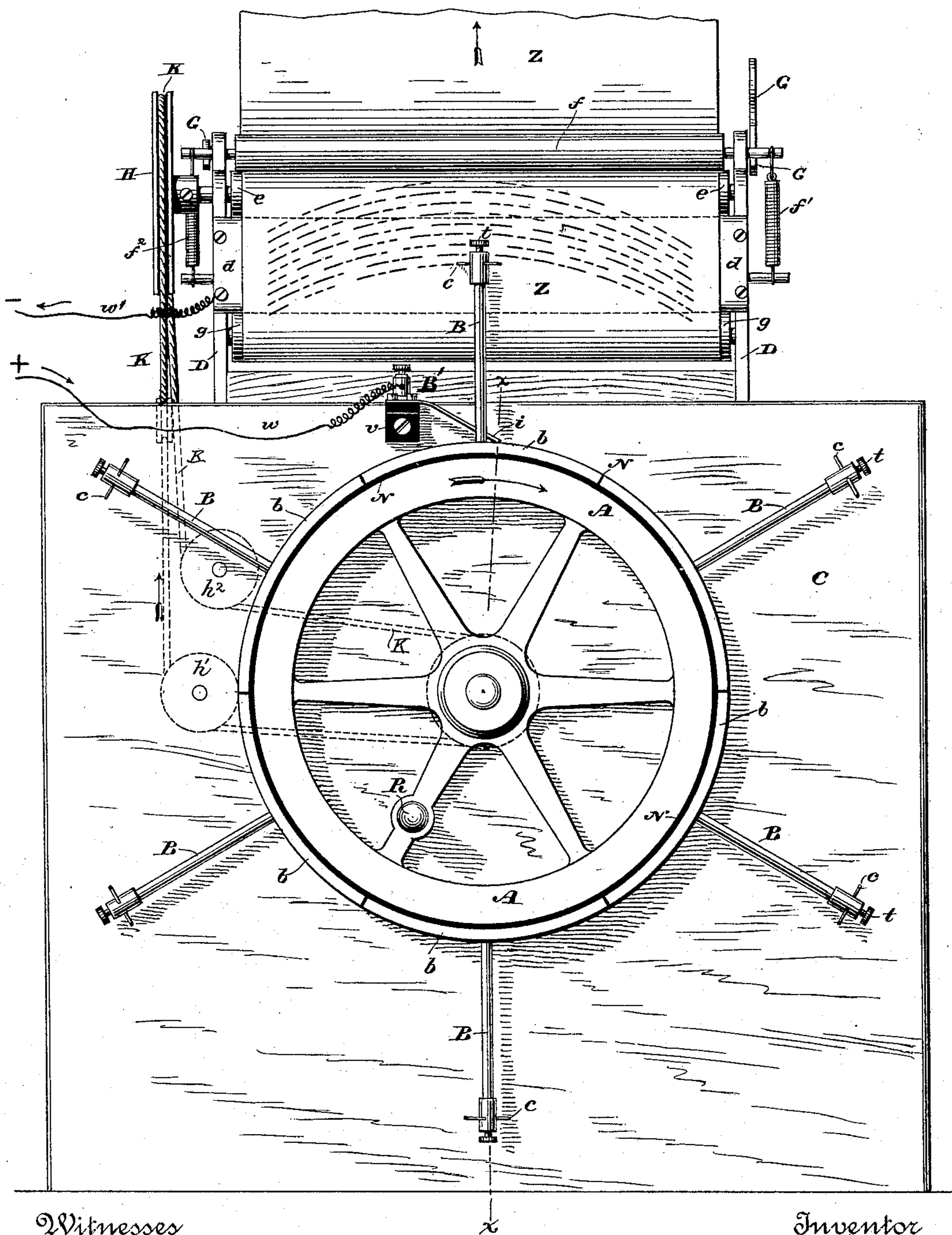


2 Sheets—Sheet 1..

No. 407,461.

Patented July 23, 1889.

Fig.1,



Witnesses

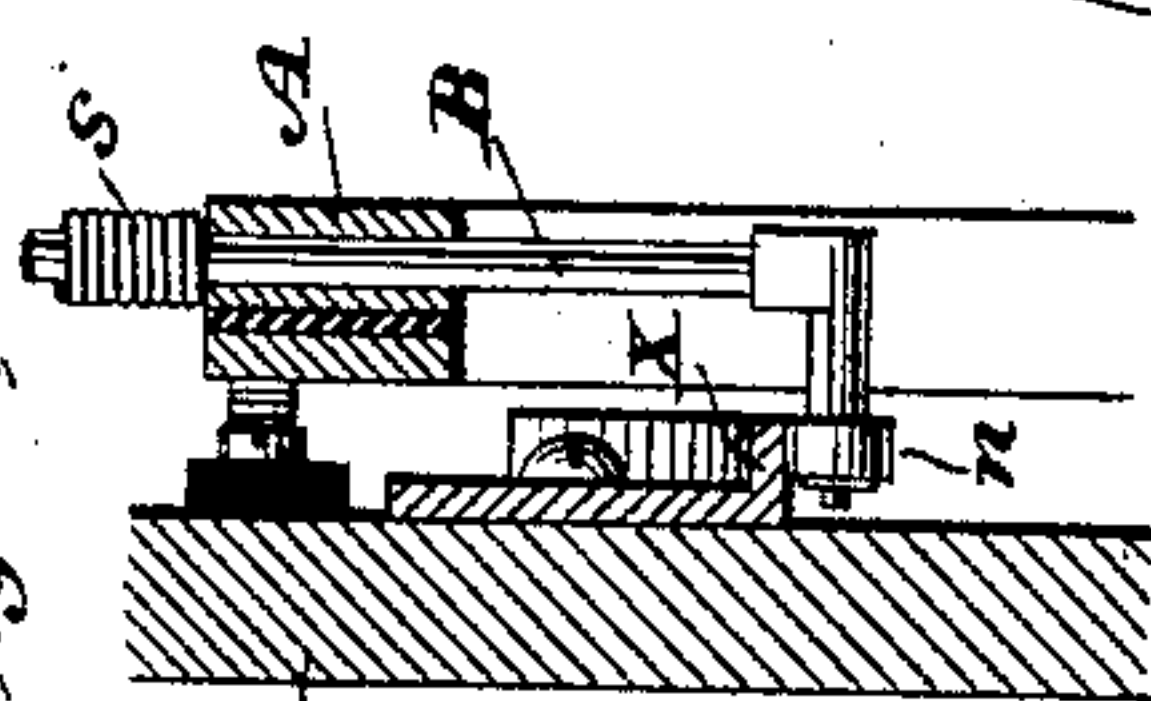
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

FRANK ANDERSON, OF PEEKSKILL, NEW YORK.

AUTOMATIC TELEGRAPHY.

SPECIFICATION forming part of Letters Patent No. 407,461, dated July 23, 1889.

Application filed February 9, 1889. Serial No. 299,264. (No model.)

To all whom it may concern:

Be it known that I, FRANK ANDERSON, a citizen of the United States, residing at Peekskill, in the county of Westchester, State of New York, have made a new and useful Invention in Telegraphy, of which the following is a specification.

My invention relates particularly to improvements in that class of telegraphs known as "automatic" or "stylographic" telegraphs; and to this end it consists in an improved form of automatic telegraphic receiver.

The object of my invention is to produce a record upon a continuous sheet of paper in such a manner that it may be read as an ordinary paged book or paper is read, so that the record is made by a series of lines which indicate in sequence the characters transmitted, said characters being of the well-known Morse or equivalent type. I accomplish this object by the apparatus hereinafter described, and particularly pointed out in the claims which follow this specification.

In all automatic telegraphic receivers in general use with which I am familiar the record is produced upon sensitized paper or an equivalent receiving-strip, either in one continuous row extending in the direction of the length of the strip, or it is produced upon a cylindrical roll of paper in the nature of a spiral line also extending in a continuous line recorded from one end of the cylinder to the other, so that it is only possible to place a limited amount of record-paper upon the receiving-instrument.

My invention is designed to utilize sensitized or equivalent record-paper from a roll in the general manner in which paper is taken from the roll in the printing of newspapers, books, and other publications.

Referring to the drawings, in which like letters represent like parts wherever used, Figure 1 represents an end elevation of my improved automatic telegraphic receiver. Fig. 2 represents a cross-sectional view on line xx , Fig. 1, taken through the body of the instrument, and showing the upper portion thereof in side elevation. Fig. 3 represents a detailed view of a modified form of the apparatus designed to form the received record in horizontal or straight lines across the page. Fig. 4

is a detailed sectional view on line yy , Fig. 3. Fig. 5 is a detailed view of a modified form of the contacting apparatus designed to repeat the portions of the record at the ends of the lines.

Referring to the drawings in detail, C represents the supporting-frame of the instrument, in which is journaled an axle a , to the outer end of which is affixed the receiving-wheel A, which has attached to one of its spokes a handle R for rotating said wheel, or I may rotate it by any desired kind of power applied to the pulleys P, (shown in Fig. 2,) the rotation being of course kept in unison with the transmitting-wheel, of any desired form, either by any of the improved forms of governors, or, if rotated by hand, by making the same number of rotations of said instruments at both stations.

On the top of the frame C is an additional frame D, carrying the paper-feeding rollers e , f , and g , together with the paper-sustaining roll E, from which the sensitized paper Z is conducted under roll g in front of a metallic surface d , up and between the feed-rolls e and f , the latter being connected by a cord or belt K with the pulley h on the main shaft a , two idle-pulleys h' and h'' being provided to change the direction of said belt or cord around the large pulley H, carried by the feed-roll e .

The upper feed-roll f is journaled in two slotted bearings located on the opposite sides of the frame D, and is provided with a lifting device consisting of a rod extending from side to side parallel with the feed-roller and having a lifting-lever G, with a short-armed lever at its lower end, which, together with a similar short-armed lever affixed to the other end of the aforesaid rod, lift said feed-roll out of contact with the paper Z and against the stress of the springs f' and f'' .

The function of this apparatus is to prevent the paper from being fed forward when no messages are being transmitted, so that paper may not be wasted. In other words, if an interval of time occurs while the apparatus is running in which no messages are being received, the operator may simply lift the upper feed-roll from contact with the paper, and the feed of the paper is therefore stopped un-

til the receiving apparatus indicates through the pens on the paper that an additional message is being transmitted.

The wheel A is preferably of metal, and has attached to its exterior surface a series of metallic sectors *b*, insulated from said wheel and from each other. Each of these sectors carries an arm B, in the outer end of which is fixed, adjustably, by a set-screw *t* or other equivalent means, a conducting contact-pen *c*, set at an angle, as shown, so that when the wheel is rotated to the right in the direction of the arrow said pens will be brought successively into contact with the paper.

i is a contact-spring insulated from the frame of the machine and adapted to bear successively upon the segments *b* as the wheel A is rotated in the direction of the arrow. This spring is connected to a binding-post B', which in turn is connected by a wire *w* to the main line running to the distant station. (Not shown.)

d is a flat metallic surface, against which the paper is held by the action of the feed-rolls. This metallic surface *d* is insulated from the frame D, and is connected by a conductor *w'* to the earth, or by return-wire to the distant station, as desired.

The operation is as follows: Suppose the transmitter (not shown) to have been set in motion at the distant station and the receiver to be rotating at substantially the same rate of speed, either by hand or by power, as described. The first impulses transmitted over the line will pass by wire *w* to binding-post B', contact-spring *i*, sector *b*, arm B, pen *c*, through the sensitized paper to the metallic surface *d*, thence by wire *w'* to the earth and to the distant station. All of the impulses which are transmitted through the first sector *b* will therefore be recorded in a curved line having a length substantially equal to the width of the paper. As long as the feed-roll *f* is held in contact with the paper, and the lower feed-roll *e* and the receiving-wheel A are rotated, the paper will be fed forward with a continuous motion, and each pen as its particular sector comes in contact with the spring *i* will make a record in the nature of a curved line, running from left to right across the face of the paper, during the time that said sector is under the contact-spring, so that the six pens shown in the drawings, Fig. 1, will record in sequence six substantially concentric or parallel lines of characters, the left-hand ends of which will be slightly higher than their right-hand ends, owing to the advance of the paper as it is fed forward.

Of course it will be understood that the record-pens *c* make the record characters upon the sensitized paper Z by the well-known manner in which an automatic receiving apparatus works—that is to say—by chemical decomposition or equivalent means.

In Figs. 3 and 4 I have shown a modified form of the apparatus designed to produce the record in parallel lines, and this is accom-

plished by making the rods B adjustable in the rim of the wheel A, said rods having spiral springs *s'*, which bear against shoulders at their upper ends and against the surfaces of the sectors on the wheel at their lower ends, said rods of course being insulated from all portions of the wheel A except the sectors, and provided at their lower ends with cam wheels or pulleys *n*, which, in the rotation of the wheel, ride under the cam-surface X, rigidly secured to the frame C of the machine, the curvature of the cam-surface X being of such a nature as to cause the pens *c* to make a record in a straight line, as clearly shown in Fig. 3. The special advantage of this form lies in the fact that it might be applied directly to either of the cylinders *e* or *g*, thereby dispensing with the metallic surface *d*, as it will be understood, of course, that with such an arrangement the record would be made upon an element of the cylinder *e*. As the wheel rotates in the direction of the arrow, and as the first pen strikes the paper, the cam-wheel *n* comes in contact with the surface X of the fixed cam, and as said wheel continues to advance the pen advances, and is at the same time drawn downward, so that the record is made in horizontal lines, as clearly shown on the paper Z, Fig. 3, the construction in this modified form of the apparatus being in all other particulars essentially the same as that shown in Fig. 1.

In Fig. 5 I have shown an arrangement whereby the record will be duplicated for a short space at each side of the paper, so that the translator thereof may ascertain the correct beginning and ending of each line. With the arrangement shown in Fig. 1, were a letter having several elements to be transmitted near the end of a line, it is possible that the elements of said letter might be divided between the right-hand side of the page in that line and the left-hand side of the page in the next succeeding line. With the modified form shown in Fig. 5 all characters will be duplicated at both sides of the page for a period of time dependent on the distance between the two springs *i'* and *i*, which succeed each other in passing from sector to sector, and hence make a duplicate record. This duplication of record would at once indicate to the translator the correct sequence of the whole number of characters.

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

1. An automatic telegraphic receiver consisting of a record roll or supply of sensitized paper or equivalent material, with feeding mechanism for advancing said record-paper according to the demands of the transmitting apparatus, and a series of independent receiving-styluses connected to a wheel, said styluses being insulated from each other and having electrical connections for bringing them successively into circuit as the wheel is rotated, substantially as described.

2. In an automatic telegraphic recording apparatus, a series of independent recording-pens mounted on the periphery of a rotatable disk and insulated from each other, in combination with a recording-surface lying in a plane parallel to that of the series of pens, and electrical connections consisting of electrical conducting-segments, and a contacting spring adapted to bear successively thereon as the disk is rotated, whereby said recording-pens are brought successively into circuit, substantially as described.

3. In an automatic telegraphic receiver, the combination of a series of pens or styluses attached to a wheel or disk and having sliding motion in the direction of a radius of the disk, with a fixed cam for giving to said pens or styluses such sliding motion in succession, substantially as described.

4. In an automatic telegraphic receiver, the combination of the following elements: a supply or roll of record-paper or analogous material, a series of record pens or styluses insulated from each other and adapted to come successively into contact with said record-paper, feeding mechanism for advancing said paper, said mechanism consisting of a pair of feed-rolls, one of which is provided with means for lifting it from the paper and thereby preventing the forward feed, and electrical connections consisting of electrical conducting-segments, and a contact-spring adapted to rest thereon, as described, whereby either an entire message or a series of messages may be placed upon the record-paper and then the

feed of the record-paper discontinued, substantially as described.

5. In an automatic telegraphic receiver, the combination of a series of pens carried by arms attached to independent sectors arranged around a disk and insulated therefrom, with a contacting surface and a record-surface resting on said contacting surface, and a contact-spring, said contact-spring and contacting surface being included in an electrical circuit with the successive pens and sectors, whereby as said disk is rotated the pens are brought successively into the electrical circuit and successive record-lines are made, substantially as described.

6. In an automatic telegraphic receiver, a series of recording-pens rigidly secured to a wheel or disk by insulated contacting segments, in combination with a flat conducting-surface on which the record-paper rests, and a contact-spring adapted to rest on the contacting segments successively, whereby a page-record is made transverse to the direction of motion of the record as it is fed forward, and with a margin on each side of the paper, substantially as described.

7. In an automatic telegraphic receiver, the combination of a rotary disk or wheel carrying a series of recording-pens rigidly secured thereto, said recording-pens being insulated from each other, substantially as described.

FRANK ANDERSON.

Witnesses:

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A. E. McKECHNIE.