

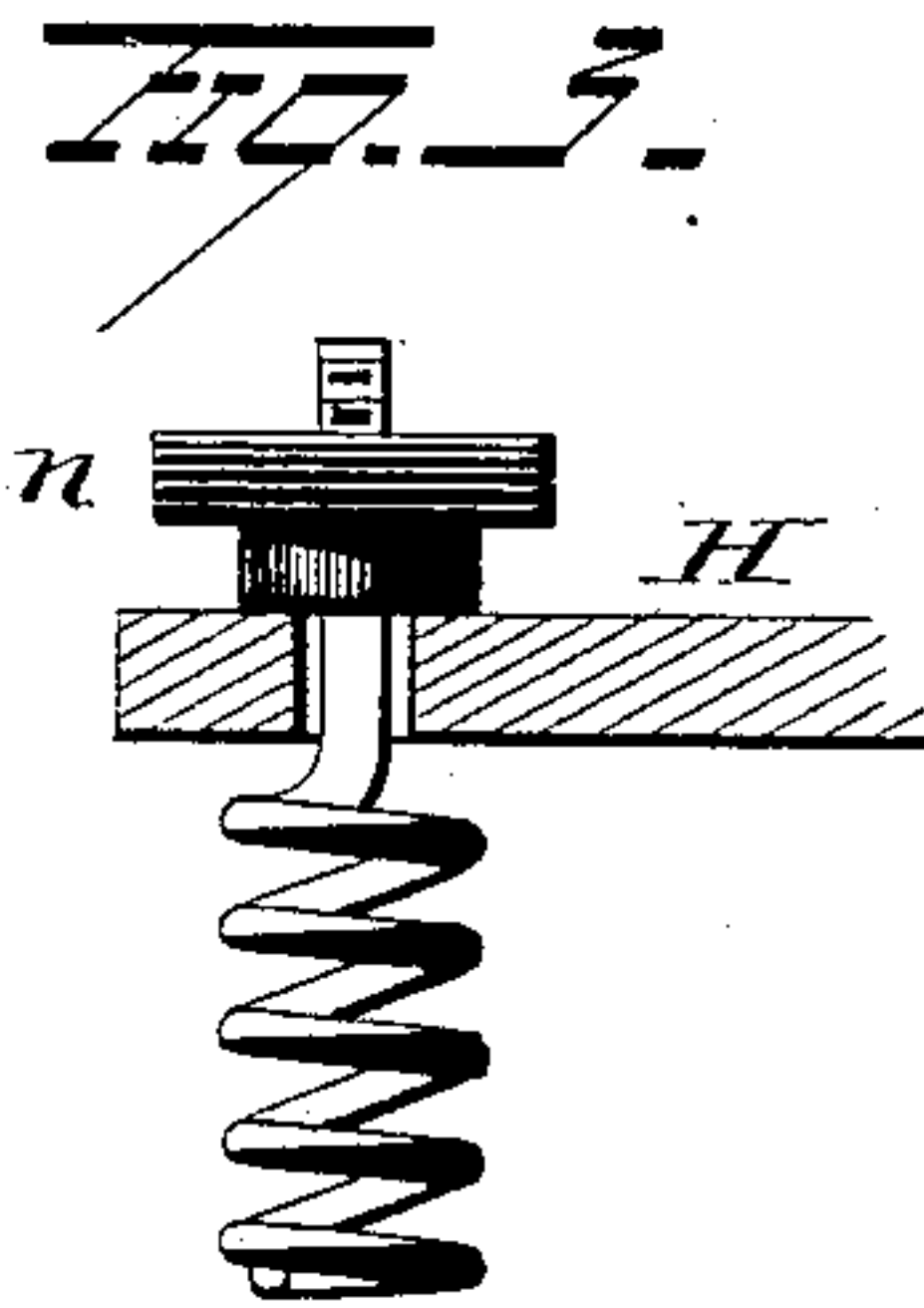
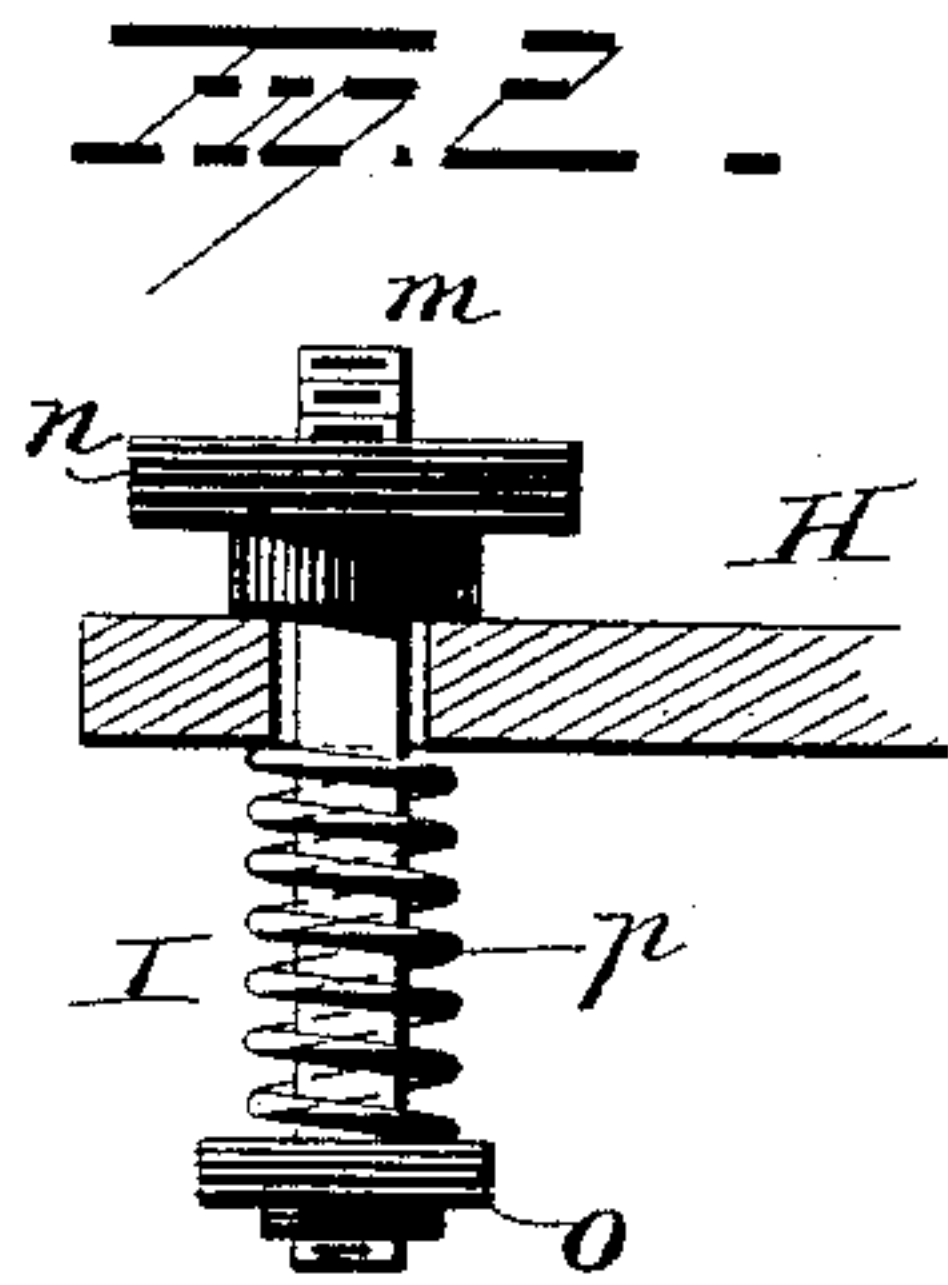
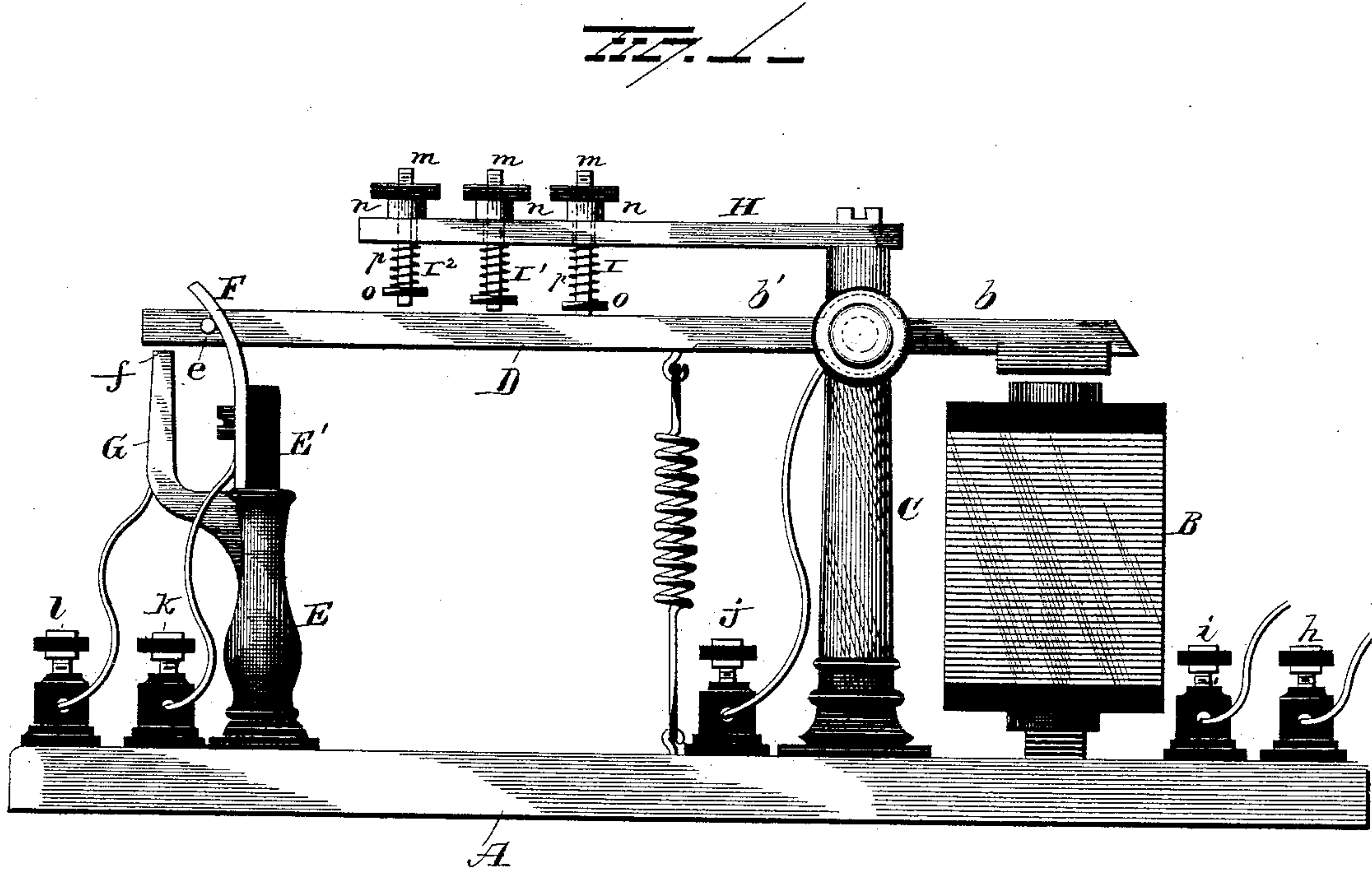
(No Model.)

F. STITZEL & C. WEINEDEL.

TELEGRAPH RELAY.

No. 385,214.

Patented June 26, 1888.



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# UNITED STATES PATENT OFFICE.

FREDERICK STITZEL AND CHARLES WEINEDEL, OF LOUISVILLE, KENTUCKY,  
ASSIGNORS TO THE AMERICAN SEMAPHORE COMPANY, OF SAME PLACE.

## TELEGRAPH-RELAY.

SPECIFICATION forming part of Letters Patent No. 385,214, dated June 26, 1888.

Application filed February 21, 1888. Serial No. 264,716. (No model.)

*To all whom it may concern:*

Be it known that we, FREDERICK STITZEL and CHARLES WEINEDEL, of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Telegraph-Relays; and we 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.

Our invention relates to an improvement in telegraphic relays.

In telegraph-relays and similar instruments where electro-magnets and vibrating armatures are employed the cores of the magnets (after constant use) are liable to retain more or less magnetism after the electric current is removed from the cores, and thus cause the armature to "stick" and produce confusion in the transmission of signals.

It is the object of our present invention to obviate this objection and to so construct a relay that it shall automatically adapt itself to varying strengths of the electro-magnet which actuates it.

With this object in view our invention consists in certain novel features of construction and peculiar combinations and arrangements of parts, as will be hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of our improved relay. Fig. 2 is a detached view of the abutments. Fig. 3 is a view of a modified form of abutment.

A indicates a base of wood or other suitable material, upon which is mounted near one end an electro-magnet, B, the coils of which are connected to the main line, as usual.

Fixed upon the base A near the magnets B is a standard or upright, C, which extends somewhat above the magnets and serves as a support for a lever, D, fulcrumed thereto at *a*. The short arm *b* of this lever D is furnished near its free end with an armature, *c*, to be attracted by the magnet. Near the opposite end of the base from the standard C is a short post or upright, E, supporting at its upper end an insulated block, E', upon which latter one end of a contact-spring, F, is secured in any preferred manner. This spring F curves upwardly

and outwardly from its connection with the block, as shown in Fig. 1. A laterally-projecting pin, *e*, fixed to the long arm *b'* of the lever D, is adapted to engage the outer face of the spring F when the armature is actuated by the magnet B. By this construction of the spring F a firm contact is insured between said spring and the pin *e* when the lever D is turned in one direction. An arm, G, secured to the post E, is bent upwardly and forms a rest for the free end of the long arm *b'* of the lever D, and may also be provided at its top with a contact-point, *g*.

Suitable binding-posts, *h i j k l*, are secured to the base A, the posts *h* and *i* being connected with the magnet-coils and having the main-line wires attached to them.

If it be desired to use the instrument as a single-contact relay, the wires of the local circuit will be fixed to the binding-posts *k*, said binding-posts being connected with the lever D and contact-spring F, respectively. When it is desired to employ a double contact, the arm G will be included in the local circuit, this arm being preferably connected with the binding-post *l*.

Secured to the top of the standard C, and extending therefrom in a line parallel with the long arm of the lever D, is an arm, H, provided with two or more perforations for the reception of a series of adjustable spring-sustained pins or abutments, *I I' I''*. These abutments are each composed of a short pin, *m*, screw-threaded at its upper end for the reception of a nut, *n*, and a plate, *o*, secured near its lower end, a spring, *p*, being inserted between said plate and the lever H, through which the abutment-pins loosely pass. The tension of these pins and their distance from the lever may be easily regulated by means of the nuts *n*.

The arm *b'* of the lever D may be made sufficiently heavy to cause it to drop when not actuated by the magnet; or, if desired, a light spring, J, may be employed.

The abutment-pins *m* are adjusted at different distances from the lever D from end to end of the series. Should the magnets become sufficiently strong to overcome the tension on the lever D, the first abutment-pin will be struck



by the lever and prevent the armature from approaching sufficiently near the magnets to stick. Should the magnet become strong enough to overcome the tension of the first  
5 abutment, the lever will strike the second in conjunction with the first, and so on throughout the series of abutments.

It will be understood that under ordinary circumstances the lever will have sufficient  
10 play to make and break the local current without materially affecting any of the abutments; but as soon as the magnet gets stronger than the tension on the lever the latter will strike the first abutment, and then the second, and so  
15 on in unison with the varying strength of the magnet. Thus it will be seen that the device is automatically adapted to the varying strength of the magnet.

In lieu of the construction of abutments  
20 above described, coiled springs may be employed having their upper ends passed through perforations in the arm H, and screw-threaded for the reception of the nuts *n*, by which the springs may be adjusted in any desired position. With this arrangement the lever D will  
25 abut directly against the ends of the springs.

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

1. In a relay, the combination, with an electro-magnet and a pivoted lever, of a series of yielding abutments arranged in the path of said lever and adapted to be engaged in regular order, substantially as set forth.

2. In a relay, the combination, with an electro-magnet and a pivoted lever, of a series of yielding abutments in the path of said lever, and a spring-contact with which said lever makes contact, substantially as set forth.

3. In a relay, the combination, with an electro-magnet and a pivoted lever carrying an armature at one end and a contact-point near the other end, of an arm, yielding abutments mounted therein, a curved spring secured to a suitable post and adapted to engage said lever, and an arm with which the lever makes contact, substantially as set forth.

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

FREDERICK STITZEL.  
CHARLES WEINEDEL.

Witnesses:

ALLAN S. BROWN,  
GEO. V. LEBRE.