(No Model.)

A. G. LEONARD.

DEVICE FOR UNITING CARS.

No. 565,547. Patented Aug. 11, 1896.

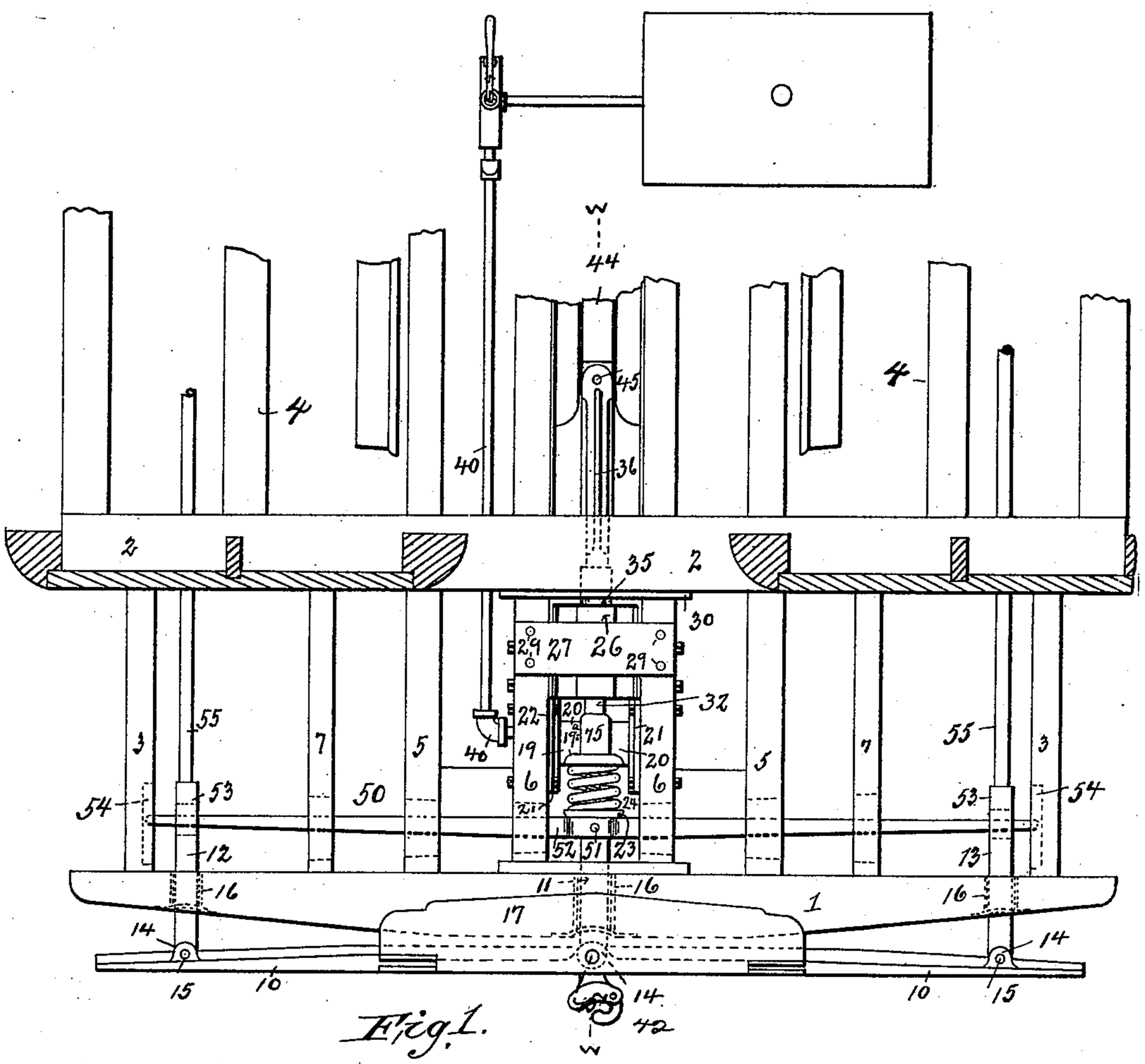

Fig. 1.

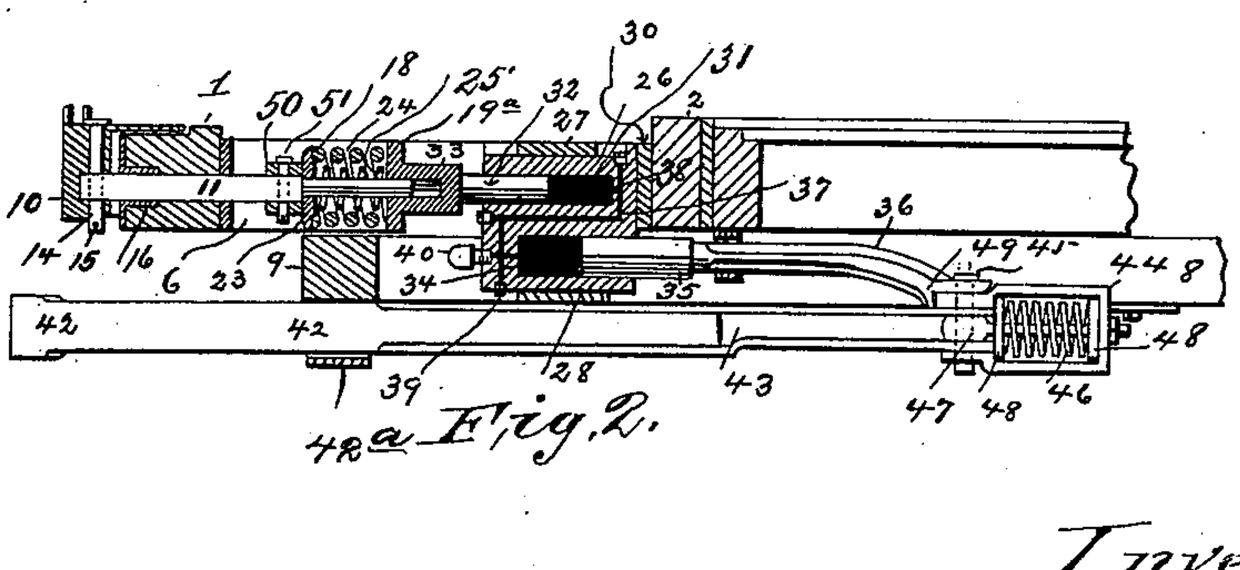

Fig. 2.

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UNITED STATES PATENT OFFICE.

ARTHUR G. LEONARD, OF NEW YORK, N. Y.

DEVICE FOR UNITING CARS.

SPECIFICATION forming part of Letters Patent No. 565,547, dated August 11, 1896.

Application filed March 9, 1894. Serial No. 503,017. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR G. LEONARD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have made certain new and useful Improvements in Devices for Uniting Cars, of which the following is a specification.

My invention pertains to means for uniting cars for steam or other railroads, and it relates more particularly to the class of car-uniting mechanism shown in an application for Letters Patent of the United States which I filed on July 10, 1893, Serial No. 480,014, the present application being substantially a division of said application, wherein the features of the invention hereinafter set forth and claimed were shown and described but not specifically claimed.

My invention has for its object to increase the safety of railway-trains by more firmly uniting the cars together than has been practised before my invention for uniting cars, by which means the car-bodies are held in their proper relative positions and the amount of movement of one car with relation to an adjoining car is greatly reduced, the effect being to cause the cars to retain a substantially normal level under the varying conditions of travel.

The invention consists in a platform carrying a friction-plate at its end, said friction-plate being pivotally connected near its center to a stem that is acted upon by a spring and an abutment capable of compressing said spring and holding it under compression, with an equalizing lever or bar connected with said stem and extending substantially parallel with said friction-plate, and with connections between the outer portions of said friction-plate and said equalizing-bar, whereby the swinging movement of the friction-plate at its ends will be transmitted to said stem, so that an equal pressure will be maintained on said friction-plate throughout its several movements. In conjunction with with said friction-plate and its stem a suitable coupling-hook is used that is arranged to be acted upon and act on the abutment above mentioned, the arrangement being such that a forward or rearward movement of the stem or the coupling-hook will cause a corresponding movement of the other part, whereby the desired amount of pressure between the abutting ends of cars will be maintained at all times.

The invention also consists in the novel details of improvement and the combinations of parts that will be more fully set forth, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a plan of a detached portion of one end of a car, showing the application of my invention; and Fig. 2 is a central longitudinal elevation on the line *w w* in Fig. 1, and on the same scale as that figure.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the several views of the drawings, the forward end of the platform is defined by the buffer-beam 1, which in this case, as in the usual practise, is as wide as the car, and at a certain distance to the rear of the buffer-beam lies the front or cross door-sill 2. Between the door-sill at both ends of the car extend longitudinal outer sills 3, and between the cross or door sills at each end of the car extend the inner longitudinal sills 4 5 6, the sills 5 6 extending past the door or cross sills to the buffer-beam, to which it is secured in the usual way, and which form part of the platform-body.

Between the door-sill 2 and the buffer-beam extends the step-sill 7, which defines the width of the platform proper. Below the sills 5 6 run additional sills 8, which lie directly below the sills 5 6. The forward ends of each of these sills abut against or are affixed to a cross-timber 9. As the sills 8 are subjected primarily to the first strain of pulling the car, as well as the strain of compressing the draw-bar springs, they may be braced longitudinally by tie-bolts passing from the cross-timber 9 to the door-sill 2, or extending to the other end of the car to a like cross-timber, as may be desired, or as more particularly set forth in my above-mentioned application, and for a more particular and detailed description of the platform and connected parts which I prefer to use with my improved car-uniting structure I refer to my said above-mentioned application.

10 indicates the friction or face plate, which is illustrated as adapted for a vestibuled car, but they may be of any shape desired so long as they are of sufficient length and have sufficient contact-surface to enable them to per-

form the work which is required of them, the friction-plate being preferably longer than the wheel-gage. As shown in Fig. 1, the friction-plate 10 is carried by three stems 11 12 13, to which stems said plate 10 is pivotally connected. Said stems may be pivotally connected with said friction-plate 10 in any desired manner, but I have shown said plate as provided with side lugs 14, that receive pins 15, that also pass through said stems. The stems 11 12 13 pass through the buffer-beam 1, or rather through suitable openings formed therein. The apertures in said beam are preferably provided with a guide-casting 16, through which said stems pass. At 17 is shown a sill-plate that lies partially over the buffer-beam 1, and which is preferably constructed as shown, the friction-plate 10 depending therefrom and extending from opposite sides thereof.

The rear end of the stem 11 is rounded and passes through a spring-plate 18 forward of a cross-head 19, provided at the side with ears 20, which work in the guideways 21, formed on the plate 22, secured in place within the sills 6. Against the shoulder formed at the intersection of the rounded and squared portion of the stem 11 lies a spring-plate 23, cast to receive one end of a spiral spring 24, which encircles the rounded portion of the stem 11, and within the spring 24 and about the stem 11 lies an auxiliary spring 25. Both springs abut against the annular part 19[a] on the cross-head 19. A duplex hydraulic cylinder 26 is supported and fixed in position between the sills 6 and 8 by means of the straps or cross-bars 27 28 above and below the cylinders, being united together by bolts 29, which serve also to hold the sills 6 and 8 together. The rear of the cylinder 26 abuts against a plate 30, which in turn lies up against the cross-sill 2. The upper portion of the cylinder 26 is provided with a cylindrical chamber 31, in which is adapted to work a suitable ram or plunger 32, the forward end of which abuts against the barrel 33 of the cross-head 19. Below the chamber 31 is another chamber 34, in which is adapted to work a suitable ram or plunger 35, the rear end of the plunger engaging with the forward end of a push-bar 36. The chamber 31 and the plunger 32 are both smaller in diameter than the chamber 34 and plunger 35, but this need not be so of necessity, and both plungers may be provided with suitable packing if desired, although the form shown is preferred.

The chambers 31 and 34 have a communicating passage 37 formed in the cylinder 26, from which lead ports 38 39 into the chambers 31 34, respectively, and opposite the port 39 is tapped a hole into which a pipe 40 enters, suitable plugs being used for closing up the ends of the channel 37. This simply illustrates the method of making the channels and ports in the cylinder, they having been drilled instead of being formed by casting. Said cylinder may be further supported and the other parts constructed as particularly set forth in my above-mentioned application, if desired. The pipe 40 leads to a force-pump supported in any desired position (preferably within the car) and of any desired construction and connected with a suitable tank containing water or other suitable fluid, and for a full description of a suitable arrangement for this purpose I refer to my application above mentioned.

At 42 is the draw-bar supported in any desirable way, as by a bracket 42[a], carried by the beam 9, the rear end of which in the instance shown is constructed of two plates 43, arranged to move in a suitable guideway and against the action of springs in any desirable manner, or preferably as follows: A housing 44, that is pivotally connected by a pin 45 with the push-bar 36 and draw-bar 42, contains springs 46, that surround a rod 47, pivoted to the pin 45, followers of plates 48 acting against said springs and against abutments carried by the car-sills, whereby the springs will be compressed as the draw-bar is drawn forward or moved rearward. The push-bar 36 has a toe or projection 49, that bears against the housing 44 to reduce strain on the pin 45. For a more particular description of the above-mentioned parts I refer to my said application above mentioned.

At 50 is an equalizing-bar that is pivotally secured to the stem 11 by a pin 51, the equalizing-bar having an eye 52, through which said stem and pin pass, the spring-plate 23 abutting directly against the back of the eye. The equalizing-lever 50 extends through apertures formed in the sills 5 6 7, and passes at its extreme ends through apertures 53 in the stems 12 13 and into recesses 54 in the sills 3, as shown in Fig. 1. The stems 12 13 have extensions 55, that pass through the sill 2. With this arrangement the forward or rearward movement of the stem 11 will communicate equal corresponding motion to the face-plate 10 and equalizing-lever 50, and the oscillations of the face-plate 10 on its pivot-pin 15 will communicate corresponding motion to the equalizing-lever 50 on its pivot-pin 51.

The operation of my improvements is as follows: When the springs about the stem 11 and at the end of the draw-bar are not under compression and the cars uncoupled, the friction-plate 10 extends out where the movement of uncoupling had left it, and the draw-bar, with its coupling-hook, has been moved to its position of rest by its springs—that is, the face of the plate may have been moved away from the buffer-beam forwardly, and the face of the coupling-hook will occupy a plane vertically forward of the friction-plate. These positions of the face-plate and the draw-bar are the normal positions, that is, at the time their springs are not compressed. When two cars are brought together by coupling in the structures in use at the present time, both the coupler and buffer-springs receive the shock, whereas in my construction

the coupling-hooks and then the springs of the coupler receive and absorb the shock due to coupling without affecting the friction-plate springs. After the cars are coupled the force-pump is operated, which will move a column of water through the pipe 40 and into the channel 37 of the duplex cylinder, forcing out the plungers 32 35, the plunger 35 moving the push-rod 36 and housing 44 against the forward follower-plate 48, which will first compress the nest of springs within the housing (the coupling of the cars not having permanently compressed the springs) and move the opposite follower 48 against the rear abutment. At the same time the plunger 32, which bears against the barrel 33 of the cross-head 19, bringing the cross-head against the nest of springs 24 25, moving the stem 11 forward, forcing out the friction-plate 10, which, when it meets the opposing friction-plate on the next car, enables the springs to be compressed, the conjoint operation being such as to cause the friction-plate of one car to push the opposing car away from it, the rearward movement of the draw-bar by the simultaneous movement of the plunger 35 and its connections to the draw-bar meanwhile pulling the opposing car toward it, which will firmly couple and unite both of the guides together and frictionally contact the friction-plates throughout their area of exposed surface. When the face-plate 10 is thus moved outward by the liquid in the cylinder forcing out the stem 11, the stems 12 13 at the ends of said face-plate and the equalizing lever or bar 50 will be correspondingly moved, and the connection of the equalizing bar or lever with said stem is such that when on a curve or when the friction-plate assumes a position radial to the curve the ends of the equalizing bar or lever will strike the ends of the slots in the side stems 12 13, enabling the plunger 32, through the springs 24 25 and the connection of the equalizing-bar with the ends of face-plate, to keep both ends of the face-plate in contact with the opposing face-plate of the next car, thus distributing the power applied at the center to the ends of the face-plate. When the water or fluid in the duplex cylinder is under compression, an inward movement of the face-plate will cause the fluid to flow and thus press on the plunger 35, causing the latter to retract the draw-bar, and thus the relative positions of the face-plate and the draw-bar will be permanently retained, the springs 24 25 remaining under compression so long as the fluid in the duplex is under pressure; but it will be understood that the springs 24 25 remain under tension, and can have proper individual movement, as the fluid in the cylinder acts as a rigid abutment behind said spring, holding them normally under the initial compression.

The peculiar advantages of my improvement are that the abutting ends of two cars are securely united, that proper swinging motion of the cars is permitted, and that at all times the desired degree of pressure between the cars is maintained, and that pressure is applied to the face-plate at its end as well as at its center in whichever position it may assume on account of the movement of one car relatively to the other.

Having now described my invention, what I claim is—

1. In a car-uniting device, the combination of a buffer-beam, with a friction-plate extended therefrom, a stem pivotally secured to and extending from the center of said plate, an equalizing-lever pivotally carried by said stem, a spring at the rear of said lever, a cylinder and a plunger to bear on said spring, a hydraulic device in connection with the cylinder to move said plunger, and stems pivotally secured at or near the ends of said plate, and connected with said lever, substantially as described.

2. In a car-uniting device, the combination of a buffer-beam, with a friction-plate extended along the outer side thereof, a stem pivotally connected with the central portion of said plate and passing through said beam, means for advancing said stem and plate and holding them so advanced, an equalizing-lever having an eye through which said stem projects, a pin passing through said stem and eye, stems pivotally connected with said plate at or near its ends, and a longitudinal slot in said stems, the ends of the equalizing-lever passing through said slot, substantially as described.

3. In a car-uniting device, the combination of a buffer-beam, with a friction-plate extended along the same, a stem pivotally connected with said plate, a resilient element connected with said stem, a hydraulic cylinder having a ram to act against said resilient element, a draw-bar, and means connecting it with said hydraulic cylinder, means for creating pressure on the fluid in said cylinder, an equalizing-lever connected with said stem, and connections between said lever and friction-plate at or near their ends, substantially as described.

4. In a car-uniting device, the combination of the buffer-beam and the longitudinal sills 5, 6, 7, with a friction-plate extended from the buffer-beam, a stem secured centrally to said plate, stems secured at or near the ends of said plate, a transverse equalizing-lever on said central stem extending through slots in said sills, the end stems being movably connected to the ends of said lever, a spring to the rear of the lever, and means for advancing the stem and compressing the spring, substantially as described.

Signed at New York, in the county of New York and State of New York, this 6th day of March, 1894.

ARTHUR G. LEONARD.

Witnesses:
HENRY B. DWYER,
HENRY B. WHIPPLE.