the draw-head and a swinging hook pivoted thereto, of a locking-pin working in an arc-shaped slot in the draw-head, and a cam-lever adapted to swing the pin out of engagement



with the hook and elevate it, substantially as set forth.

2. In a car-coupler, the combination, with the draw-head and a hook pivoted thereto, of  
5 a gravity locking-pin working in an elongated slot formed in the draw-head, a lever embracing the pin and fulcrumed on the draw-head, and inclined sections on the lever and draw-head, whereby the swinging of the lever ele-  
10 vates the pin and simultaneously throws it out of engagement with the hook, substantially as set forth.

3. In a car-coupler, the combination, with the draw-head and a swinging hook pivoted  
15 thereto, of a gravity locking-pin resting in an arc-shaped slot in the draw-head adapted to rest against the end of the hook-shank when in locked adjustment, and to be released therefrom by a movement parallel with the surface  
20 of the said end, substantially as set forth.

4. In a car-coupler, the combination, with a draw-head provided with a curved slot and a gravity-pin adapted to move laterally within the slot, of a swinging hook pivoted to the draw-head, the end of the shank of the hook  
25 resting against the pin when in coupled adjustment, and adapted to force the pin into snug contact with the end of the slot when strain is exerted upon the hook, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EZRA N. GIFFORD.

Witnesses:

GEO. F. DOWNING,  
S. G. NOTTINGHAM.