

(No Model.)

3 Sheets—Sheet 1.

W. A. TURNER.
STATION INDICATOR.

No. 547,592.

Patented Oct. 8, 1895.

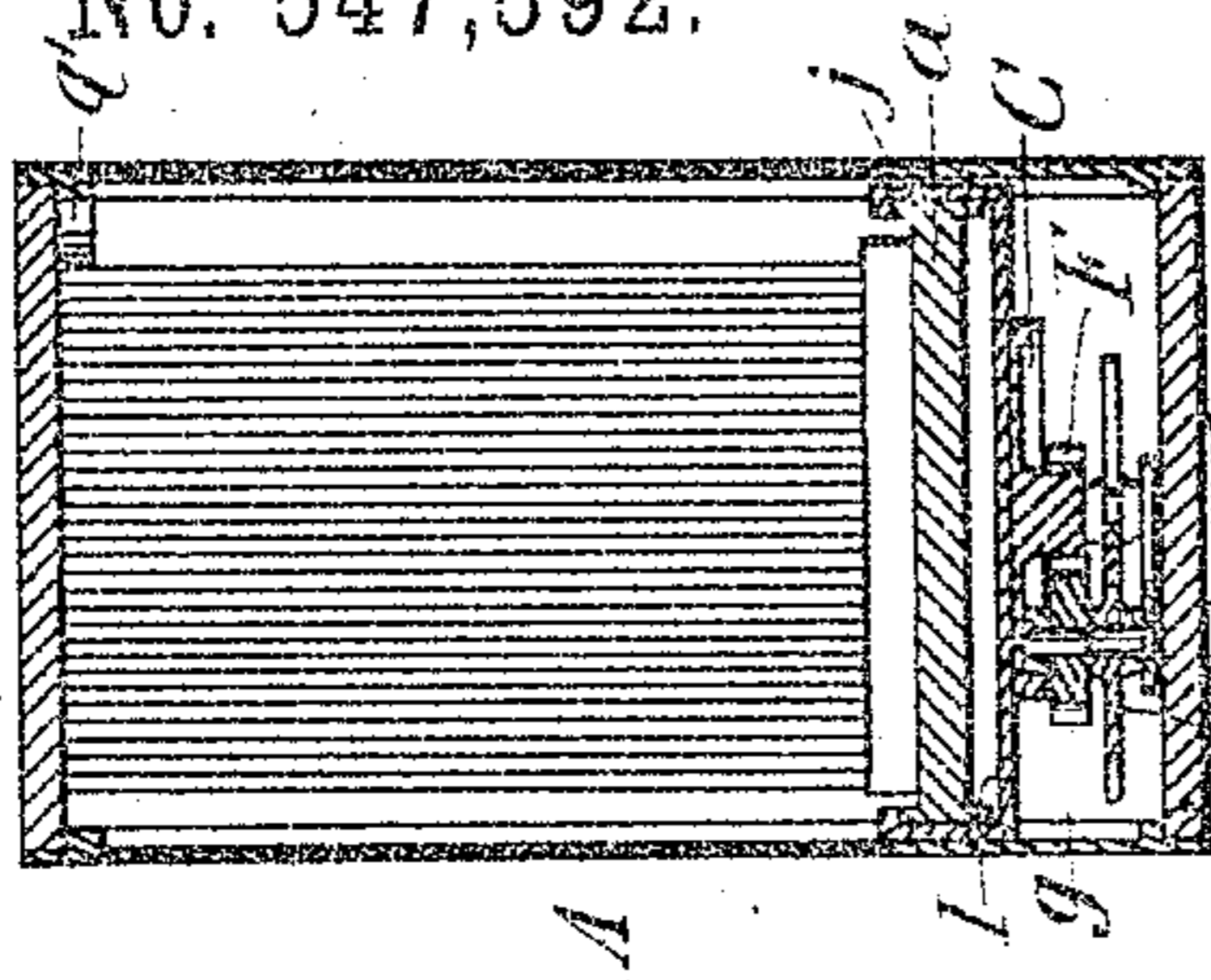


Fig. 3.

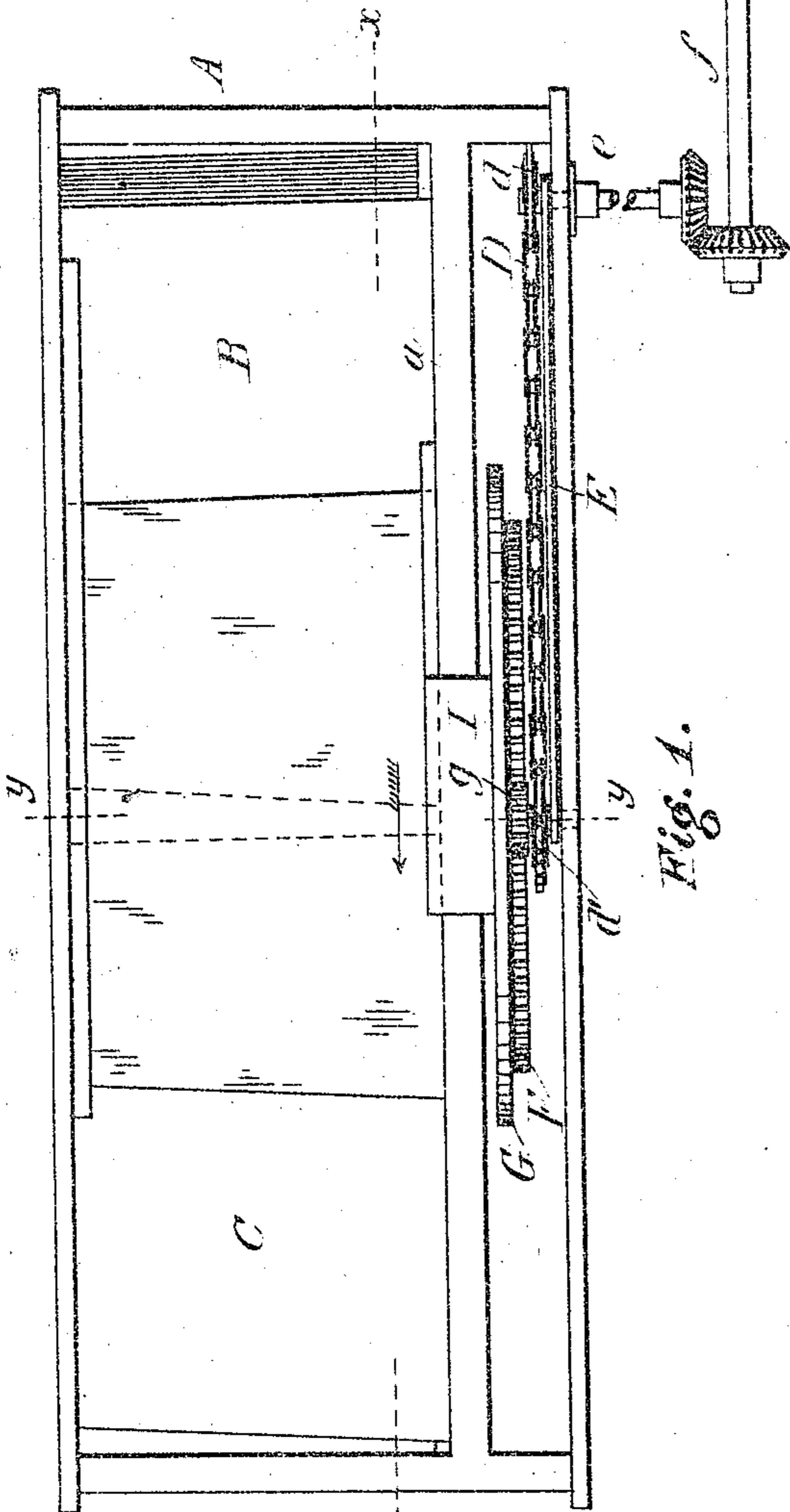


Fig. 1.

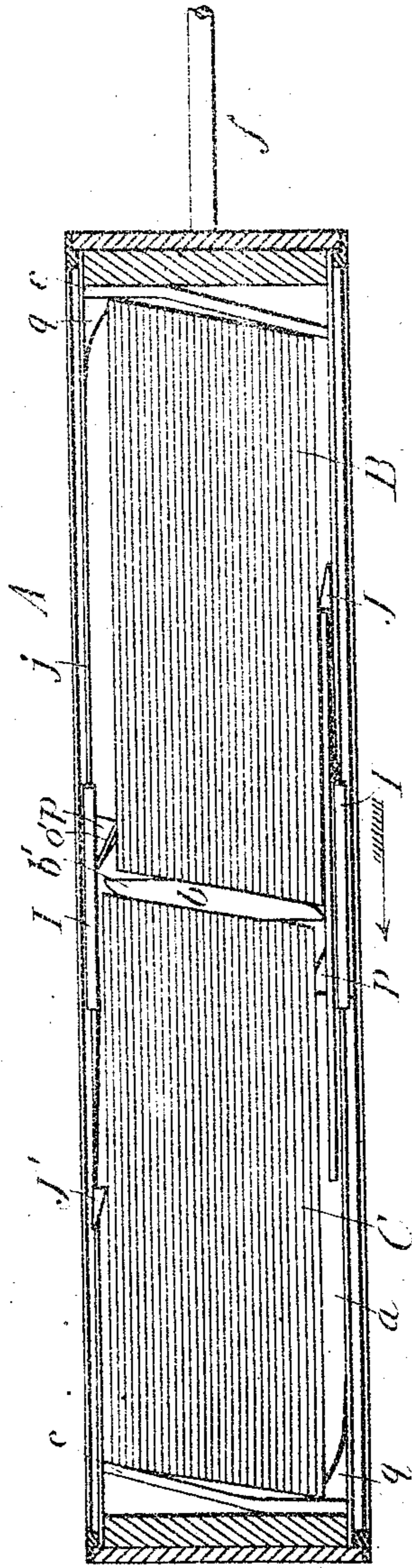


Fig. 2.

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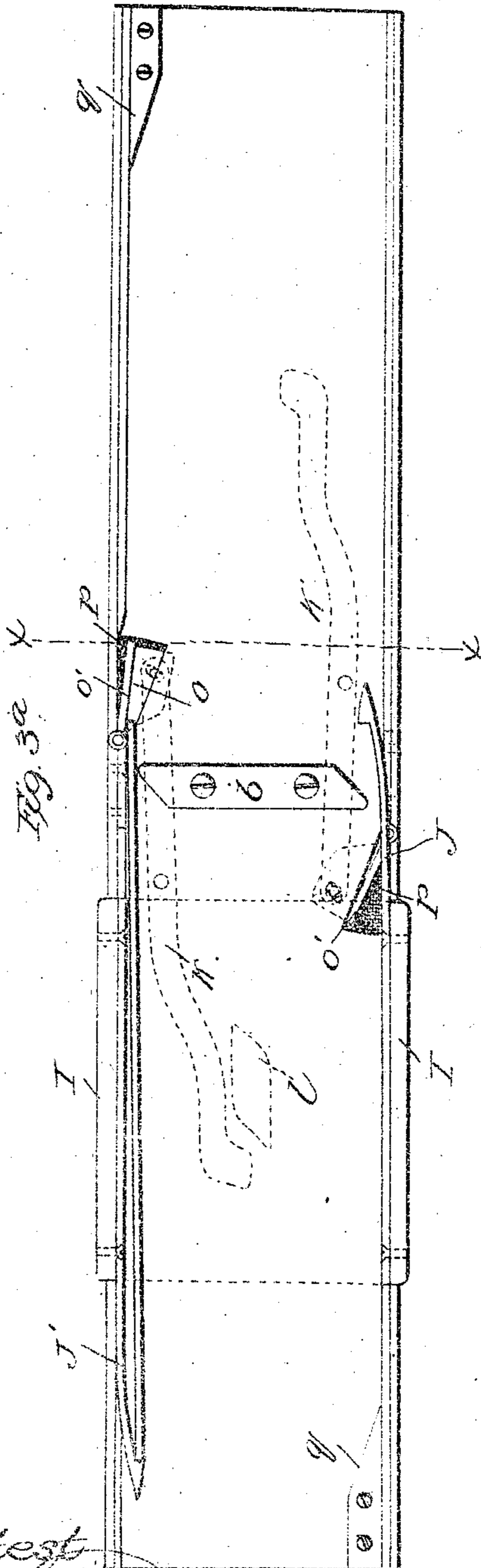
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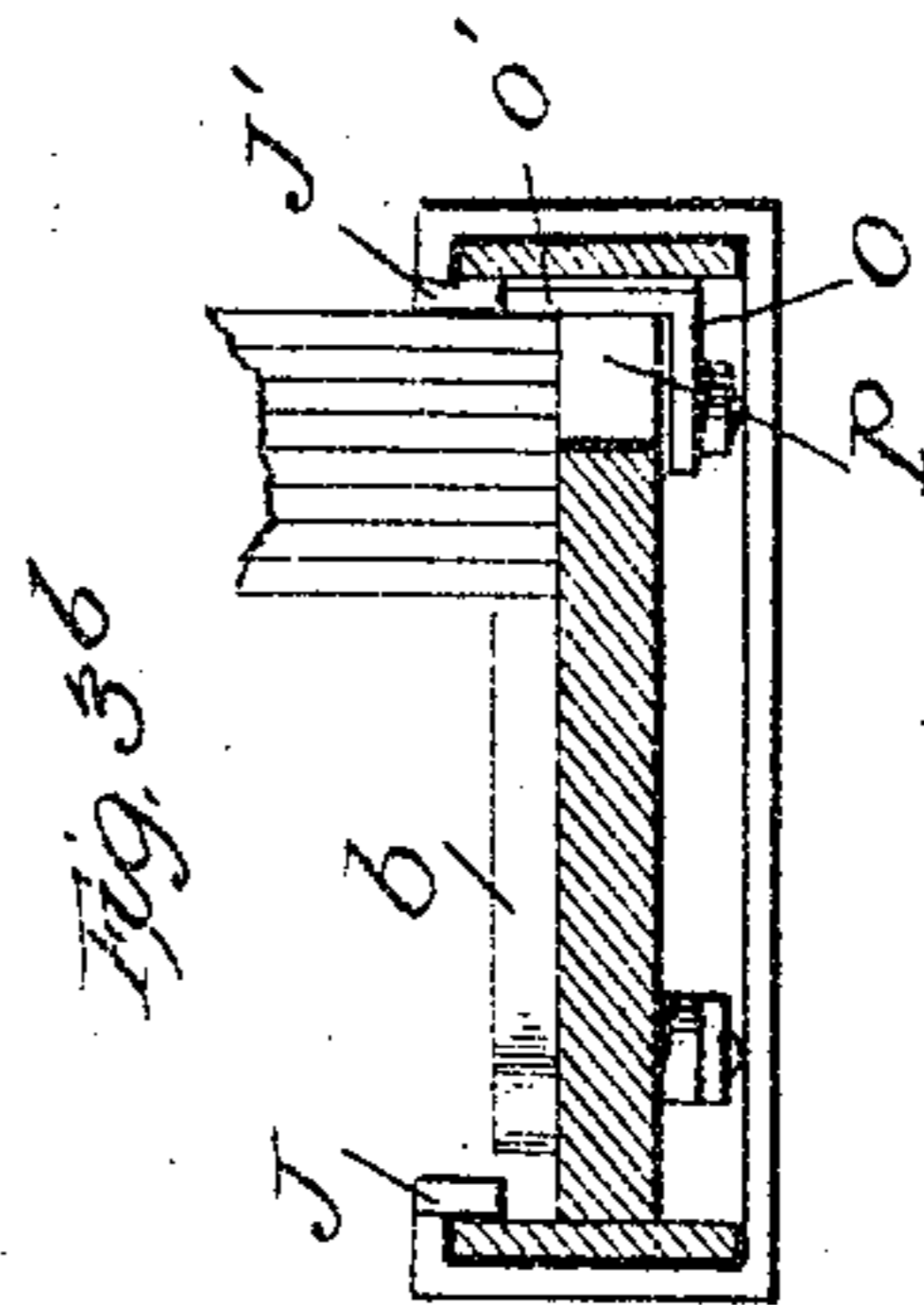
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Attest
Wm A. Turner
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3 Sheets—Sheet 3.

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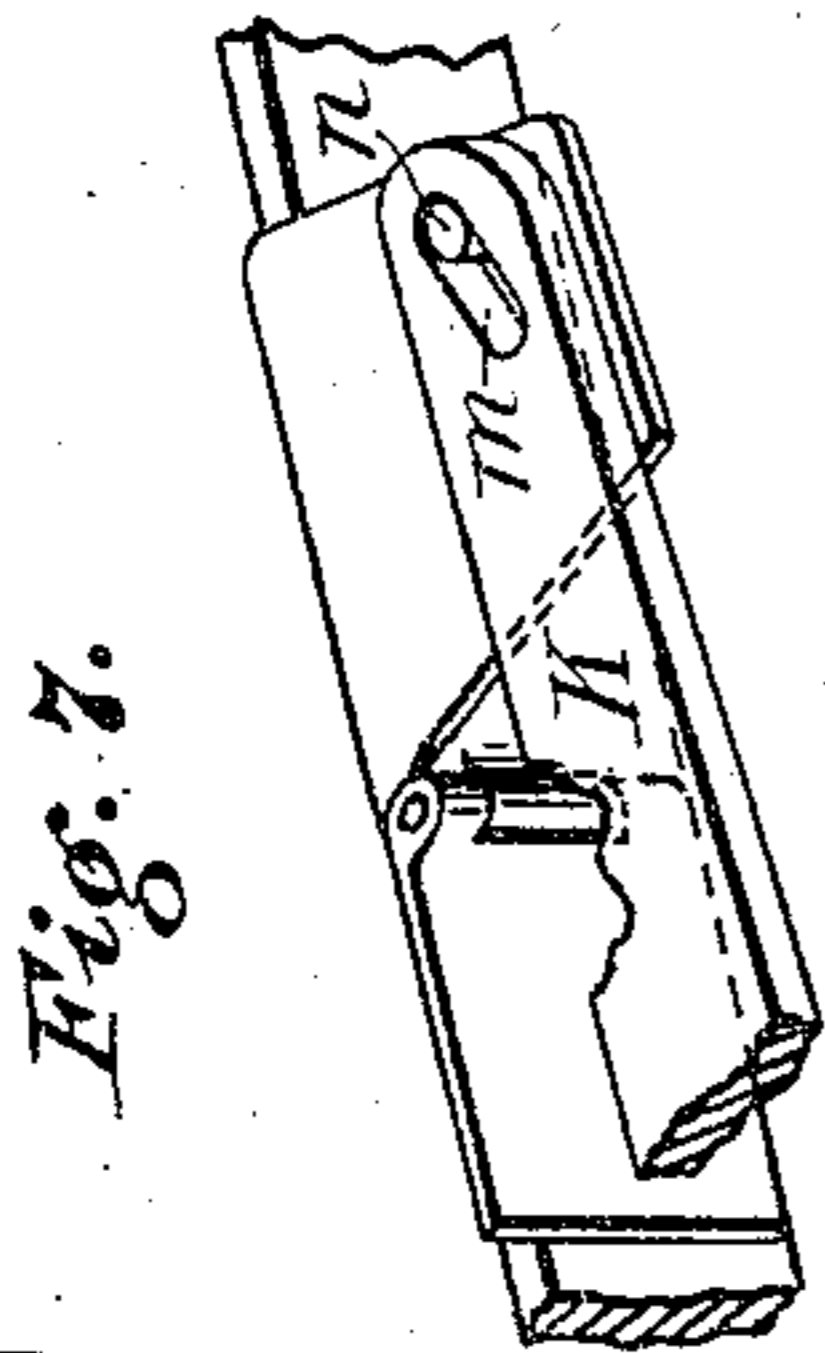


Fig. 7.

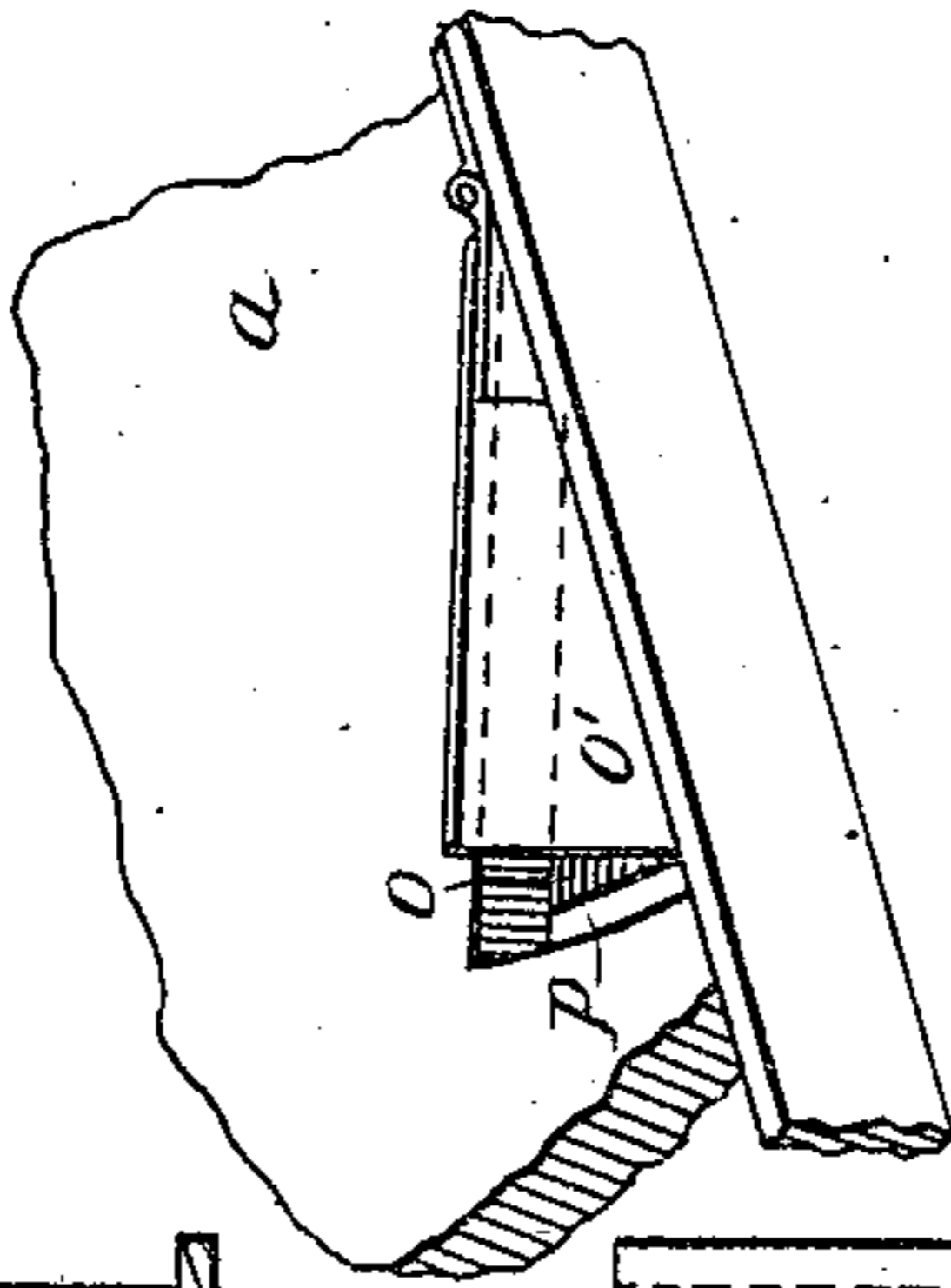


Fig. 8.

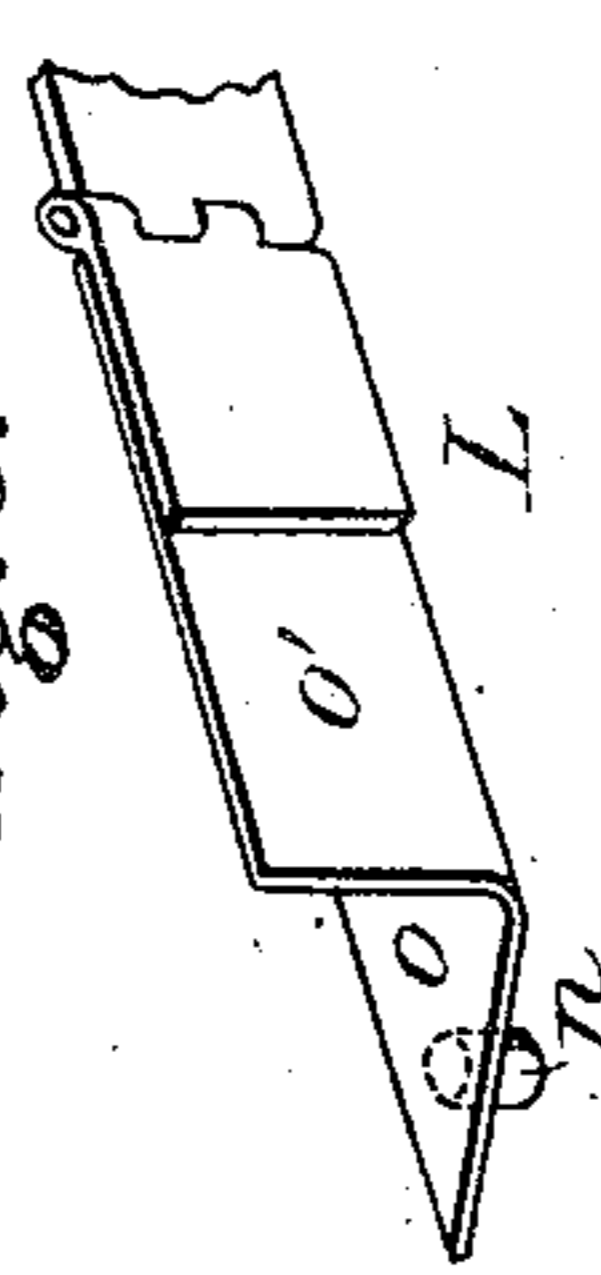


Fig. 9.

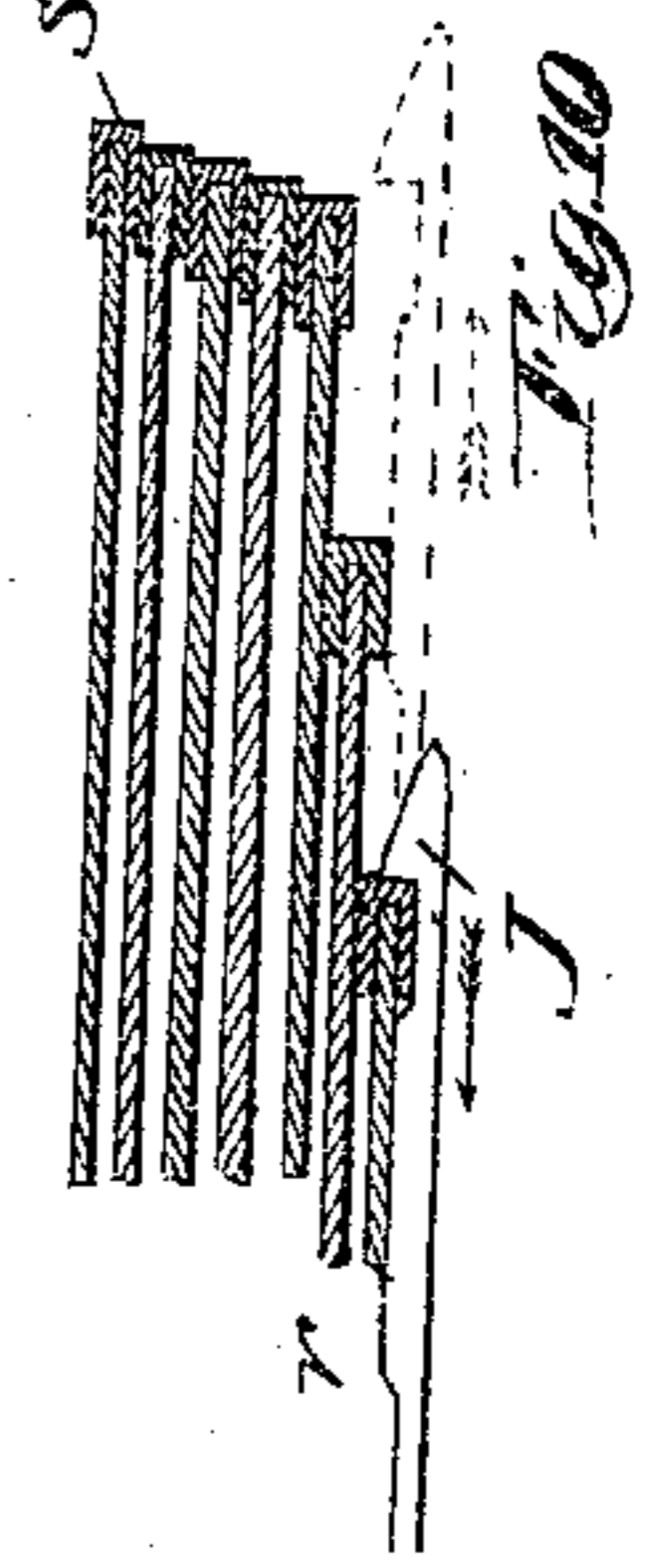


Fig. 10.

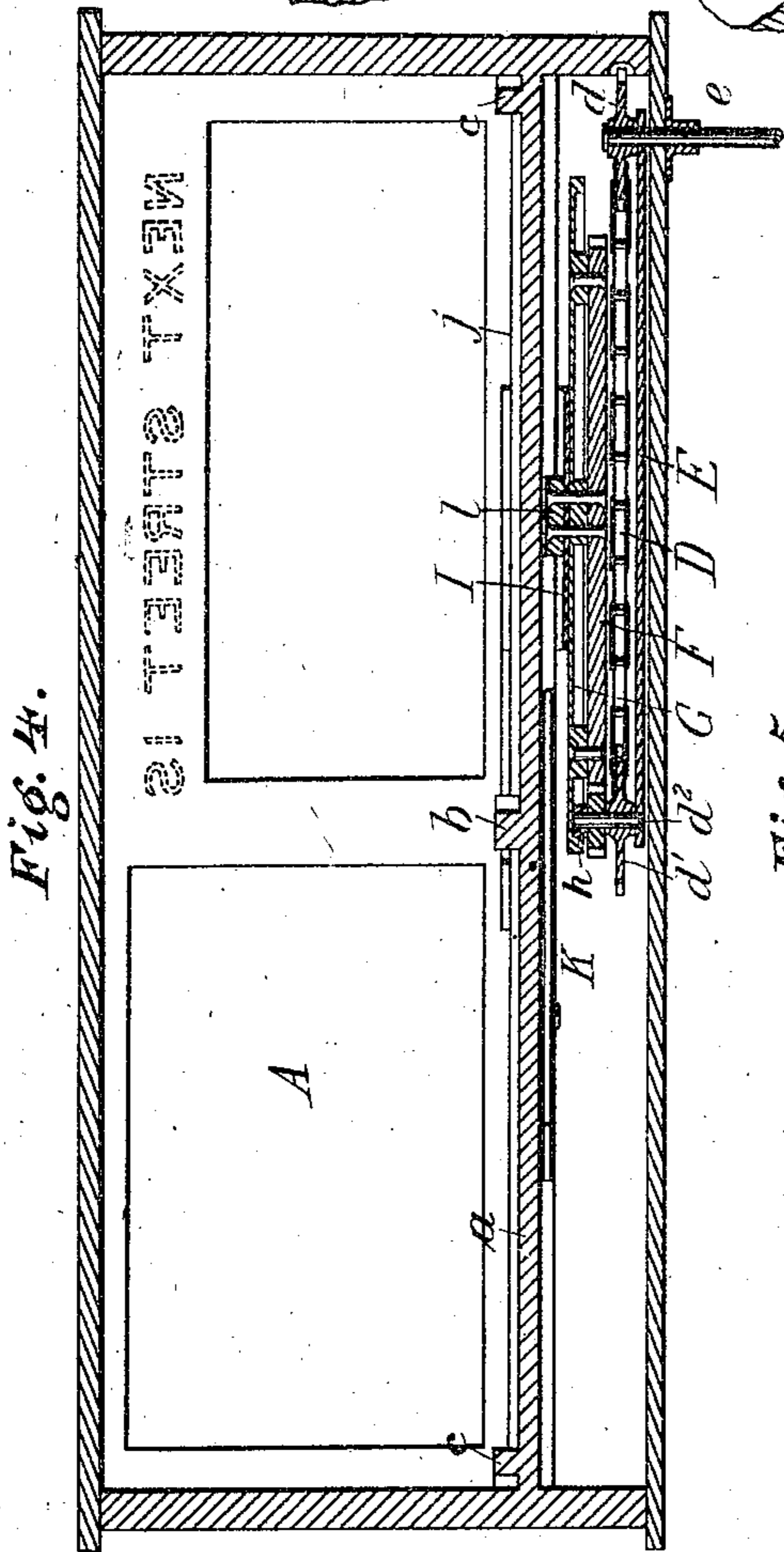


Fig. 4.

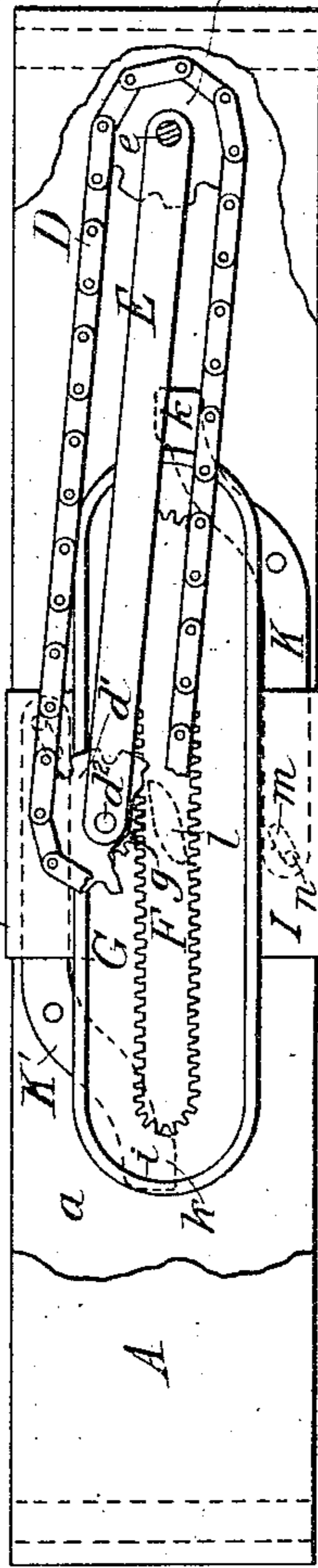


Fig. 5.

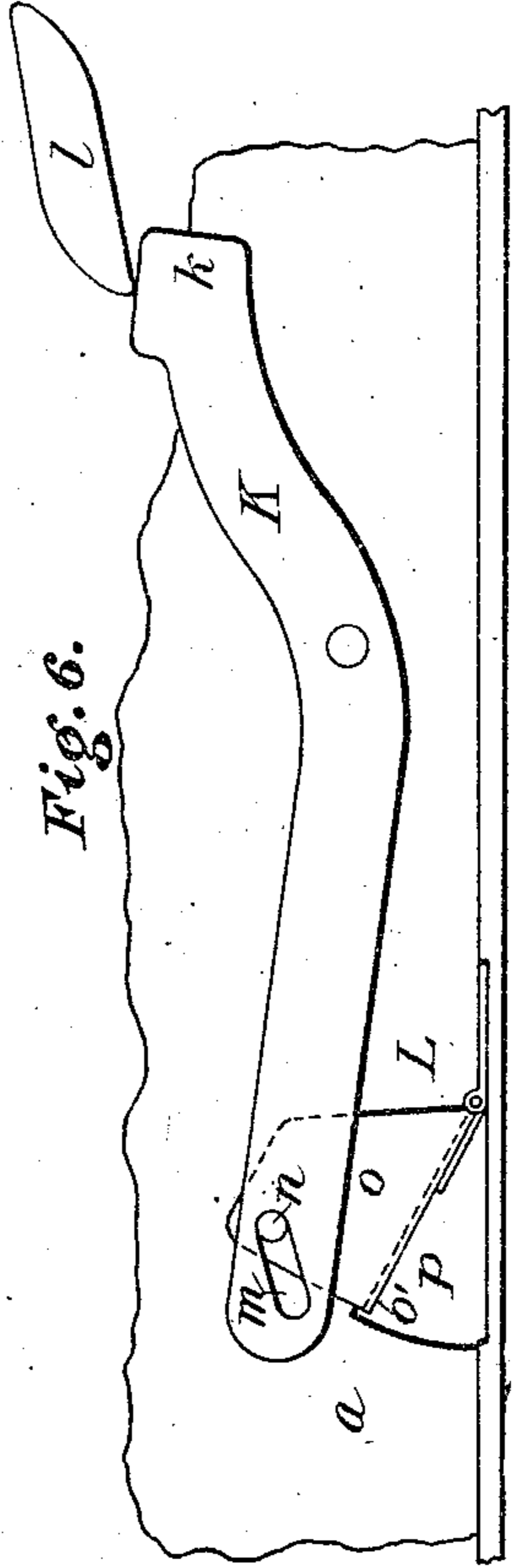


Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM A. TURNER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE
AMERICAN INDICATOR COMPANY, OF SAME PLACE.

STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 547,592, dated October 8, 1895.

Application filed March 18, 1890. Serial No. 344,371. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. TURNER, a citizen of the United States, residing at San Francisco, in the county of San Francisco, State of California, have invented certain new and useful Improvements in Street or Station Indicators; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to street or station indicators, and more particularly to the box or case in which the indications are displayed and to the mechanism contained in or by said box for producing these indications in their proper sequence. The general features of the invention are shown in Letters Patent No. 394,741, granted to me December 18, 1888, in which is described a box containing a double series of cards, each card bearing an indication and having sufficient advertising space. These cards, arranged end to end in the box, are moved transversely in opposite directions, while the two series are pressed to front and rear, respectively, so that the space of a card drawn from the face of one series to the face of the other is supplied by a card drawn from the back of the other series. Two cards are thus displayed at once, giving a double advertising-space. To this extent the present invention and that shown in the patent referred to are similar.

My present improvements relate to the construction of the box, to the shape, arrangement, and manner of holding the cards, and to the mechanism for accomplishing the transverse and longitudinal movements of the cards. To avoid confusion of terms, it should be stated that by the "transverse movement" of the cards I mean their movement across the face of the box when set at one end of the car which carries the indicator. By the "longitudinal movement" I refer to the moving of each series of cards backward or forward. The box and its mechanism herein described are particularly adapted to that form or type of indicators in which the rotation of the car-axle is the primary motive power. In my patent above referred to the devices for transferring the indicating-card were placed below

the car and were connected by flexible cords to the indicating-box. In the present invention it is only necessary to gear a single shaft from the car-axle to the indicating-box, and to connect that shaft to mechanism for operating the cards, all of which mechanism is contained in the box itself. It should be stated, however, that the shaft from which the movement of the transferring devices is derived must, in order to give them the required motion, rotate always in the same direction—that is, although its motion may be intermittent, it is a rotary shaft as distinguished from an oscillating shaft.

For a full and complete understanding of my invention reference is made to the following detailed description, and to the accompanying drawings, in which—

Figure 1 is a rear elevation. Fig. 2 is a horizontal cross-section on line *xx*, Fig. 1. Fig. 3 is a vertical cross-section on line *yy*, Fig. 1. Fig. 3^a is a detail plan view showing the operation of the gripper arms and wings. Fig. 3^b is a transverse section on line *xx* of Fig. 3^a. Fig. 4 is a vertical longitudinal section. Fig. 5 is a bottom plan partly broken away. Fig. 6 is a detail plan of the hinged bracket and lever. Fig. 7 is a detail perspective of the same. Fig. 8 is a detail perspective of the hinged bracket, showing its attachment to the frame. Fig. 9 represents the hinged bracket separately. Fig. 10 shows the engagement of the gripper and cards.

The box A is of rectangular shape, and is separated by a horizontal partition or false bottom *a* into two compartments, the upper and larger to hold the two series of cards B C and the lower and smaller to contain the mechanism through which the cards are moved. The two series of cards rest upon the partition *a*, with their inner ends in proximity, Fig. 2, but separated by an obliquely-set lug *b*, Fig. 2, which, in connection with oblique strips *cc* at the ends of the box, causes the cards to successively overlap to a slight extent in order to facilitate the seizing of each card by the gripper. The ends of the cards are also slightly inclined from the perpendicular, Fig. 1, so as to cause them to slide

past one another without interference should they come in contact. I have, however, provided against such contact by forming the lug *b* with rounded ends *b'*, Fig. 2, which act as guides to carry each card past the edge of the card in the other series. The cards thus mounted in the box are, as in my former patent, transferred from side to side by a pair of grippers, one of which takes a card from the front of one series, while the other takes the last card from the rear of the other series. In my patent these grippers were connected by a system of cords and pulleys, so as to be moved simultaneously in opposite directions, effecting the simultaneous transfer of two cards. Under favorable conditions this manner of connecting the grippers operates with reasonable accuracy; but there is a decided objection to it from the fact that the cords or wires are liable to stretch. In such a case the indicating-cards are not pulled to their proper places and become jammed in the box. A further objection is the complicated nature of the automatic mechanism required to operate the devices shown in my former patent in case it is desired to operate them automatically. In my present invention I obviate these difficulties by using positively-acting connections throughout the apparatus, both between the grippers and the device which directly controls them and also between such device and the automatic mechanism which operates the whole apparatus. In my present invention both grippers move in the same direction, and only one card is transferred at a time, as will be understood by reference to Fig. 2. These grippers, which will be more fully hereinafter described, are operated primarily by a sprocket-chain *D* through intermediate connections. This chain is carried by sprocket-pulleys *d d'*, the former of which is secured to a shaft *e*, projecting through the box. The shaft may be rotated in any desired manner, according to the class of indicator with which my box is used. I have, however, indicated a pair of miter-gears and a shaft *f*, which may be supposed to derive an intermittent rotation at proper times from the car-axle.

The sprocket-pulley *d'* is mounted upon a pin *d²*, journaled at the free end of a swinging arm *E*, pivoted upon the shaft *e*, just above the bottom of the box, Fig. 4. A spur-pinion *g*, secured upon the pin *d²* and above the sprocket-wheel, engages with a traveling rack *F*, having a guideway *G* secured to or formed with it. A roller *h* on the pin *d²* bears upon the downward flange of the guideway, and thus the movement of the sprocket-wheels and of the pin *d²* will cause the rack and guide to travel until the roller reaches the curved end *i* of the guide and travels around it, when the arm *E* on the pinion will be swung to the other side of the rack, which will then travel back, and this reciprocating movement

of the rack and guide will be carried on without changing the direction of rotation of the sprockets. The connection of the rack and guide with the grippers is shown in Figs. 2, 3, and 4. The guideway is secured to a sliding plate *I*, the ends of which are turned up and bent over the edges of the partition *a*, which are formed into guides *j*, Fig. 3, and by means of which the moving rack and guideway are supported. The grippers *J J'*, Fig. 2, are secured to opposite ends of the plate *I* and move with it. They are constructed substantially as in my patent referred to, with hooked ends, and, being springs, have a constant tendency inward, so that they will automatically seize and retain the edges of the cards. As both grippers move in the same direction, only one card at a time is moved, as in Fig. 2, the other gripper running free until it engages with the rear card of the other series, which it transfers across on the return stroke. It now remains to describe the means for giving what I have termed the "longitudinal" movement to each series of cards, the purpose of which is to move one series forward, so as to bring its front card into position to be seized by the front gripper *J*, and the other series backward to cause its rear card to be seized by the rear gripper *J'*. Below and to the false bottom are pivoted, at the front and rear, respectively, two levers *K K'*, the free ends *k k'* of which project into the path of a cam *l*, secured to the guideway *G*, Fig. 4. The other end of each lever has a slot *m*, with which engages a pin *n*, carried upon one wing *o* of a bracket *L*, Fig. 9. Slots *p* are formed in the false bottom, through which the other wings *o'* of the brackets project into the upper compartment of the box in front of the series of cards *B* and in rear of the series *C*, Fig. 2. The brackets are hinged to the guide-rails of the false bottom previously described, Figs. 6 and 7. When the free end of the lever is struck by the cam, the slotted end is thrown inward and the wing *o'* is forced against the series of cards, pressing them inward. The wing is thrown back against the rail when it is struck by the succeeding card drawn by the gripper *J*. It thus keeps the cards pressed inward while the gripper is going free, as illustrated in connection with the gripper *J'* in Fig. 2. I have also provided inclines *q q'* at the sides of the box and at top and bottom to deflect the end of the card inward, as shown in Fig. 2. The card is thus held at both ends, giving a clear space for the next card to pass across the face.

I have shown in Fig. 4 the opaque plate or strip described in my former patent referred to, which covers the upper portion of one side of the closed front of the box and conceals the name of the street or station carried by the outer card in the series at that side of the box. In using spring-grippers which have a constant tendency inward to insure the en-

gagement of the hook with the edge of the card a difficulty is liable to arise, which I have provided against by means illustrated in Fig. 10. It may possibly happen that the friction between adjoining cards may, as the face-card is pulled by the gripper, start the second card a short distance, as shown in the drawings. In such case when the gripper returns a space might be left beyond the end of the card so displaced sufficient to permit the spring end to engage with the third card, and thus positively pull two cards (the second and third) at once. This I guard against by forming a bead, swell, or projection, as *r*, on the gripper, which will bear on the face of the displaced card and prevent the hook from swinging in far enough to seize the third card. The cards are preferably bound at the edges with metal strips, as shown at *s*, and when this binding is used the thickness of the projection *r* need be only equal to or very little in excess of the thickness of the metal strip. Of course such a bead or projection might be formed separately upon each card and accomplish the same result; but considerations of economy would always make it preferable to have such projection on the gripper. The same result may be accomplished by forming a projection on the opposite end of the gripper, which on the return of the gripper for a new card would strike the edge of the displaced card and pull it back into its proper position.

Having thus described my invention, I claim—

1. In a street or station indicator, the combination with a box or case, of two series of cards arranged therein, grippers for transferring cards from each series to the other, a shaft having movement in a constant direction of rotation, and connections substantially as described between said shaft and said grippers.

2. In a street or station indicator the combination of a box or case, two series of cards arranged therein, grippers at the front and rear of the box moving together and in the same direction for transferring cards singly and successively from each series to the other and means for moving the grippers.

3. In a street or station indicator, the combination of a box or case, a shaft having a constant direction of rotation two series of cards arranged therein, grippers for transferring cards successively from each series to the other, and positively operated presser wings for forcing one series of cards to the front, and the other to the rear of the box, substantially as and for the purposes set forth.

4. In a street or station indicator, the combination with a box, containing cards arranged in two series, of oblique lugs for causing said cards to arrange themselves so that their ends successively overlap, and grippers for transferring said cards from each series to the other, substantially as described.

5. In a street or station indicator, the combination with a box or case, of a series of cards arranged in two series end to end, the ends of such cards being inclined from the perpendicular, and grippers for transferring cards from each series to the other, substantially as set forth.

6. In a street or station indicator, the combination with the cards arranged in two series, and with grippers for transferring the cards of each series to the other, of an obliquely arranged separating lug between the series having rounded or inclined ends, substantially as and for the purposes set forth.

7. In a street or station indicator, the combination with a box or case, and with a rotary shaft of cards arranged in the case in two series edge to edge, and a pair of grippers moving together and in the same direction for alternately transferring a card from the front of one series and from the rear of the other, substantially as described.

8. In a street or station indicator, the combination of a box containing two series of cards arranged substantially as described, a pair of grippers for transferring the cards from each series to the other, a reciprocating rack connected to said grippers, and an oscillating pinion having an unchanging direction of rotation and engaging alternately with opposite sides of said rack, substantially as set forth.

9. In a street or station indicator, the combination of a box containing two series of cards arranged substantially as described, a pair of grippers for transferring the cards from each series to the other, a reciprocating rack and guide way having curved ends, and connected to said grippers, and an oscillating pinion engaging with opposite sides of said rack alternately and having an unchanging direction of rotation, substantially as described.

10. The combination, to operate a station indicator, with a shaft carrying a sprocket wheel, a pivoted arm, carrying at its free end a sprocket pulley, pinion, and guide roller, of the reciprocating rack, having a guide way for said roller, substantially as described.

11. The combination with a box or case containing two series of cards arranged substantially as described, of a hinged wing or bracket for moving each series of cards, a pivoted lever connected to each bracket, and a reciprocating cam for striking said levers and operating such brackets alternately, substantially as and for the purposes set forth.

12. The combination, in a station indicator, of two series of cards; grippers for transferring the cards of each series successively to the other; a reciprocating rack for operating said grippers; a hinged bracket or wing acting on each series of cards to press them respectively forward and backward; a pivoted lever connected to each bracket; and a cam traveling with said rack for operating said le-

vers and brackets, substantially as described and shown.

13. In a station indicator, the combination with a series of cards placed edge to edge substantially as described, of a pair of grippers for transferring the cards from each series to the other series, such grippers being provided with projections for bearing on a card acci-

dentally displaced, whereby the engagement of said grippers with two cards at once is prevented, substantially as described.

WILLIAM A. TURNER.

Witnesses:

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L. W. SEELY.