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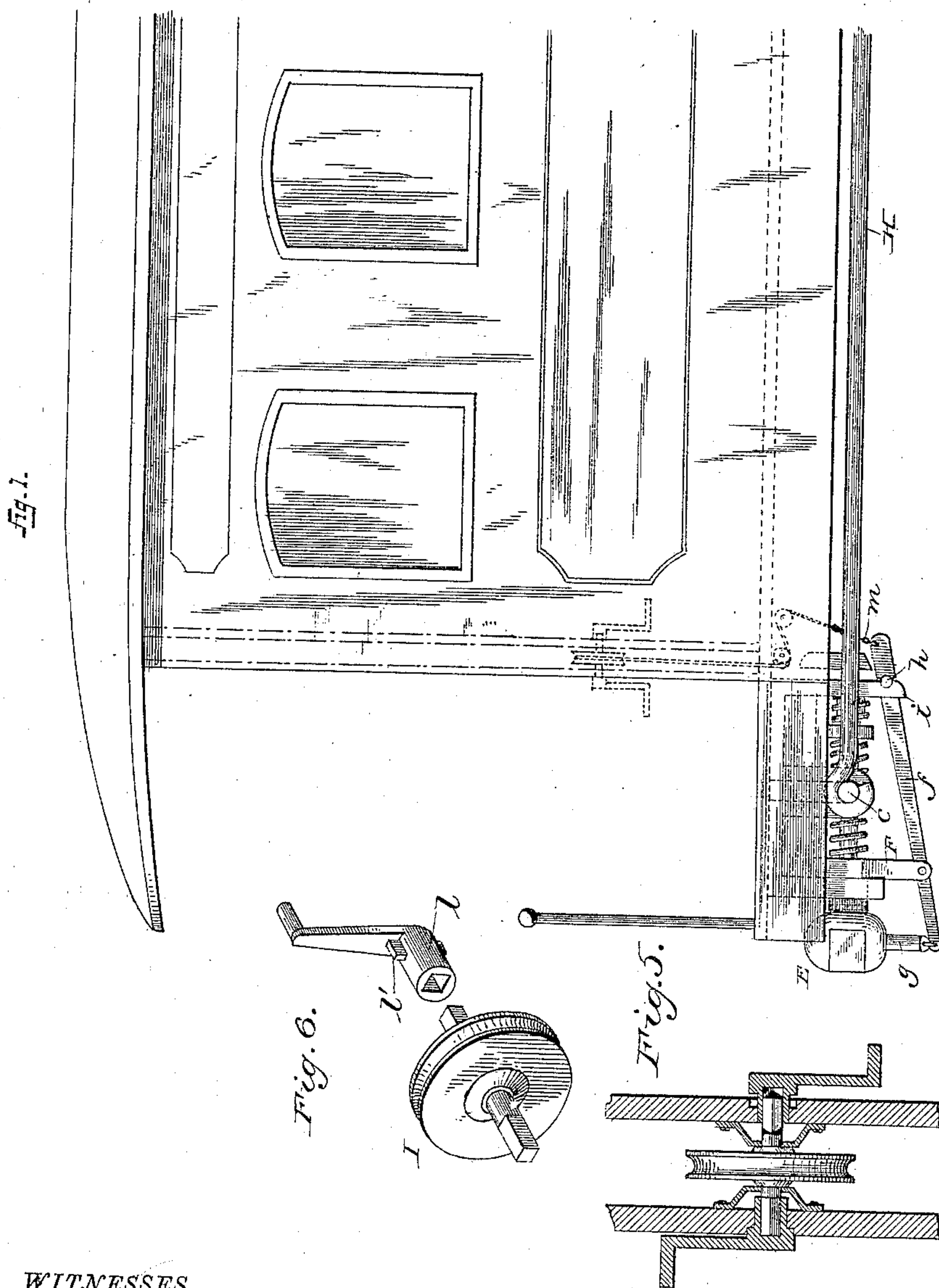
2 Sheets—Sheet 1.

J. R. AVERY.

CAR COUPLING.

No. 330,284.

Patented Nov. 10, 1885.



WITNESSES

*N. W. Mortimer,*  
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INVENTOR

*James R. Avery,*  
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(No Model.)

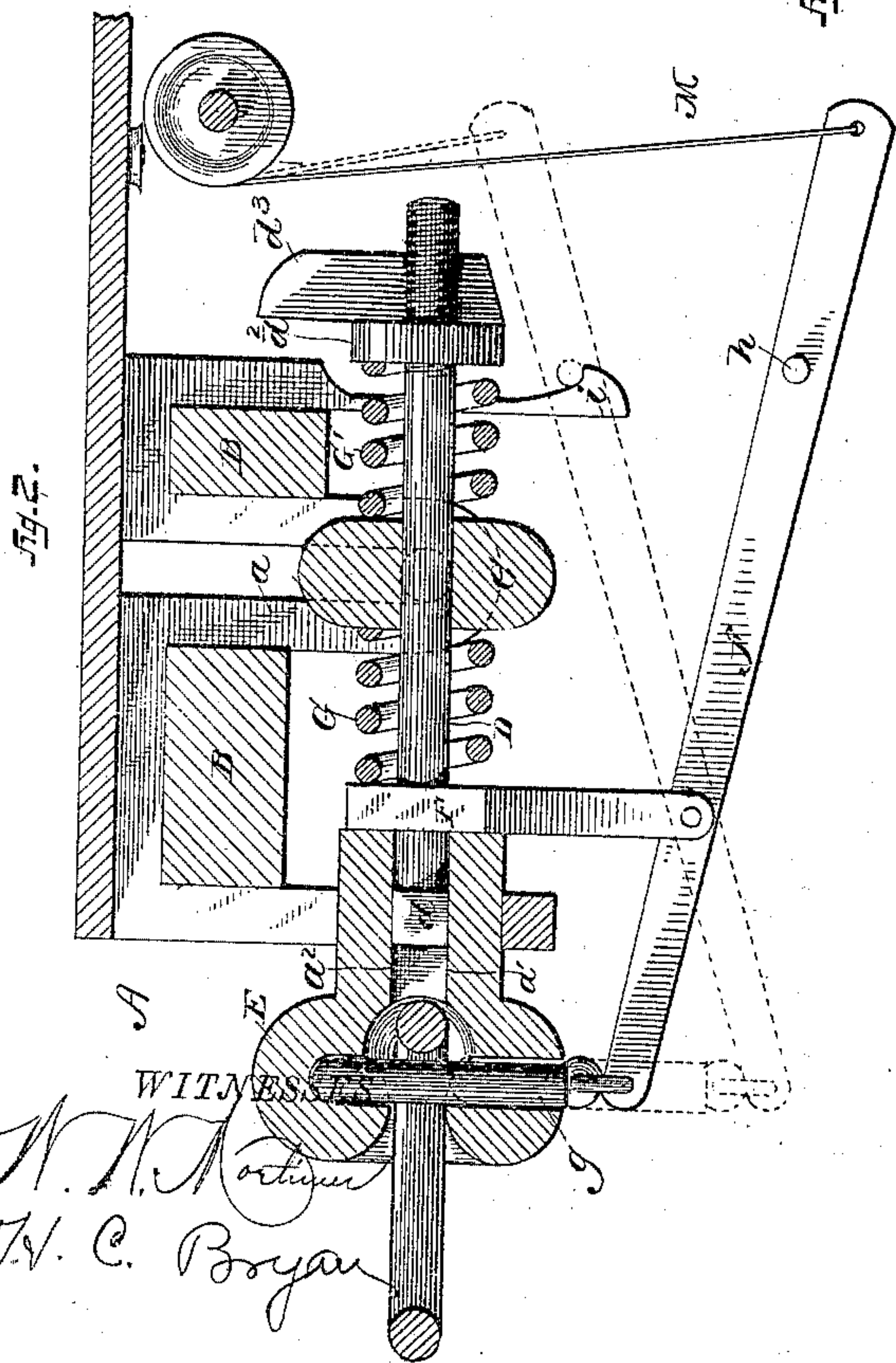
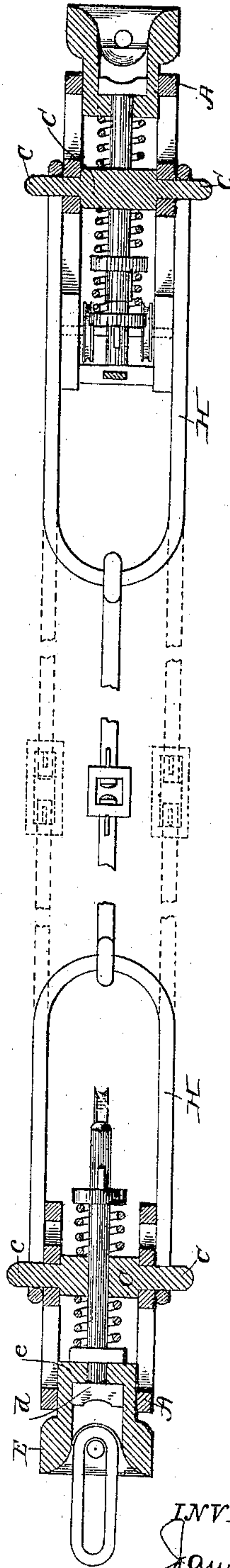
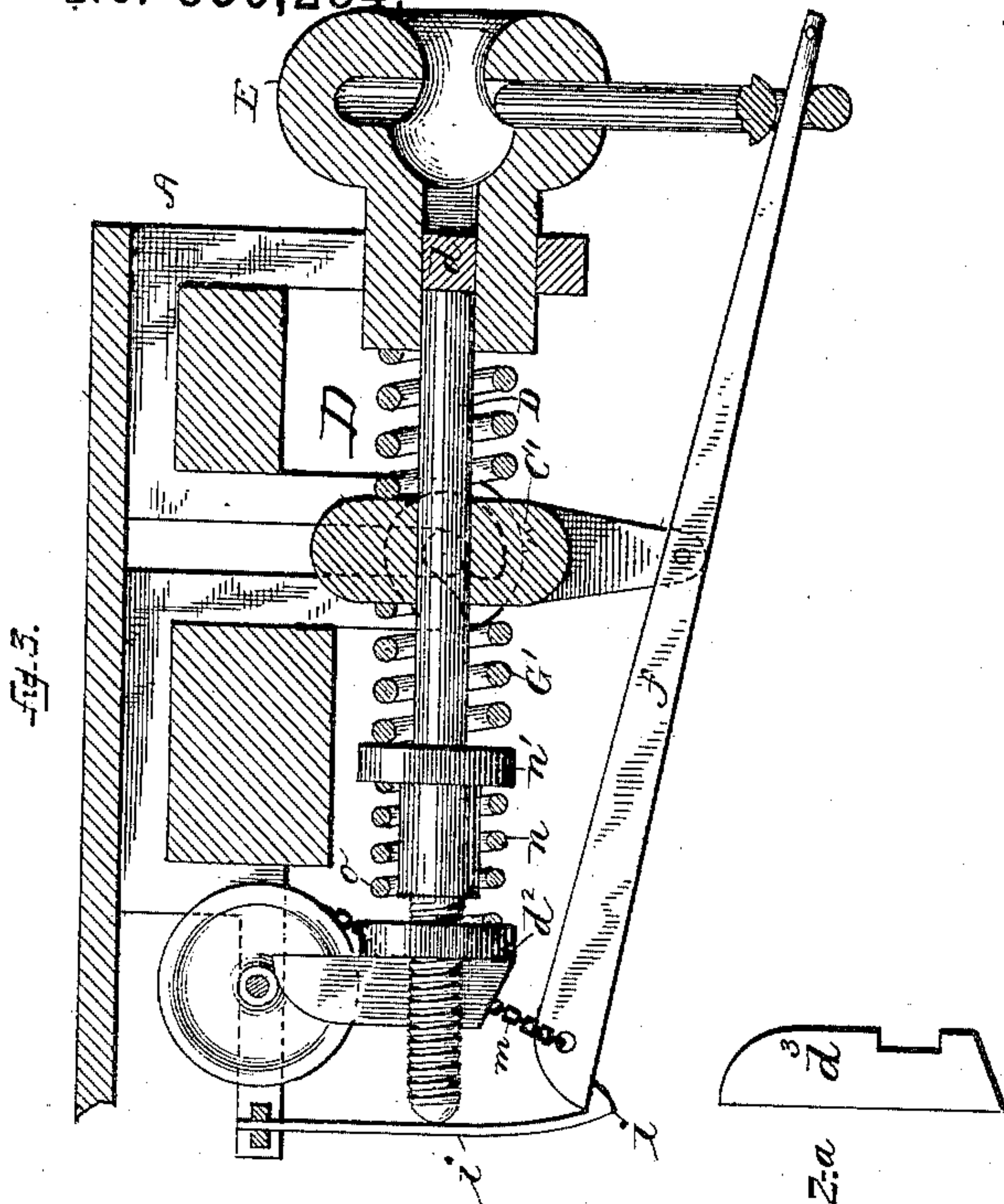
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his Attorney



# UNITED STATES PATENT OFFICE

JAMES R. AVERY, OF LOUISVILLE, KENTUCKY.

## CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 330,284, dated November 10, 1885.

Application filed September 22, 1885. Serial No. 177,840. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES R. AVERY, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Car-Couplings; 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.

My invention relates to car-couplers.

The objects of my invention are, first, to provide a coupler by which the jar and strain in coupling and draft will be lessened and distributed throughout the train, and to relieve the car from draft-strain or concussion; second, to provide means whereby the coupling of cars will be automatic and with little or no danger to human life and limb or property, said means embracing devices for uncoupling; third, to provide a coupler-head which will hold the link in such position that the coupling will be rendered certain; fourth, to construct a coupler which will be of small cost, perfect in its operation, and, while light in weight, of great strength and durability.

The invention consists, principally, in a car-coupler comprising a coupler-frame, a cross-bar pivoted therein, a draw-bar with a link-receiving coupler-head sliding longitudinally upon the front end thereof, the said draw-bar passing through the cross-bar pivoted in a coupler-frame, and springs interposed between the coupler-head and cross-bar and between the cross-bar and a nut or other abutment upon the rear end of the draw-bar, whereby push or draft upon the coupler-head meets with a yielding resistance.

The invention further consists in the combination, with mechanism just described, of rods or bars extending the entire length of the car and connected with the pivotal cross-bar mounted in the coupler-frame at each end of the car, forming the cross-bars into a single abutment, whereby concussion and draft-strain are distributed throughout the train, the said rods or bars forming the coupling mechanism in the train into a continuous elastic or resilient connection.

The invention consists, further, in a peculiar form of link-cavity, which, when the link

is in place therein, will permit only the movement of the outer end of said link within a space corresponding with and having radii equal to those of the opening, the rear wall of said cavity being provided with an additional cavity, into which the inner end of the link may be placed to hold the link elevated.

The invention consists, further, in means for coupling automatically by the movement of the coupler-head upon the draw-bar releasing a weighted lever carrying the coupling-pin, and so moving the same into the coupler-head.

The invention also consists in certain details of construction, all of which, together with those abovementioned, will be hereinafter fully described.

In the accompanying drawings, forming part of this specification, like letters of reference indicate corresponding parts in the several figures.

Figure 1 is a view in side elevation of one end of a railroad-car provided with my improved coupler. Fig. 2 is a vertical longitudinal section of the coupler on a larger scale. Fig. 2<sup>a</sup> is a detail view of the key at the end of the draw-bar. Fig. 3 illustrates in vertical longitudinal section, also on larger scale, a coupler, including springs, as shown in Fig. 1. Fig. 4 illustrates in plan view and horizontal section two ways in which the couplers at each end of a car may be united. Figs. 5 and 6 illustrate the coupling-pin setting-wheel and a peculiar form of crank for turning and locking said wheel.

The letter A designates what I will term the "coupler-frame," which is constructed to fit upon cross-beams B on the under side of the end of the car. This frame has depending bearings *a* and a cross-piece, *a'*. Between the loops extends a cross-bar, C, having projecting ends or journals *c*, extending through the depending loops, in which the said journals may turn, permitting a similar movement of the cross-bar. A draw-bar, D, is fitted at its front end with a head, *d*, and is screw-threaded and provided with a slot or hole at its rear end. A washer or nut, *d'*, is fitted upon said screw-threaded end, and holds a pin or key, *d''*, in place in the slot. In order that the pin or key may be held from longitudinal movement in its slot, it is provided with a notch in one edge



of a length a little more than equal to the diameter of the screw, so that when the key or pin  $d^3$  is placed in the slot the notch will engage the end wall of the slot when the nut is  
 5 screwed up against the other side or edge, as best shown in Fig. 2. The draw-bar D passes through an opening in the cross-bar C. Upon the headed end of the draw-bar D is placed the coupler-head E in such manner as to be  
 10 capable of movement longitudinally thereon. The coupler-head rests upon the cross-piece  $a'$  of the coupler-frame A. The coupler-head is made with a cavity having a concave back wall, preferably semi-elliptical in form, joined  
 15 with curved walls in the opening, which form a portion of the mantle of a cylinder, and which lead to and blend with the walls of the cavity. In conjunction with the link-cavity, and bisecting the concave or semi-elliptical back wall  
 20 thereof, is a cavity,  $a^2$ , for the reception of the inner end of the link for greater elevation of its outer end when a higher coupling than ordinary is desired. This cavity also serves for the reception, security, and operation of the  
 25 draw-bar, the said draw-bar projecting by concussion the link resting therein.

The upper side of the outer portion of the coupler-head is made convex and solid, in order that snow, ice, and other objectionable  
 30 matter may not accumulate thereon to interfere with the operation of the device.

It will be observed that the front portion of my coupler-head is made cylindrical, whereby the same may be shorter, while having a portion performing the function of a guide, the decrease in length effecting a decrease in weight and a saving in material, and enabling me to employ a shorter link. The under side of the  
 35 outer portion is provided with the usual coupling-pin hole, continued vertically in socket form into the upper side of the link cavity preferably, but may continue through, and a pin-seat provided in the front wall of its upper section to receive the pin inserted from above  
 40 for its elevation preparatory to a coupling.

The head of the draw-bar is constructed to fit nicely in the rear end of the socket  $a^2$  in the rear wall of the link-cavity. When the link is in place in the socket  $a^2$ , its end rests against  
 50 the head  $d$ , the rear wall,  $e$ , of the coupler-head preventing the withdrawal of the draw-bar therefrom rearward.

A hanger or block, F, which has a depending arm, is mounted upon the draw-bar D in  
 55 such manner as to slide thereon. The location of this block or hanger F is preferably next the rear end of the coupler-head, in order that the rearward movement of the coupler-head may cause a like movement of said hanger or  
 60 block. At the lower end of the depending arm of this block is fulcrumed and pivoted a lever,  $f$ , made with its rear end heavier than its front end, to which latter end the coupling-pin  $g$  is attached. At the rear portion of the  
 65 lever  $f$  is a pin or rod,  $h$ , which, when said lever is sufficiently elevated at that end, engages a notch or catch,  $i$ , in a rigid or spring

arm or arms depending from the coupler-frame or from the under side of the car, and preferably as indicated in full lines, Fig. 1, 70 and in broken lines, Fig. 2. Between the sliding hanger or block F and the pivoted cross-bar C, and between the nut  $d^2$  and the said pivoted cross-bar C are interposed springs G and G'. In Figs. 1 and 3 it will be noticed 75 that in place of the single spring G', as shown in Fig. 2, two springs are indicated. This construction is preferred, and will hereinafter be set forth fully. The spring G, or that upon the front end of the draw-bar, cushions the 80 inward thrust of the coupler-head E, and the spring G', or that upon the rear end of the coupler-head, cushions the outward thrust of the draw-bar, the thrust in both directions being received by the cross-bar C. Upon the 85 projecting journals  $c$  of the cross-bar C are secured the ends of rods, chains H, or their equivalents, which extend the entire length of the car, and are secured to a fellow coupler at the other end of the car in a similar man- 90 ner. Each of these rods H is preferably composed of two sections connected at the meeting ends with means for tightening or loosening. Two ways of constructing this connection between the couplers at the ends of a car 95 are indicated in Fig. 4; but it is obvious that this connection between the couplers may be made by other arrangement of the rods.

By connecting the couplers of each car as above described, it will be understood that 100 concussion and draft-strain upon one coupler will be transmitted through the rods to its fellow, or throughout the couplers and rods of an entire train, thus relieving the cars themselves or their frames of the violent shocks 105 and the tremendous strain to which they are usually subjected.

As a means for operating the lever supporting the coupling-pin to put the same in position for automatic coupling, I have devised 110 the following: A wheel or drum, I, is mounted in suitable bearing in the car-frame in such position as to be within convenient reach of a trainman or other attendant, and preferably so that one end of the journal or shaft will 115 project within the car and the other without, as indicated in Fig. 1 by the broken lines. The ends of the journal or shaft of this wheel or drum are squared to receive a cranked key for rotating the same. This cranked key  $l$  is 120 provided with feathers or splines  $l'$  to engage notches or their equivalents upon the car-frame, and thus, when the key is pushed inward upon the squared end of the shaft, prevent rotation of the wheel or drum. A chain 125 or cord,  $m$ , is secured at one end to the drum or wheel and at the other end to the rear end of the lever  $f$ , so that when the wheel is rotated in the proper direction the chain or cord will be wound up on the wheel and elevate 130 the lever  $f$  until the pin  $h$  engages the notch in the depending arm  $i$ , in which position the coupling-pin is withdrawn and the device is ready for automatic coupling. If it is de-



sired that the cars shall not couple upon their coming together, the cranked key for winding up the chain or cord can be pushed inward upon the end of the shaft until the feather  $l'$  engages a notch in the frame, which engagement will lock the wheel or drum from rotation, and consequently prevent the operation of the coupling-pin lever. The chain or cord  $m$  may be made to pass over one or more guide-pulleys, as indicated in Fig. 1. The wheel or drum for winding the chain or cord  $m$  may be located in suitable bearings on the under side of the car, as shown in Figs. 2 and 3, and may be operated from the side of the car in obvious manner.

Referring now to the construction shown in Fig. 3, which best shows the preferred arrangement of springs, the lever  $n$  indicates a cylindrical sleeve provided with a flange,  $n'$ , at one end. This sleeve fits and is adapted to slide upon the rear portion of the draw-bar D between the cross-bar C and the nut or equivalent abutment  $d^2$  upon the rear end. In addition to a heavy spring,  $G'$ , which in this instance is placed between the cross-bar C and the flange or collar  $n'$ , is interposed a lighter spring,  $o$ , between the nut  $d^2$  and the flange  $n'$ .

As shown in Fig. 3, the cross-bar C may be provided with a depending arm,  $C'$ , to form the support or hanger for the lever  $f$ . In this case the front end of the lever engages the coupling-pin by passing through an eye or hole in the end of the pin, and the inner or rear end of the draw-bar operates by its rearward movement the spring-hook arm or catch  $i$  to release the rear end of the lever  $f$  when the cars are to be automatically coupled.

The operation of the coupler shown in Figs. 1 and 2 is as follows: An approaching car, having its coupler-head provided with a link, abuts against the coupler-head E, having its pin and lever in the position indicated in Fig. 1 by full lines and in Fig. 2 by broken lines, causing said head to move backward upon the draw-bar D and push back the sliding hanger or block F, which carries the lever  $f$ . The backward movement of the lever  $f$  releases the pin or rod  $h$  from the notch of the arm or arms  $i$ , permitting the rear or inner end of said lever to drop by its own weight and elevating the outer end, and with it the coupling-pin, which passes through the link, entering the coupler-head, and thus couples the cars.

The operation in automatic coupling by the construction shown in Fig. 3 will be as follows: When the parts are in the position indicated, the entering link of the approaching car will drive rearward the draw-bar D, the end of which will push back the spring-arm  $i$ , thus releasing the heavier end of the lever  $f$ , which will drop by its own weight, elevating the outer or front end thereof, and with it the coupling-pin, thus coupling the cars, as before described.

It will be noticed that the pin  $d^3$  is of such

length that should the draw-bar be drawn sufficiently far forward it will abut against a beam, B, and act as a stop to prevent too great a compression of the spring  $G'$ .

As the coupler is pivoted on the journal  $c$ , it will be seen that the coupler-head can be moved vertically within the compass of a short arc, and that the coupler will thus yield and rise should the link of the approaching car strike too high in the mouth of the coupler-head, thereby insuring a coupling and preventing or lessening the liability of injury to the link or other parts.

By constructing the bearings for the journals of the cross-bar C as shown, vertical movement of said journals is permitted.

By constructing the link-cavity as hereinbefore described, a link placed therein will, by the formation or contour of the cavity alone, be held in position to enter the coupler-head of another coupler, thus avoiding the necessity of manually holding the link every time two cars are coupled, and the danger to life and limb consequent thereto and also pecuniary loss by breakage of parts are obviated.

I wish it to be clearly understood that I do not limit myself to the exact construction of parts shown and described, as they can be modified or changed without departing from the spirit of my invention.

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

1. In a car-coupler, the herein-described improved coupler-head having its cavity made with a semi-elliptical or other concave form, of the rear wall joined by cylindrically-circular walls blending therewith and forming the front opening to the said cavity, substantially as described, and for the purpose set forth.

2. In a car-coupler, the herein-described coupler-head having its cavity made with a semi-elliptical or concave rear wall joined by cylindrically-circular walls blending therewith and forming the front opening to the cavity, the said rear wall provided with an additional rearward-extending cavity for the reception of the inner end of the link to hold its outer end elevated for coupling with a higher car, substantially as set forth.

3. The coupler-head having its cavity made with a concave or semi-elliptical rear wall joined by circular walls blending therewith and forming the front opening of the cavity, the said rear wall provided with an additional rearward-extending cavity for the reception of the inner end of the link, combined with a draw-bar having its end constructed to fit in said rearward-extending cavity to permit the longitudinal movement of the coupler-head, substantially as and for the purpose set forth.

4. In a car-coupler, a coupler-head having a pin-hole entering its under side, passing vertically into its upper side, preferably not quite through, and with the contour of said upper side convex, a link-cavity having a con-



cave rear wall and reverse cylindrically-circular walls thereto, and link-rest and draw-bar cavity, all substantially as and for the purpose specified.

5 5. In a car-coupler, the pivoted cross-bar having the draw-bar passing therethrough, the said draw-bar carrying the coupler-head, constructed and operating substantially as set forth.

10 6. The combination, with the coupler-frame, of a cross-bar pivoted therein, a draw-bar supported by said cross-bar, and a coupler-head supported on the end of said draw-bar, substantially as described.

15 7. The combination, with the coupler-frame, of a cross-bar pivoted therein, a draw-bar supported by said cross-bar, a coupler-head supported on the end of said draw-bar, and springs interposed between the ends of the  
20 draw-bar and the cross-bar to cushion thrust in both directions, as set forth.

8. In a car-coupler, the combination, with a pivoted cross-bar and a draw-bar supported therein, of springs interposed between the  
25 ends of the draw-bar and the pivoted cross-bar, as set forth.

9. In a car-coupler, the combination, with a pivoted cross-bar and a draw-bar supported therein having a coupler-head connected with  
30 and adapted to slide upon the front end thereof, of a spring or springs interposed between the sliding coupler-head and the cross-bar, and a spring or springs interposed between the rear end of the draw-bar and the cross-bar by which  
35 it is supported, as set forth.

10. In a car-coupler, the combination of a pivoted cross-bar having a draw-bar passing therethrough, a coupler-head connected with and sliding longitudinally upon the front end,  
40 and a nut or other abutment upon the rear end of said draw-bar, and springs interposed between the sliding coupler-head and cross-bar and between the nut or other abutment and the cross-bar, substantially as and for the  
45 purpose set forth.

11. In a car-coupler, the combination, with a coupler-frame, of a pivoted cross-bar having a draw-bar passing therethrough, a coupler-head connected with and sliding longitudinally  
50 upon the front end, and a nut or other abutment upon the rear end of said draw-bar, and springs interposed between the sliding coupler-head and cross-bar and between the nut or other abutment and the cross-bar, substantially as and for the purpose set forth.  
55

12. In a car-coupler, the combination, with a coupler-frame, of a pivoted cross-bar having a draw-bar passing therethrough, a coupler-head connected with and sliding longitudinally  
60 upon the front end, and a nut or other abutment upon the rear end of said bar, and springs interposed between the sliding coupler-head and cross-bar and between the nut or other abutment and the cross-bar, substantially as  
65 and for the purpose set forth.

13. In a car-coupler, the combination, with a cross-bar supporting the sliding draw-bar

and coupler-head, of a rod or rods, chain or chains extending the entire length of the car and rigidly connecting with the cross-bar at  
70 the other end of the car, substantially as set forth.

14. In a car-coupler, the combination, with a cross-bar supporting the sliding draw-bar and coupler-head, of a rod or rods, chain or  
75 chains extending the entire length of the car and rigidly connected with the cross-bar at the other end of the car, and means for adjusting and tightening the said rods, as set forth.

15. In a car-coupler, a cross-bar having a  
80 draw-bar passing therethrough, a coupler-head connected with and sliding longitudinally upon the front end, and a nut or other abutment upon the rear end of said draw-bar, springs interposed between the sliding coup-  
85 ler-head and cross-bar and between the nut or other abutment and the cross-bar, combined with rods, bars, or chains connecting the couplers of the same car rigidly, as shown and described.  
90

16. A car-coupler comprising the coupler-frame, a cross-bar pivoted in said frame, a draw-bar passing through said cross-bar, a coupler-head connected with and sliding longitudinally upon the front end, and a nut or  
95 other abutment upon the rear end of said bar, springs interposed between the sliding coupler-head and cross-bar and between the nut or other abutment, and the cross-bar and rods or their described equivalents connected with  
100 the cross-bar and extending the entire length of the car, and connected with the coupler at the other end of the car in a similar manner, as set forth.

17. In a car-coupler, the combination, with  
105 the cross-bar, a draw-bar passing through said cross-bar, and a coupler-head connected with and sliding longitudinally upon the front or outer end of said draw-bar, of a sliding hanger supporting the link-operating lever, a spring  
110 arranged to press against said hanger to hold the lever in a locked position, and means to lock said lever, the said hanger arranged to be operated by the coupler-head upon the inner movement thereof on the draw-bar to re-  
115 lease the said locked lever to operate the coupling-pin, substantially in the manner and for the purpose set forth.

18. In a car-coupler, the coupler-frame, a cross-bar pivoted therein, a draw-bar passing  
120 through said cross-bar, a coupler-head connected with and sliding longitudinally upon the front or outer end of said draw-bar, a sliding hanger supporting the link-operating lever, a spring arranged to press against said  
125 hanger to hold the lever in locked position, and means to lock said lever, combined with means, substantially as described, for operating said lever to withdraw the coupling-pin from the link-cavity, all arranged and oper-  
130 ating substantially as set forth.

19. The cross-bar and the draw-bar supported to slide therein and having upon its outer end a coupler-head, combined with a



flanged sleeve supported upon the rear portion of the draw-rod, and springs supported between the cross-bar and the flanged sleeve and between the said sleeve and the end, substantially as described.

20. The cross-bar and the draw-bar supported to slide therein and having upon its outer end a spring or springs interposed between said coupler-head and the cross-bar, combined with a flanged sleeve supported upon the rear portion of the draw-bar, and a spring interposed between the collar and the cross-bar and between the cross-bar and the rear end of the draw-bar, all constructed and operating substantially as set forth.

21. In a car-coupler, the sliding draw-bar made with its rear end provided with a screw-thread, combined with a notched pin in a slot and a screw-nut bearing against said pin to hold the notch portion thereof against a wall of the slot, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES R. AVERY.

Witnesses:

R. G. DYRENFORTH,  
H. C. BRYAN.