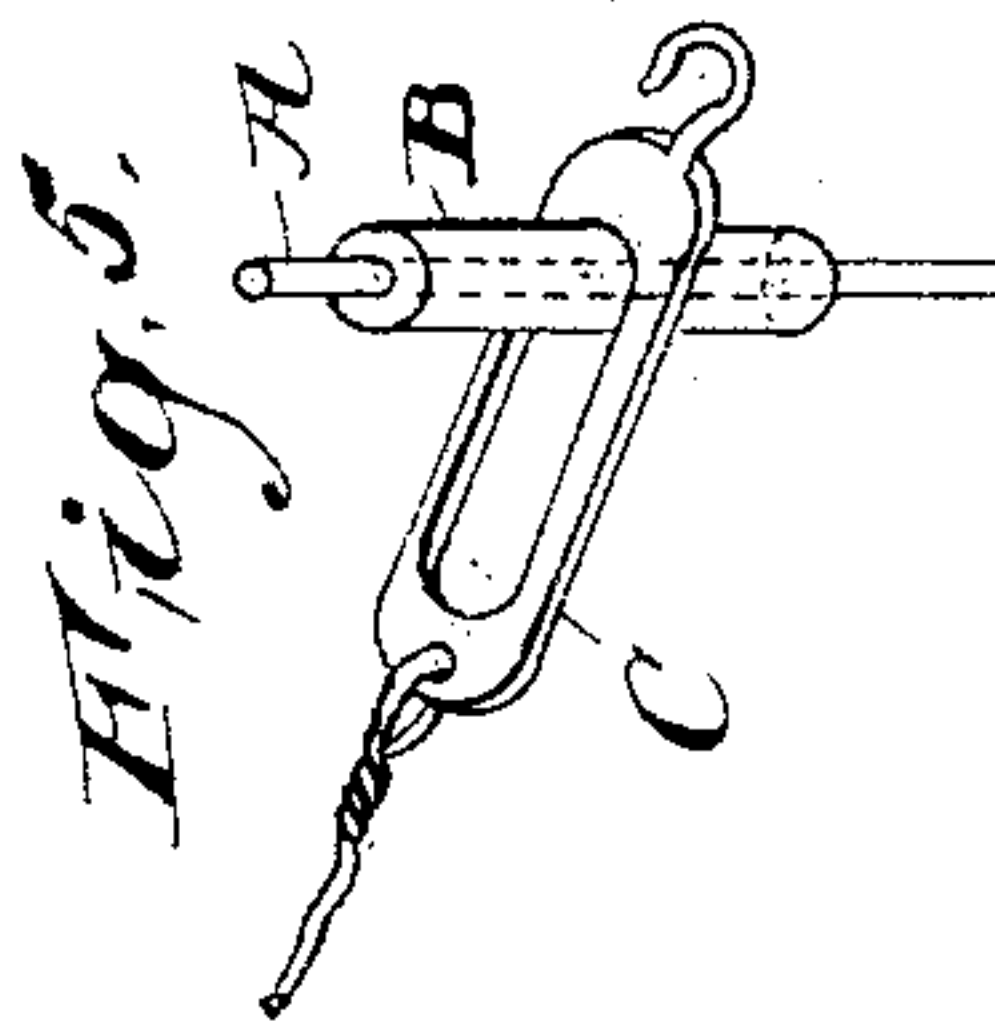
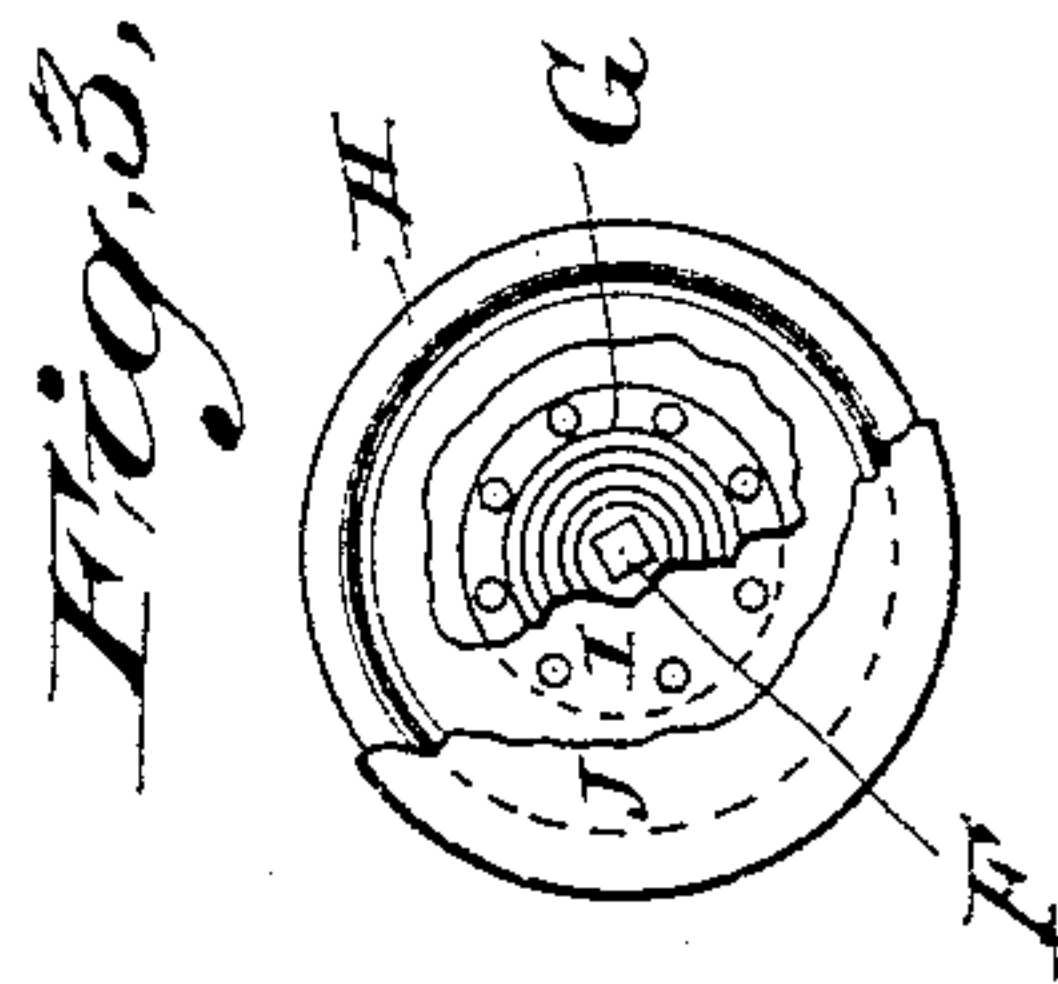
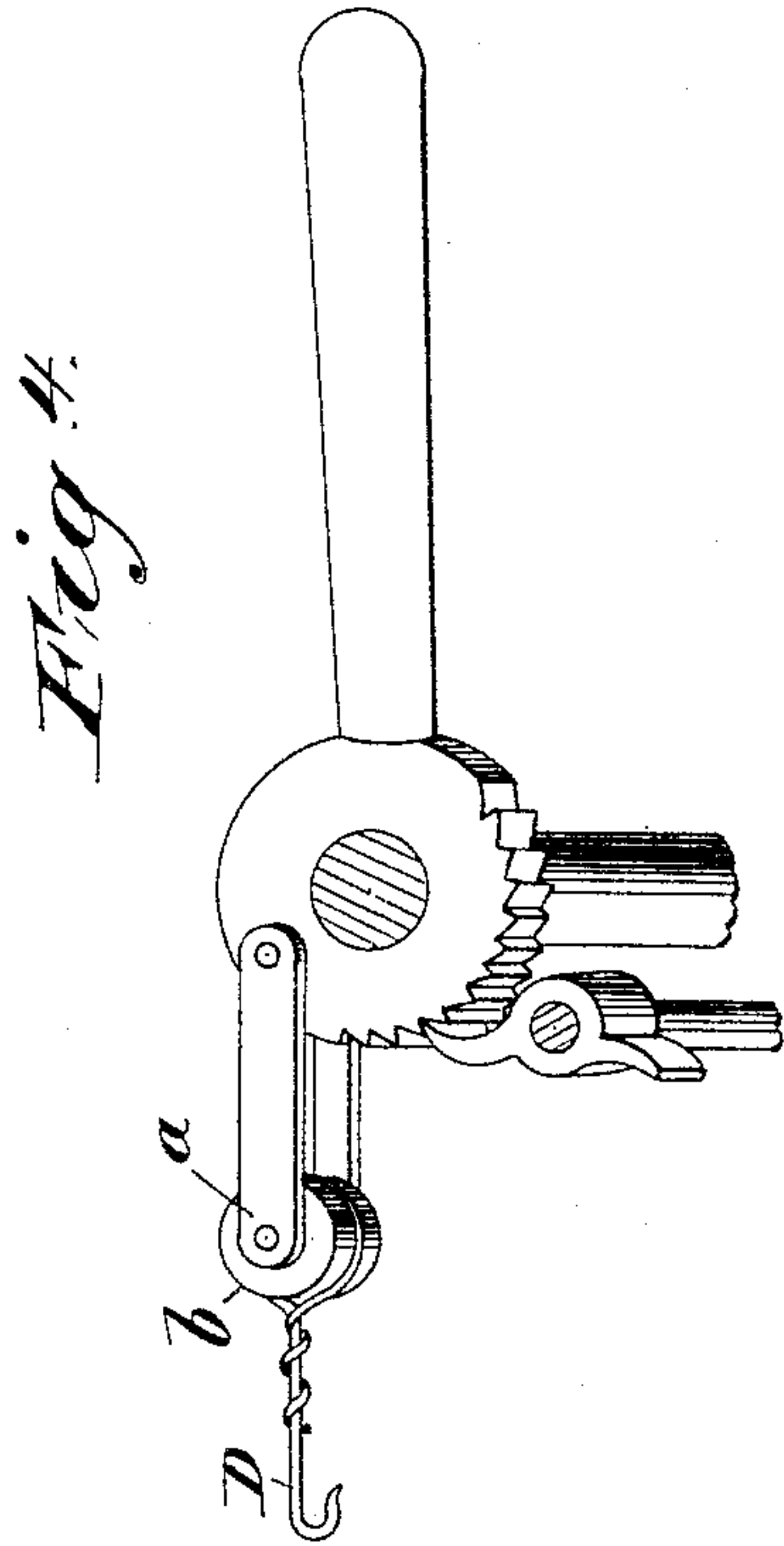
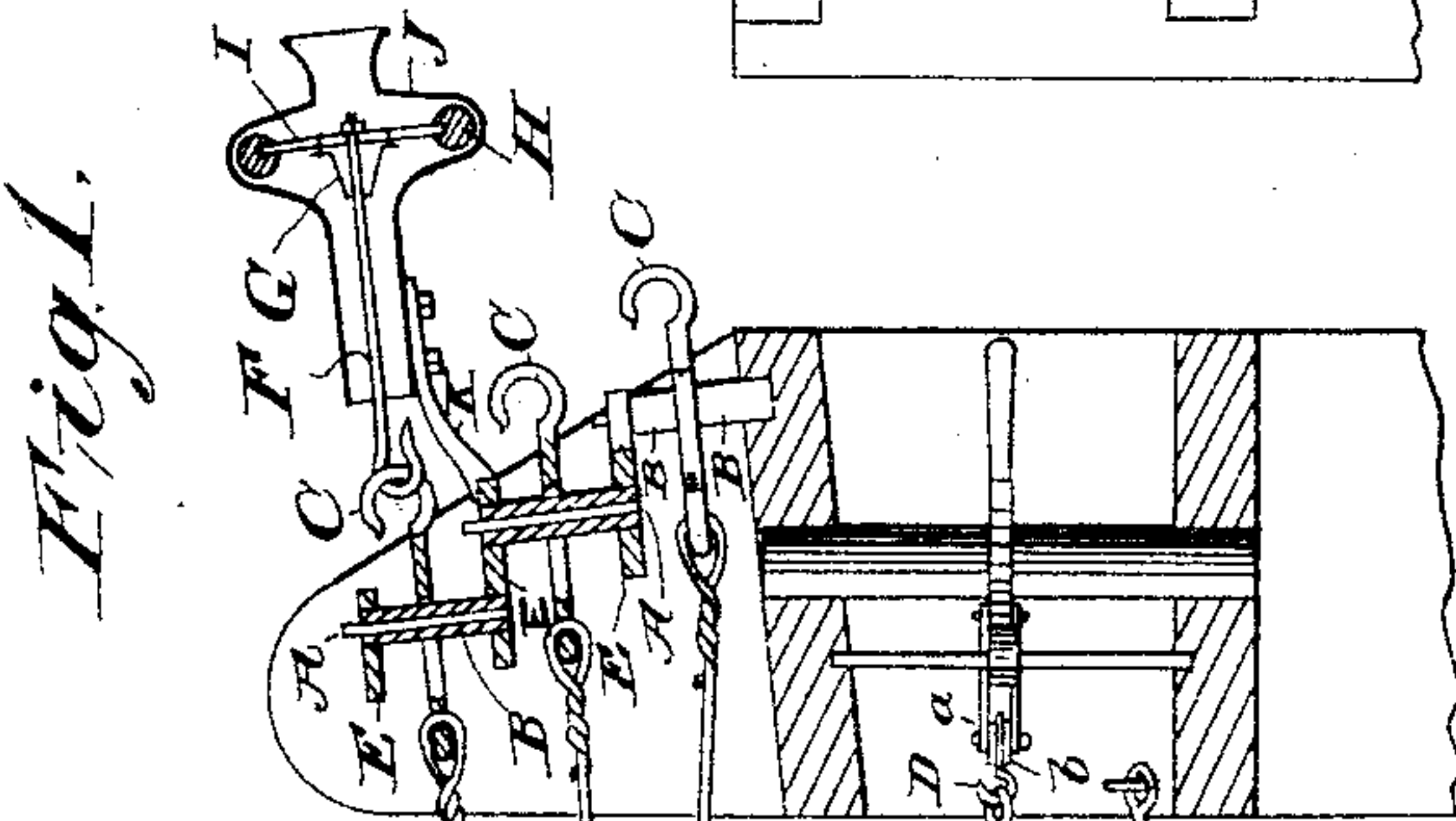
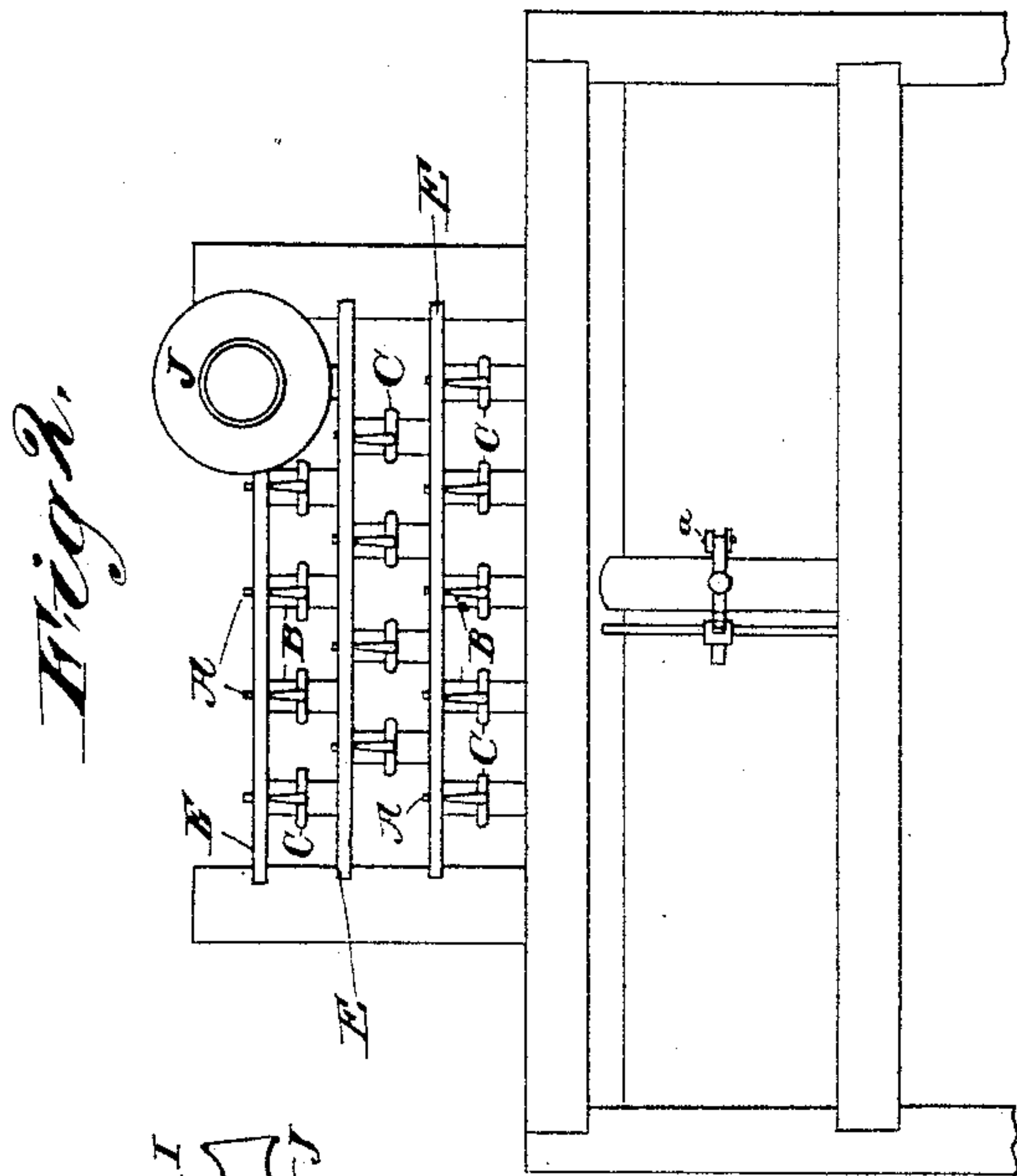


(No Model.)

G. F. SHAVER.
MECHANICAL TELEPHONE EXCHANGE.

No. 444,462.

Patented Jan. 13, 1891.



Attest:
C. W. Benjamin,
W. J. O'Connor

Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE FREDERICK SHAVER, OF NEW YORK, N. Y., ASSIGNOR TO THE
SHAVER CORPORATION, OF NEW JERSEY.

MECHANICAL-TELEPHONE EXCHANGE.

SPECIFICATION forming part of Letters Patent No. 444,462, dated January 13, 1891.

Application filed May 1, 1890. Serial No. 350,211. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FREDERICK SHAVER, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Mechanical-Telephone-Exchange Apparatus, of which the following is a specification.

The object of my invention is to provide improvements in mechanical-telephone-exchange apparatus, whereby better articulation and greater facility of operation are attained. The means whereby this end is accomplished is shown in the accompanying drawings, of which—

Figure 1 shows a side elevation, partly in cross-section. Fig. 2 shows a front elevation. Fig. 3 shows a front view of a movable hand telephone with parts broken away in order to better show the interior construction. Fig. 4 is a detail of the switching mechanism, showing an improved connecting-hook or vibrator. Fig. 5 shows a detail of the line terminus and supporting device.

Like letters refer to like parts of the different figures.

A represents a piece of steel wire of sufficient size to withstand the tension of the line-wire, attached at right angles to the same.

B represents an elastic tube or cushion, preferably made of soft rubber and envelops said wire A.

C represents a loop or link to which the line-wires are attached, and surrounds the wire A and envelops C and terminates in a hook for engagement with the rigid bar F of the movable hand telephone.

D represents a wire hook for connecting a pair of auxiliary line-terminals together, the opposite end or shank of the hook being bent around an elastic support *b* and wire *a*.

E E E represent a series of bars or steps, which are perforated to receive and support the wires A and the tubes B and connected line-terminals C.

F represents a hook-bar for connecting the line-terminal C C with the diaphragm I of the hand telephone J.

G represents a cone, the base of which is

riveted to the diaphragm I and the apex is soldered to the bar F, which passes through the center of the cone and diaphragm, and the whole being rigidly secured together by a nut upon the bar F, which bears upon the face of the diaphragm I.

J represents a movable hand telephone, which is provided with the lug K, which engages with the bars E.

H represents a ring of metal resting against the edges of the diaphragm I. The improved articulation resulting from these improvements are due to the elastic cushions B *b*, which allow the vibrations to pass by the support A *a* without changing their character. The articulation is further improved by the method of securing the bar F to the diaphragm of the hand telephone. The use of the cone fixes the bar rigidly at right angles to the plane of the diaphragm, and the base of the cone, by resting upon the diaphragm, prevents over resonance or prolongation of tone, and the resonance is further eliminated by the ring of metal H, which surrounds and rests against the edge of the diaphragm, or may be placed over or under it as may be most conveniently manufactured.

The improvement in mounting the hook D upon an elastic tube, instead of the manner shown in Fig. 5 of my patent, No. 414,170, issued October 29, 1889, permits of freer vibration of the hook and consequent less loss of power when transmitting from one line to another. The supporting-bars E E E are placed one a slight distance above and at one side of the other, but overlapping, similar to the construction of a stairway, in order to allow of the removal of any line-terminal without interfering with the rest, and the placing of the terminals in a series of rows enables me to bring a large number of lines into the exchange-frame within a small space without crossing or interference one with another. The tension of the line-wire is transferred to the diaphragm of the hand telephone by first engaging the bar F with the terminal hook C, and then, pressing downward upon the telephone-case, the lug K engages with the bar E, which acts as a fulcrum, thus forcing the tele-

phone away from the exchange-frame and imparting the requisite tension to the bar F and diaphragm I.

What I claim as new, and desire to secure by Letters Patent, is—

1. A permanent terminal support for mechanical-telephone lines, consisting of an elastic tube or cushion interposed between and in combination with a fixed support and the terminal of a line-wire, substantially as herein set forth and described.

2. A terminal support for mechanical-telephone lines, consisting of a wire A and an elastic envelope B, in combination with supporting-bars E and a mechanical-telephone line-terminal, substantially as herein set forth and described.

3. A mechanical-telephone line-terminal consisting of a loop or link C, provided with means for temporary engagement with a movable hand telephone, in combination with a fixed supporting-wire placed at right angles thereto, and an elastic tube or cushion interposed between said loop and the supporting-wire, substantially as herein set forth and described.

4. In a mechanical-telephone-exchange ap-

paratus, the combination of a hook D, provided with an extended shank, said shank being bent into a circular form and inclosing an elastic tube *b*, fitted with a wire or bar *a*, passing through the center of said tube, substantially as herein set forth and described.

5. The diaphragm of a movable hand telephone fixed at right angles with a connecting-bar F by means of and in combination with the cone G, substantially as herein set forth.

6. A supporting-frame for mechanical-telephone line-terminals, consisting of a series of parallel bars arranged one above another and at an angle with the perpendicular, in combination with a series of mechanical-telephone line-supports connecting each pair of bars together, substantially as herein set forth and described.

Signed at New York, in the county of New York and State of New York, this 30th day of April, A. D. 1890.

GEORGE FREDERICK SHAVER.

Witnesses:

M. CARSON,

H. S. TOOTNER.