

(No Model.)

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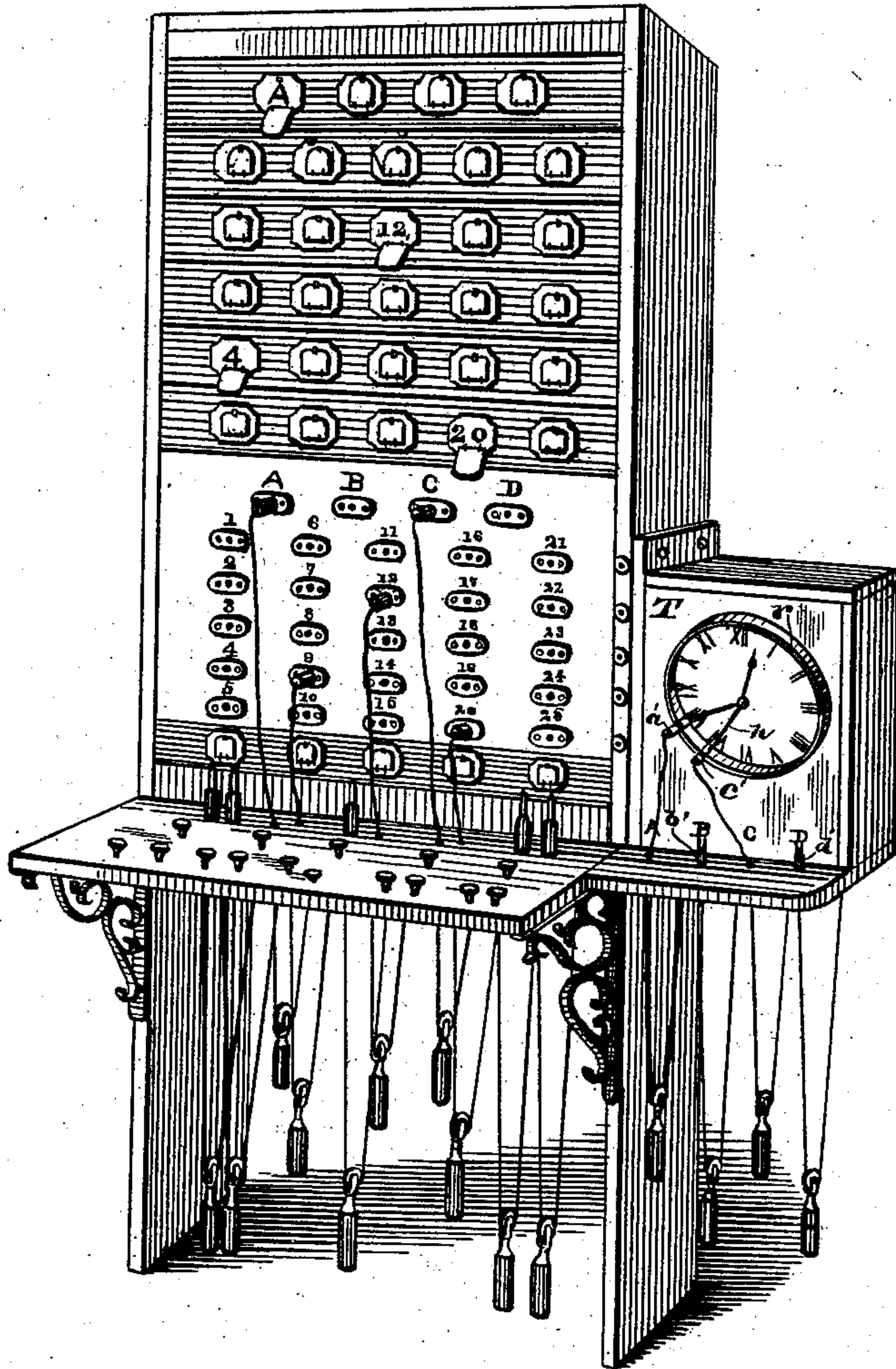
A. S. HIBBARD.

TIME SIGNAL FOR TOLL LINES OF TELEPHONE EXCHANGES.

No. 293,736.

Patented Feb. 19, 1884.

Fig. 1



Attest
Paul A. Staley
M. L. Rafter

Inventor
August S. Hibbard
By *George M. Barton*
Attorney

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2 Sheets—Sheet 2.

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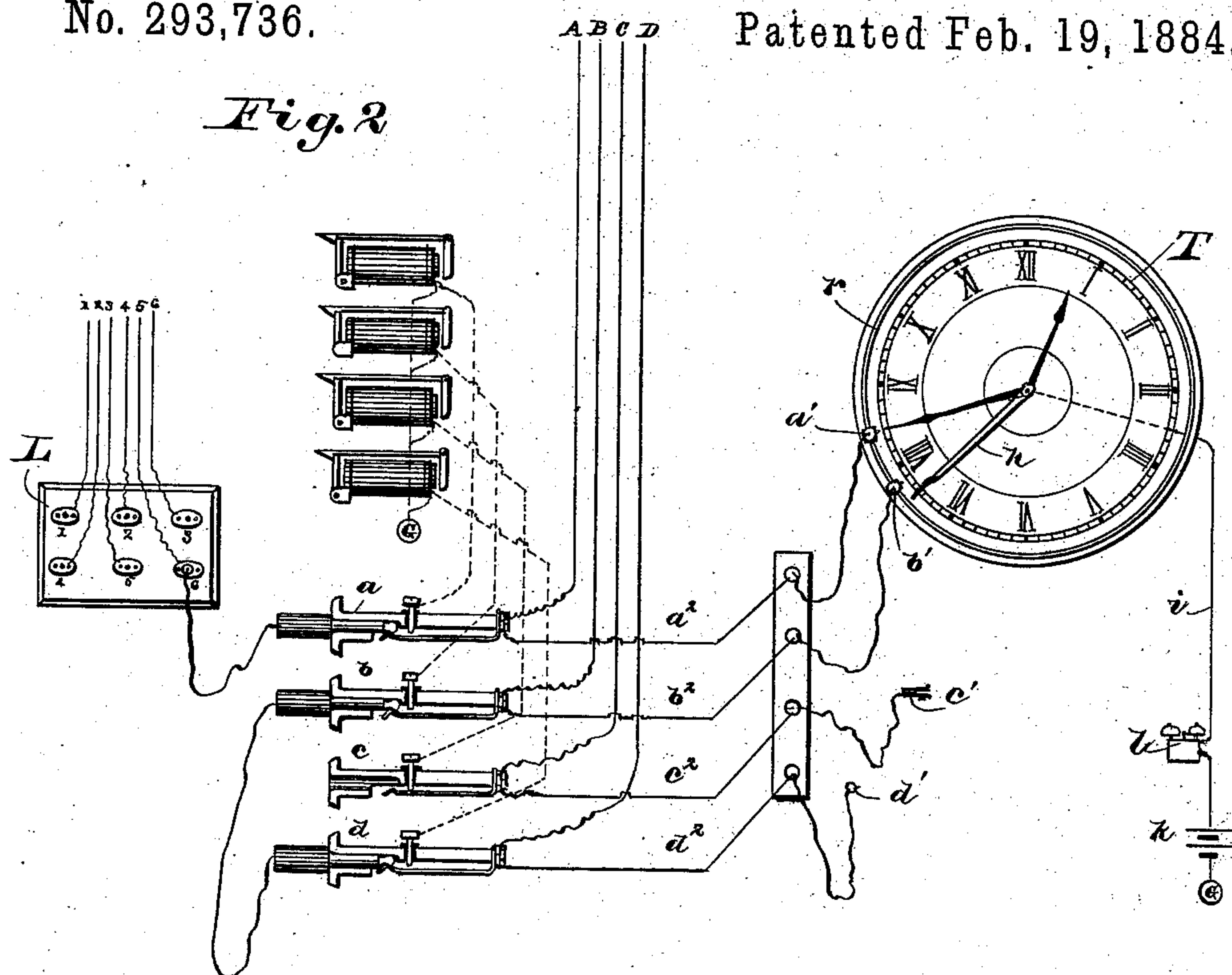


Fig. 5

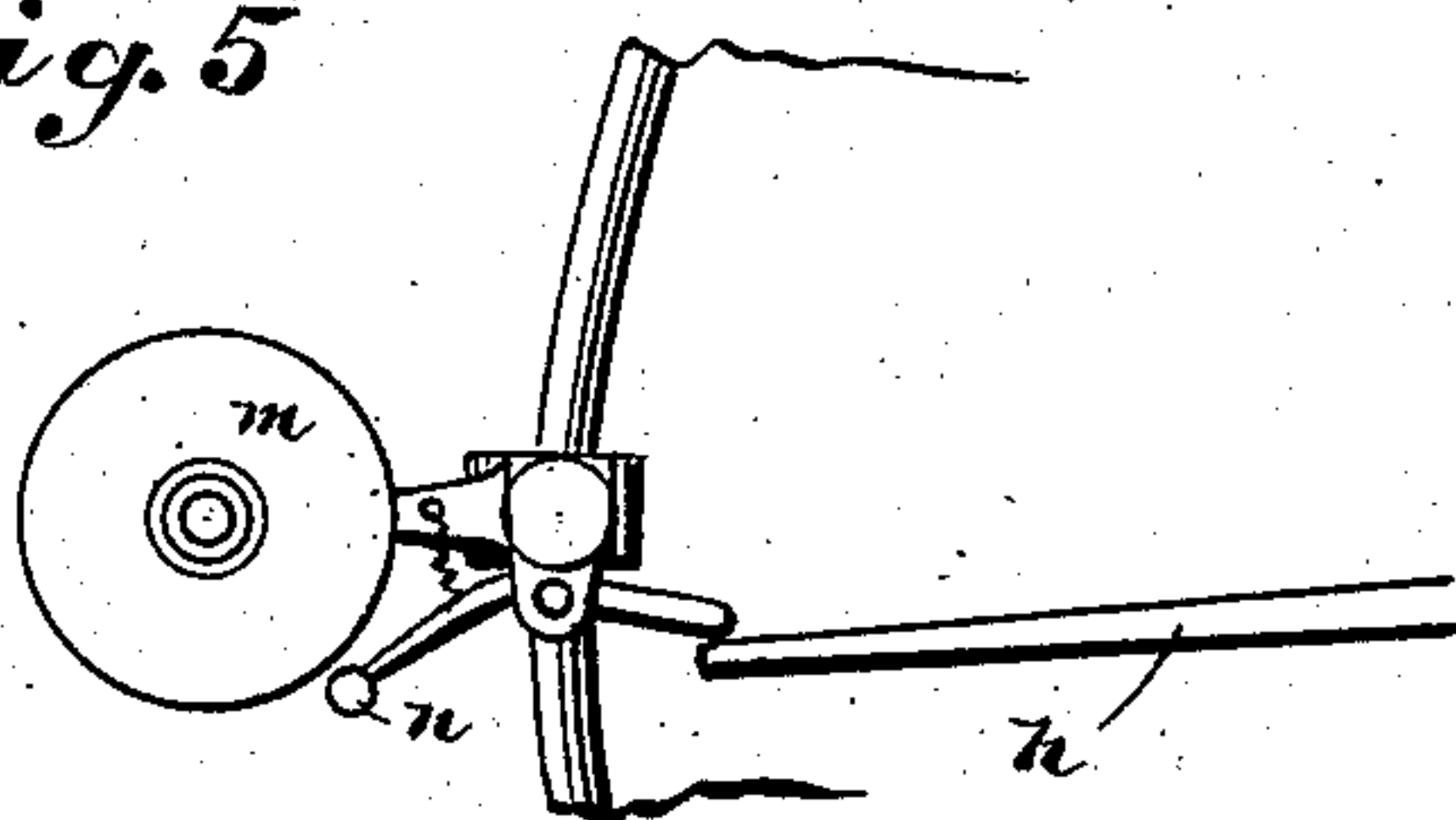


Fig. 3

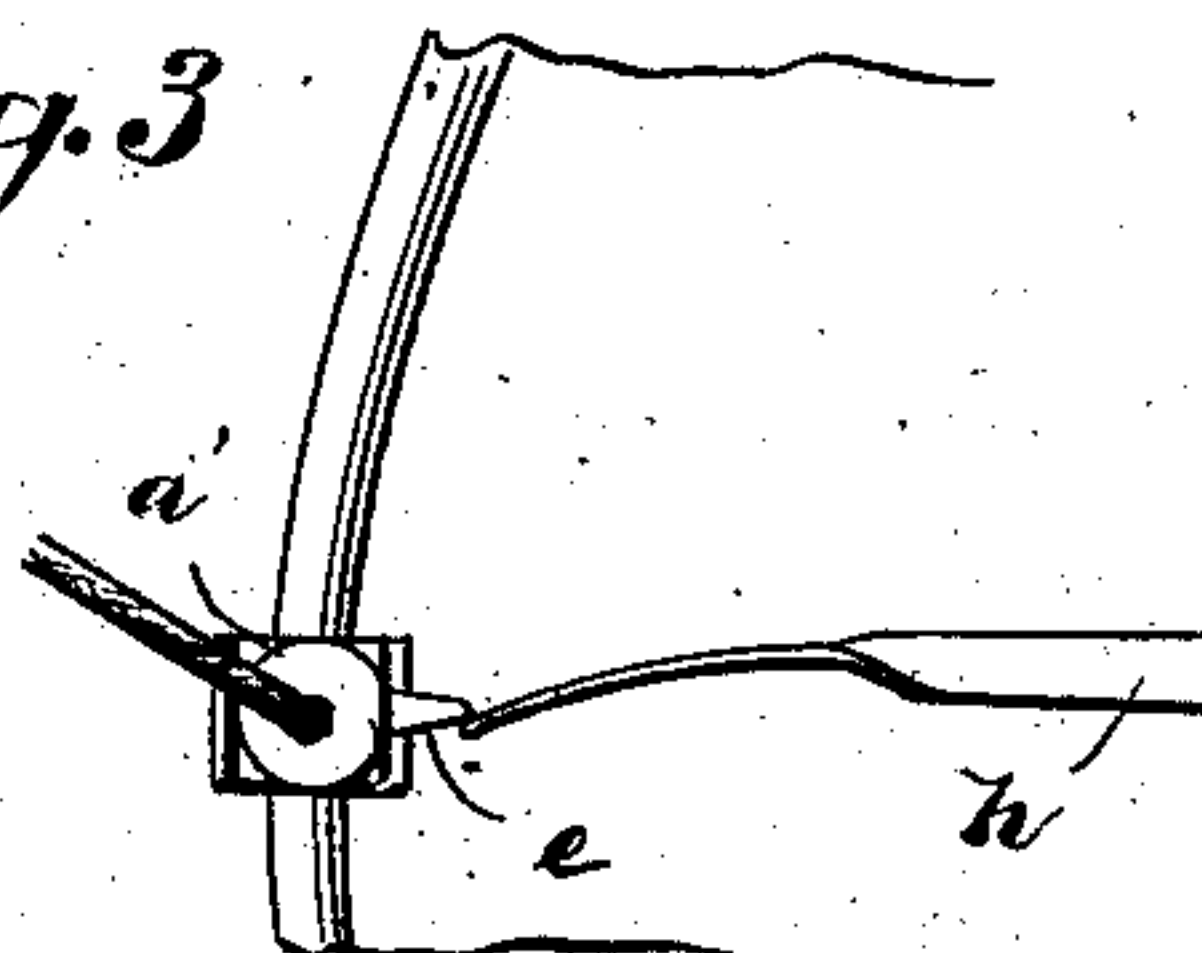


Fig. 6

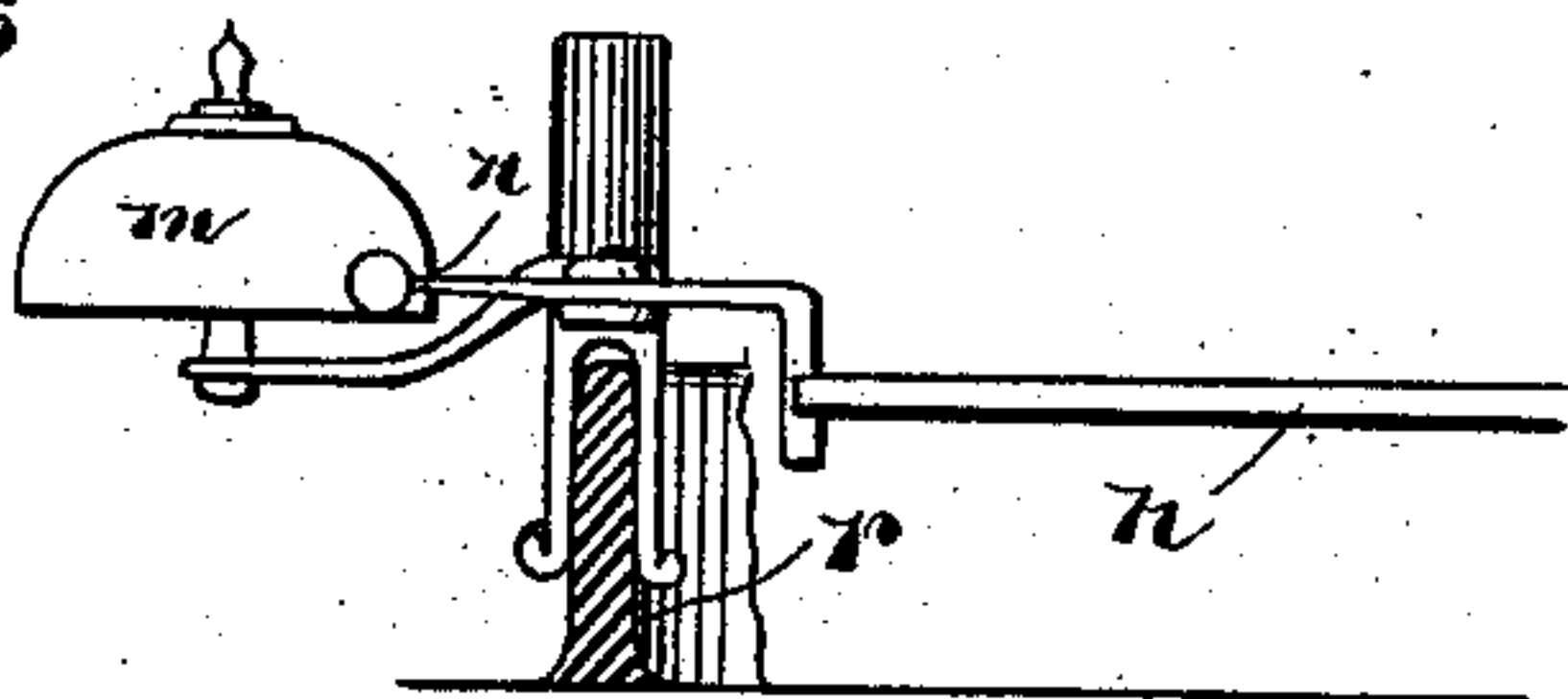
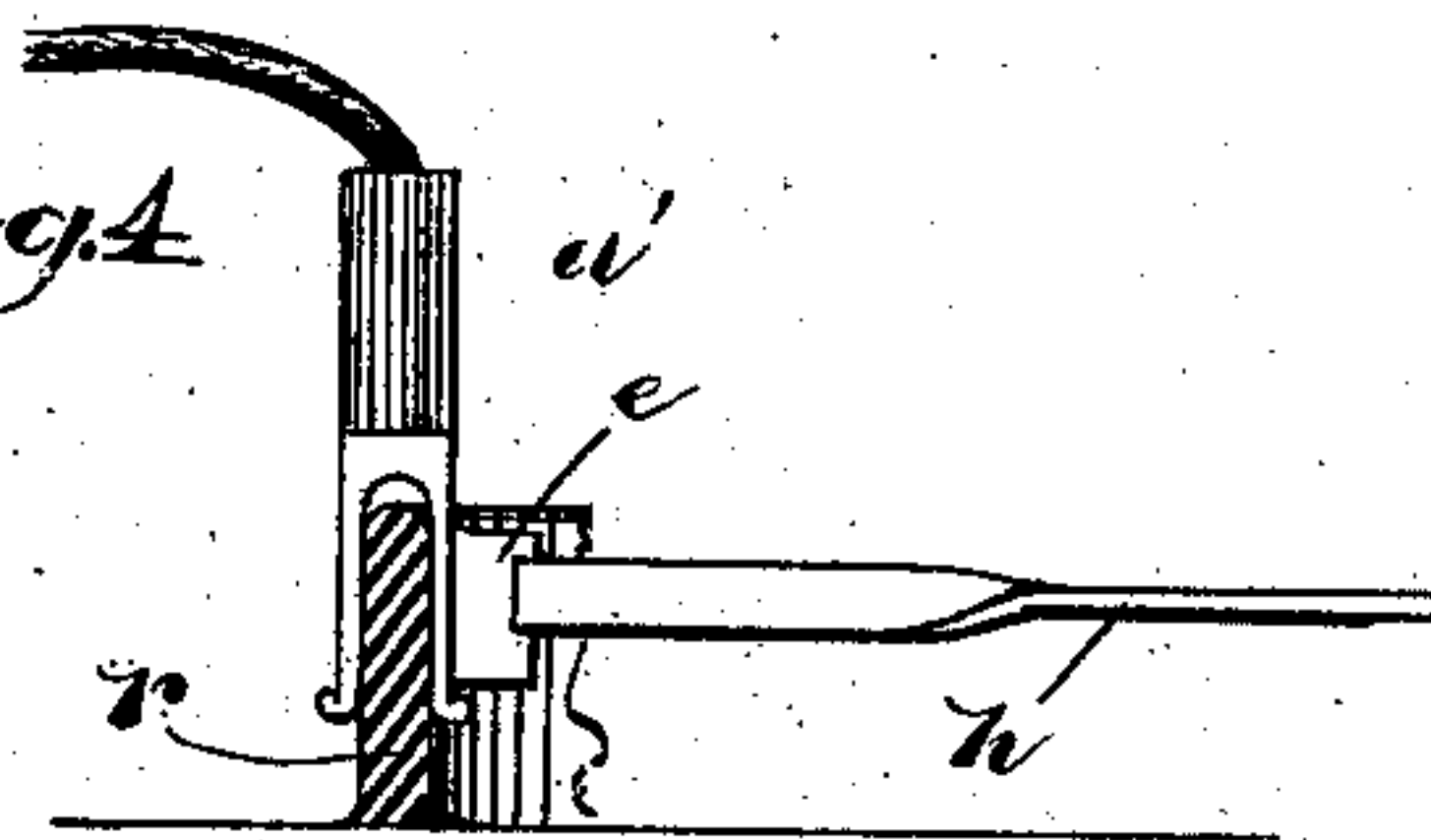


Fig. 4



Attest

Paul A. Stamp

M. L. Rafter.

Inventor

August S. Hibbard

By

George P. Barton

Attorney

UNITED STATES PATENT OFFICE.

ANGUS S. HIBBARD, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

TIME-SIGNAL FOR TOLL-LINES OF TELEPHONE-EXCHANGES.

SPECIFICATION forming part of Letters Patent No. 293,736, dated February 19, 1884.

Application filed April 30, 1883. (No model.)

To all whom it may concern:

Be it known that I, ANGUS S. HIBBARD, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Time-Signals for Toll-Lines of Telephone-Exchanges, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

It is now common to connect telephone-exchanges with one another by means of extra-territorial or toll lines. Subscribers connected with the same exchange are usually entitled to talk with one another as often and as long as they desire for a stipulated amount yearly; but for a connection or conversation outside of the exchange a subscriber must pay a toll of from, say, ten to twenty-five cents for each five minutes' conversation. It is therefore necessary for the toll-line operator to note the time so as to give a subscriber his full five minutes, or whatever the time may be, and no more. Heretofore it has been customary for the toll-line operator to make out a ticket noting the time at which a conversation is begun and then the matter must be kept in mind, so as to be able to disconnect at the proper time. This system works well so long as the connections required are few; but when several subscribers require the toll-service at the same time great confusion frequently arises. By the use of my system a single operator is enabled to make the connections and disconnections of toll-lines promptly and without fatigue or confusion.

My invention consists in a time-piece and mechanism, as herein described and claimed, whereby an automatic signal may be given to notify the operator to disconnect the lines.

My invention further consists in the use of a time-piece, with circuits, and mechanism for automatically signaling to the subscribers and to the operator at the close of any desired space of time.

In the drawings, which are illustrative of my invention, Figure 1 is a perspective view of a switch-board to which my improved time-signal system has been applied. Fig. 2 is a

diagram view of circuits and connections. Figs. 3 and 4 are enlarged detailed views of some of the parts shown in Fig. 2. Figs. 5 and 6 are views of a modification of my invention. This modified form consists in a bell adapted to be operated by the time-piece directly at the close of any desired interval of time, without the aid of the battery and circuits shown in Fig. 2.

In Fig. 1, I have shown, for convenience, the switches and annunciators of twenty-five lines arranged in the usual way upon the switch-board. Any usual operator's outfit may be used.

A B C D represent four toll or extra-territorial lines, which may be provided each with a switch and annunciators, as shown. By means of cords and plug arranged in the usual way, as shown, I am enabled to connect any two lines together. I may connect two toll-lines, or I may connect two subscribers' lines, or I may connect any subscriber's line with either one of the toll-lines. I have shown the toll-line A connected with telephone-line 9, and I have also shown telephone-line 20 connected with toll-line C. The calls and connections, as above described, may be made in any well-known manner.

The time-piece T, which serves to operate the signals, I have shown in Fig. 1 secured to the switch-board. This time-piece is provided with an extra hand, *h*, which is placed a given distance behind the minute-hand—say five minutes—on the dial. This hand *h* is made of conducting material and moves with the minute-hand.

Around the dial of the time-piece T is a ring, *r*, preferably of hard rubber or other non-conducting material, which projects from the surface, so as to be clasped by the plugs which mark the time at which a given conversation is begun, as hereinafter set forth.

From the spring jack or switch of each toll-line, in addition to the usual normal connections, I make a connection with a signal plug or clasp attached to a flexible cord, and adapted to be placed upon the ring *r* opposite any given point on the dial. These connections are shown in the diagram view, Fig. 2, in which *a b c d* represent the respective switches,

5 $a' b' c' d'$ the plugs or clasps connected to said switches by wires $a^2 b^2 c^2 d^2$. Each plug or clasp, as shown in Figs. 3 and 4, consists of a bifurcated metallic piece adapted to clasp the ring r , as shown in Fig. 4. It is preferably provided with a rubber handle, through which the flexible cord passes to make an electrical connection with the metallic portion. On one side of the metallic portion of each signal-plug is a lug, e , against which the hand h strikes in passing. This hand h is connected to ground by a line, i , in which is included a battery, k , and a vibrating bell, l , or other signaling device. The outer end of the hand h is made flexible, and preferably consists of a platinum ribbon.

10 In the diagram view, Fig. 2, I have shown a local-switch board, L , to line 6 of which the toll-line A is shown connected. The toll-lines $B D$ are shown connected together by flexible cords and plugs in the usual manner.

15 The operation of my signal system is as follows: When a connection is made on a toll-line—as, for instance, on line A —the clasp or plug a' , connected to the switch of said line, is placed on the ring r of the time-piece opposite the minute-hand. The operator is then free to attend to the calls of local subscribers, or other duties. When the time allotted for conversation has expired, the minute-hand having advanced five minutes, the hand h is brought into contact with the metallic portion of the signal-plug a' , thus establishing a connection from the battery k to the line of the connected subscribers. The signaling device l is set to operating, thus notifying the operator, and at the same time sending a signal to both subscribers that the time is up. In case the subscribers are not through with the line, the operator ascertains the fact in the usual manner, and the signal-plug a' is again placed opposite the minute-hand and another five minutes allotted to the connected subscribers. When the subscribers are through talking, the lines are disconnected and the signal-plug removed from the ring r .

20 By this system a number of lines may be in use at the same time without confusing the operator. A signal-plug being placed on the ring r opposite the minute-hand when the connection is made, the subscribers of each connected line and the operator will be notified automatically at the expiration of the time allotted, in the order in which they were connected.

25 The signal-plugs may be arranged with cords and weights in a similar manner to the spring-jack plugs used for making the connections on the switch-board, as shown in Fig. 1; but a small amount of space will thus be occupied in making the connections, while the plugs will always be convenient for use.

30 The modification shown in Figs. 5 and 6 is simply intended to notify the operator at the expiration of any given time and does not signal the subscribers. It consists in a small signal-bell, m , mounted upon the signal-plug.

The bell-hammer n is adapted to be struck by the hand h in passing, and thus gives a signal to the operator, who then calls up the connected subscribers and ascertains if they are through.

35 If desired, the hand h may be dispensed with by an adaptation of the minute-hand to give the required signal when the allotted time is up. In this case the signal-plug would be placed in advance of the minute-hand a distance on the dial equal to the time allotted.

40 It is obvious that the invention is susceptible of various other modifications. I do not, therefore, limit myself to the specific means as herein set forth for carrying out the same.

Having thus described my invention, I claim—

1. The combination, with two connected subscribers of a telephone-exchange, of a normally-open branch circuit, and a time-piece adapted to automatically close said branch circuit to the circuit of the connected subscribers, and thus send a signal to line at the expiration of a given time, substantially as set forth.

2. The combination, with two subscribers' lines connected together, of a normally-open branch circuit to ground, including a signal-bell and battery, and a time-piece, whereby said branch circuit may be closed automatically at the expiration of a given time, substantially as and for the purpose set forth.

3. The combination, at a telephone exchange, with toll-lines and connecting apparatus, of independent branch lines, one branch line from each toll-line, a normally-open earth-circuit, including a battery and signaling device, and means whereby the said earth-circuit may be connected automatically at different times to the independent branch lines, substantially as and for the purpose specified.

4. The combination, at a telephone exchange of two or more telephone-lines and their spring-jacks, of branch lines provided with terminal plugs or clasps, one branch line from each spring-jack, a time-piece adapted to support said terminal plugs or clasps about its dial, and means for automatically sending a signal on a telephone-line when the hand of the time-piece arrives at the plug connected to said line, substantially as and for the purpose set forth.

5. The combination, with a telephone-line, of a time-piece having an extra hand placed at a given distance behind the minute-hand and moving with said minute-hand, and a normally-open branch circuit adapted to be closed to said telephone-line by said extra hand when it has advanced a distance equal to the distance between it and the minute-hand, substantially as specified.

In witness whereof I hereunto subscribe my name this 23d day of April, A. D. 1883.

ANGUS S. HIBBARD.

Witnesses:

S. R. KEMPER,
 A. H. ELMORE.