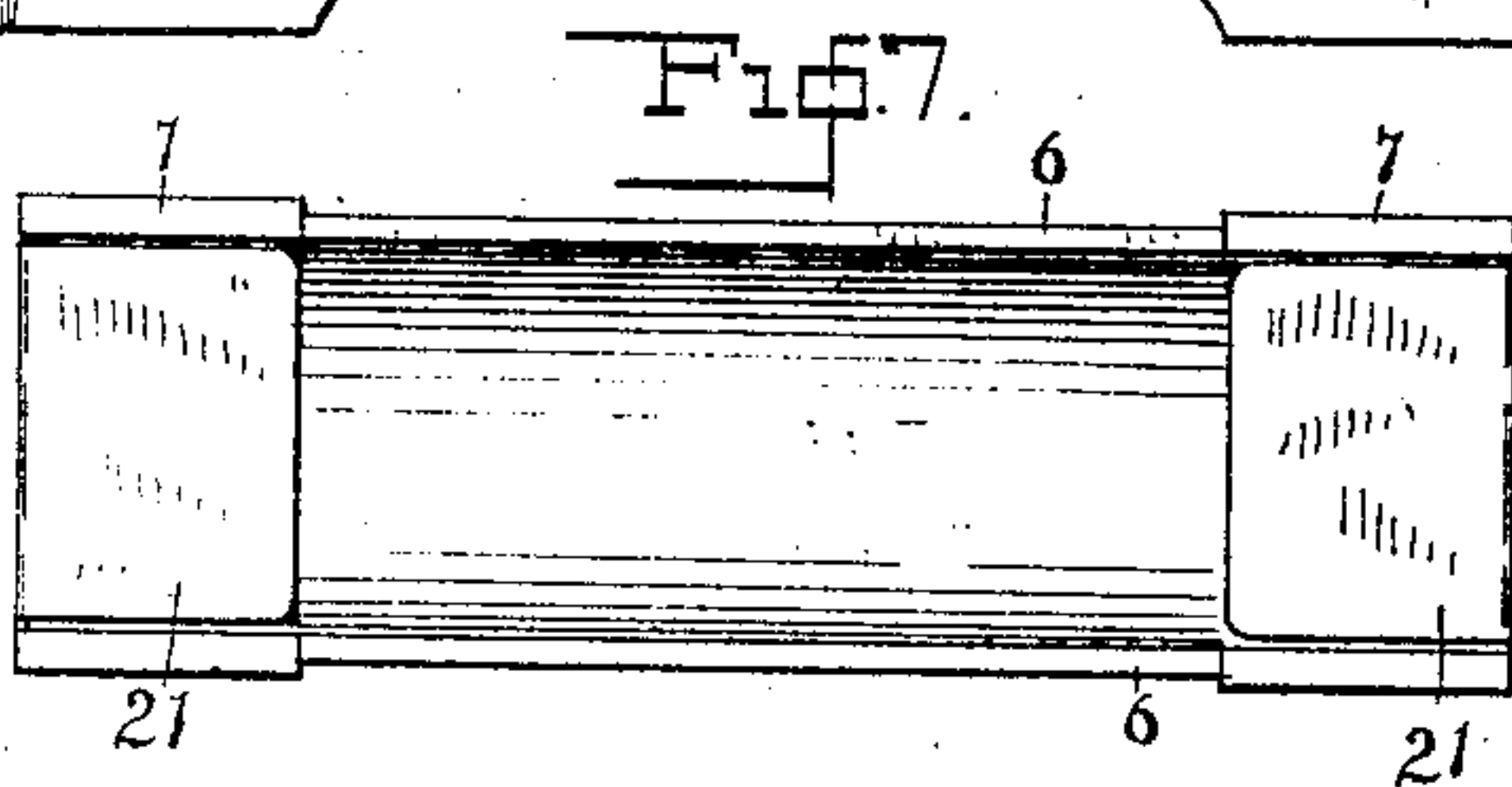
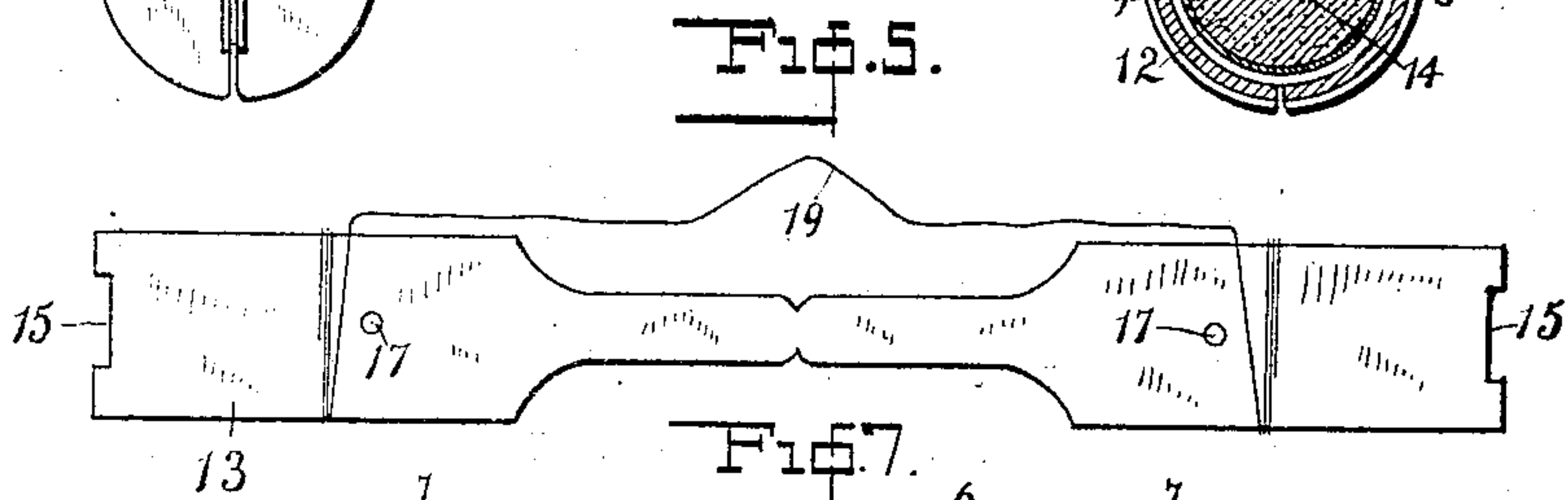
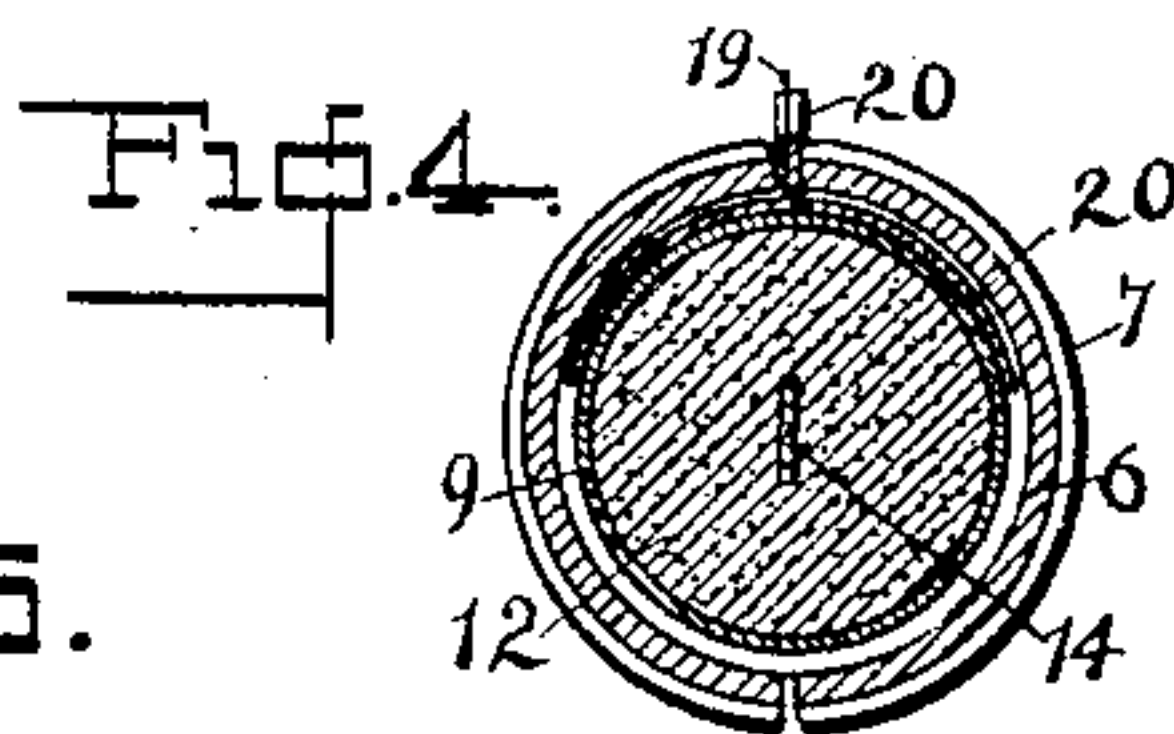
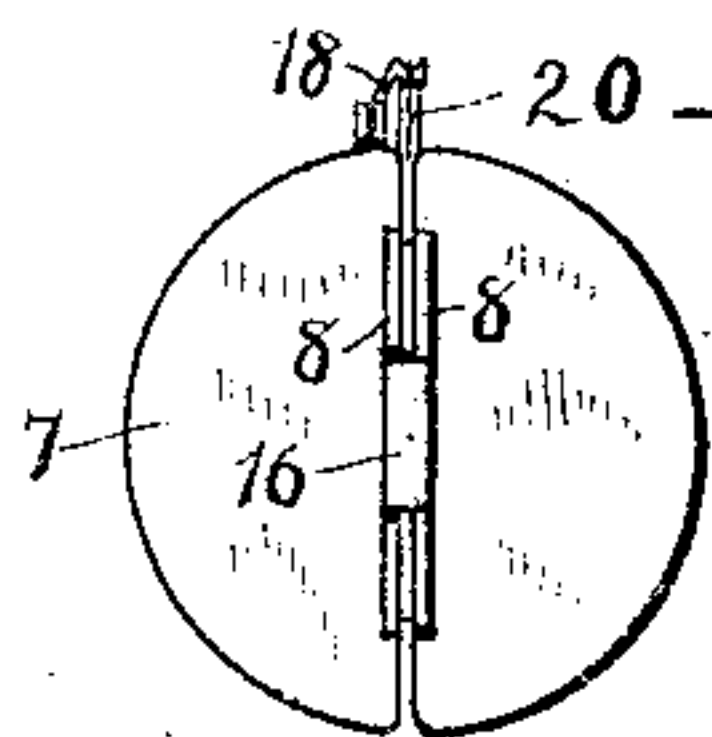
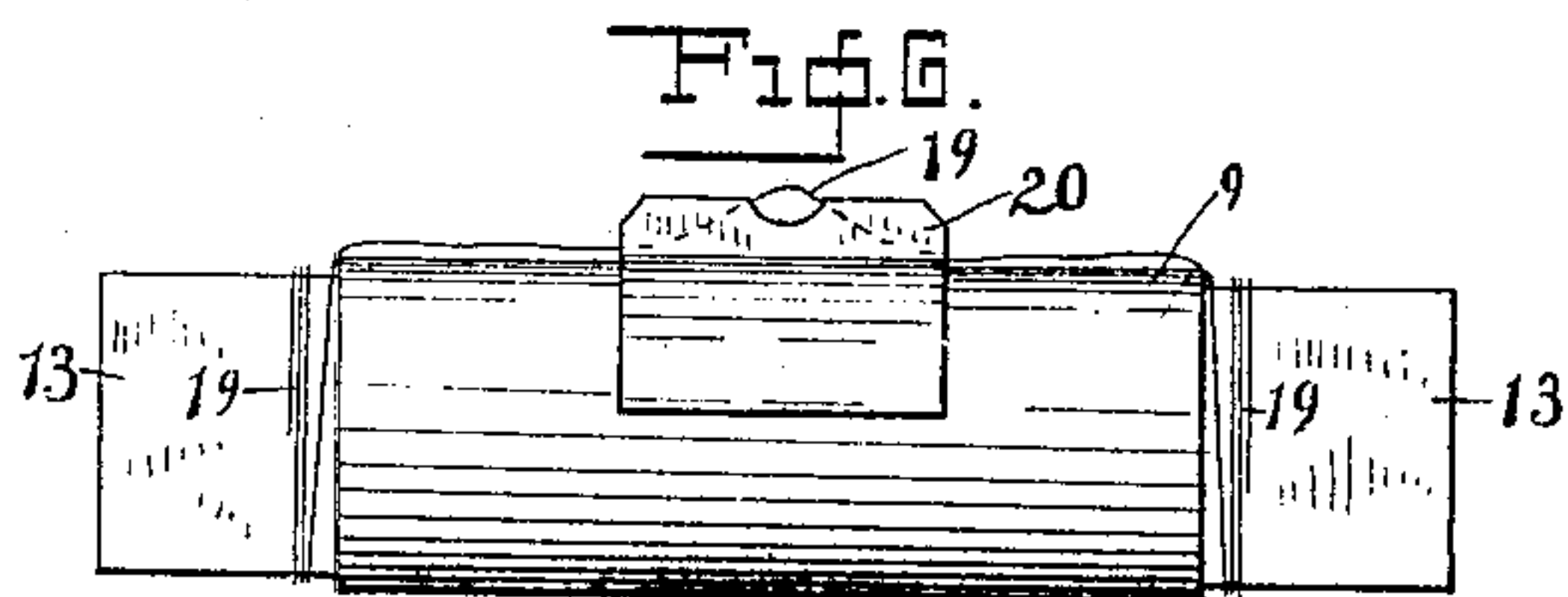
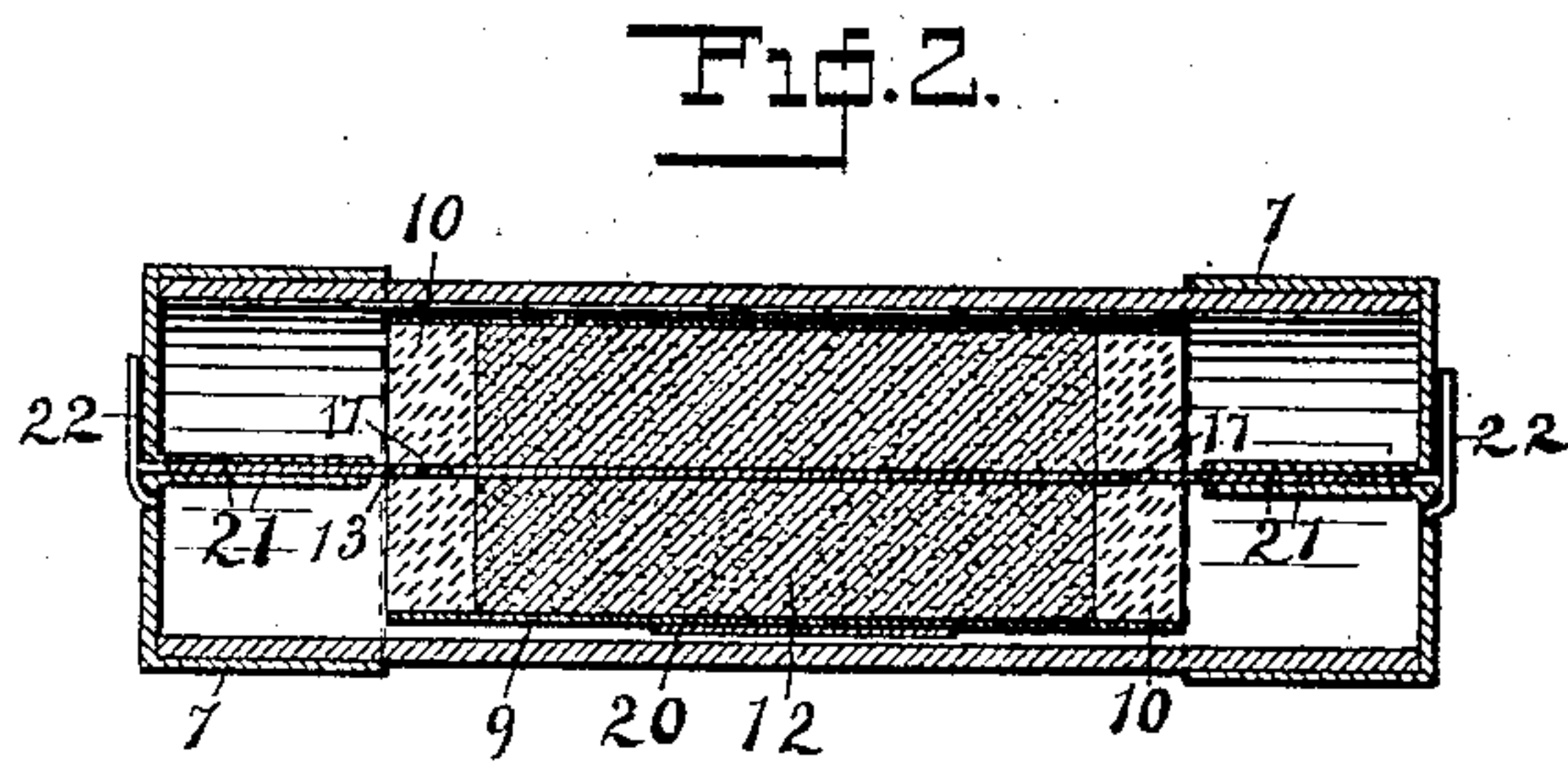
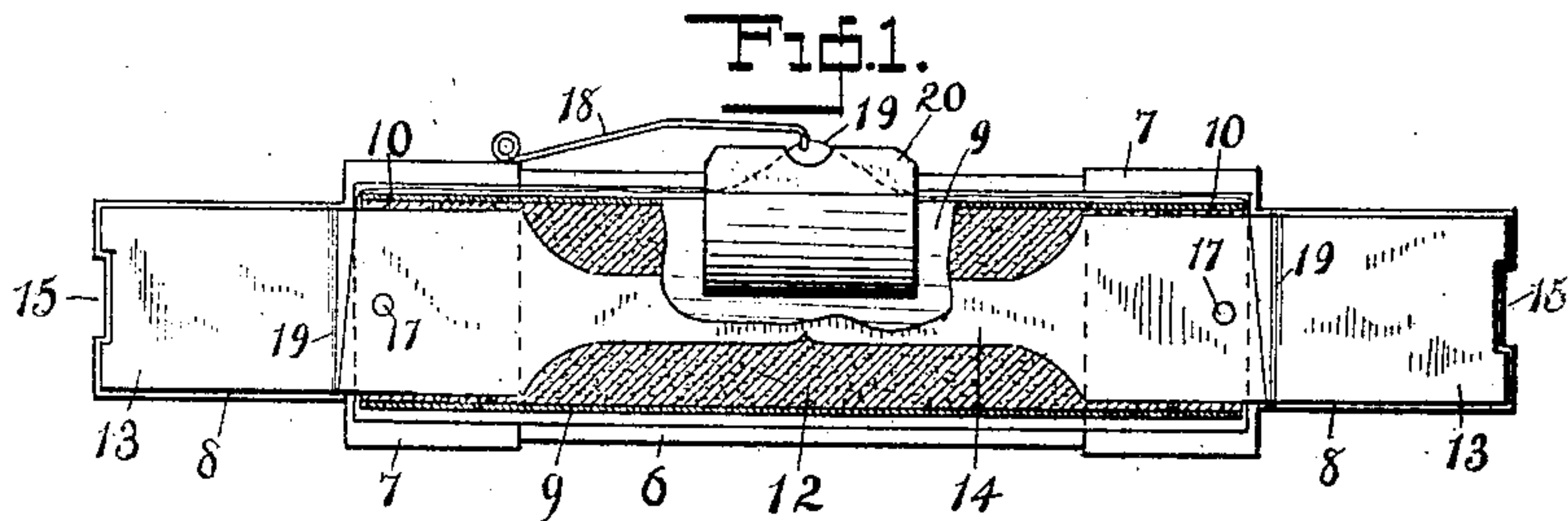


No. 878,212.

PATENTED FEB. 4, 1908.

S. J. LEVEEN.
ELECTRIC FUSE.

APPLICATION FILED NOV. 3, 1906.



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ELECTRIC FUSE.

No. 878,212.

Specification of Letters Patent.

Patented Feb. 4, 1902.

Application filed November 3, 1906. Serial No. 341,821.

To all whom it may concern:

Be it known that I, SWAN J. LEVEEN, a citizen of the United States, residing at Rock Island, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Electric Fuses, of which the following is a specification.

This invention relates to improvements in electric fuses, and the especial object of the improvements which form the subject matter of this application for patent, is to provide a fuse holder or shell that may be easily and cheaply refilled as often as the fusible element is burned out.

A further object is to produce a fuse of economical manufacture, in which the fusible element will be effectively sensitive to resistance conditions in the circuit but not so easily fused as to render it impractical under ordinary working conditions.

A still further object is to provide a fuse in which the parts will be protected from fire incident to the burning out of the fusible element.

Having the foregoing and other objects of utility, I have invented the fuse shown in a preferred and a modified form in the accompanying drawing.

In said drawing:—Figure 1 is a longitudinal sectional view of my improved fuse in its preferred form; Fig. 2 is a longitudinal sectional view of a fuse of modified construction (at right angles to the section plane of Fig. 1) but embodying the same principles of construction and operation as the form shown in Fig. 1; Fig. 3 is an end view of a complete fuse of the form shown in Fig. 1; Fig. 4 is a transverse section of the fuse shown in Fig. 1, and Fig. 5 is an elevational view of the zinc-fuse plate of Fig. 1, and the spring-holding wire, showing the relative arrangement of the two; Fig. 6 shows the fusible element and its protective sleeve or covering; Fig. 7 shows one-half of the shell of the form embodied in Fig. 2.

Referring to Figs. 1, 3, 4, 5, and 6, of the drawing, 6 represents the fiber semi-cylindrical sleeve which forms one-half of the casing or shell. On each end of this sleeve section is fitted a copper cap 7 which is formed with an extension 8. These extensions on one of the sleeve sections are formed with lugs 16 bent up at right angles, which are adapted to interlock with notches 15 cut in the corresponding ends of the extensions of

the complementary sleeve section, thus serving to connect the two sections together.

Soldered or otherwise suitably secured to one of the caps 7 is a wire spring 18 the free end of which is bent to form a hook, and the attached end to form a coil so that the normal tension of the spring is exerted to throw it upwardly when released. With the exception of the lugs and notches and this spring, the two halves or sections of the shell are formed alike.

A tube 9 formed of asbestos paper of a size adapted to be embraced by the shell-sections, has extending longitudinally through its center a zinc fuse-plate 13 formed in the shape shown in Fig. 5, and provided with end notches 15, corresponding to the notches 15 in the extensions 8, and with holes 17, 17. Except at its ends the tube is filled with asbestos powder as 12, and into its ends, plaster of paris is poured in semi-liquid form, so that it enters the holes 17, and thus forms a bond to hold the fuse-plate 13 against endwise movement and maintain it in its proper relation to the protective cover 9.

Partly embracing the asbestos tube 9 and secured thereto by a suitable adhesive is a paper label 20, the folded portion of which projects above the tube 9, and has a small hole cut therein to expose the fine fuse-wire 19 which runs through the folded portion of the label, and extends along the outside of said tube and has its ends wound around the zinc-fuse plate 13, as clearly shown in Figs. 1 and 5. By pressing down the spring 18 its hooked end will engage the exposed portion of the wire 19 and the latter will hold the spring depressed until it fuses.

In practice, the fuse-plate is of relatively low resistance and the wire 19 of high resistance, so that the latter will remain intact or be unaffected by the current so long as the zinc plate remains unfused, but the instant the latter fuses, the wire becomes incandescent and burns the proper label, and because of its weakened condition resulting from incandescence, is easily broken by the spring the tension of which is upward. As soon as released, the spring assumes an upright position, thus indicating the "blowing" of the fuse plate. The burned label will also serve to indicate the blowing of the fuse-plate. If the tension of the spring should be insufficient to disrupt the fine fuse-wire, the burned label will partially release the latter and thus

permit the spring to assume a semi-upright position which will serve to indicate visually that the fuse-plate is impaired if not entirely burned out, it being understood that the label normally holds the portions of the wire covered thereby closely to the tube 9 to which the label is attached.

When the fusible elements become destroyed in the manner described, new ones can be inserted by simply bending back the lugs 16, disconnecting the two half-sections of the shell, removing the burned fuse-plate, its protective sleeve 9 and attached wire 19, and inserting the prepared substitute. It will be seen that the portion of the fuse-plate within the shell is surrounded by asbestos powder, plaster of paris and the asbestos tube 9, thus effectively protecting the fiber shell against the heat generated from any cause in the circuit in which the fuse is placed, so that the shell may be repeatedly used. As the ends of the plate 13 project a considerable distance beyond the ends of the shell and as they are embraced on both sides by the extensions 8 of the caps 7, there will be a large area of contact surface thus insuring maximum efficiency, it being understood that the extensions 8 are suitably connected with the circuit in which the fuse is used.

In the form of device shown in Fig. 2, the caps 7 have no outward extensions 8, but are provided with inward extensions 21, between which the fuse-plate 13 is held. The ends of the shell-sections are connected by means of a lip 22 secured to the cap of one section and adapted to be bent over and inserted in a hole provided therefor in the corresponding end of the other section. These lips prevent endwise movement of the fuse-plate 13. This form of shell is adaptable to a different style of holder than that shown in Fig. 1, but except in the particulars mentioned it is the same as that shown in said figure.

Having thus described my invention what I claim is:—

1. A fuse-shell comprising two separable corresponding complementary sections composed of suitable non-conductive material, each of said sections having metal caps secured to its ends, said caps having integral portions adapted to embrace a fuse-plate, and means for separably connecting the caps of the complementary sections.

2. A fuse-shell comprising two semi-cylindrical complementary sections composed of suitable non-conductive material, each of said sections having metal-caps secured to its ends, said caps having integral extensions adapted to embrace a fuse-plate, and having separable interlocking portions.

3. A fuse-shell comprising two semi-cylindrical sections composed of a suitable non-conductive material, each of said sections having metal end-pieces adapted to contact

with a fuse-plate, said end-pieces having detachable interlocking portions.

4. In a fuse device of the character described, fusible elements comprising a fuse-plate of relatively low resistance and a fuse-wire of relatively high resistance, said wire connected with said plate and exposed for a portion of its length, and means under tension engaging the exposed portion of said wire.

5. In a fuse device of the character described, fusible elements comprising a fuse-plate, a fuse-wire having its ends wrapped around said plate, and indicating means connected with said fuse-wire, said means exerting tension on said wire.

6. In a fuse device, a two-part shell, a non-combustible tube embraced by said shell, a fuse-plate partially inclosed by said tube, a fuse-wire connected with said plate and having a portion exposed, means securing said wire to said tube, and a spring secured to said shell and engaging the exposed portion of said wire.

7. In combination, a fuse-shell, composed of two readily separable interlocking sections, a fusible-plate arranged between the adjacent sides of said sections, a non-combustible cover for said plate, means for holding said plate against movement in said cover, and indicating means adapted to operate upon the fusing of said plate.

8. In combination, a fuse-shell composed of two readily separable interlocking sections having metal extensions, a fusible plate arranged between said sections and adapted to be clamped by said extensions, a tube surrounding the unclamped portion of said plate, a non-combustible filling for said tube, and indicating means adapted to operate upon the fusing of said plate.

9. In combination, a fuse-shell composed of readily separable interlocking sections, a fusible plate inclosed by said sections, means for protecting said sections from heat from said plate when fusing, and means for indicating on the outside of said shell, the fusing of said plate.

10. In combination, a shell composed of two parts detachably joined together, a fusible plate embraced by said shell and having integral portions extending thereupon, non-combustible means for protecting the shell from heat from said plate when fusing, and a fuse wire connected with said plate and having a portion projecting from said shell.

11. In combination, a two-part fuse-shell, means connecting said parts together, a fuse-plate embraced by said shell, and having its ends exposed, means protecting the shell from heat from said plate when fusing, a fuse-wire connected with said plate and exposed from said shell, a spring detachably connected with said wire and adapted to change its position upon the fusing and disruption of the wire.

12. A fuse-shell divided longitudinally into complementary sections, means for connecting and disconnecting said sections, in combination with a fusible plate embraced and held by said sections.

13. In an electric fuse device, a filler element consisting of a fusible plate having its ends adapted to form contact terminals and having a portion between its ends of relatively greater resistance than the end portions, a wrapper of non-combustible material surrounding the portion of said plate having increased resistance, and a fuse-wire connected with said plate on opposite sides of said portion of increased resistance.

14. In a fuse device, a filler element composed of a plate of suitable material, an incombustible covering surrounding a portion of said plate, means for preventing endwise movement of said plate relative to said covering, and a fuse wire connecting the ends of said plate.

15. A fuse-shell divided longitudinally into complementary sections each section having contact terminals at its opposite ends, means on said terminals for connecting and disconnecting said sections, in combination with

a fusible plate embraced and held by said sections and having its end portions embraced by the contact terminals of the sections.

16. In a fuse device, a fusible element composed of a fusible plate, a cover for said plate consisting of incombustible material inclosed within an incombustible envelop and a sealing medium at the ends of said envelop, said sealing medium engaging said plate.

17. In an electric fuse, a filler or cartridge element consisting of a fusible plate having its mid-portion of reduced area, a non-combustible wrapper or sleeve surrounding the mid-portion of said plate and inclosing a non-combustible substance, means preventing the endwise movement of said plate in said sleeve, and an attenuated fuse-wire connected with said plate at points on opposite sides of its mid-portion.

In testimony whereof I affix my signature in presence of two witnesses.

SWAN J. LEVEEN.

Witnesses:

ELMER B. WHARTON,
R. C. VANCE.