

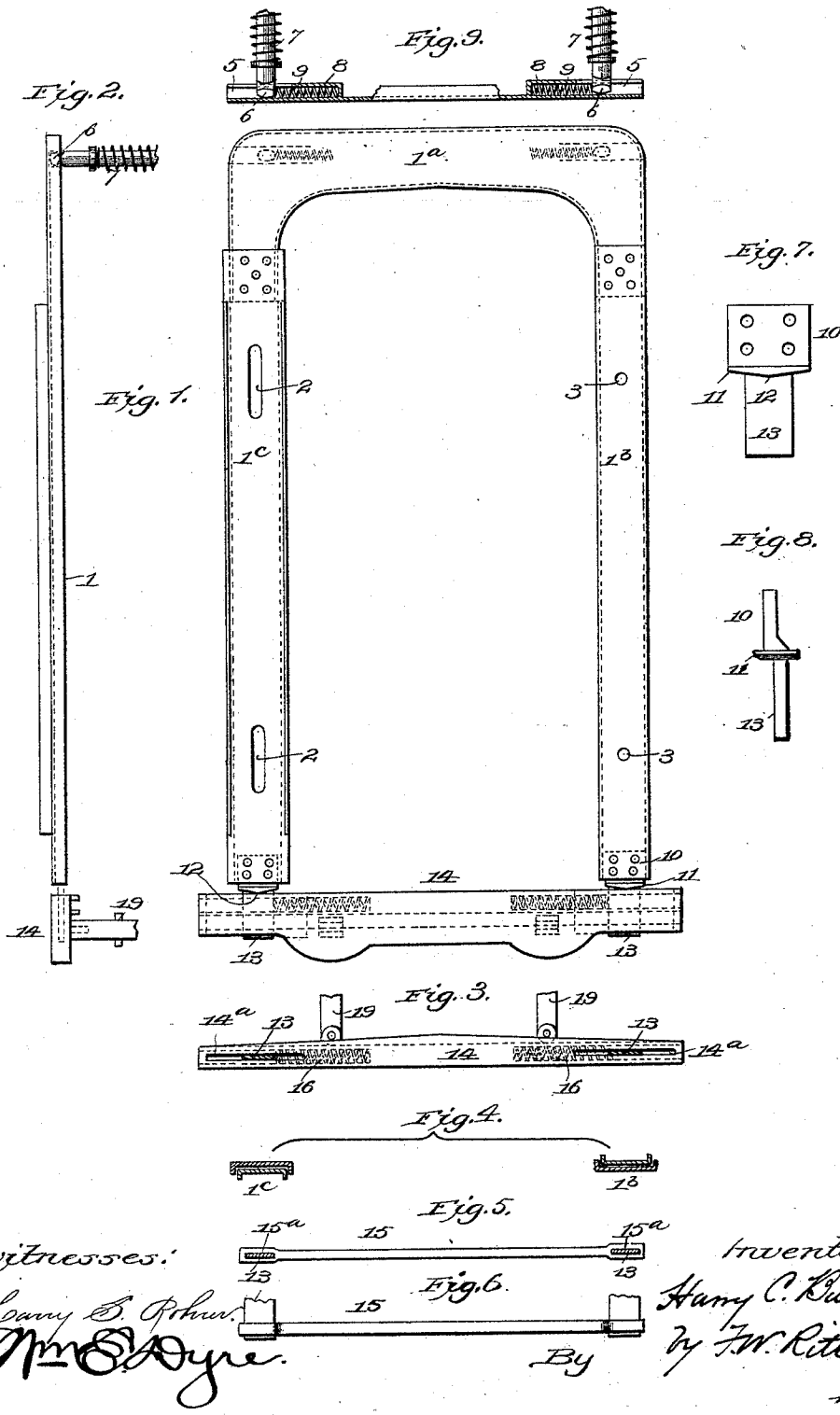
(No Model.)

3 Sheets—Sheet 1.

# H. C. BUHOUP. CAR VESTIBULE DIAPHRAGM OR FACE PLATE.

No. 526,803.

Patented Oct. 2, 1894.



Witnesses:

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H. C. BUHOUP.

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Fig. 10.

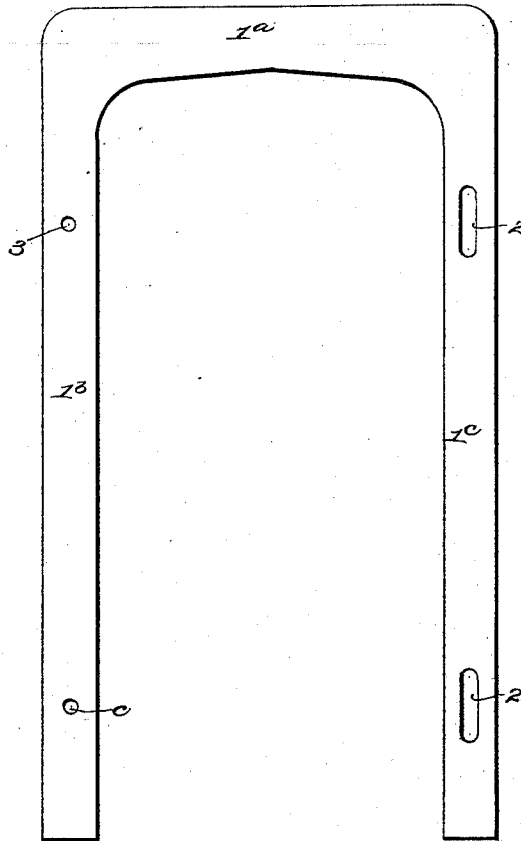


Fig. 11.

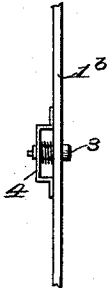
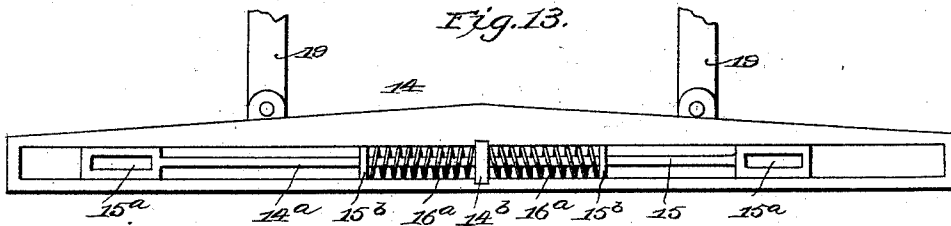


Fig. 12.



Fig. 13.



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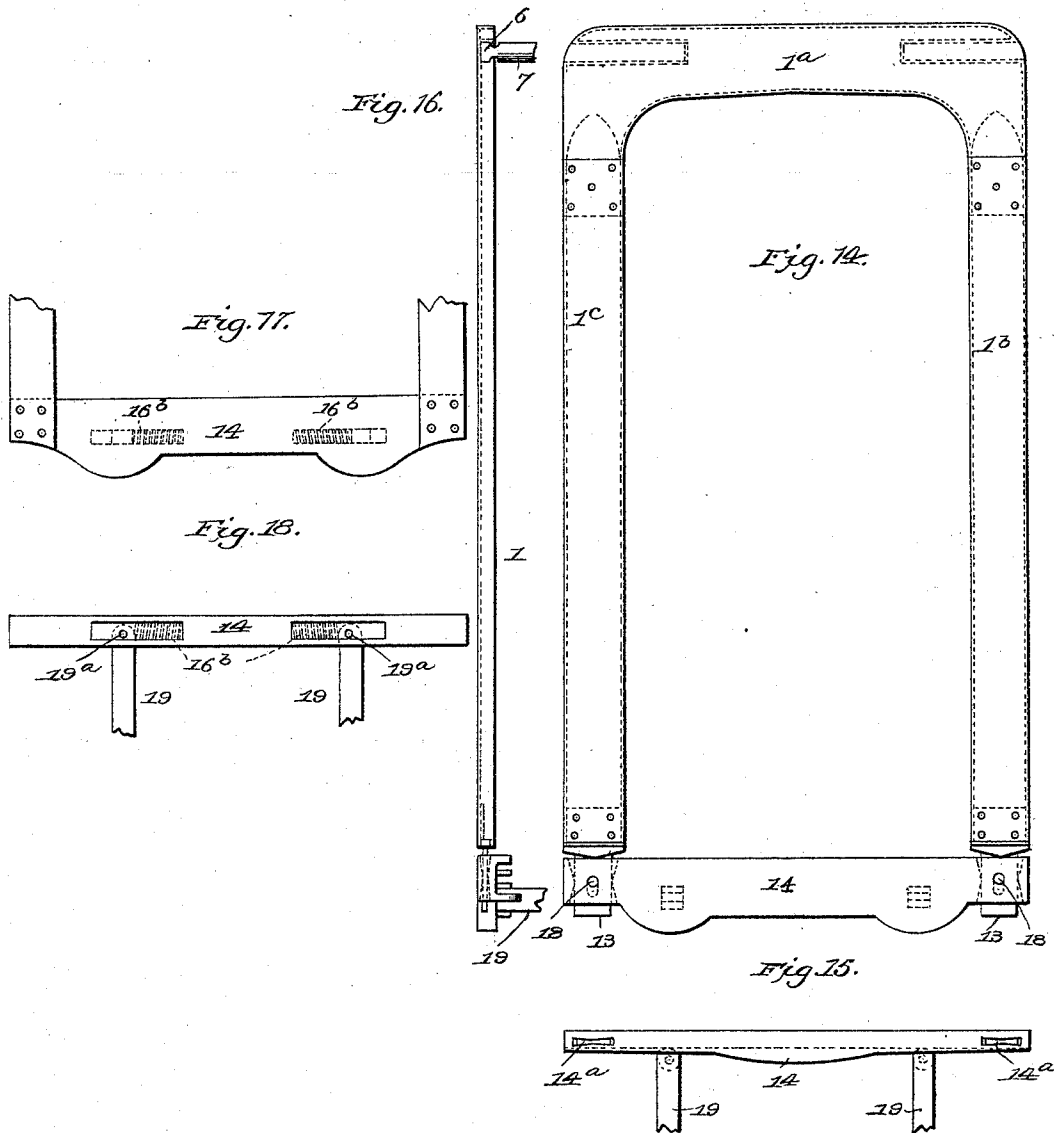
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CAR VESTIBULE DIAPHRAGM OR FACE PLATE.

No. 526,803.

Patented Oct. 2, 1894.



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# UNITED STATES PATENT OFFICE.

HARRY C. BUHOUP, OF CHICAGO, ILLINOIS.

## CAR-VESTIBULE DIAPHRAGM OR FACE-PLATE.

SPECIFICATION forming part of Letters Patent No. 526,803, dated October 2, 1894.

Application filed March 22, 1894. Serial No. 504,651. (No model.)

To all whom it may concern:

Be it known that I, HARRY C. BUHOUP, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Car-Vestibule Diaphragms or Face-Plates; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1, is an elevation of a vestibule diaphragm embodying my invention. Fig. 2, is a vertical side (or edge) view of the same with portions of the buffer stems, and stems which support the top of the diaphragm. Fig. 3, is a plan view of the buffer plate and portions of the usual buffer-stems, the foot pieces of the diaphragm plate being in section, and the lateral springs being indicated in dotted lines. Fig. 4, is a transverse sectional view of two abutting diaphragm plates. Figs. 5 and 6, are edge and side views respectively of a span-bar or connecting bar for preventing the spreading of the side pieces or legs of the diaphragm. Figs. 7 and 8, are face and edge views, respectively, of a foot piece for the sides of the diaphragm. Fig. 9, is a top edge view of the diaphragm, with portions of the stems which support the top of the diaphragm. Fig. 10, is a face view of the diaphragm detached from the buffer plate, and showing spring actuated pins on one side and pin slots on the other. Figs. 11 and 12, are detail edge views of portions of the diaphragm showing the spring pin and pin-slot, respectively. Fig. 13, is a plan view of the buffer-plate and the span-bar or connecting bar, with modification of the lateral spring support for foot of diaphragm. Fig. 14, is an elevation of the diaphragm and the buffer-plate showing a rocking connection between the same which may be used when the span-bar or connecting bar and lateral springs are not desired. Fig. 15, is a plan view of the buffer-plate of Fig. 14, and Fig. 16, is an edge view of the diaphragm, Fig. 14. Fig. 17, is an elevation of the lower part of the diaphragm and buffer-plate, showing a modification in the connection of the diaphragm and buffer plate and arrangement of the laterally acting spring supports. Fig. 18, is a plan view of Fig. 17.

Like symbols refer to like parts wherever they occur.

My invention relates to that class of railway cars known as vestibule cars, in which a flexible extension or passage-way is arranged on the car platform, and wherein is employed a diaphragm or face plate adapted to abut with a like construction on an adjacent car, for the purpose of forming and maintaining a closed passage way between two cars similarly equipped, when coupled together.

In vestibule connections as ordinarily constructed, provision has heretofore been made for a longitudinal movement of the diaphragms or face-plates to compensate for the varying distance between the cars in pulling or pushing the cars when coupled. Provision has also been made for a movement of the face-plates in response to curving movements of the cars—the objects of said several provisions being to maintain the closed passage way when the cars are coupled, without reference to the relative position of the cars. It has been found, however, that the two above noted provisions fall short of the requirements, for the reason that the requisite continuity and uniformity of the passage way is frequently disturbed by the changing relative position of the cars, which give rise to independent lateral and frictional movement of the diaphragm plates on each other. This occurs, notably, when the cars are passing over a reverse curve, or one car passing a curve, the abutting car being on a straight track. In either case it is obvious that the abutting diaphragms will move laterally independently of each other, and consequently will not remain in alignment.

One object of my present invention is to prevent this independent lateral movement of the face-plates, and to make provision for a joint lateral movement and a rotating or vibrating lateral movement of the diaphragms or face-plate, and also to provide for the return of the diaphragms to their normal positions when the cars resume their usual or normal position.

A further object of my invention is to provide simple and efficient means for maintaining the alignment of the diaphragms or face-plates.

To this end the main feature of my invention embraces what may be termed a "floating diaphragm," or a face-plate yieldingly loosely connected with or supported from its projecting stems by means of interposed

yielding bearings which permit the face plate to move or float across the ends of the projecting stems, so as to be capable of a free lateral vibrating, rotating or rocking movement, uncontrolled by the movements of the car to which said diaphragm is attached.

In carrying out my invention the preferred construction involves the combination with the foot of the diaphragm plate of knife edge bearings, and laterally acting springs which permit the independent vibration of the face-plate and impel its return to the normal position when the disturbing cause ceases, and said construction or its equivalent embraces a second feature of my invention.

There are other minor features of invention pertaining to particular combinations of elements, and also to special features of construction, all as will hereinafter more fully appear.

I will now proceed to describe my invention more fully so that others skilled in the art to which it appertains may apply the same.

In the drawings, 1 indicates the diaphragm or face-plate which may be composed of top or arch section 1<sup>a</sup> and side sections or legs 1<sup>b</sup> 1<sup>c</sup> suitably connected—or if preferred the arch and legs may be integral. The legs or sections 1<sup>b</sup> and 1<sup>c</sup> are preferably of angle iron, or flanged, and of different widths as well as reversely flanged (see Fig. 4) so that of the abutting surfaces one shall rest within the flanges of the other and thus assist in preserving the alignment of the diaphragms. In conjunction therewith, if desired, the leg or section 1<sup>c</sup> may have longitudinal pin-slots 2, and the section or leg 1<sup>b</sup> spring pins 3 supported by brackets 4, secured to the back of the diaphragm or face-plate, which will contribute to preserving the alignment of the diaphragm plates. Though either may be relied on for effecting the purpose, yet I prefer to employ both of the above recited devices. The arch section 1<sup>a</sup> is provided at its rear with horizontal slots or ways 5, 5, for the reception of the ball-heads 6, 6, of the longitudinal stems 7, 7, which support the top of the diaphragm plate—and said arch is also provided with spring pockets 8, 8, in line with said slots or ways 5, 5, for the reception of springs 9, 9, or equivalent means of maintaining a floating or rocking and laterally yielding connection between the diaphragm plate and the upper longitudinally movable stems 7, 7. The stems 7, 7, may have the usual buffer or projecting springs, or any other suitable means for controlling the longitudinal movement of the diaphragm plate.

Secured to, or if preferred integral with, the legs 1<sup>b</sup> 1<sup>c</sup> of the diaphragm or face-plate are foot-pieces 10, each having a shoulder 11 the under surface of which is doubly inclined to form a knife edge bearing—or apex—12 by means of which the diaphragm rests, and vibrates or rocks laterally on the buffer-plate of the platform.

The downward extensions or tongues 13 of

the foot-pieces 10 enter a vertical longitudinal slot (or slots) 14<sup>a</sup> on the buffer plate 14 of the diaphragm, and pass through slots or eyes 15<sup>a</sup> on the ends of a span-bar or connecting bar 15 (see Figs. 5 and 6) which prevents the legs 1<sup>b</sup> 1<sup>c</sup> of the diaphragm from spreading.

The slot (or slots) 14<sup>a</sup> of the buffer plate 14 is (or are) of such length as will permit the lateral movement of the diaphragm plate 1 on the buffer plate,—and to yieldingly maintain the diaphragm plate in its normal position laterally operating springs 16 or their equivalents are arranged within the buffer plate and bearing upon the foot pieces of the diaphragm.

If desired, the modified construction shown in Fig. 13 may be adopted as a yielding lateral support for the foot of the diaphragm—to wit—the center of the slot 14<sup>a</sup> of buffer-plate 14 may be divided by a perforated block or bridge 14<sup>b</sup> through which passes the span-bar or connecting bar 15, and said span-bar 15 may have two attached collars 15<sup>b</sup> one on each side of the bridge 14<sup>b</sup>, between which collars and bridge are interposed the laterally acting springs 16<sup>a</sup>.

In some instances it may be deemed desirable to dispense with the yielding lateral movement of the foot of the diaphragm while retaining the lateral vibratory or laterally rocking motion thereof, in which case the laterally operating springs 16 and span-bar or connecting bar 15 may be omitted and the tongues 13 of foot pieces 10 entered directly in slots in the buffer-plate (see Figs. 14, 15, and 16), in which case the slots should be inclined outward in all directions from the center to accommodate the play of tongues 13, and pins 18 may be passed through the buffer plate and tongues to retain the tongues within the slots, the pin holes in the tongues, however, being elongated to permit a limited vertical movement of the diaphragm.

In the modification shown in Figs. 17 and 18 of the drawings, the diaphragm 1 is secured to the buffer-plate 14, either rigidly or otherwise as preferred, and said buffer plate 14 is made movable laterally or horizontally against the buffing stems 19, 19, which are connected with the buffer-plate by pins 19<sup>a</sup> 19<sup>a</sup> in such manner as to allow of a lateral movement of the buffer-plate, which lateral motion is opposed by the side springs 16<sup>b</sup>. The rigid connection of the vertical legs of the diaphragm with the buffer plate at the platform of the car practically joins them to form a vertical buffer-plate, supported upon, and backed by four longitudinal carrying stems, one at or near each of the four corners of the diaphragm, the diaphragm being free to move vertically, laterally, and with lateral rotating movement relative to the said carrying stems, and having its said lateral movements opposed by side springs, attached to the body of the diaphragm and bearing against the carrying stems. It is not imperative that the connection between the buffer-

plate and legs of the diaphragm should be rigid, as the same results may be obtained when the connection is a flexible one, as shown in other views of the drawings.

5 The buffer-plate 14 may have the usual or any approved form of buffer stems 19, and suitable buffer springs therefor.

From the foregoing description, taken in connection with the drawings, it will be noted  
10 that the connections of the diaphragm or face-plate proper with the longitudinally movable and rigid stems 7, 7 above, and the buffer plate 14 below, are such that the diaphragm or face-plate is free to move laterally  
15 in a parallel line in either direction, and also to rotate, rock, or vibrate laterally on the buffer plate either with or without lateral movement of the foot pieces of the diaphragm, and furthermore a vertical movement between the diaphragm and buffer plate is obtained—the movements of the abutting diaphragms being a joint movement so that no separation, shifting or loss of alignment can occur; so that the diaphragms may be literally  
20 said to float or move independently of the spring projecting mechanism of the vestibule or buffer plate.

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

30 1. In a car vestibule the combination with a diaphragm or face plate, of supporting and projecting stems at the top thereof, spring bearings on said diaphragm or face plate for the free ends of said supporting stems, and a horizontal buffer plate on which the verticals of the diaphragm rest; substantially as and for the purpose specified.

40 2. In a car vestibule, the combination with longitudinally movable carrying stems arranged at the top of the vestibule, of a diaphragm or face-plate carried by said stems and having laterally yielding bearings operating against the sides of said stems; substantially as and for the purposes specified.

45 3. In a car vestibule, the combination with longitudinally movable stems having ball heads, of a diaphragm or face-plate having horizontal ways for the reception of said ball heads, and yielding bearings which permit the lateral movement of the diaphragm or face plate with relation to the stems; substantially as and for the purposes specified.

50 4. The combination with a vestibule diaphragm or face-plate, of projecting stems therefor side springs located transversely on said plate and which bear on the ends of the projecting stems; substantially as and for the purposes specified.

60 5. The combination with a vestibule diaphragm plate and its longitudinally movable upper supports or carrying stems, of a horizontal buffer plate its projecting stems, independent side springs located on said diaphragm plate at or near its upper part, and side springs located at and acting against the

base of the diaphragm; substantially as and for the purposes specified.

6. In a car vestibule, the combination with a laterally vibrating diaphragm or face-plate, 70 of a slotted buffer plate in which the legs or vertical side pieces of the diaphragm are loosely stepped, and a span-bar or connecting bar, for connecting the vertical legs of the diaphragm below, substantially as and for 75 purposes specified.

7. In a car vestibule, the combination with a buffer plate, of a laterally vibrating diaphragm or face-plate each of its two side sections or legs having a knife edge bearing 80 on the buffer plate; substantially as and for the purposes specified.

8. In a car vestibule, the combination with a buffer plate, of a laterally vibrating diaphragm or face-plate each of its two side 85 sections or legs having a rocking bearing on said buffer-plate, and laterally acting side springs for restoring and maintaining the normal position of the diaphragm; substantially as and for the purposes specified. 90

9. The combination with a vestibule diaphragm, of side springs located at the top and bottom and transversely of said diaphragm, a buffer plate slotted at or near each end to engage the bottom of said diaphragm, 95 said buffer plate having a chamber for the reception of side springs which oppose the lateral movements of the diaphragm; substantially as and for the purposes specified.

10. A diaphragm or face-plate for car vestibules, having one of its legs or verticals slotted and the other provided with spring pins; substantially as and for the purposes specified. 100

11. In a car vestibule, the combination of 105 a diaphragm and a horizontal buffer plate, with longitudinal carrying stems located at or near the four corners of said diaphragm and buffer plate, the connections between said diaphragm and carrying stems provided 110 with means to allow of said diaphragm moving laterally independent of said carrying stems; substantially as and for the purposes specified.

12. In a car vestibule, the combination with 115 a diaphragm and horizontal buffer plate, of longitudinal carrying stems located at or near the four corners of said diaphragm and buffer plate, said diaphragm having lateral movement relative to said carrying stems, upper 120 and lower side springs bearing upon said longitudinal carrying stems and upon the diaphragm to oppose the lateral movements of the diaphragm and buffer plate; substantially as and for the purposes specified. 125

In testimony whereof I affix my signature, in presence of two witnesses, this 17th day of March, 1894.

HARRY C. BUHOUP.

Witnesses:

GEO. ABEL,

P. HIEN.