

924,370.

I. J. OWEN.
DISPLAY APPARATUS.
APPLICATION FILED FEB. 10, 1908.

Patented June 8, 1909.
4 SHEETS—SHEET 1.

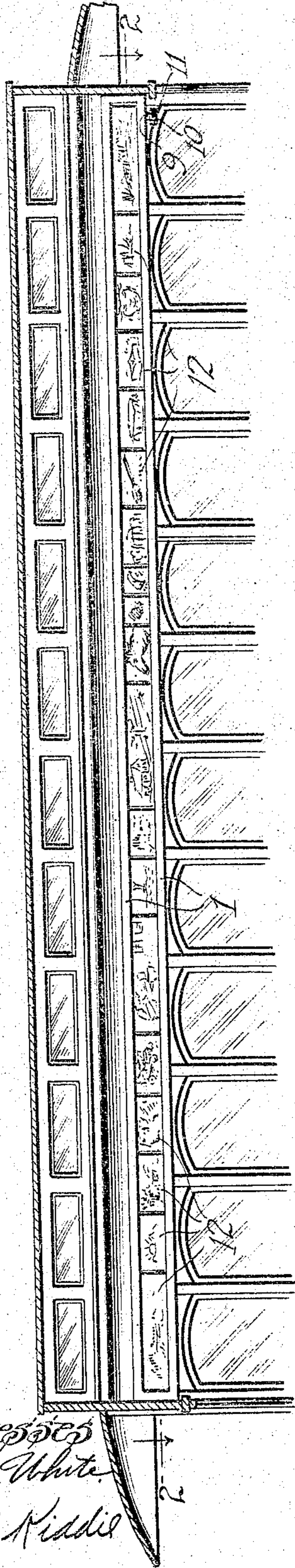


FIG. 1.

Witnesses
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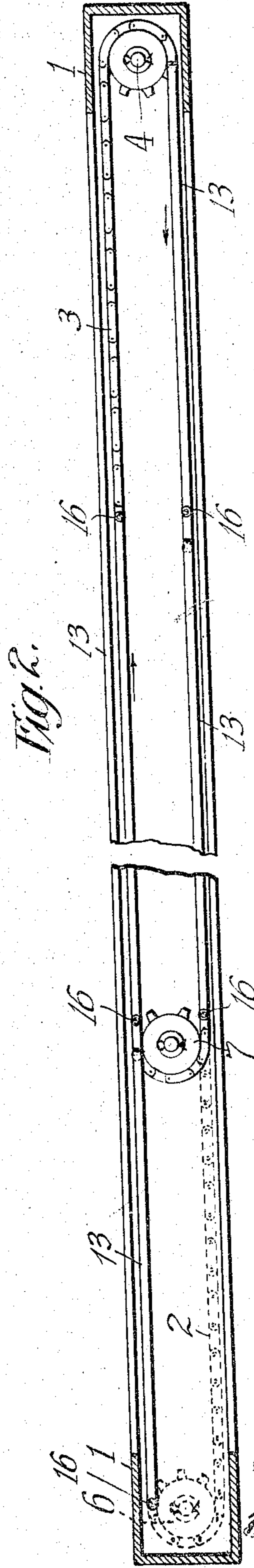


FIG. 2.

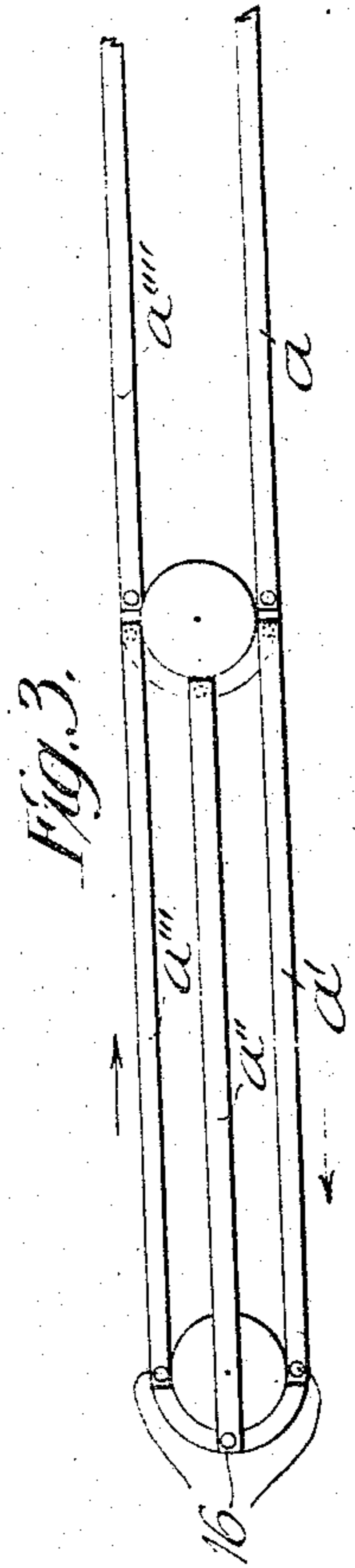


FIG. 3.

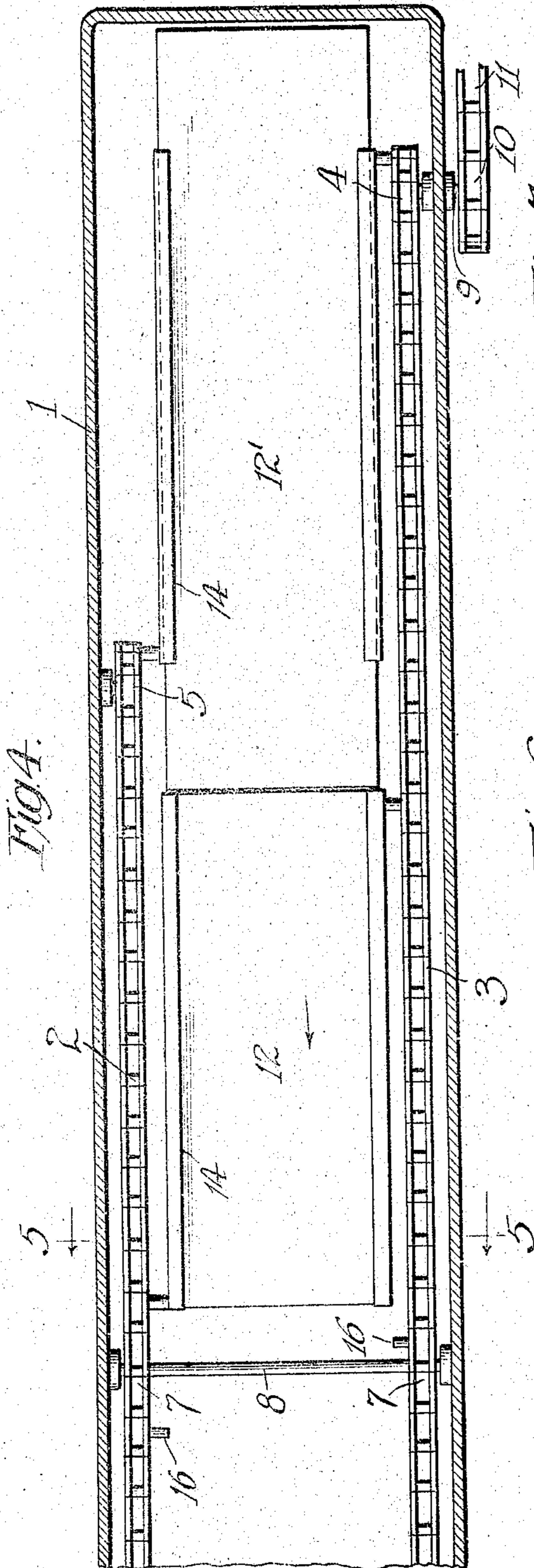
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By *[Signature]*
Attorney

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4 SHEETS—SHEET 2.



Witnesses
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FIG. 7.

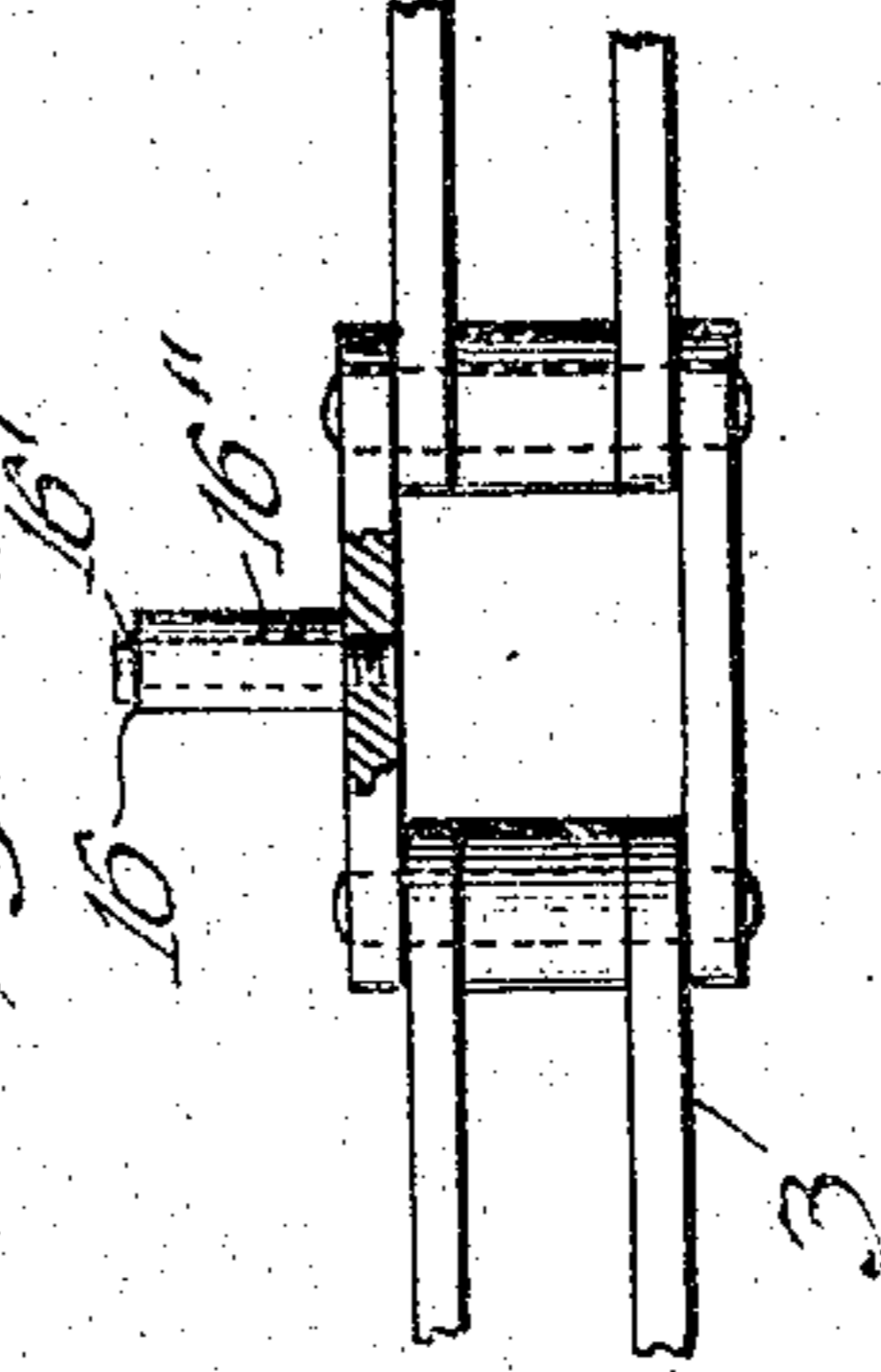


FIG. 6.

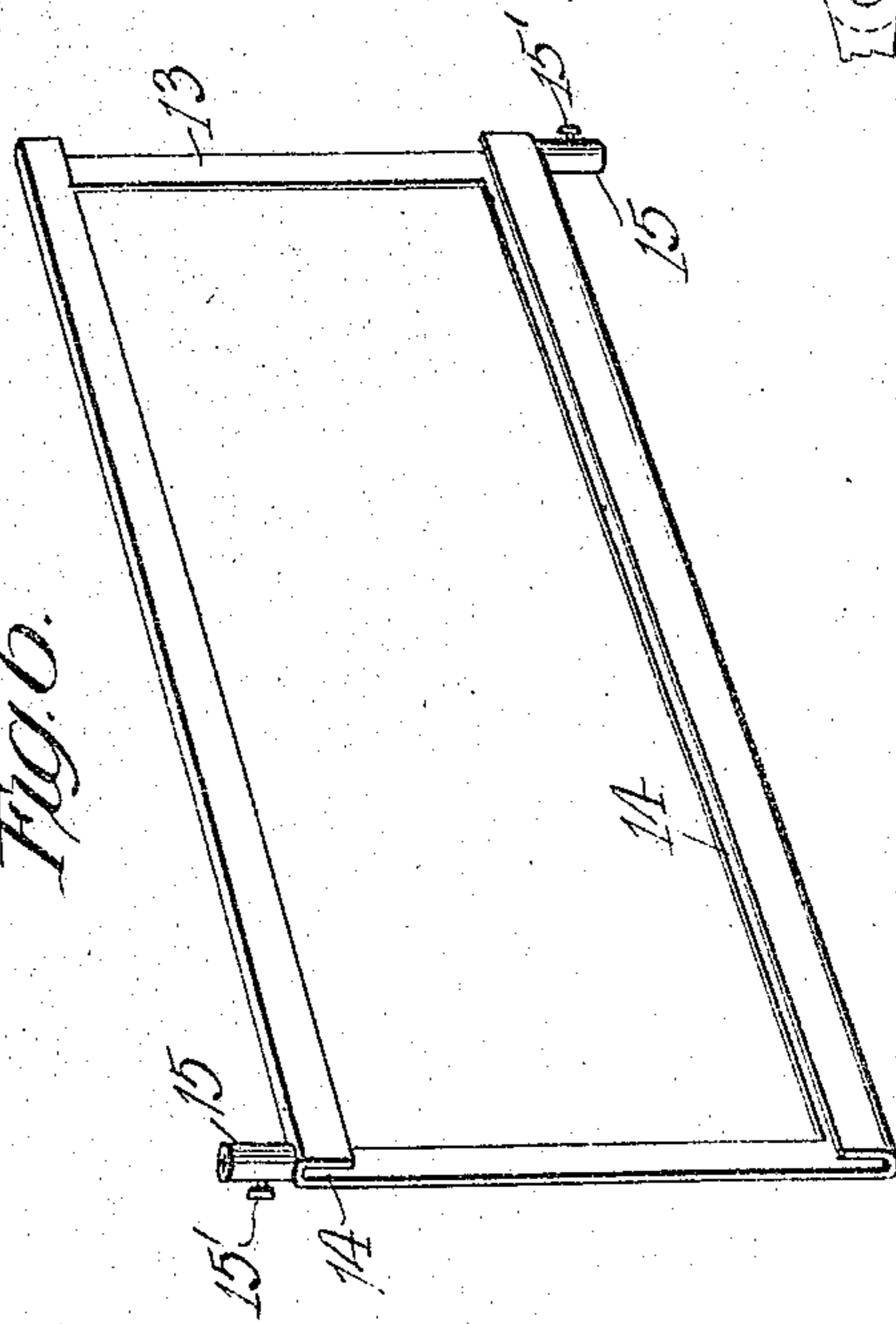


FIG. 8.

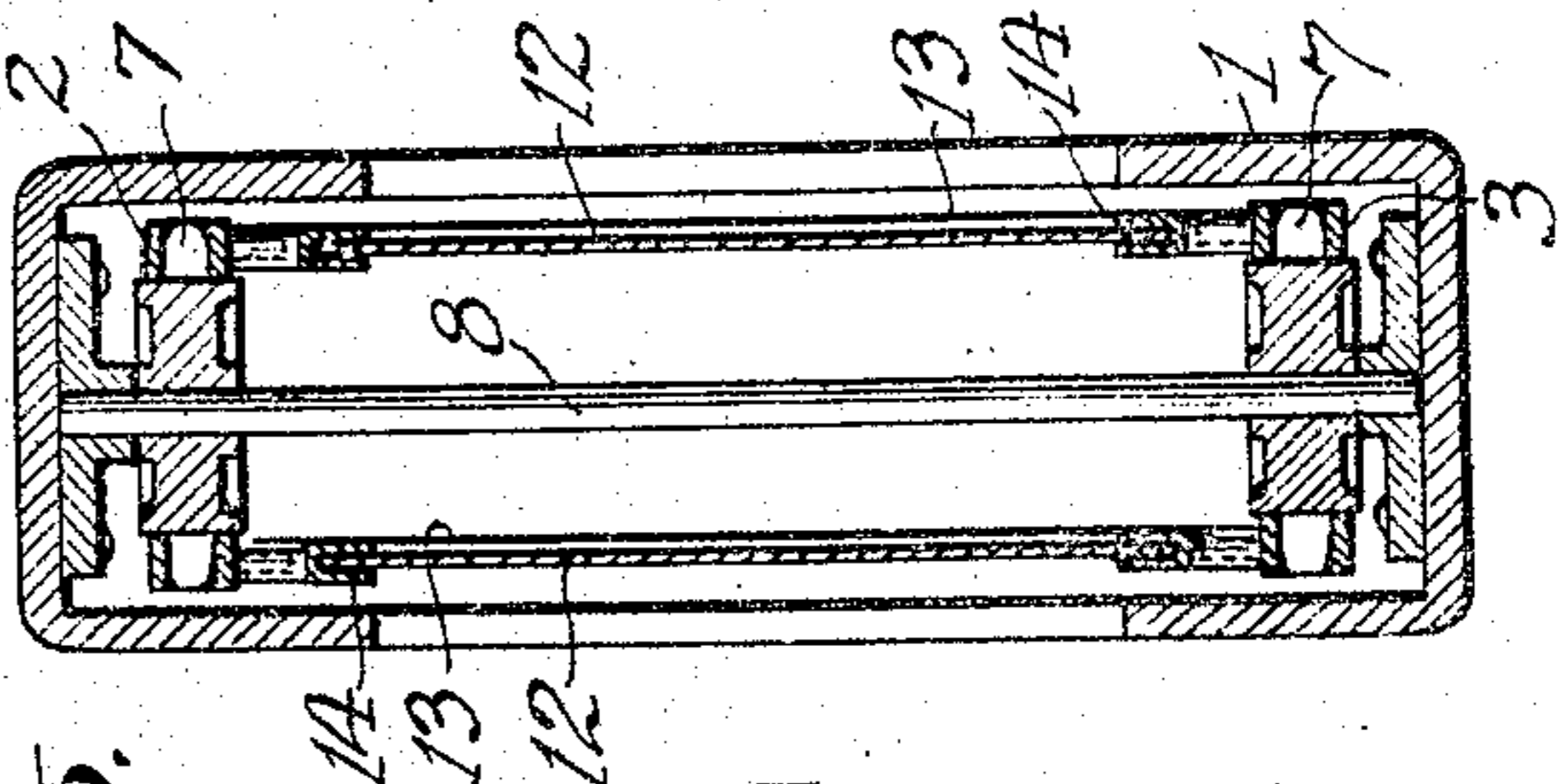
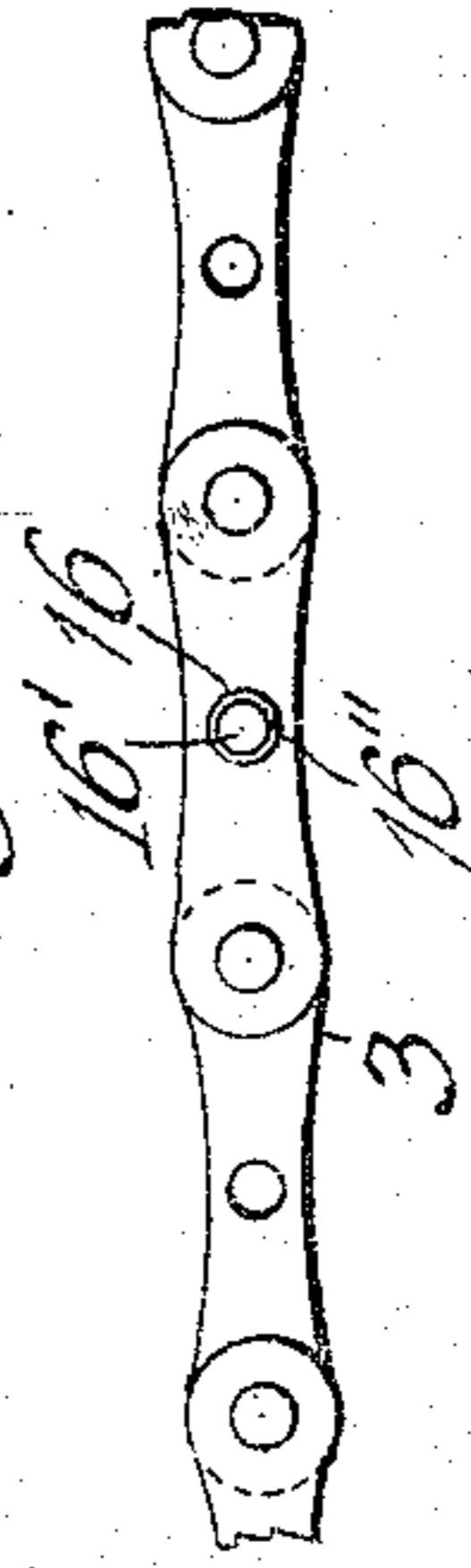


FIG. 5.

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4 SHEETS—SHEET 3.

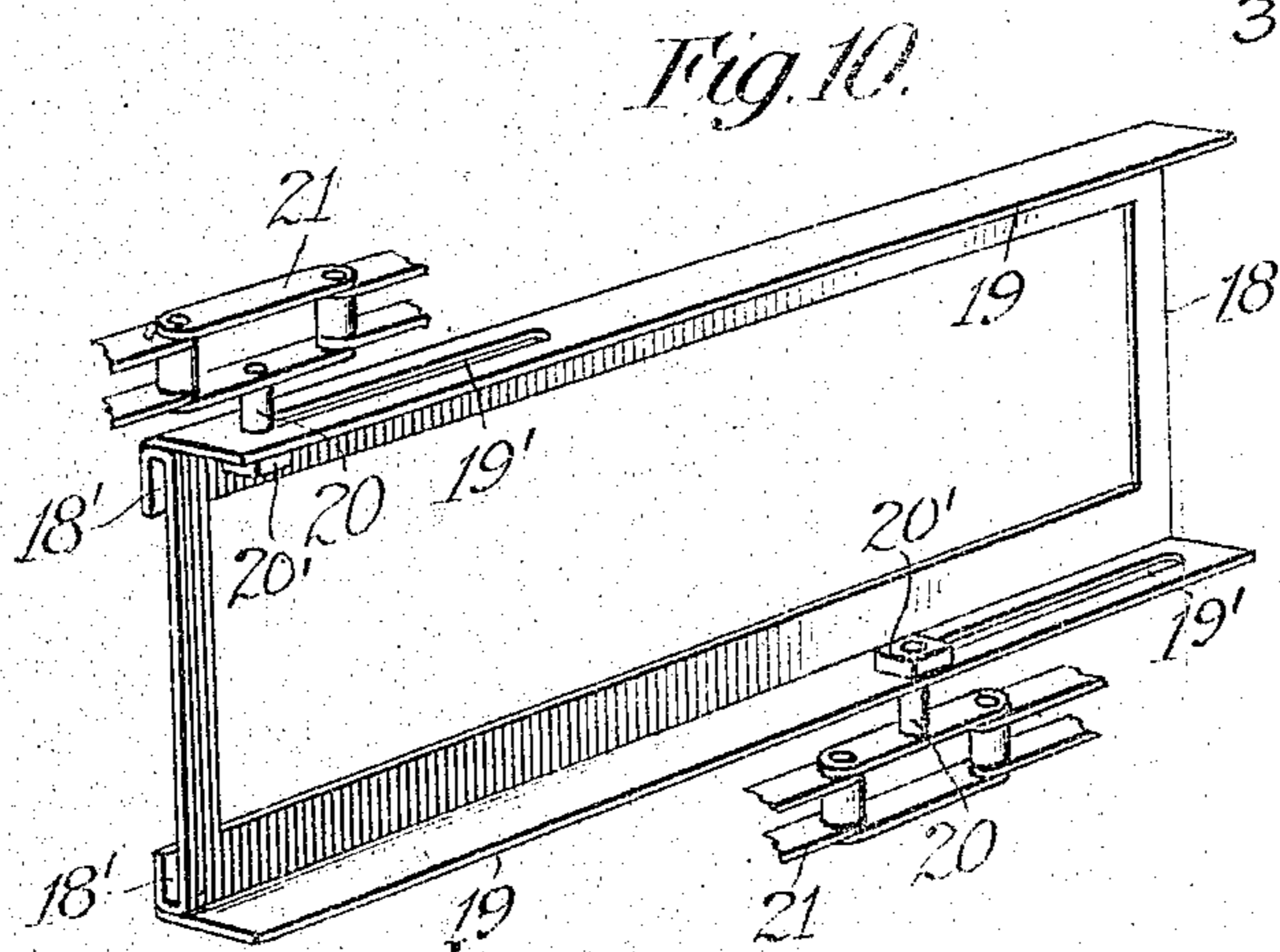
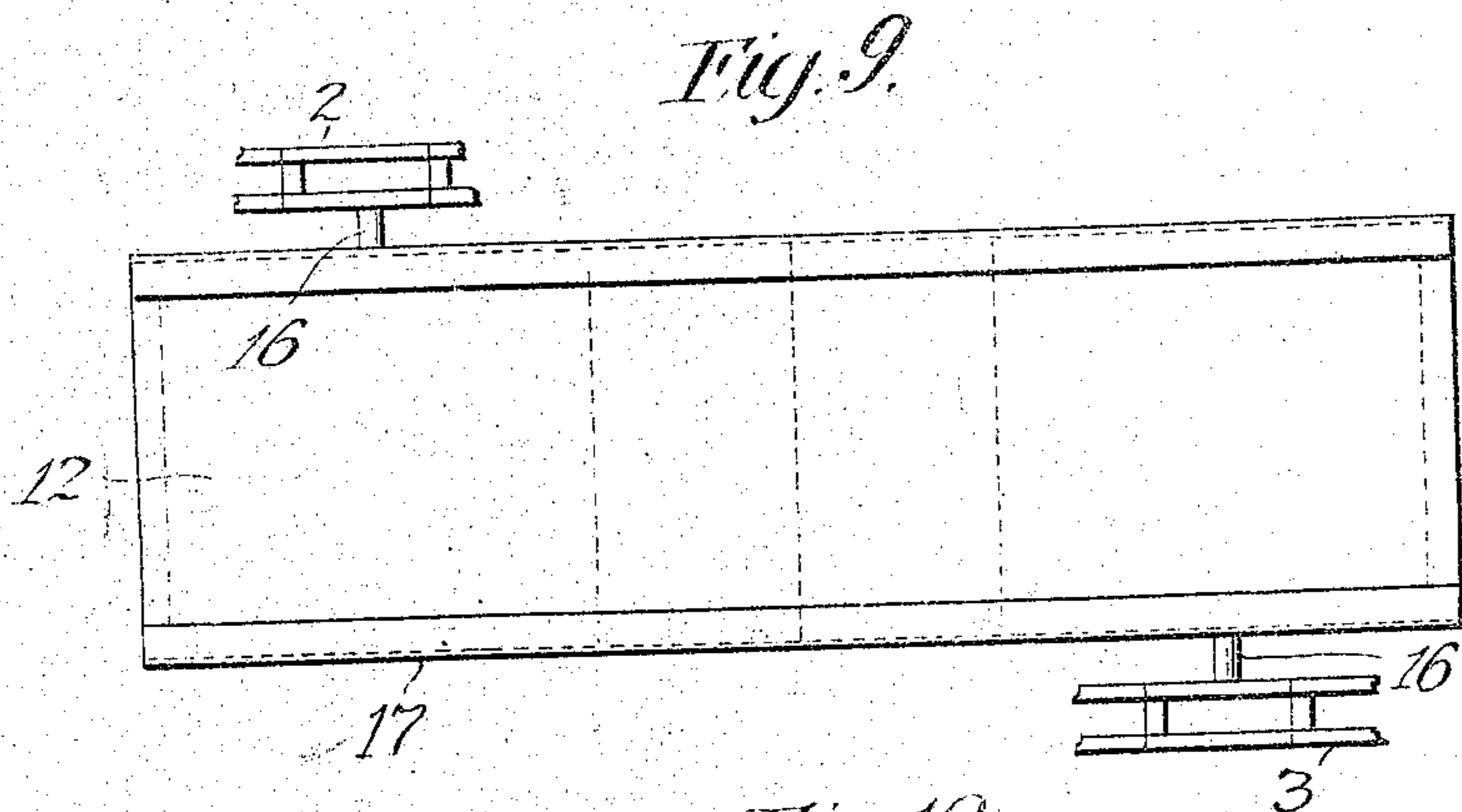


Fig. 11.

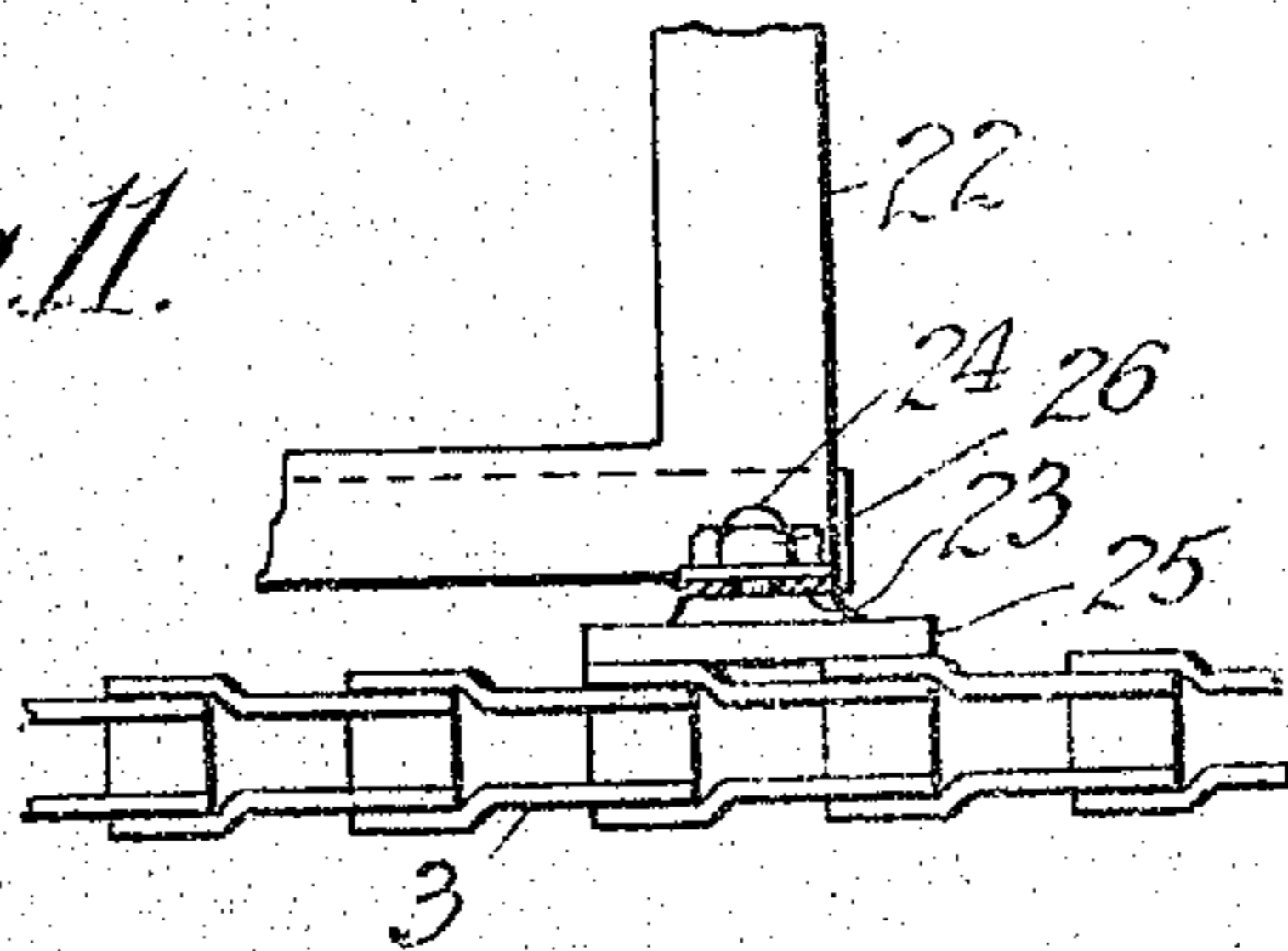
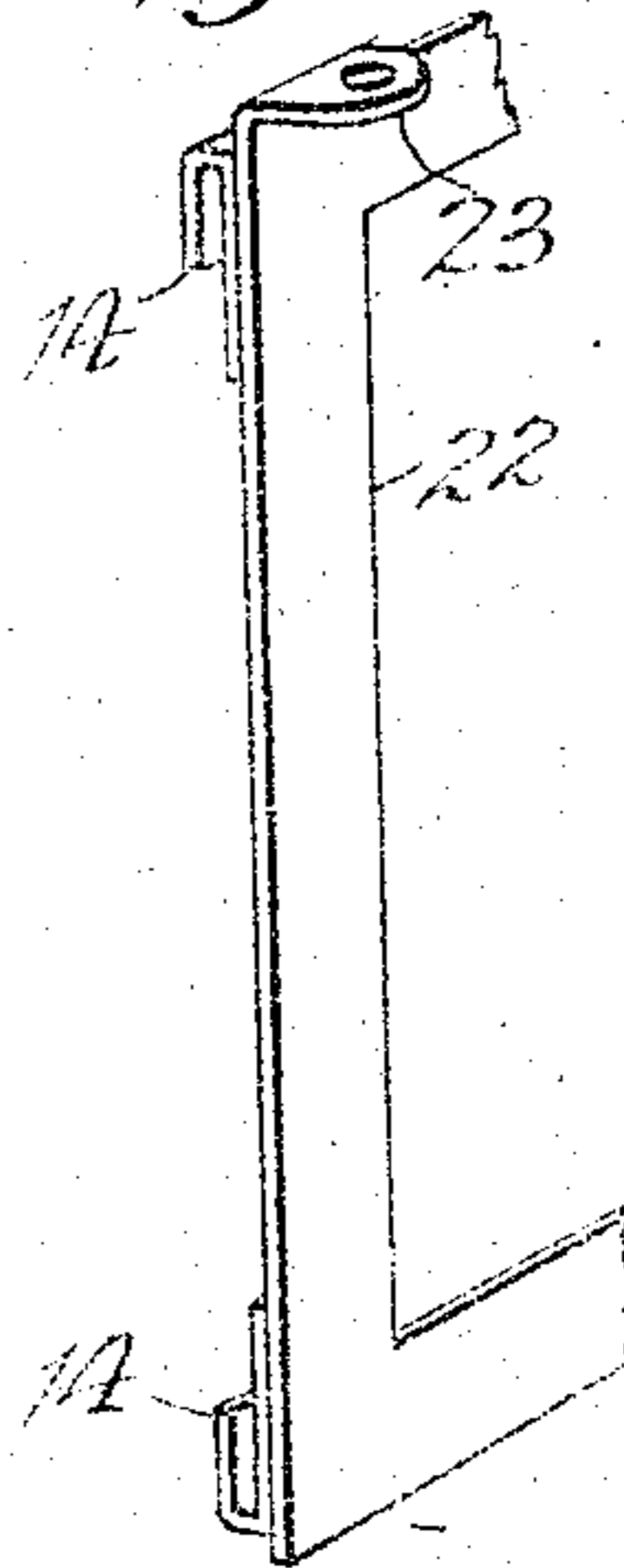


Fig. 12.



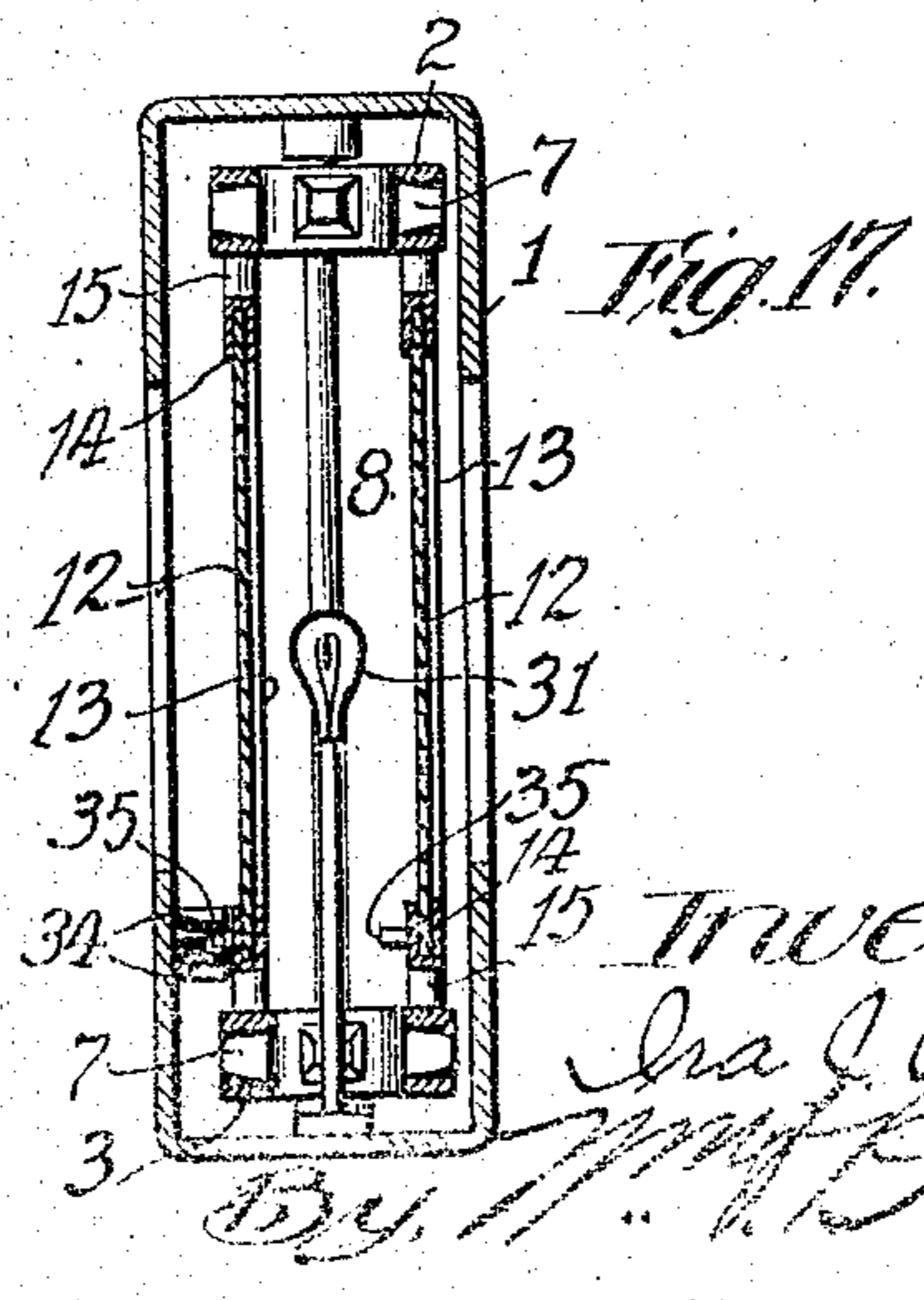
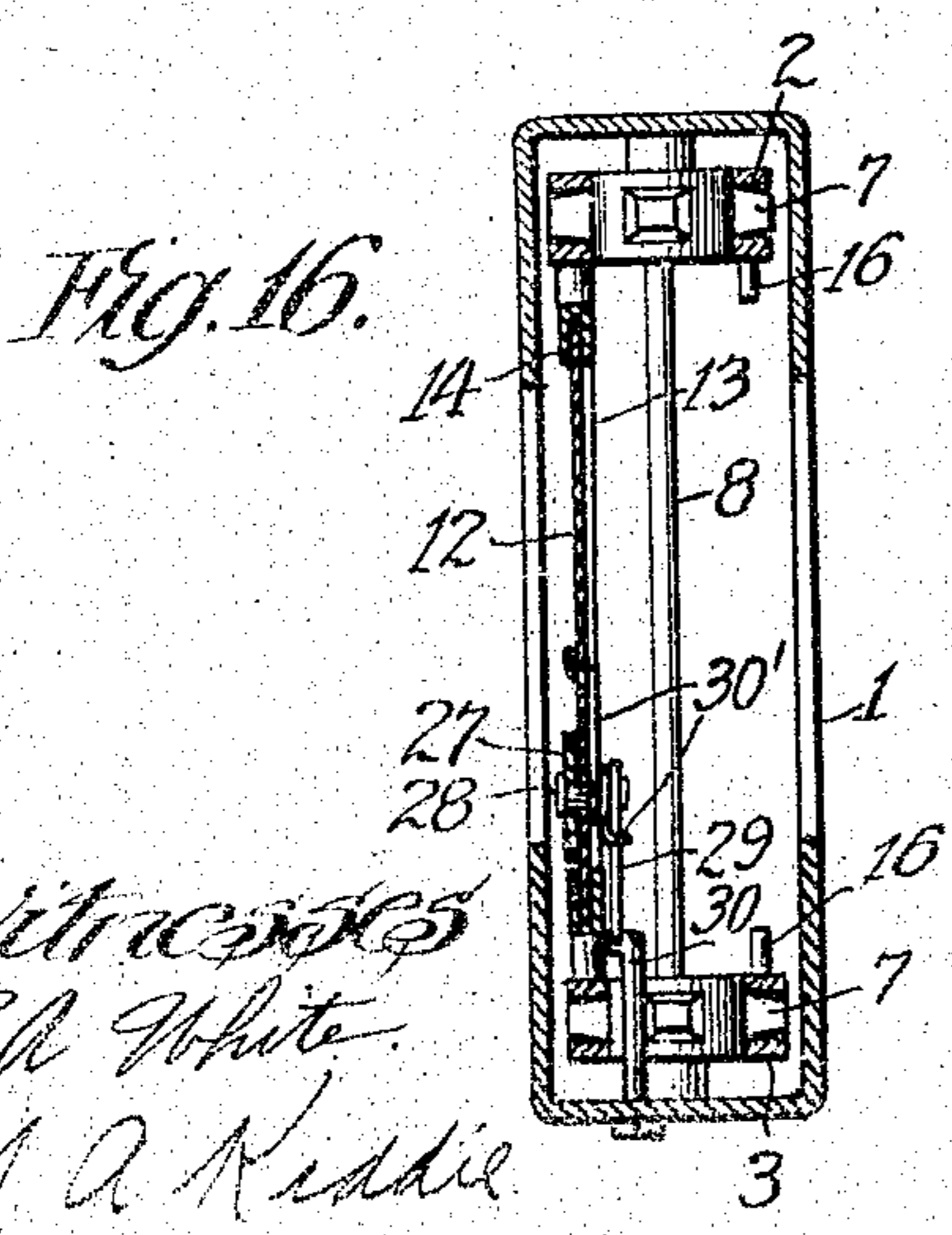
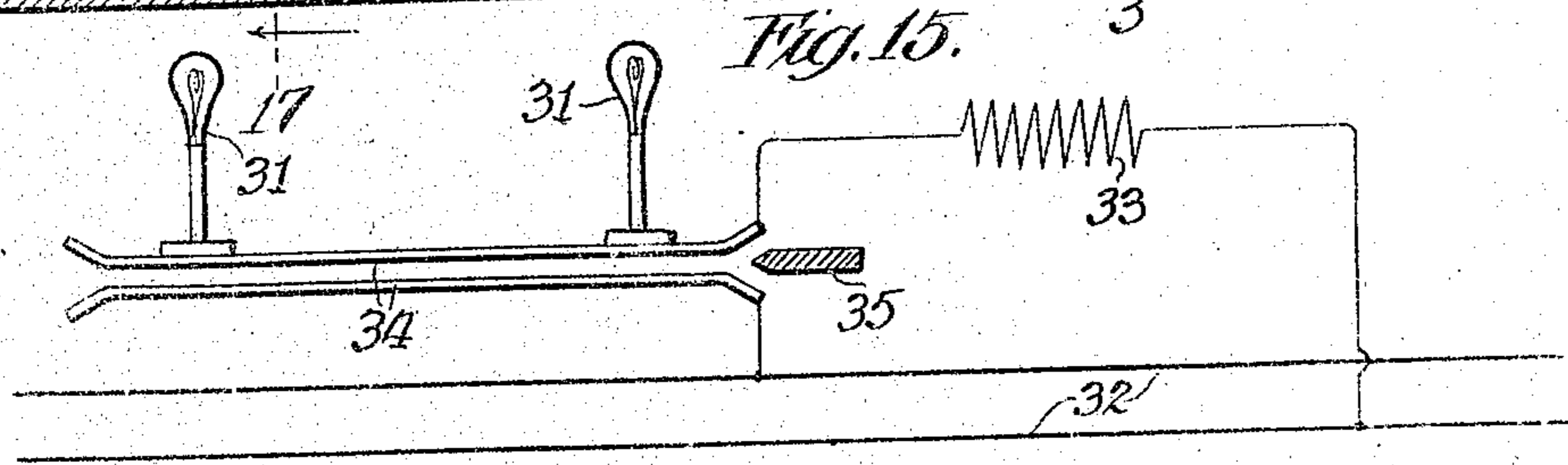
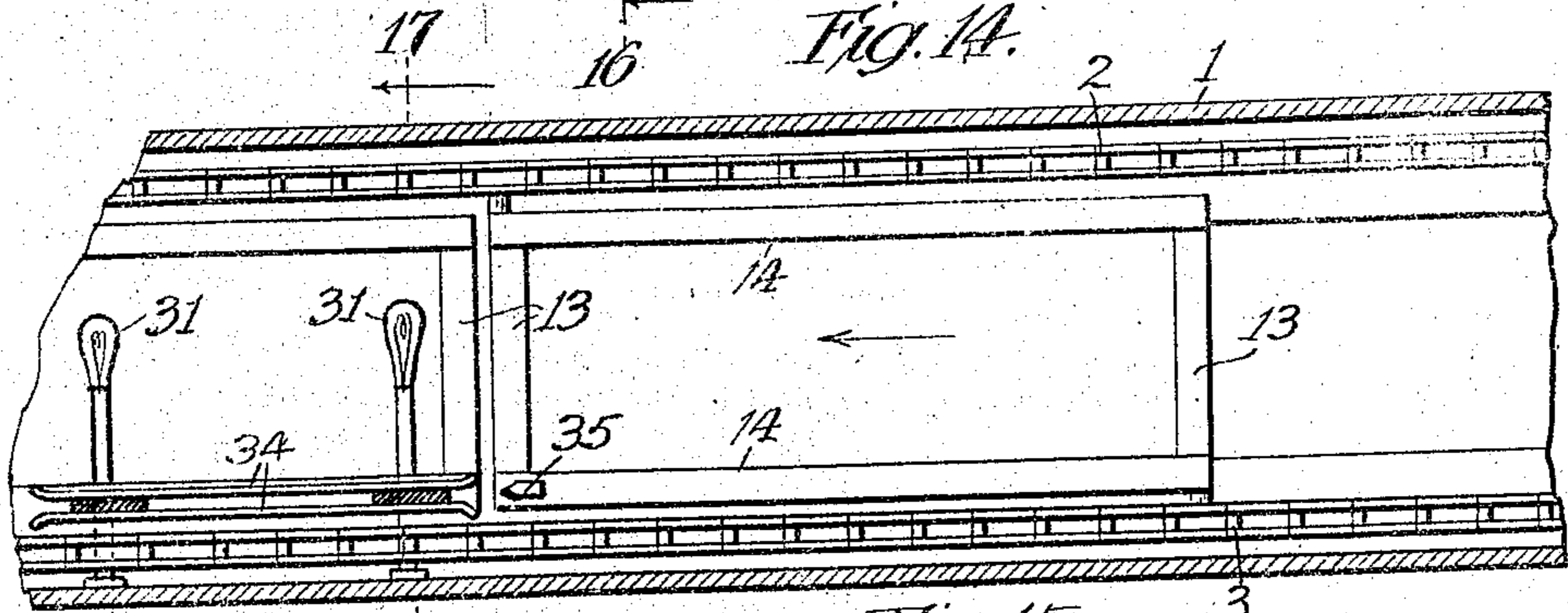
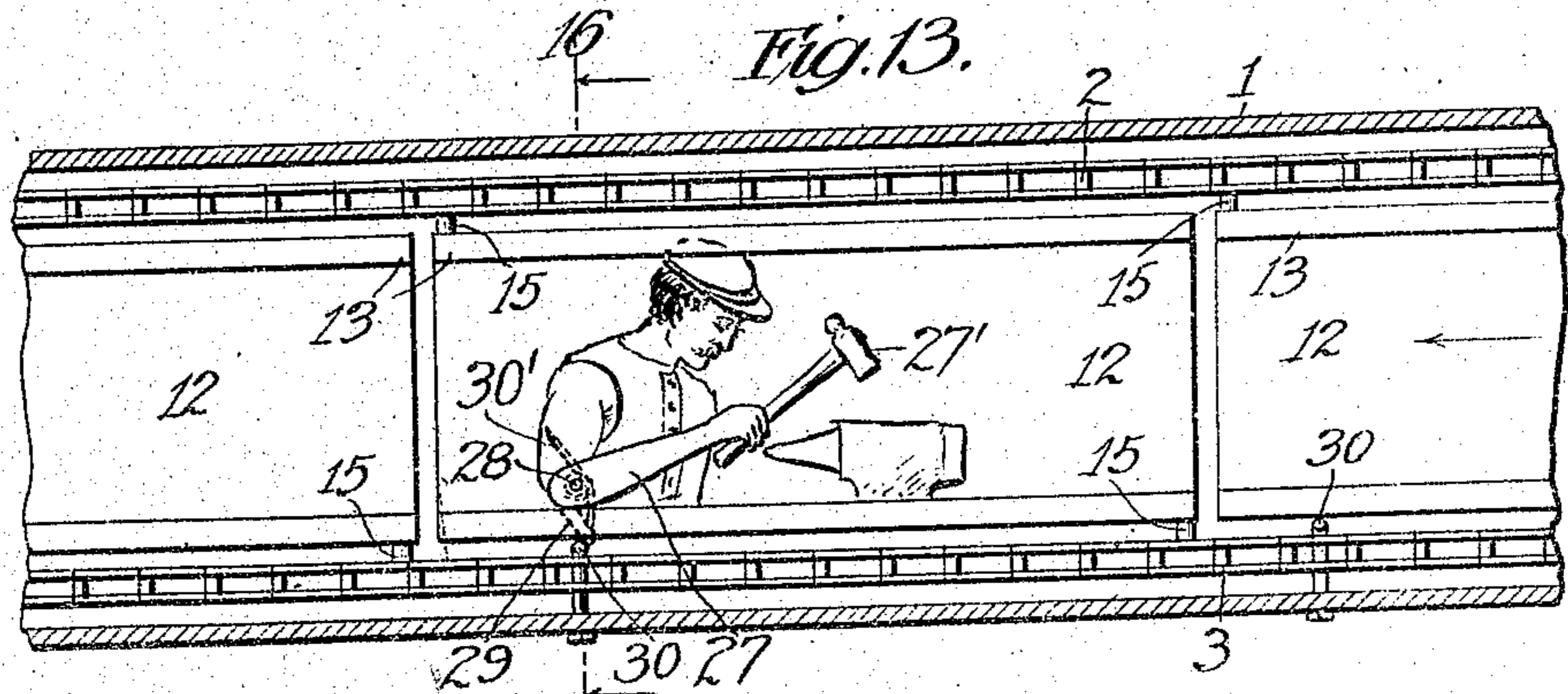
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4 SHEETS—SHEET 4.



Witnesses
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UNITED STATES PATENT OFFICE.

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DISPLAY APPARATUS.

No. 924,370.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed February 10, 1908. Serial No. 415,103.

To all whom it may concern:

Be it known that I, IRA J. OWEN, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented new and useful Improvements in Display Apparatus, of which the following is a specification.

The object of this invention is primarily to provide an apparatus of simple construction and compact form to display a plurality of separate and detachable cards bearing advertisements or other matter while moving in regular order through a specified path of travel, the cards being maintained in parallel relation at all times and especially at the ends of the path of travel when the card is moving into and out of display position.

Another object of the invention is to enhance the attractiveness and advertising value of the cards by providing for actuating mechanical cards and illuminating transparent cards.

My invention is capable of use in street cars, stores, restaurants, railway stations and other places where advertising cards are now or may be displayed, and the cards may be moved through a path of travel extending in a vertical, horizontal or any other desired direction.

For the purpose of explaining the construction, arrangement and operation of my invention in one embodiment thereof, I have shown it arranged in a street car in the accompanying drawings in which—

Figure 1 is a vertical sectional view showing the interior of the upper portion of a street car with my invention embodied therein. Fig. 2 is an enlarged horizontal sectional view on the line 2—2 of Fig. 1 showing both ends of the apparatus but with the middle portion removed. Fig. 3 is a detail diagrammatic view showing several positions of a card at the left end of the apparatus as it retires from display position.

Fig. 4 is an enlarged vertical sectional view of the right end of the apparatus. Fig. 5 is a sectional view on the line 5—5 of Fig. 4. Fig. 6 is a detail perspective view of a card frame. Figs. 7 and 8 are detail views of the chain. Fig. 9 is a detail view showing a frame designed to carry a card of double the usual length. Fig. 10 is a perspective view showing a card frame adjustably connected to the chains. Figs. 11 and 12 show another manner of connecting the card

frame to the chain. Fig. 13 shows a mechanical card. Figs. 14 and 15 show means for illuminating a transparent card. Fig. 16 is a sectional view on the line 16—16 of Fig. 13. Fig. 17 is a sectional view on the line 17—17 of Fig. 14.

The invention can be embodied in a carrier frame of any suitable form and construction but I have found that it can be very conveniently arranged in an oblong frame 1 having channeled sides and ends and made of light metal (Figs. 2, 5). An upper sprocket chain 2 and a lower sprocket chain 3 are arranged to travel in the carrier frame on sprocket wheels suitably disposed along the top and bottom of said frame. These two carrier chains are of equal length but they are arranged in staggered relation to each other, that is to say the right end sprocket 4 for the lower chain is located at a distance beyond the right end sprocket 5 for the upper chain (Fig. 4) and the left end sprocket 6 for the upper chain is located at a distance beyond the left end sprocket 7 for the lower chain (Fig. 2). These end sprockets are supported on the carrier frame in any suitable manner and intermediate idle sprockets 7 are located at intervals along the carrier frame to guide and keep the chains taut. One or more pairs of these idle sprockets 7 are mounted on a shaft 8 (Fig. 4) whereby motion is communicated from the driving chain to the other chain and thereby both chains are kept moving in unison. Power may be applied to one of the chains in any suitable manner and in the drawings I have shown the lower chain 3 to be the driving chain and the shaft 9 of the end sprocket 4 extended through the carrier frame and carrying a sprocket 10 which receives the power chain 11. Instead of the chain 11 the sprocket 4 may be suitably geared or otherwise arranged to be driven electrically or by a spring motor, gravity mechanism or other means and the power may be applied continuously or intermittently in any suitable manner, this forming no part of my present invention.

The cards 12 are separate and independent from each other and are detachably arranged in skeleton frames 13 (Fig. 6) provided at top and bottom with grooves 14 to receive the edges of the cards. These frames have a swivel connection at the upper left hand corner and at the lower right hand corner

with the upper and lower chains, respectively, and for this purpose the card frame is provided with socket posts 15 to receive pivot studs 16 on the chains. The swivel points on the card frame may be variously located on the opposite edges of the frame but they must bear essentially the same diagonal relation to each other that the axes of the sprockets at each end of the carrier frame bear to each other. In Figs. 7 and 8 I have shown one form of stud which comprises a pin 16' screwed into a link of the chain and carrying a loose sleeve 16''. A set screw 15' operating through the socket post will lock the sleeve 16'' in the socket of the post to secure the card frame in fixed position on the chains but at the same time permitting the pins 16' to turn within the sleeves as the chains travel around the end sprockets in the carrier frame.

In the apparatus illustrated in the drawings the cards are in display position while they are traveling from right to left of the carrier frame, each card frame having a swivel connection at its upper left hand corner to the upper chain and at its lower right hand corner to the lower chain. The card frames are arranged between the two chains and as the upper chain projects at the left end of the carrier frame beyond the lower chain a distance approximately equal to the length of a card frame it will be readily understood that when a card frame carries a card to the extreme end of its travel to the left it will move backward from front to rear in the carrier frame as the swivel studs travel around the end sprockets of the chains. While it is thus retiring at the end of the travel from right to left into position to begin its travel from left to right in the carrier frame the card frame will maintain its position in parallelism with all the other card frames so that the card will be in plain view until it proceeds on its return travel from left to right.

In Fig. 3 I have shown a card diagrammatically in several positions at the left end of the frame. In this figure *a* indicates the card as it approaches and *a'* the card after it has reached its position at the end of its travel from right to left; *a''* shows the card as it is retiring from front to rear; *a'''* the card after it has reached its rearward position and is ready to start on its travel from left to right and *a''''* indicates the card on its travel back to initial position at the right end of the frame. It will be observed that in each position illustrated, and likewise in every intermediate position, the card is maintained in parallelism with the other cards. If the apparatus is arranged to have the cards travel through display position in a vertical plane, each card will be maintained in a vertical position while retiring at one end of the frame and while moving from

rear to front at the other end of the frame, for it will be understood that when the card reaches the one end of the frame it will move forward, as the swivel studs pass around the sprockets, in like manner, but in the reverse direction to the movement at the other end of the frame.

The swivel studs are detachably connected to the chains so that they can be adjusted to proper position for the card frames. Or instead of moving the studs a sufficient number thereof may be permanently carried by the chains to enable any changes in position of the card frames or the cards as occasion requires.

I may use cards of a standard length to accommodate which the card frames are constructed, or the cards may be of double length, as indicated by the card 12' (Fig. 4). It will be necessary, of course, that the card frame should be provided with its swivel connections to the chains at the same points at all times whether a card of ordinary length, or of half length, or of double length is carried by the card frame, but a double length card can be arranged in an ordinary card frame, as shown in Fig. 4, the ends of the card projecting beyond the length cards can be arranged in the ordinary card frame. When a double length card is arranged in the card frame, as shown in Fig. 4 it will be necessary to adjust the adjacent frames so that they will not be overlapped by the projecting ends of the double length card and also permit the double length card to retire at the left end and move forward at the right end of the carrier frame in the desired manner. I may provide a special card frame 17 (Fig. 9) to carry a double length or two ordinary length or several smaller cards but as before stated the swivel connections with the chains must be located on this double length card frame at the same relative positions as they would be on the frame for ordinary cards.

The card frames 13 (Fig. 6) heretofore described and the double card frame 17 (Fig. 9) may be readily connected with the swivel studs on the chains and secured thereto by set screws 15' as a precaution against accidental disconnection, but this is not believed to be necessary under ordinary conditions. These card frames 13 and 17 are detachable from the chains and are intended to be detached to facilitate the insertion and removal of cards and for readjustment relative to adjacent card frames.

In Fig. 10 I have shown a card frame which is intended to be permanently connected with the chains and is adjustable lengthwise relative to the chains. This card frame 18 is provided with the usual grooves 18' for the card and has at top and bottom a flange 19. These flanges have slots 19' to re-

ceive swivel studs 20 on the chains 21 and the frames are secured in adjusted position to the chains by nuts 20' on the studs.

In Figs. 11 and 12 I have shown another form of swivel connection in which the frame 22 is provided with an ear 23 to receive a swivel stud 24 carried by a plate 25 fastened to the chain, the frame being secured in place on the stud by a nut 26.

The cards are moved by the chains along the display path of travel and are then, one at a time and without changing their parallelism with the other cards, switched to the return path of travel from which they are in like manner switched to the display path again, this operation being continued as long as the carrier chains are in motion. The cards are separate from and independent of each other and are detachable from the card frames, whereby they may be frequently changed and are capable of a high degree and a variety of artistic printing, coloring and ornamentation, which contributes to the attractiveness of the display.

But the most attractive feature of the invention from a standpoint of commercial advertising is the fact that the cards are constantly moving throughout the length of the carrier frame and are switched out of and into display position at the ends of the display path of travel in a smooth and regular manner without disclosing any of the mechanism of the apparatus and without necessitating a turning or tilting or other manipulation of the card and which would tend to attract the attention of the observer, thus destroying the uniformity of movement of the cards and taking the observer's attention away from the advertisements on the cards. With my invention the movement of the cards is uniform throughout and entirely free from any manipulation which would tend to render the cards unreadable or place them in an awkward or unusual position while still remaining in sight.

As heretofore stated the cards are all maintained in parallelism at all times so that any card may be read as easily while it is retiring and before it has passed behind the card in front of it as it can be when in the middle of the display path of travel. It is also of especial importance to provide for the use of cards of different length for some advertisers will buy more space than others in order to make a greater display of their advertisement. This also enhances the attractiveness of the general display, and, as has been pointed out heretofore, cards of different length can be used with my invention without requiring card frames of special size and only necessitating the adjustment of adjacent frames so that the cards will not overlap.

I may provide for the use of any number of mechanical cards, that is to say a card

having a movable part thereon and which are more or less familiar. In Figs. 13 and 16 I have shown one of these mechanical cards and the manner of its operation. This card bears a picture representing a blacksmith at his anvil and a part 27 representing the blacksmith's arm carries a representation of a hammer 27' and is pivoted at 28 on the front of the card. A trigger 29 connected with the pivot pin 28, behind the card, is arranged to strike a tripper 30 mounted in the carrier frame 1 (Fig. 16). A spring 30' is fastened to the card and the trigger to hold the arm 27 normally in lowered position with the hammer apparently engaging the anvil. When the card in moving along carries the trigger into engagement with the tripper 30 the arm 27 and the hammer 27' will be swung upward as shown in Fig. 13 carrying the hammer away from the anvil and as soon as the trigger passes the tripper 30 the spring will return the arm and hammer to lowered position. This movement takes place very quickly and may be repeated as often as desired by providing a suitable number of trippers 30.

The cards may be made of transparent material and electric lights arranged between the paths of travel at any desired points to illuminate the cards or any number of them as they pass in front of the lights. This may be accomplished very simply and easily by supporting one or more incandescent electric lights 31 within the carrier frame between the paths of travel and connecting them in a suitable manner with any electric light wires 32, a resistance 33 being provided if necessary. Elongated spring contacts 34 are arranged in circuit with the lights 31 and a sliding contact 35 on a card frame is arranged to enter between the spring contacts 34 to complete the light circuit. These lights may be located as frequently as desired along the carrier frame so that the transparent cards will be repeatedly or, to all intents and purposes, continuously illuminated if desired.

While the invention is particularly adapted for use in street cars because advertising cards of this kind have for so long been used in street cars it can obviously be used with the same effectiveness and in the same manner in any place where advertising cards have or may be displayed, such as, for example, in stores, in restaurants, in railway stations, or on the outside of buildings, or in some position on the public streets and it will be readily understood that if two cards are put in each frame, back to back, they will be displayed from either side of the frame if the apparatus is arranged so that the frame can be observed from both sides. And instead of having the cards travel in a horizontal path the chains may be arranged to move the cards in a vertical or in any other

direction. The arrangement is such that the chains may be moved in either direction without requiring any changes and for this reason the power may be applied in a suitable manner to cause the chains to move intermittently first in one direction and then in the other. In this connection it may be observed that the carrier frame while desirable is not an absolutely essential element of the invention for the frame is not required to guide the cards and is really only provided to give a finish and completeness to the apparatus and form the support for the sprockets and other parts. The reason the frame is not necessary for the proper operation of the cards is because the cards are carried between and by the chains and depend for their movement entirely upon the movement of the chains. The frame does conceal the chains and the sprockets, it constitutes the support for the sprockets, the trippers and the lights and gives a finish to the apparatus, for which reasons the frame is a desirable element of the invention.

What I claim and desire to secure by Letters Patent is:

1. In a display apparatus, the combination of a plurality of card frames arranged end to end, and means connected to the card frames at diagonally opposite corners thereof for moving said card frames forward in one plane and back in a parallel plane and bodily from one plane to the other at each end of said paths of movement and constantly maintaining the cards in parallel planes.
2. In a display apparatus, the combination of a pair of endless carriers arranged in staggered position and traveling in parallel paths, means for moving said carriers in unison, and a card frame connected to both of said carriers to travel bodily therewith in a path corresponding to the paths of travel of the carriers.
3. In a display apparatus, the combination of a pair of endless carriers arranged in staggered position and traveling in parallel paths, means for moving said carriers in unison, and a card frame connected to both of said carriers at points diagonally opposite each other to travel bodily with the carriers in a path corresponding to the paths of travel of the carriers.
4. In a display apparatus, the combination of a pair of endless carriers arranged in staggered position and traveling in parallel paths, means for moving said carriers in unison, and a card frame arranged between said carriers and pivotally connected to both of said carriers at points on its side edges diagonally opposite each other to travel bodily with the carriers in a path corresponding to the paths of travel of the carriers.

5. In a display apparatus, the combination of a pair of endless carriers arranged in staggered position and parallel relation, means for moving said carriers in unison, and a card frame arranged between said carriers and connected at diagonally opposite points to both of said carriers to travel therewith.

6. In a display apparatus, the combination of a pair of endless carriers arranged in staggered position and parallel relation, means for moving said carriers in unison, and a card frame connected at diagonally opposite corners to both of said carriers to travel therewith.

7. In a display apparatus, the combination of a pair of endless carriers arranged in staggered position and parallel relation, means for moving said carriers in unison, and a card frame having a swivel connection at one corner with one carrier and a similar connection at the diagonally opposite corner with the other carrier to travel therewith.

8. In a display apparatus, the combination of a pair of endless carriers arranged in staggered position and parallel relation, means for moving said carriers in unison, a card frame, and a connection between said card frame and each of said carriers at diagonally opposite points on the frame, each of said connections comprising a stud member and a socket member to receive said stud member.

9. In a display apparatus, the combination of a pair of endless carriers arranged in staggered position and parallel relation, means for moving said carriers in unison, a card frame, and a connection between said card frame and each of said carriers at diagonally opposite points on the frame, each of said connections comprising a stud member, a sleeve loosely mounted on said stud member, a socket member to receive said sleeved stud member and a set screw operating through said socket member to engage said sleeve.

10. In a display apparatus, the combination of a pair of endless chains arranged in staggered position and parallel relation, means for moving said chains in unison, a plurality of pivot studs on said chains, the studs of one chain being arranged in staggered relation to the studs on the other chain, a plurality of card frames, and socket members at diagonally opposite points on said card frames to engage pivot studs on the chains.

11. In a display apparatus, the combination of an endless carrier, a card traveling with said carrier, a movable part on said card, a trigger connected to said movable part, and a tripper arranged in the path of said trigger to engage the same and swing said movable part.

12. In a display apparatus, the combina-

tion of a pair of endless carriers arranged in staggered position and traveling in parallel paths, means for moving said carriers in unison, a card frame connected to both of said carriers to travel bodily therewith in a path corresponding to the paths of travel of the carriers, a card carried by said card frame, a movable part on said card, a spring holding said movable part normally in one position, a trigger connected to said movable part, and a tripper arranged in the path of movement of the trigger to engage the same and swing said movable part.

13. In a display apparatus, the combination of an endless carrier, a transparent card traveling with said carrier, an electric light circuit, and means traveling with said carrier for closing the circuit, substantially as and for the purpose described.

14. In a display apparatus, the combination of an endless carrier, a transparent card carried by said carrier, an electric light cir-

cuit, a lamp in said circuit adjacent to the path of travel of the card, a pair of spring contacts in said circuit, and a sliding contact traveling with the card to engage said spring contacts and complete the circuit.

15. In a display apparatus, the combination of a pair of endless chains arranged in staggered position and traveling in parallel paths, sprocket wheels at the terminals of said paths and upon which the chains travel, means for moving said chains in unison, a card frame pivotally connected at opposite edges to said chains, the pivot points of said card frame being diagonally located and bearing the same relation to each other that the centers of the sprocket wheels at each end of the paths of travel bear to each other.

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