(No Model.)

4 Sheets—Sheet 1.

J. K. GRIFFIN.

VESTIBULE CAR.

No. 455,427. Patented July 7, 1891.

Fig. 1.



WITNESSES:
Ira R. Steward
C. L. Davis

INVENTOR
James Kent Griffin
BY
Marble, Mason & Canfield,
ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 2.

J. K. GRIFFIN.

VESTIBULE CAR.

No. 455,427. Patented July 7, 1891.

Fig. 2.

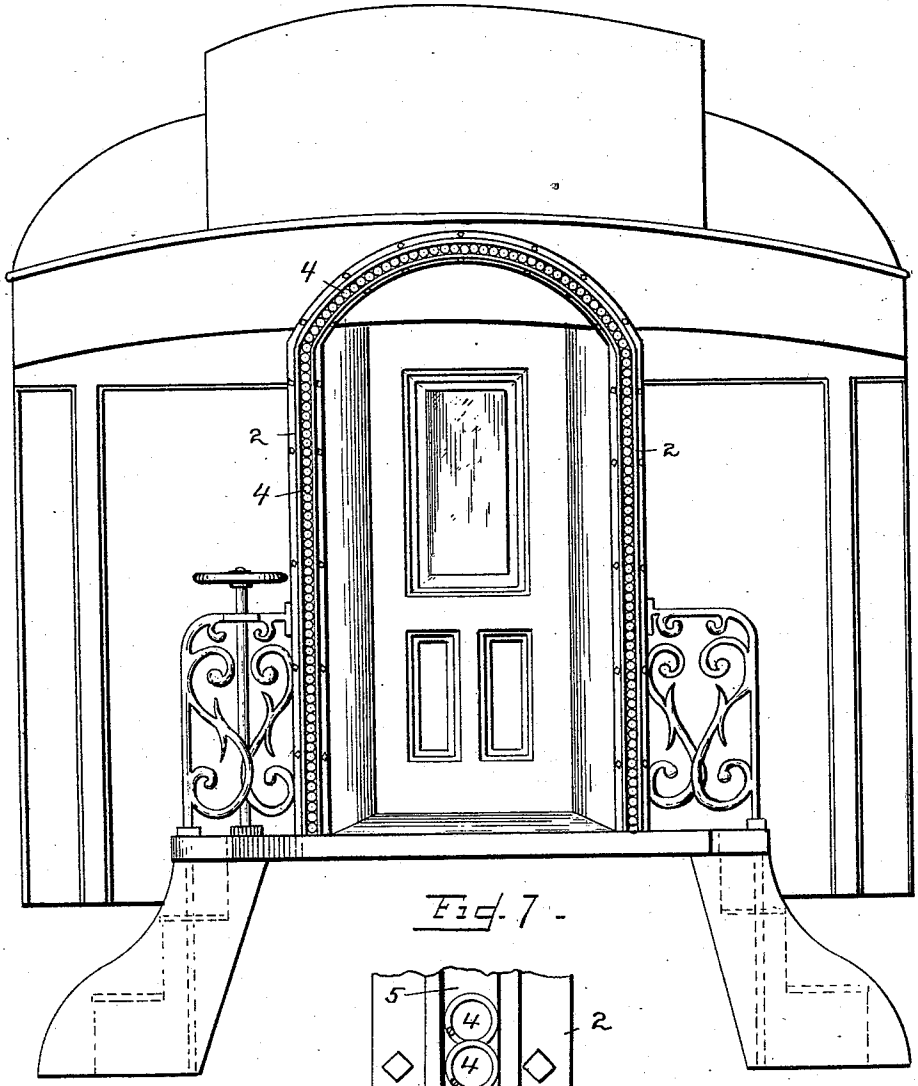
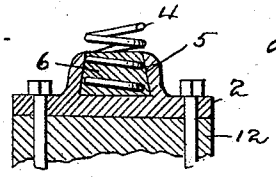


Fig. 7.

Fig. 8.



WITNESSES:

Ira R. Steward

C. L. Davis

INVENTOR

James Kent Griffin

BY

Marble, Macon & Ranfield

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 3.

J. K. GRIFFIN.

VESTIBULE CAR.

No. 455,427. Patented July 7, 1891.

Fig. 3.

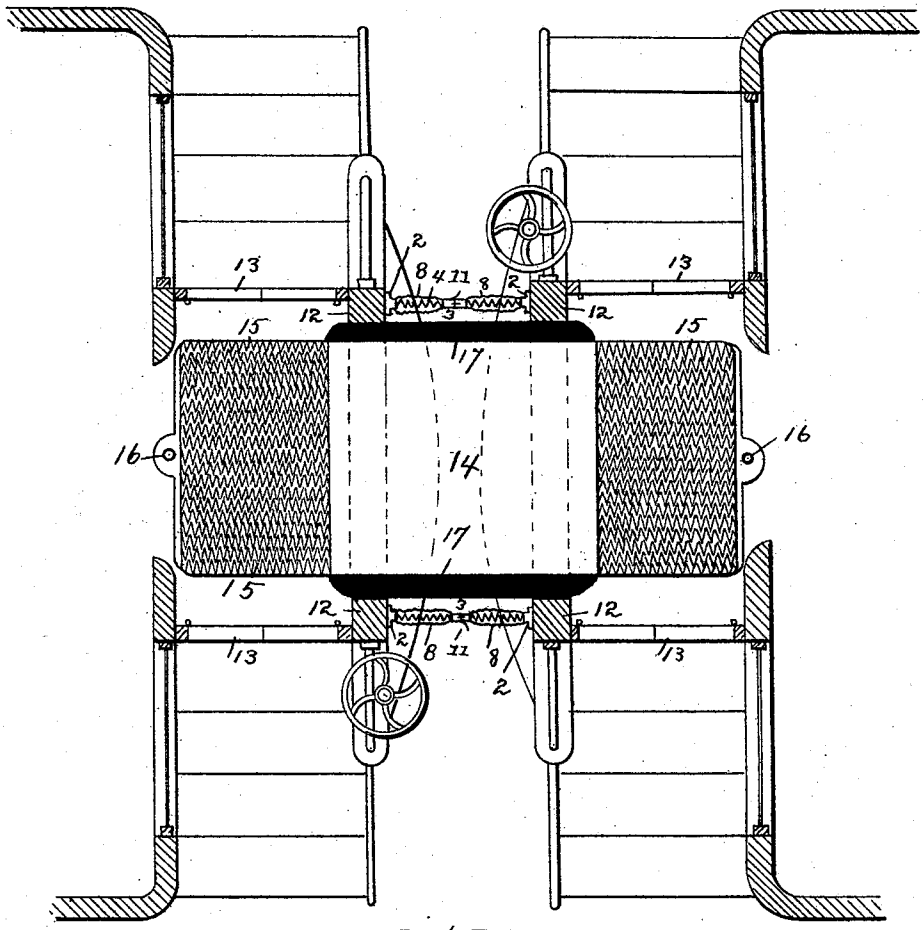
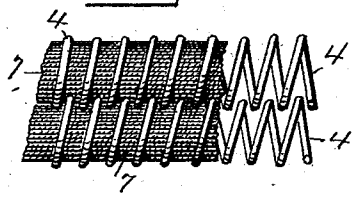


Fig. 9.



WITNESSES:
Ira R. Steward
C. L. Davis

INVENTOR
James Kent Griffin
BY
Marble, Mason & Caulfield
ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 4.

J. K. GRIFFIN.

VESTIBULE CAR.

No. 455,427. Patented July 7, 1891.

Fig. 4.

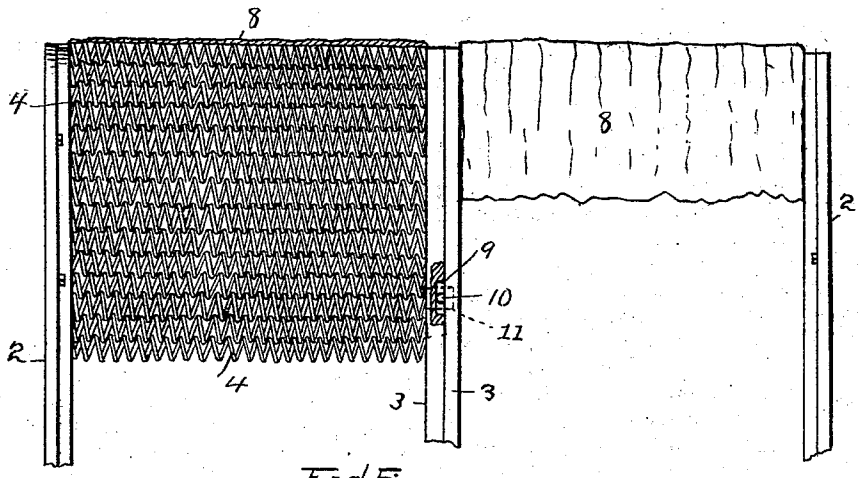


Fig. 5.

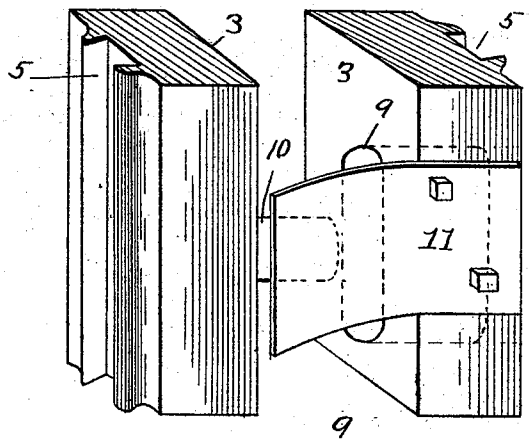
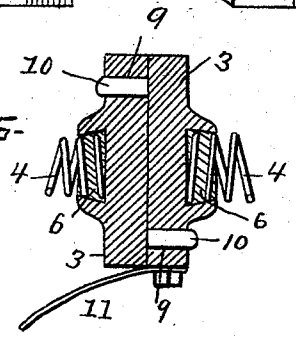


Fig. 6.



WITNESSES:

Ira R. Steward

C. L. Davis

INVENTOR

James Kent Griffin

BY

Marble, Macon & Canfield.

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES KENT GRIFFIN, OF BROOKLYN, NEW YORK.

VESTIBULE-CAR.

SPECIFICATION forming part of Letters Patent No. 455,427, dated July 7, 1891.

Application filed October 29, 1890. Serial No. 369,650. (No model.)

To all whom it may concern:

Be it known that I, JAMES KENT GRIFFIN, a citizen of the Dominion of Canada, residing at the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Vestibule-Cars and Connections Therefor, of which the following is such a full, clear, and exact description as will enable others skilled in the art to make and use the same.

The object of this invention is to provide a more simple and effective vestibule connection for cars and means for inclosing the space between them than any heretofore known or used, and also to provide a better, more simple, economic, and effective construction or device from which such vestibule connection may be formed.

My invention involves the formation or production of an inclosing device consisting of steel springs or other elastic equivalent, provided preferably with supporting-frames, so constructed as to in and of itself meet the requirements of constantly-shifting pressure and strains in various directions caused by the movement of the cars when the train is in motion, and form a firm and elastic connection or vestibule which will dispense with the complicated mechanism now in use. For this purpose I construct a hood or cover, preferably arch-shaped in cross vertical section, for each car or vestibule, which, when in position is adapted to close the space between the cars and complete the vestibule, of spiral springs arranged preferably horizontally and contiguous to each other, interlocked, interwoven, or separate, of such size, tension, and strength that when united or formed into a whole the device thus produced will be sufficient to withstand the buffeting and shifting of the cars, of such rigidity as to be self-sustaining, and of such flexibility as to yield in any direction that may be necessary, the springs being united or formed into a whole by being rigidly secured at their ends to arched supports formed to inclose and cover the space between the cars.

My invention is fully described in the following specification, of which the accompanying drawings form a part, in which similar reference-numerals designate like or equivalent parts wherever found throughout the several views, and in which—

Figure 1 is a side view of the ends of two cars provided with my improved vestibule connection; Fig. 2, an end view of a car, showing a section of the vestibule connection; Fig. 3, a plan view of the floor connection or covering of the vestibule; Fig. 4, a side view of a portion of the vestibule connection, the bottom being broken away, one side showing a portion of the spring construction which forms the body of the vestibule connection and the other a portion of a cover for the same; and Figs. 5, 6, 7, 8, and 9 represent details of my improvement.

I preferably form my vestibule connection of two separate similar sections 1, arch-shaped, as shown in Fig. 2, one of which is connected with each vestibule or car in such a manner that they meet when the cars are coupled and remain in close contact by the tension of the spring fabric or bodies thereof upon the uniting faces or plates with which they are provided. In the form shown the separate sections of the hood or arched connections are provided with two end pieces 2 and 3, each of which are preferably arch-shaped, a portion of the part 2 being shown in front elevation in Fig. 7 and in cross-section in Fig. 8, both being on an enlarged scale, and a portion of the part 3 being shown in detail and on an enlarged scale in Fig. 5 and a modification thereof in Fig. 6. The part 2 constitutes the arched support at one end of a section of the hood by which it is secured to the vestibule of the car, and the part 3 a similar support on the opposite end of the section, also constituting a face-plate against which a similar support or face-plate on the opposite section abuts when the cars are coupled. The space between these end pieces 2 and 3 in each section is filled in with and the end pieces or supports are secured together by spiral springs 4, arranged, preferably, horizontally and contiguous, as shown, or they may be interlocked or interwoven or separate, of such size, tension, and strength that when united and secured to the end pieces, and the separate sections of a hood or vestibule thus formed are brought together by the coupling of the cars, the vestibule con-

nection thus produced will be sufficient to withstand the buffeting and shifting of the cars, and of such rigidity as to be self-sustaining, and of such flexibility as to yield in any direction that may be necessary. The most successful and effective way to accomplish this result consists in the arrangement shown, in which the body of the separate sections of the vestibule connection consists of spiral springs arranged horizontally and preferably so that the coils of the separate springs mesh with each other, as shown in Figs. 1 and 4 and in detail in Fig. 9, the springs being firmly secured to the end pieces by means of grooves or recesses 5 formed in each, within which the ends of the springs are placed, after which the grooves or recesses are filled in with lead or other suitable substance, as shown at 6 in Figs. 6 and 8. It will be seen that as thus constructed the body portion of each arched section of the hood or vestibule connection or that part thereof between the end pieces is composed entirely of the springs 4, and it may be almost entirely closed or rendered sufficiently so to exclude draft or moisture by filling in the spaces within the spiral springs with any suitable elastic substance adapted to the purpose, as shown at 7 in Fig. 9; and in addition to this, or independent thereof, I contemplate the use or employment of a flexible cover 8 for the body portion of the vestibule-sections, composed of any preferred material, preferably water-proof, so arranged on either side of the vestibule as to cover the entire spring portion thereof, loosely or in folds, to admit of the shifting, contraction, or expansion thereof, caused by the movement of the cars, and these covers may be so arranged as to admit of being rolled up or folded, as shown in Fig. 1. It is evident, however, that the filling or packing 7 within the springs, or the cover 8, or both, may be omitted with advantage under certain circumstances, as when it is very warm, when the open-work of the vestibule connection will assist materially in the ventilation of the cars if the doors communicating therewith are left open.

When the cars are coupled, the separate sections of my improved vestibule connection come together, as shown in Figs. 1 and 3, the end supports 3 serving as abutting face-plates and constitute a complete vestibule hood or connection. The separate sections are secured together by the pressure of the spring-body portion of each, and to prevent the lateral displacement or slipping apart of the face-plates I preferably employ the construction shown in Figs. 4, 5, and 6, either form of which will serve the purpose. That shown in Figs. 4 and 5 consists simply of a socket 9, formed in the face-plate or support of one of the sections, and a bolt or pin 10, formed with or secured to the face-plate or support of the opposite section on either or both sides thereof, and at the top, if necessary, in such manner that when the sections are brought together by the coupling of the cars, the bolts 10 will enter the sockets 9. To facilitate this operation, I form on or attach to the sides of the face-plates a guide 11, the operation of which will be apparent. The socket 9 is preferably formed vertically oblong, in order to admit of a slight vertical motion or movement of the sections without throwing strain upon the spring-body portion; but this is comparatively immaterial, as this would be so distributed as to be almost imperceptible, and the socket may be formed so as to be entirely filled by the plug or bolt. In the form shown in Fig. 6 the face-plates are made wider and thinner, and the sockets are formed at the sides of and extend through the face-plates. This form admits of the use of longer bolts, and makes a more secure connection, the spring or guide 11 being also employed, if desired.

It is evident that I may employ end pieces or supports of different form or construction and attach the springs thereto by other means without departing from the scope of my invention, all that is necessary being that the connection between the end pieces or supports and the springs be secure, and that the former be so made that one end of each section may be securely attached to the car and the other so that when the cars are coupled the sections will properly abut. I may also form the connecting sections so that the abutting face-plates will be at the top only, the dividing-line being at the top and parallel with the line of the cars, in which case one section would constitute one entire side of the vestibule connection, and being secured to one car would extend over and couple directly with the other when the cars were brought together, and the separate sections would abut at the top only. These and many other modifications of the principles of my invention will readily suggest themselves, and while preferring the form of connection shown and described I do not limit myself thereto. With this construction the end pieces 2 are secured to the stanchions 12, and these, together with the vestibule-doors 13, are substantially the same as those now employed.

The floor 14 of my vestibule connection is composed, preferably, of a plate or plates of any desired material secured together, of such width as to fill or nearly fill the entire space between the stanchions 12, and of such length as to extend some distance at each end over the car-platforms or the floor of the vestibule proper when the cars are coupled, and to each end of this I preferably secure an additional extension consisting of a spring-mat made, preferably, of longitudinal or interwoven wire springs in the same manner as the sections of my vestibule connections, but much lighter; or they may be woven or braided in any desired manner, all that is necessary being that they be capable of expansion longitudinally and diagonally and possessed of such elasticity as will enable them to resume their original form whenever

released from strain or tension. Each end of this floor-piece is removably secured, as at 16 in Fig. 3, to the floor of the car platform or vestibule in any suitable manner, and when so made and attached will admit of any possible movement of the cars when coupled, by reason of the spring-extension, and will always remain in proper position. I prefer to make the center piece 14 slightly less in width than the space between the stanchions 12, and attach to the sides thereof rubber strips, as 17, which will yield with the movement of the cars and maintain at all times a practically complete flooring for the vestibule connection over the coupling mechanism of the cars.

Instead of the construction here shown and described, I may employ a floor-piece composed entirely of spring-matting, so formed as to be capable of longitudinal, lateral, and diagonal expansion, and such a floor-piece may be formed in the same manner as my vestibule connection.

Constructed as herein described my invention constitutes a safe, durable, and economical vestibule connection, one which is absolutely self-sustaining and which, when the separate sections thereof are brought together in the manner described by the coupling of the cars, will remain firmly closed and admit in and of itself of any and all possible movements of the cars while coupled, the abutting face-plates being at all times and under all changes of position pressed firmly together by the springs constituting the body portions of the sections, and prevented from slipping out of contact under the most violent lateral or vertical movement of the cars by the tension of the spring-body portion or by the locking devices described.

The spring-body portion of the sections constitutes under all circumstances a perfect pressure-equalizer in any and all positions of the cars, yielding readily in any direction vertically, laterally, longitudinally, and diagonally, yet always self-sustaining, and resuming and maintaining their normal shape and position at once when released from pressure or torsion.

I do not limit myself to the form of spring fabric or body portion for my connecting-section shown and described, as many changes therein may be made without producing any material difference in the results, and I regard any spring-connecting substance or body used for this purpose capable of producing substantially the same results as coming within the scope of my invention.

Having fully described my invention, its construction, and operation, what I claim, and desire to secure by Letters Patent, is—

1. A complete vestibule connection for cars, consisting of two similar sections, each of which is composed of an elastic spring-body portion consisting of contiguous interwoven or interlocked spring-wires and two end pieces or supports, one of which is adapted to be attached to a car and the other to form a face-plate or abutting surface by which the sections are united when the cars are coupled, substantially as shown and described.

2. A connecting-section for vestibule-cars, consisting of two end portions or supports and a body portion composed of contiguous interwoven or interlocked spring-wires, substantially as shown and described.

3. A complete vestibule connection for cars, consisting of two similar sections, one attached to each car, each consisting of two end portions or supports, and a body portion composed of elastic spring-wires which fill the space between the end portions, substantially as shown and described.

4. A complete vestibule connection for cars, consisting of two similar sections, one attached to each car, each having an elastic spring body portion consisting of contiguous interwoven or interlocked springs, and each section so arranged that the vestibule connection is completed by the coupling of the cars, substantially as shown and described.

5. A complete vestibule connection for cars, consisting of separate sections, one attached to each car, having spring body portions consisting of contiguous interwoven or interlocked spring-wires, the sections being attached to the cars so that the vestibule connection is completed when the cars are coupled by the corresponding ends of the sections coming in contact, the contact thereof being maintained by the action of the spring body portions, substantially as shown and described.

6. A section of a vestibule connection for cars, consisting of a spring body portion composed of contiguous interwoven or interlocked spring-wires provided at each end with proper supports, one of which is adapted to be secured to a car, the section being self-sustaining when so attached and the free end being capable of movement in any direction by reason of the elasticity of the body portion, substantially as shown and described.

7. A complete vestibule connection for cars, consisting of two similar sections, one attached to each car, each composed of a spring body portion consisting of contiguous interwoven or interlocked spring-wires provided at each end with proper supports, one of which is adapted to be secured to a car and the other to form an abutting surface or face-plate when the cars are coupled and the sections brought together, the vestibule connection thus completed being self-sustaining and capable of a yielding elastic movement in any direction when the cars are in motion, substantially as shown and described.

8. A complete vestibule connection for cars, consisting of separate similar sections having elastic spring body portions consisting of contiguous interwoven or interlocked spring-wires and abutting face-plates 3, provided with connecting devices, whereby the plates

are prevented from moving laterally when the cars are in motion, substantially as shown and described.

9. A vestibule connection for cars, consisting of separate similar sections having elastic spring body portions consisting of contiguous interwoven or interlocked spring-wires and abutting face-plates 3, the face-plates being provided with sockets 9 and bolts or pins 10, as and for the purposes set forth.

10. A vestibule connection for cars, having an elastic spring body portion, the openings or interstices within the springs of which the body portion is composed being filled with flexible material, substantially as shown and described.

11. A vestibule connection for cars, having an elastic spring body portion consisting of contiguous interwoven or interlocked spring-wires, in combination with a covering composed of a loose flexible material, substantially as shown and described.

12. A vestibule connection for cars, having an elastic spring body portion, the openings or interstices within the springs of which the body portion is composed being filled with flexible material, in combination with a covering composed of flexible material, substantially as shown and described.

13. A floor-piece for vestibule connections for cars, consisting partly or wholly of elastic spring-wire matting capable of yielding longitudinally, laterally, and diagonally, substantially as shown and described.

14. A floor-piece for vestibule connections for cars, provided at each end with elastic spring-wire sections capable of yielding longitudinally, laterally, and diagonally, substantially as shown and described.

15. A floor-piece for vestibule connections for cars, provided at each end with elastic spring-wire sections and at the sides of the central portion with rubber strips, substantially as shown and described.

16. The combination, with a vestibule connection for cars, of a floor-piece attached at each end to the cars, consisting partly or wholly of elastic spring-wire matting capable of yielding longitudinally, laterally, and diagonally, substantially as shown and described.

17. The combination, with a vestibule connection for cars, of a floor-piece provided at each end with elastic spring-wire sections capable of yielding longitudinally, laterally, and diagonally, and at the sides of the central portion with yielding strips, substantially as shown and described.

18. A complete vestibule connection for cars, composed of separate similar sections, one attached to each car, having elastic spring body portions consisting of horizontal contiguous interwoven or interlocked spiral springs, the separate sections being united by the coupling of the cars, the connections thus completed being self-sustaining and of sufficient flexibility and elasticity to yield in any direction and adjust itself to the various movements of the cars when in motion, substantially as shown and described.

19. A vestibule connection for cars, having an elastic spring body portion consisting of contiguous interwoven or interlocked spring-wires, substantially as shown and described.

JAMES KENT GRIFFIN.

Witnesses:
IRA R. STEWARD,
C. L. DAVIS.