No. 816,336. PATENTED MAR. 27, 1906.

F. KELLER & D. BOWERS.

CAR COUPLING.

APPLICATION FILED JULY 12, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

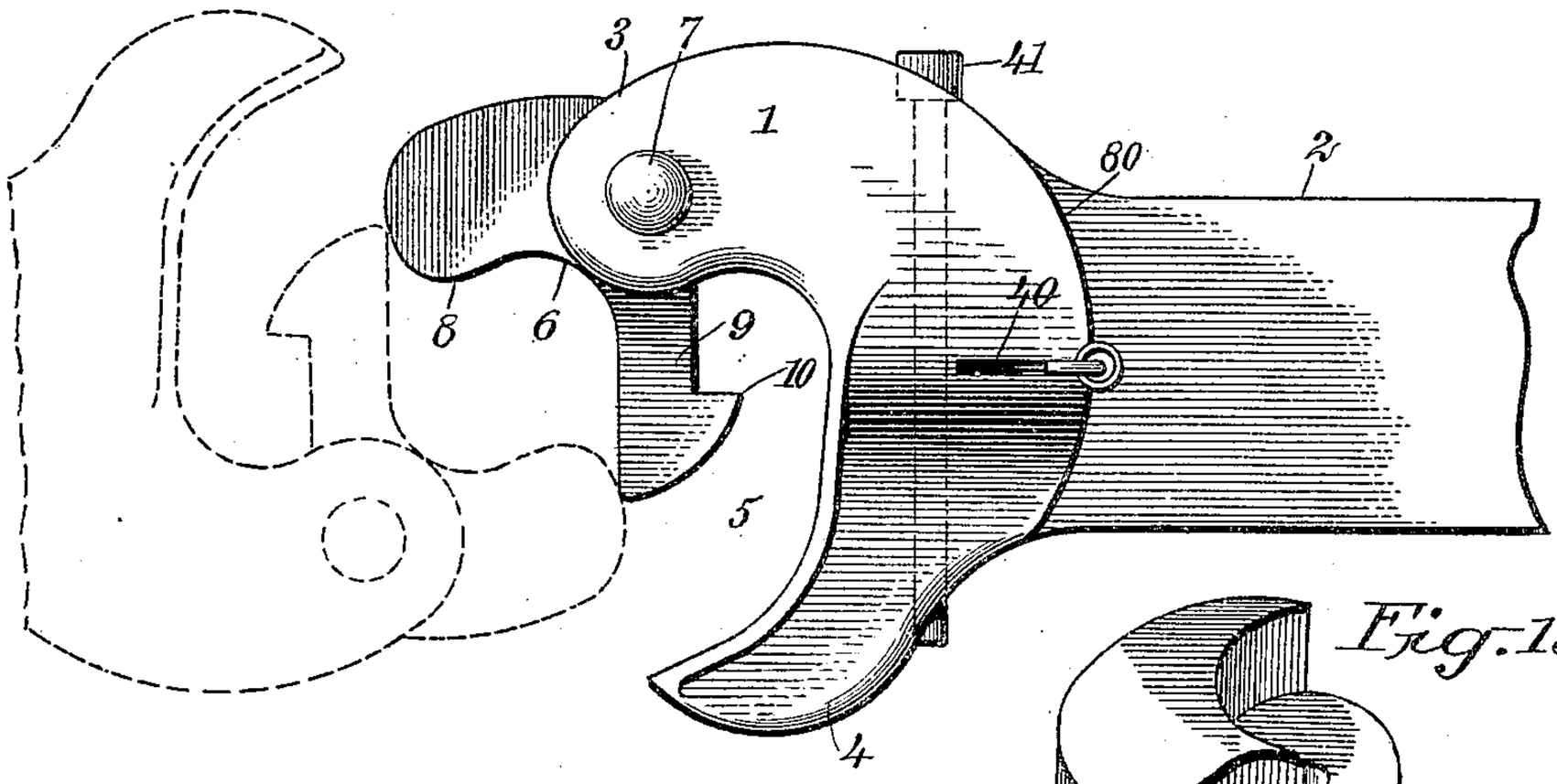


Fig. 13.

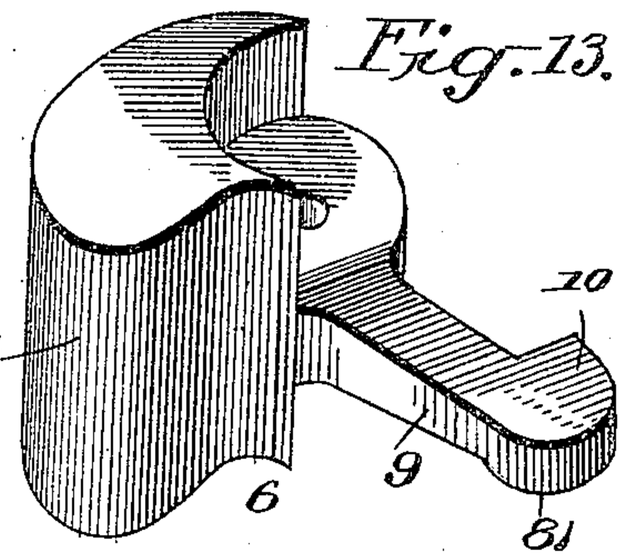


Fig. 2.

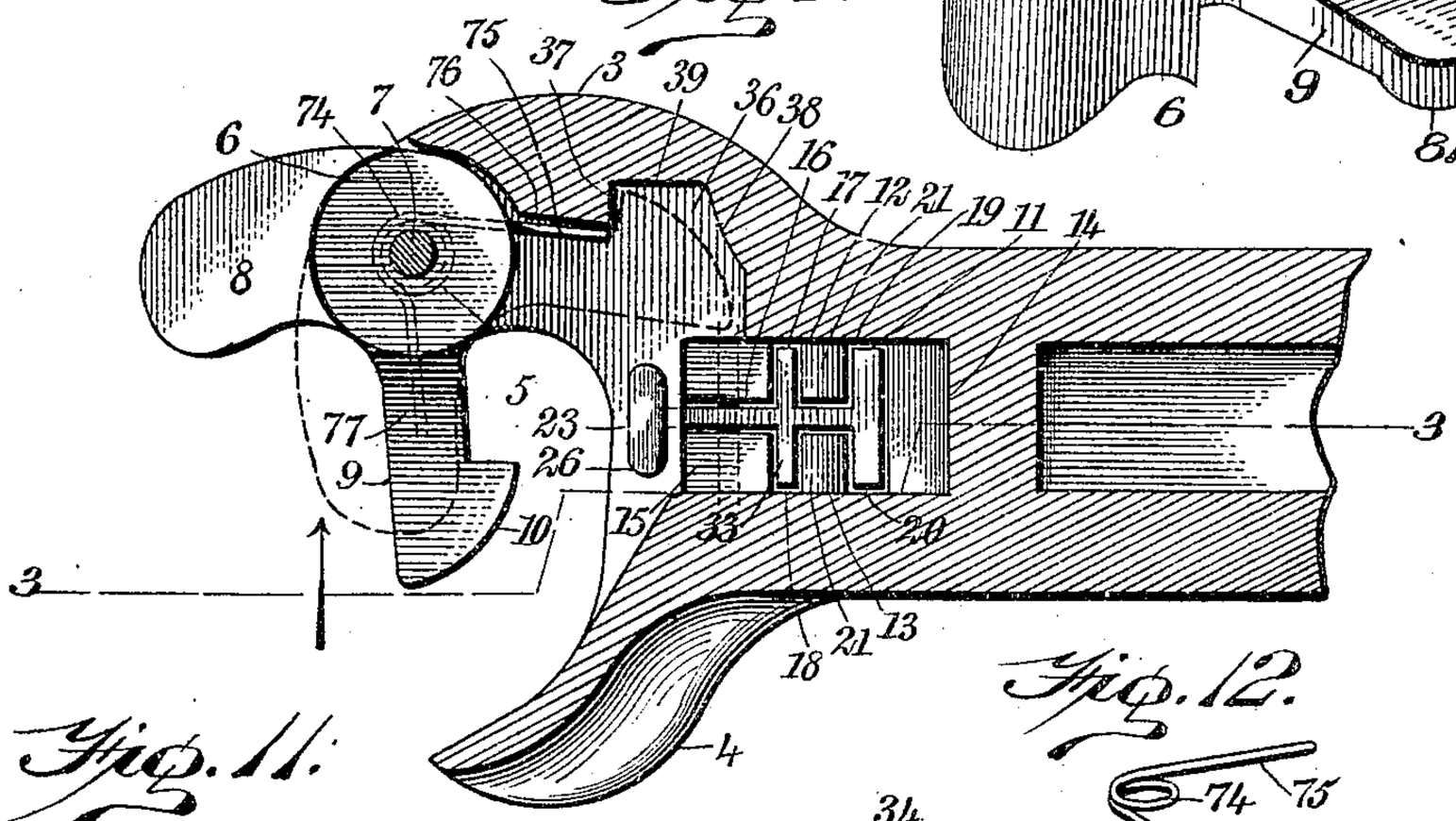


Fig. 11.

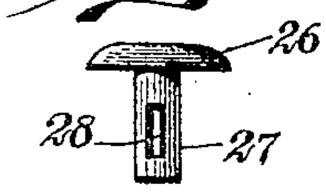


Fig. 12.

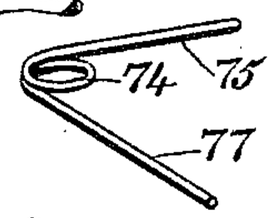
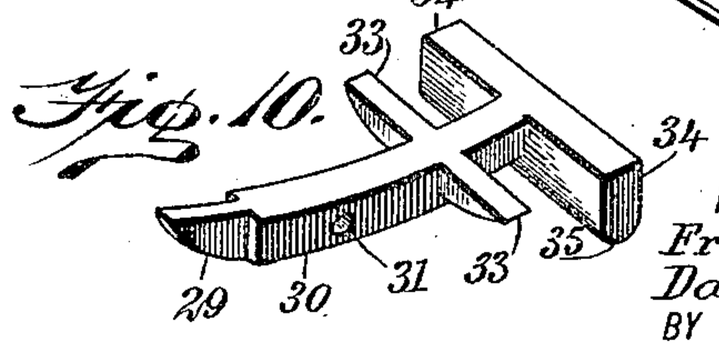


Fig. 10.



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2 SHEETS—SHEET 2.

Fig. 3.

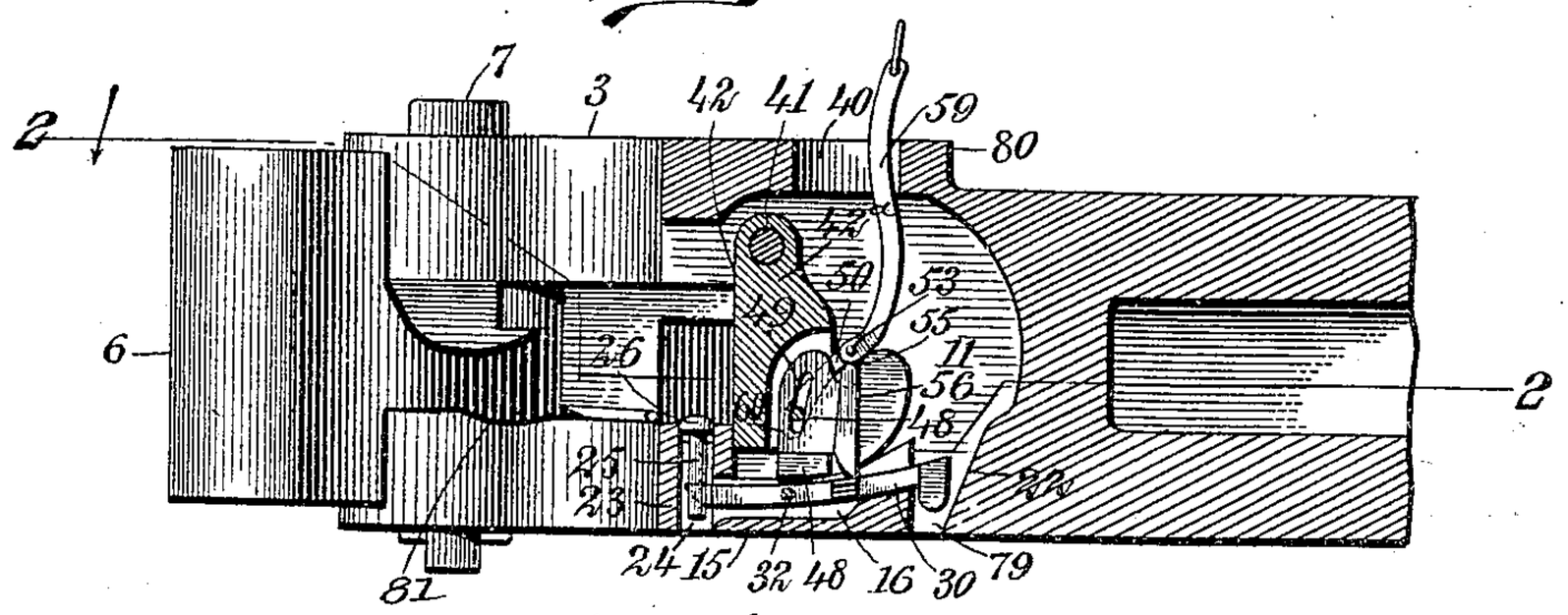


Fig. 4.

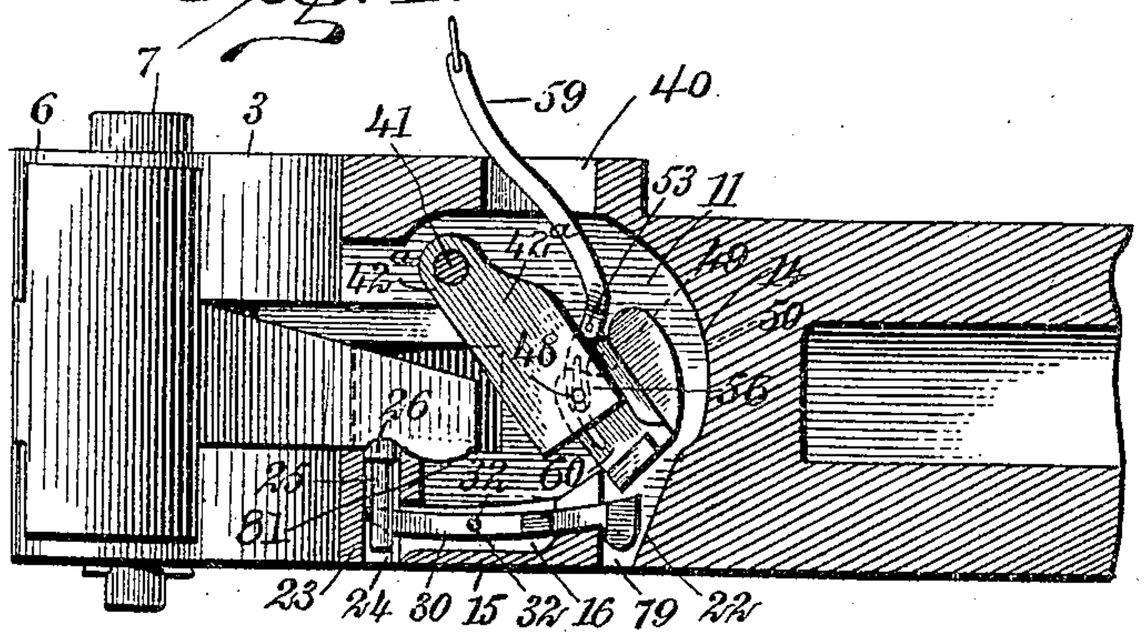


Fig. 5.

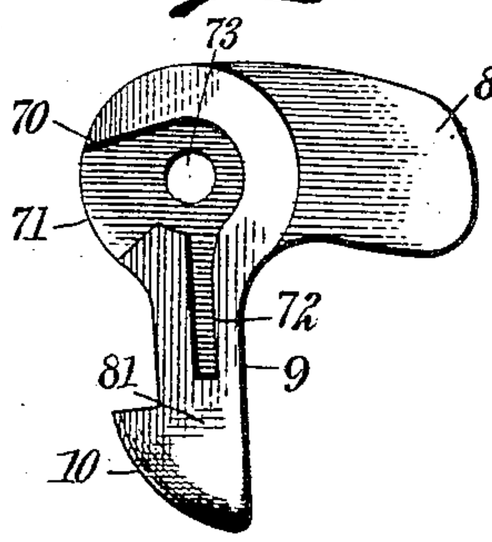


Fig. 6.

Fig. 7.

Fig. 8.

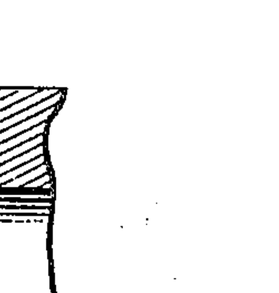
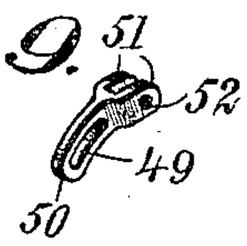


Fig. 9.



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CAR-COUPLING.

No. 816,336. Specification of Letters Patent. Patented March 27, 1906.

Application filed July 12, 1905. Serial No. 269,276.

To all whom it may concern:

Be it known that we, FREDERICK KELLER, a resident of Allentown, and DAVID BOWERS, a resident of Emaus, in the county of Lehigh and State of Pennsylvania, citizens of the United States, have invented a new and Improved Car-Coupling, of which the following is a full, clear, and exact description.

This invention relates to car-couplings; and it consists, substantially, in the details of construction and combinations of parts hereinafter more fully described, and pointed out in the claims.

The invention has reference more especially to car-couplings of the type illustrated and described in our former Letters Patent, No. 777,057, dated December 6, 1904, though applicable to other types; and one of the principal objects thereof is to provide a car-coupling of an embodiment overcoming numerous disadvantages frequently encountered in the use of many other structures heretofore devised for similar purposes.

A further object is to provide a structure of this kind which is simple in the construction and organization of the parts thereof, comparatively inexpensive to manufacture, and not liable to get out of order, besides being thoroughly effective and reliable in operation and possessing the capacity for long and repeated service.

The above and additional objects are attained by means substantially such as are illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of a car-coupling embodying our improvement, one of the coupling-heads being shown in dotted lines. Fig. 2 is a horizontal longitudinal sectional view taken on the line 2 2 of Fig. 3. Fig. 3 is a vertical longitudinal sectional view taken on the line 3 3 of Fig. 2. Fig. 4 is substantially a similar view to Fig. 3, showing the locking-block as secured in rearward position for enabling the connection between the two coupling-heads to be broken. Fig. 5 is a perspective view of the swinging knuckle of one of the coupling-heads, the same being taken from the under side thereof to more clearly indicate the construction. Fig. 6 is a perspective view of the locking-block. Fig. 7 is a view in perspective of that one of the elements of the locking devices in each coupling-head by which the locking-block of the head is held or secured in its inner or rearward position. Fig. 8 is a perspective view of that one of the elements of the locking devices in each head by which the locking-block is secured in its forward position normally both before and after a coupling has been effected between the two coupling-heads. Fig. 9 is a perspective view in detail of another one of the elements of the locking devices contained in each coupling-head. Fig. 10 is a view in perspective of the compound lever by which the engagement and release of each of the main elements of the locking device within the coupling-head is effected. Fig. 11 is a view in detail of the device in each coupling-head operated by the coupling-arm of the knuckle of the opposite head for enabling the secure coupling between two heads to be effected automatically, and Fig. 12 is a perspective view of the ejector-spring for the knuckle of the coupling-head.

Before proceeding with a more detailed description it may be stated that in the form of our improvements herein shown we employ a car-coupling comprising coupling-heads which are practically duplicates of each other in their embodiments and each of which is of special construction interiorly, by which to contain and permit of the working organization of the inner operative devices of the head. A specially-constructed locking-block is employed in each coupling-head, combined with which are special devices for securely holding the same in operative position both when the two heads are in coupled or uncoupled relation, further special devices being employed for setting and securing the locking-block in rearward position within the head to enable either one of the coupled cars to be disconnected from the other without the presence of a workman or other operator, as is now frequently necessary with former embodiments of car-couplings—as, for instance, when the cars are backed onto a side track for the purpose of leaving one of them thereon.

The action of the locking-block of each coupling-head is entirely automatic, as will hereinafter appear, and we still further provide for each coupling-head a specially-constructed knuckle which in the coupled relation of the two coupling-heads occupying

such relation to its own particular coupling-head as to entirely remove all strain from the fastening-pin therefor.

While we have shown our improvements in a certain preferred embodiment, it will be understood, of course, that we are not limited to the precise details thereof, since immaterial changes therein may be resorted to coming within the scope of our invention.

Inasmuch as the coupling-heads of our improvement are duplicates of each other, we have herein shown but one of them, which is deemed sufficient for all the purposes of the present application.

Reference being had to the drawings by the designating characters thereon, 1 represents the coupling-head, which may be of any preferred construction exteriorly and which is provided with a shank 2 of conventional form, the said head being provided at one side thereof with a forward divided horn or projection 3 and at the other side thereof with an undivided horn or projection 4, oppositely disposed with reference to the said horn or projection 3 and at such distance therefrom as to provide a throat or space 5, permitting of the proper swinging movement of the knuckle 6, which, as shown, is rotatably held within the space between the divisions of the said horn or projection 3 by means of a pivot-pin 7, as shown, the said knuckle being provided with a coupling-arm 8 and with a locking-arm 9, having at the end thereof a hook 10. The coupling-head 1 is hollowed out interiorly to form a chamber 11, the side walls of which are indicated at 12 and 13 and the rearward wall at 14. The upper surface of the base 15 of said chamber is preferably concaved or dished slightly from the open forward end of the chamber to said rearward wall 14 thereof, and said surface has formed therein a longitudinal channel or groove 16, intersecting with which at right angles thereto are forward laterally-disposed grooves 17 and 18, while also intersecting with said channel or groove 16, also on either side thereof and at right angles thereto, are the rearward laterally-disposed grooves 19 and 20. Intermediate of the said sets of laterally-disposed grooves the said upper surface of the base 15 of the chamber 11 in the coupling-head is formed with parallel abutments 21, disposed on opposite sides of the said longitudinal channel or groove 16, while the rearward wall 14 of the chamber 11 is preferably constructed of a projection 22. The forward end of the base 15 of the chamber 11 terminates or intersects with what may be termed a "sill" 23, extending transversely of the coupling-head and through which extends a vertically-disposed opening 24, in which is located a pin or trigger 25, (see Fig. 11,) having preferably a rounded oblong head 26 and formed in the stem 27 thereof with a vertically-disposed slot 28. Working loosely between the sides of said slot is a tongue 29, formed at the forward end of what I term a "compound lever" 30, having therethrough an opening 31 for the passage of a pin 32, supporting this lever between the sides or walls of the hereinbefore-mentioned longitudinal channel or groove 16, said lever being further provided at a suitable part of its length with laterally-disposed branches 33, preferably flat on their upper surfaces and curved on their lower surfaces, the said branches being received in the hereinbefore-mentioned laterally-disposed grooves 17 and 18, as shown. The inner or rearward end of the said compound lever 30 is also provided with laterally-disposed branches 34, also flat on their upper surfaces and preferably curved transversely on the lower surfaces thereof, as indicated at 35, these lateral branches 34 normally occupying a position rearwardly of the abutments 21 and the rearward faces thereof being normally somewhat separated from the hereinbefore-mentioned shoulder 22 at the rearward wall 14 of the chamber 11. The rearward lateral branches 34 of the said compound lever 30 are of considerably increased dimensions over the said lateral branches 33 of the lever, thus to give to the latter sufficient weight to normally hold both sets of branches, as well as the lever itself, in positions practically flush with the surrounding portions of the upper surfaces of the hereinbefore-mentioned base 15 of the chamber 11. In this way the upper end of the pin or trigger 25 is normally maintained somewhat elevated above the upper surface of the sill 23, so that when the two coupling-heads of the structure are brought into coupled relation with each other a portion of the under surface of the locking-arm of the knuckle of each coupling-head will move over and in contact with the head 26 of the pin or trigger 25 of the other coupling-head, thus to slightly elevate the rearward end of the compound lever 30 within the longitudinal groove 16 of each coupling-head, the sets of lateral branches 33 and 34 of this lever being of course slightly elevated within the sets of laterally-disposed grooves in which they work.

The purpose of the operation just described will be more fully explained farther on; but attention is directed at this point to the fact that the coupling-head is formed interiorly with a laterally-disposed recess 36, the inner end of which is in open communication with the forward open end of the chamber 11 and the forward and rearward walls of which are indicated at 37 and 38, respectively, the said forward wall being practically straight and the said rearward wall being curved slightly outward, as shown, and the two walls being intersected by a side wall 39. (See Fig. 2.) This recess is for the reception of the hook 10, formed at the end of the locking-arm 9 of the knuckle 6, whenever

the said knuckle is thrown inwardly in the act of coupling together two coupling-heads, and by the engagement of the inner face of said hook 10 with the said forward wall 37 of the recess 36 it is seen that a most rigid and secure fastening may be had when the two coupling-heads are united in the manner intended therefor.

The coupling-head 1 is formed therein with a longitudinal slot 40, which extends all the way through the top portion of the chamber 11 and opens into this chamber, while pivotally mounted on a pin 41, extending through an opening therefor formed transversely of the coupling-head, is a locking-block 42, which, as will be seen in Figs. 3, 4, and 6, is substantially rectangular in shape at its forward part, the forward face 42ª thereof being preferably flat and occupying substantially a vertical position in the normal position of the locking-block, while said block comprises two side members 43, separated from each other by a space 44, the upper intersecting portion 45 between said side members being formed with a notch 46. The side members 43 are formed therethrough with corresponding alining openings 47, through which extends (see Figs. 3 and 4) a rigidly-mounted rod 48, which also extends through a curved slot 49, formed in a link 50, having bifurcated ears 51, having corresponding openings 52 therein, through which passes a pivot-pin 53, (see Figs. 3 and 4,) on which in turn is loosely pivoted or swung a lug 54 of a yoke 55, having parallel locking-arms 56, which are preferably curved or rounded forwardly and thence rearwardly on their forward faces, as indicated at 57, and formed with comparatively sharp edges 58. Also loosely mounted on the said pivot-pin 53 is the lower forked end of a curved lever 59, extending upwardly through the hereinbefore-mentioned slot 40 and having movement therein both forwardly and rearwardly. Fitting and working within the space between the inner surfaces of the said side members 43 of the locking-block 42 are the separated parallel members 60 of an auxiliary locking-block 61, the base 62 of which connects the lower ends of the separated members 60 and extensions 63 of which are lateral to the said members. (See Fig. 7.) The rearward portion of the body 64 of this auxiliary block 61 is formed on opposite sides thereof with cheeks 65, the rearward edges of which are curved or rounded downwardly and forwardly, while the forward faces 66 thereof are preferably straight, and in the normal position of both the main locking-block 42 and the auxiliary locking-block 61 these forward faces occupy substantially vertical planes. The said body 64 of the auxiliary locking-block is embraced by the members 56 of the yoke 55, it being noted that the cheek-pieces 65 of this block are sufficiently higher than the upper surface of said body, as indicated at 68, to form between them a recess in which the lower forked end of the lever 59 is ordinarily received when the parts are in the position indicated in Fig. 4. Also when the parts are in this position the forward edge of the base 62 of the connecting members 60 of the body 64 of the auxiliary block is in locking engagement with the rearward edges of the hereinbefore-mentioned abutments 21, and thus the main locking-bar and the auxiliary locking-bar are temporarily maintained in inoperative relation, this position of the said main and auxiliary locking-blocks being derived by simply exerting a slight upward lift to the said lever 59. When the parts are in the positions just described, it is apparent that the coupling-head of one car may be readily disconnected from the coupling-head of another car, and when such disconnection is effected it will also be apparent that the locking-arm of the knuckle of each coupling-head will so operate the pin or trigger 25 of the coupling-head as to depress the forward end of the compound lever 30 and elevate the rearward end thereof, thereby releasing the locking engagement of the forward edge of the base of the auxiliary block and permit the two said blocks to swing forwardly and downwardly and occupy the first or original positions thereof (indicated in Fig. 3) in readiness for a coupling to be effected any time between the two coupling-heads. While the parts are in the position indicated in Fig. 3 the lower edges of the side members 43 of the main locking-block 41 will practically rest upon the upper surfaces of the lateral extensions 63 of the base 62 of the auxiliary locking-block, while the straight edges 58 of the lower ends of the members 56 of the yoke 55 will be in locking engagement with the forward surfaces of the said abutments 21, the rearward sides of said members 57 of this yoke being also practically engaging with the forward faces 66 of the cheeks 65 of the auxiliary locking-block. In this position of the inner parts of the structure absolutely no separation of the operative devices can possibly take place due to strain, jar, or other causes, since it will appear that the main locking-bar can only be carried from its normal or vertical position by first causing the pin or trigger 25 to be depressed or lowered by the locking-arm of the knuckle, as already explained.

As a means of insuring the effective operation of the knuckle 6 of the coupling-head we provide the under side thereof with a recess 70, having a throat 71, and leading from which and extending longitudinally of the under side of the locking-arm 9 is a groove 72. Seated within said recess 70 and surrounding the hole 73 in the knuckle through which extends the fastening-pin 7 is the spiral member 74 of a spring, having a member

75 extending within the coupling-head and bearing against an inner surface portion 76 thereof, and also another member 77 extending within the groove 72 and exerting its tension against the sides thereof. In this way the said knuckle is caused to operate positively at all times, as is apparent, it being noted that due to the special relation had between the locking-arm of the knuckle and the inner structure of the part of the coupling-head coöperating therewith there is practically no strain imposed upon the fastening-pin 7 during the time the coupling-head is in coupled relation with the head coöperating therewith.

Preferably we provide the under side of the coupling-head with an opening 79, leading from the interior of the chamber 11 of the head and through which any moisture or dirt gathering within the said chamber may escape. The upper surface of the coupling-head is preferably raised with respect to the upper surface of the shank thereof, as indicated at 80, (see Fig. 1,) this being a preferred construction with most of the car-couplings at present in use.

From the foregoing it is thought that the construction and operation of our improved car-coupling will be thoroughly understood, as will also the advantages thereof as compared with many similar structures hitherto devised and frequently employed in maximum of strength derived therefrom, combined with the lightness and easy working of the several parts and the compactness of organization thereof.

It may be added that in the coupled relation of the two coupling-heads the hooked end of the locking-arm 9 of each head is closely locked or confined in the recess 36 of the head by the adjacent side of the main locking-block, thus preventing lateral displacement of the knuckle and rigidly preserving the coupling-arm of the knuckle of each coupling-head in the desired relation to that of the other. To insure the proper depression of the pin or trigger 25 by the passing engagement of the locking-arm on the knuckle therewith, the under surface of said arm is preferably provided with a hump or protuberance 81, as indicated in Fig. 5, for instance, it being noted that the certain release of the main locking-block 42 takes place before the hooked end of the locking-arm strikes or engages therewith. The sill 23 serves as a stop for preventing the lower end of the said main locking-block from swinging too far inwardly, as will be apparent. When the parts are in the position shown in Fig. 4, the lever 59 assumes the position shown.

The spring 74 serves to automatically eject the knuckle at the proper time, as will be apparent, thereby obviating the necessity for pulling the knuckle out by hand. It maintains the knuckle at the full limit of its open position and can be removed and replaced at any time.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber, and normally occupying a forward position therein by gravity, means for locking the block in this position, a movable knuckle having a locking-arm and means for releasing the locking-block on the inward movement of the locking-arm to permit entrance of the latter within the chamber and engagement thereof by the locking-block when the latter again assumes its forward position, said first-named means embodying an auxiliary locking-block connected to but having movement independently of the main locking-block, and an operating-lever having movable connection with said auxiliary locking-block.

2. A coupling comprising a coupling-head having an inner chamber therein and formed at one side of the forward open end of the chamber with a communicating recess, a locking-block mounted to swing back and forth in the chamber and normally occupying a forward position within the entrance to said recess by gravity, means for securing the block in this position, a locking-arm having a hook at its end, and means for releasing the locking-block in the inward movement of the locking-arm to permit entrance of the latter within the chamber and the confinement of said hook within said recess by the locking-block when it assumes its forward position, the said first-named means embodying an auxiliary locking-block connected to but having movement independently of the main locking-block, and an operating-lever having movable connection with said auxiliary locking-block.

3. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber and normally occupying a forward position therein by gravity, means for locking the block in this position, a movable knuckle having a locking-arm, and means for releasing the locking-block on the inward movement of the locking-arm to permit entrance of the latter within the chamber and the engagement thereof by the locking-block when the latter again assumes its forward position, said first-named means embodying an abutment and engaging device therefor, an auxiliary locking-block connected to but having movement independently of the main locking-block, and an operating-lever having movable connection with said auxiliary locking-block.

4. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber, and normally occupying a forward position therein by gravity, means for locking the block in this position, a movable knuckle having a locking-arm, and means for releasing the locking-block on the inward movement of the locking-arm, to permit entrance of the latter within the chamber and the engagement thereof by the locking-block when the latter again assumes its forward position, said first-named means embodying duplicate abutments on the base of the chamber, and engaging devices therefor.

5. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a main locking-block mounted to swing back and forth in the chamber and normally occupying a forward position therein by gravity, means for locking the block in this position, a movable knuckle having a locking-arm and means for releasing the locking-block on the inward movement of the locking-arm to permit entrance of the latter within the chamber and the engagement thereof by the locking-block when the latter again assumes its forward position, the forward end of the chamber being provided with a sill acting as a stop to limit the forward movement of the locking-block, and said first-named means embodying an auxiliary locking-block connected to but having movement independently of the main locking-block, and an operating-lever having movable connection with said auxiliary locking-block.

6. A coupling comprising a coupling-head having an inner chamber therein, and formed at one side of the forward open end of the chamber with a communicating recess, a main locking-block mounted to swing back and forth in the chamber and normally occupying a forward position within the entrance to said recess by gravity, means for securing the block in this position, a locking-arm having a hook at its end, and means for releasing the locking-block on the inward movement of the locking-arm to permit entrance of the latter within the chamber and the confinement of said hook within said recess by the locking-block when it assumes its forward position, the forward end of the chamber being provided with a sill acting as a stop to limit the forward movement of the locking-block and said first-named means embodying an auxiliary locking-block connected to but having movement independently of the main locking-block, and an operating-lever having movable connection with said auxiliary locking-block.

7. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber, and normally occupying a forward position therein by gravity, means for locking the block in this position, a movable knuckle having a locking-arm, and means for releasing the locking-block on the inward movement of the locking-arm, to permit entrance of the latter within the chamber and the engagement thereof by the locking-block when the latter again assumes its forward position, said second-named means embodying a pivoted lever and an operating-trigger therefor, actuated both on the inward and outward movements of the locking-arm.

8. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber, and normally occupying a forward position therein by gravity, means for locking the block in this position, a movable knuckle having a locking-arm, and means for releasing the locking-block on the inward movement of the locking-arm, to permit entrance of the latter within the chamber and the engagement thereof by the locking-block when the latter again assumes its forward position, said second-named means embodying a pivoted lever and an operating-trigger therefor, actuated both on the inward and outward movements of the locking-arm, the trigger having an oblong-shaped head having a rounded surface.

9. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber, and normally occupying a forward position therein by gravity, means for locking the block in this position, a movable knuckle having a locking-arm, and means for releasing the locking-block on the inward movement of the locking-arm, to permit entrance of the latter within the chamber and the engagement thereof by the locking-block when the latter again assumes its forward position, said second-named means embodying a pivoted lever and an operating-trigger therefor, actuated both on the inward and outward movements of the locking-arm, the trigger having an oblong-shaped head having a rounded surface, the locking-arm having on the under surface thereof a protuberance for effecting movable contact with the trigger.

10. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber, and normally occupying a forward position therein by gravity, means for locking the block in this position, a movable knuckle having a locking-arm, and means for releasing the locking-block on the inward movement of the locking-arm, to permit entrance of the latter within the chamber and the en-

gagement thereof by the locking-block when the latter again assumes its forward position, said locking-block being constructed of duplicate side members separated by a space and connected by a pin and said first-named means embodying abutments on the base of the chamber, a link working on said pin and a yoke having pivotal connection with the link and normally engaging with said abutments.

11. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber, and normally occupying a forward position therein by gravity, means for locking the block in this position, a movable knuckle having a locking-arm, and means for releasing the locking-block on the inward movement of the locking-arm, to permit entrance of the latter within the chamber and the engagement thereof by the locking-block when the latter again assumes its forward position, said locking-block being constructed of duplicate side members separated by a space and connected by a pin and said first-named means embodying abutments on the base of the chamber, a link working on said pin, a yoke having pivotal connection with the link and normally engaging with said abutments, and said second-named means embodying a pivoted lever having branches coöperating with said yoke and an operating-trigger therefor actuated by the locking-arm when moved in either direction.

12. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber and normally occupying forward position therein by gravity, means for carrying said main locking-block rearwardly within the chamber, and means for catching and retaining the same in this position, embodying an abutment within the chamber, said first-named means embodying an auxiliary locking-block connected to but having movement independently of the main locking-block and an operating-lever having movable connection with said auxiliary locking-block.

13. A coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a locking-block mounted to swing back and forth in the chamber and normally occupying forward position therein by gravity, means for carrying said main locking-block rearwardly within the chamber, and means for catching and retaining the same in this position, said locking-block being constructed with duplicate side members separated by a space and connected by a pin, and said first-named means embodying an auxiliary block in said space and having separated members formed with corresponding curved slots through which said pin extends, said members being connected by a base having lateral extensions, a link working on the pin, and an operating-lever working through a slot in the head and having movable connection with the link.

14. A car-coupling comprising a coupling-head formed with an inner chamber, the forward end of which is open, a main locking-block to swing back and forth in the chamber and normally occupying a forward position therein by gravity, the base of the chamber having abutments thereon, means for locking the block in its forward position embodying a yoke having pivotal support and the members of which are normally in engagement with the forward edges of said abutments, a movable knuckle having a locking-arm, means for releasing the locking-block on the inward movement of the locking-arm embodying a pivoted lever having lateral branches coöperating with said yoke and provided with an actuating-trigger operated on the inward and outward movements of the locking-arm, said lever having at the rearward extremity thereof weighted lateral extremities normally engaging the rearward edges of the abutments, and means for catching and retaining the main locking-block in the position within the chamber embodying an auxiliary locking-block having movable relation to said main locking-block, a link having movable relation to said main block, and an operating-lever extending through a slot in the head and having pivotal connection with both the said block and link, the auxiliary block being provided rearwardly thereof at the sides with cheeks, the forward faces of which normally engage with the rearward faces of the operative members of the yoke.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

FREDERICK KELLER.
DAVID BOWERS.

Witnesses:
PHAON C. WEAVER,
CHAS. H. JOBST.