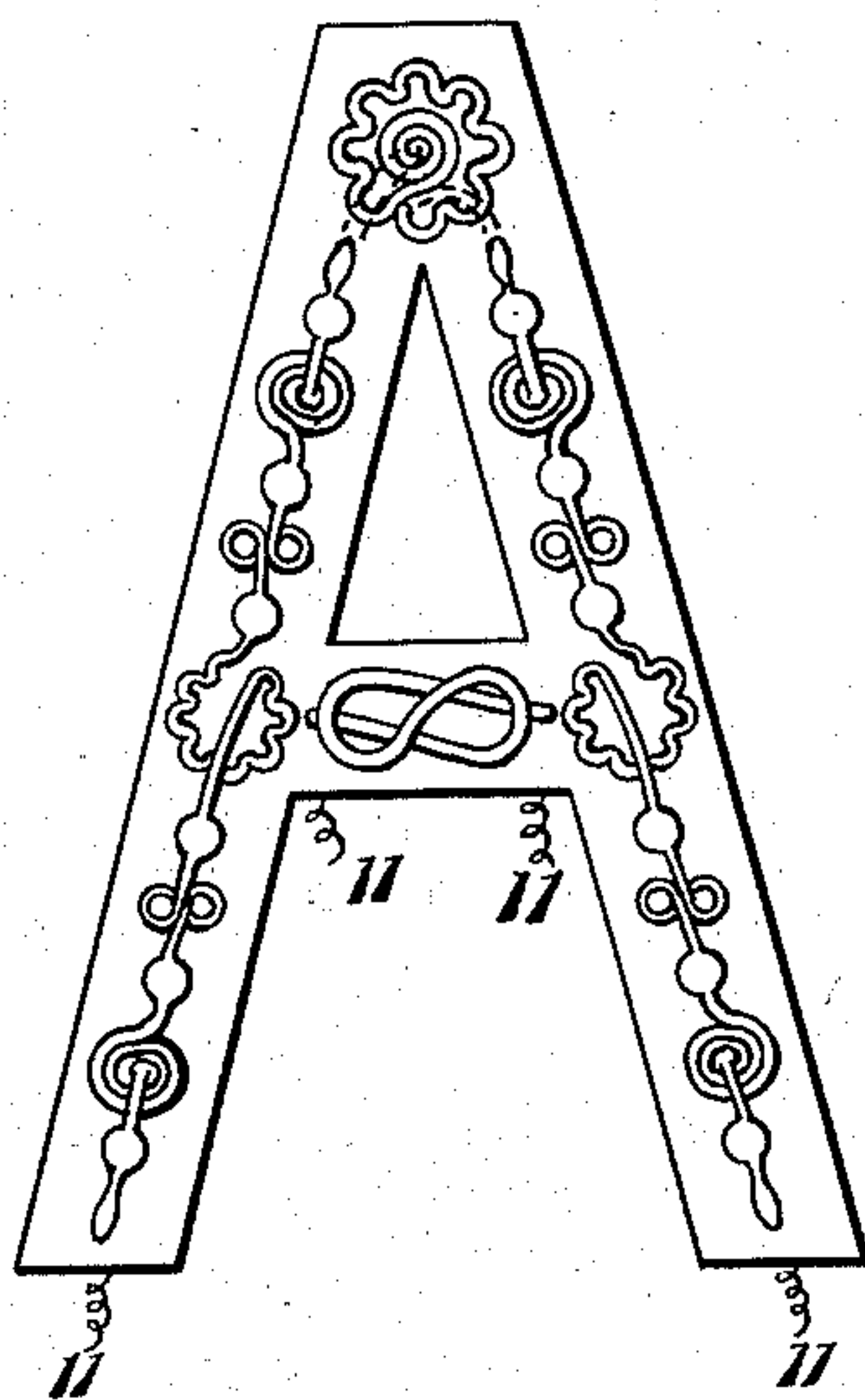
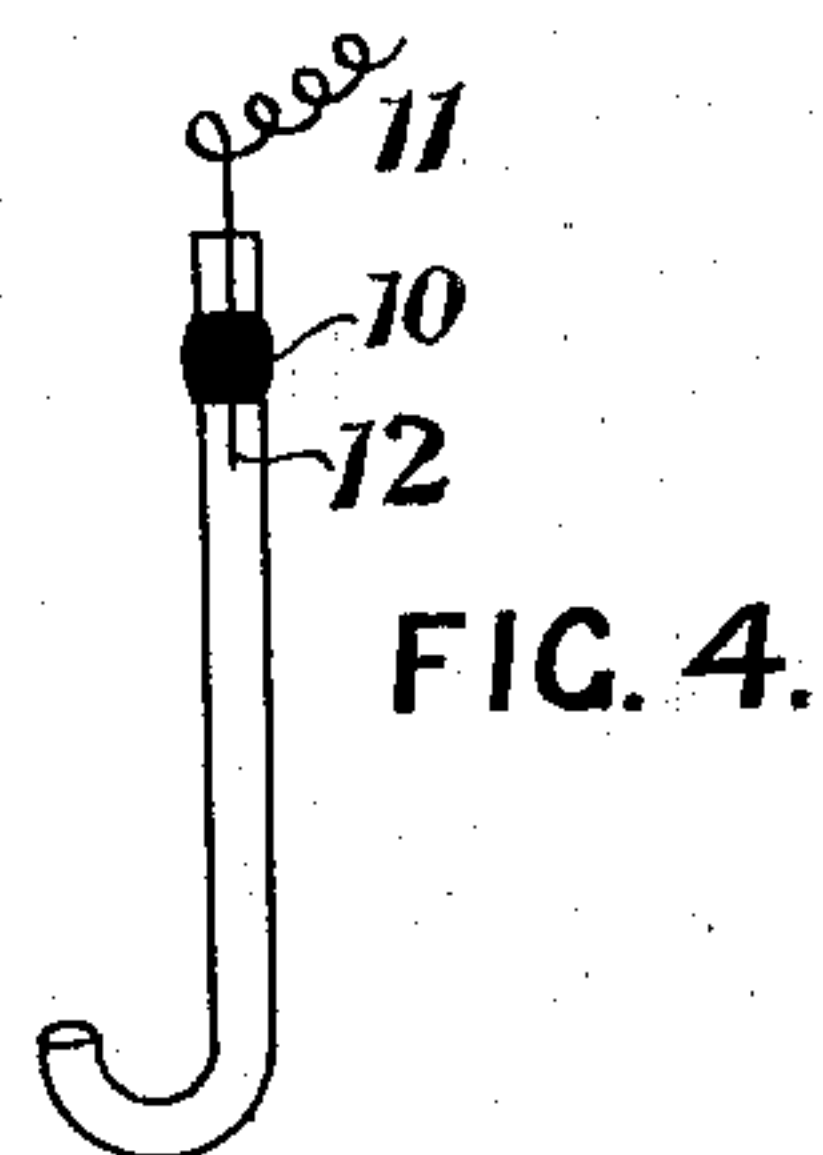
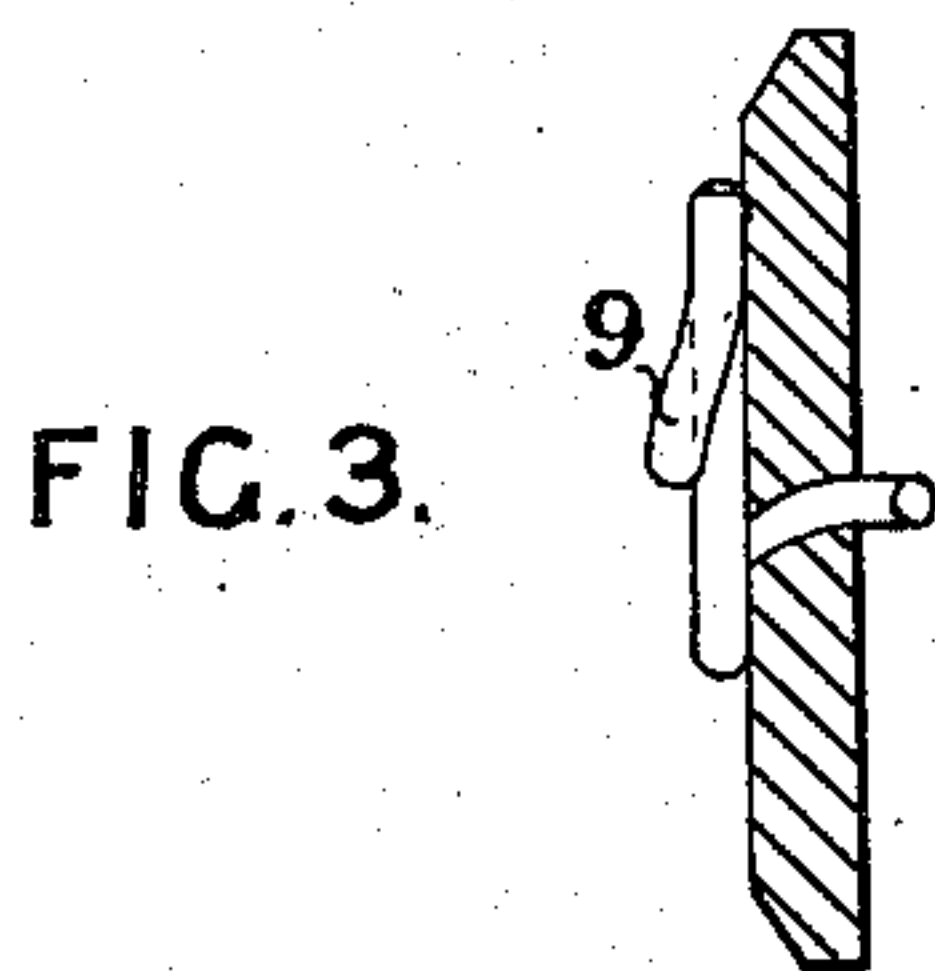
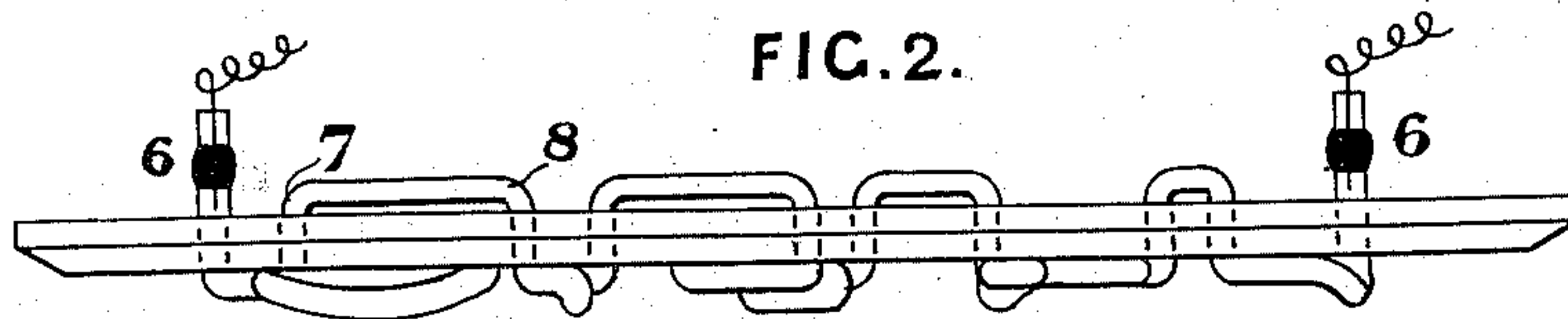
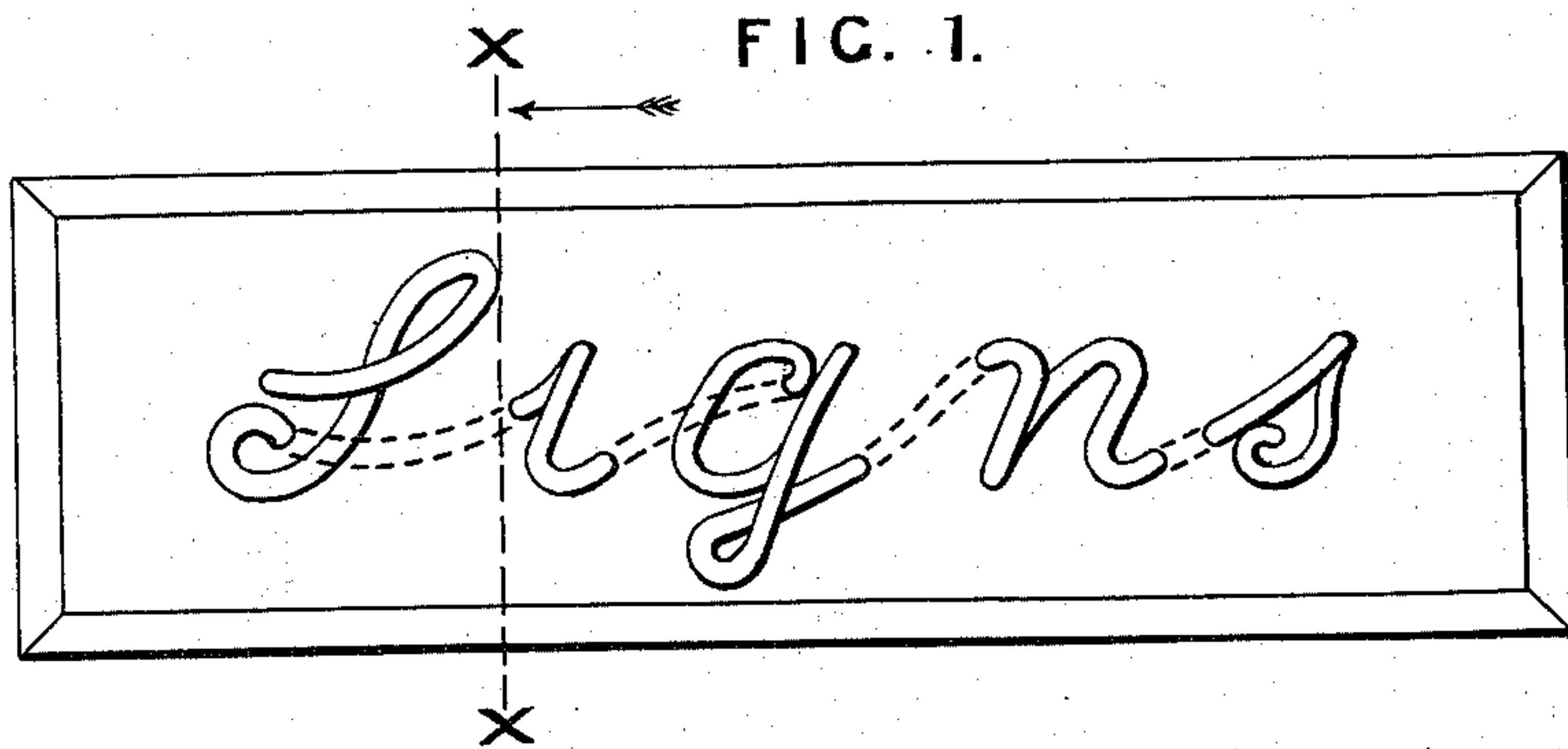


(No Model.)

E. BÖHM.
SIGN.

No. 524,752.

Patented Aug. 21, 1894.



WITNESSES.

Joseph H. Hamlin
Geo. Chandler

FIG. 5.

INVENTOR,

Ernst Böhm
by his Attorney
Frankland Janner

UNITED STATES PATENT OFFICE.

ERNST BÖHM, OF LONDON, ENGLAND, ASSIGNOR TO THE BÖHM & COMPANY, OF SAME PLACE.

SIGN.

SPECIFICATION forming part of Letters Patent No. 524,752, dated August 21, 1894.

Application filed February 4, 1893. Serial No. 461,044. (No model.) Patented in England April 30, 1891, No. 7,514.

To all whom it may concern:

Be it known that I, ERNST BÖHM, a subject of the King of Saxony, residing at London, in the county of London and Kingdom of England, have invented certain Improvements in and Relating to Apparatus for Advertising, Display, Decorative, and Such Like Purposes, (for which I have obtained Letters Patent in Great Britain, No. 7,514, bearing date April 30, 1891,) of which the following is a specification.

This invention relates to apparatus for advertising, display, decorative, and such like purposes.

15 The invention consists of a tube or tubes of glass bent or curved to the desired shape so as to form a letter, figure, word, design, or other part of an advertisement or decorative device, or the like and so connected and
20 mounted as to admit of the practical application to advertising, display, decorative, and such like purposes of the well known brilliant and beautiful effects of the sparking of the electric current when passing through a vacuum tube. The tube or tubes may be of
25 white or colored glass, as desired, and may be exhausted, or may be filled with nitrogen or other gases.

The tube or tubes being bent or curved to the desired shape, I mount them as follows:—
30 I lay the tube upon a flat surface of board, millboard, glass or other suitable substance prepared for the purpose (this prepared surface or mounting I shall hereafter for convenience speak of as the board); the ends of the tube are bent or curved backward and carried through apertures made in the board to receive them, and, in like manner, other
35 parts of the tube or tubes, forming connections between letters, words, or parts of a design, may, where advisable, be bent or curved backward and carried through apertures in the board made for their reception and brought again to the front surface. At each
40 place where a tube passes from the front to the rear of the board or vice versa, I support and affix the tube to the board by paraffin wax, cement, or other suitable means for rigidly fastening and maintaining the tube in
45 position. It is, of course, essential that the

tube should be continuous between the electrical contacts, otherwise the circuit could not flow, and by my method of mounting I am enabled to make words or designs in continuous tubing of considerable length which, 55 if not so mounted and supported would be liable to fracture from the least shock or jar; or from the specific gravity of the tubing itself. I sometimes cover the board with dark plush, velvet, or other substance, whereby 60 the apertures through which the tube is carried are concealed and the electrically lighted tube is shown to greater advantage. For further protection I may place the board with the tube mounted thereon, as before described, in a suitable frame or case having a glass frame or window. The tube whether 65 exhausted or filled with nitrogen or other gases, is provided with platinum or other contacts which are connected with terminals 70 upon the outside of the case to which the leads from an induction coil or other transformer, made suitably to the conditions used, are attached.

My system of mounting tubes as described 75 may be clearly seen by reference to the accompanying drawings, upon which—

Figure 1 shows an elevation, and Fig. 2 a plan, of a board having the word signs thereon: the said name is formed from a vacuum tube 80 bent to the shape of the letters and secured to the board. Fig. 3 is a section on the line X—X, Fig. 1, looking in the direction of the arrow shown. Fig. 4 is a section through the tube, showing the construction of the elec- 85 trical contacts, and Fig. 5 is a representation of the letter "A," with my invention.

The ends of the vacuum tube are carried through the board as shown at 6—6, Fig. 2, and then the tube is bent and carried through 90 the board at 7, Fig. 2, between the first letter, "S," and the second letter, "i," the connection between the two letters being on the back of the board as shown at 8, Fig. 2. The dotted lines in Fig. 1 indicate the parts of 95 the tube which are situated at the back of the board and such parts are clearly shown at Fig. 2. Where a letter is curved or looped, as for instance the letter "S," the two parts of the loop of the tube will lie one upon the other, 100

as shown at "g" in Fig. 3, so that the current may flow through every part of the letter, word, or design.

To prevent the diminution of the vacuum, which often occurs by air entering at the electrical contacts, I adopt the means shown in Fig. 4. In each end of the tube I form a chamber 10, through which protrude the ends of platinum or other electrical contact pieces, 11 and 12. One of these contacts (12) projects into the interior of the vacuum tube and the other (11) is connected with the source of electricity. The chamber 10 is filled with mercury which acts as a seal to prevent the entrance of air and, at the same time, completes the circuit between the electrical contacts 11 and 12; as in the ordinary construction of the "Geissler" vacuum tube.

As an illustration of a fanciful design in which my invention may be used in an effective manner, I have shown in Fig. 5 a representation of the letter "A," which may be made like an ordinary block of wood, or other suitable material on which vacuum tubes may be laid and mounted and secured in the same manner as before described. In large letters so produced each part of the letter may be separately connected with the source of electricity. For example, in the letter shown it would be more convenient to separately connect the vacuum tubes laid upon each leg and upon the cross piece to the electric source than to make the tube continuous and thus cause one electric current to traverse every part of the letter.

Another method of mounting a design of this description would be to fix strips of reflecting glass at an angle to each other and to secure the vacuum tube at the apex of the angle between them. When the current was sparking through the tube or tubes the reflection of the mirrors would produce a dazzling effect.

As a modification of my invention I may take vacuum tubes, properly mounted and

connected, and cover them with an opaque envelope from which the word or words of the advertisement, &c., has been cut out or perforated.

With each or any of the methods of using my invention as herein described an automatic mechanism may be used for making or breaking contact at intervals, so that the current passes through the tube or tubes intermittently, thus enhancing the effect and economizing the electric current required.

I am aware that vacuum tubes have been already formed into letters, words, and various designs, and therefore I make no claim to the construction and use of vacuum tubes so made. Hitherto however it has been found impossible to use such tubes for commercial purposes on account of the fragile nature of the tubes, and the insufficient manner of supporting them, and therefore I shall claim only the mounting of such tubes in the manner substantially as hereinbefore described.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A display apparatus consisting of a suitable backing having figures secured thereon, said figures being formed from a single continuous "Geissler's tube," so arranged that the electric spark will pass through every part thereof, that portion of the said tube connecting the several figures being passed through and behind the backing, as set forth.

2. A display apparatus consisting of a suitable backing having figures secured thereto formed from a continuous Geissler's tube, such portions of said tube as form no part of the display being concealed below the surface of said backing, as set forth.

ERNST BÖHM.

Witnesses:

WILLIAM EDWARD GEDGE,
GEORGE WALTER WHITTON.