

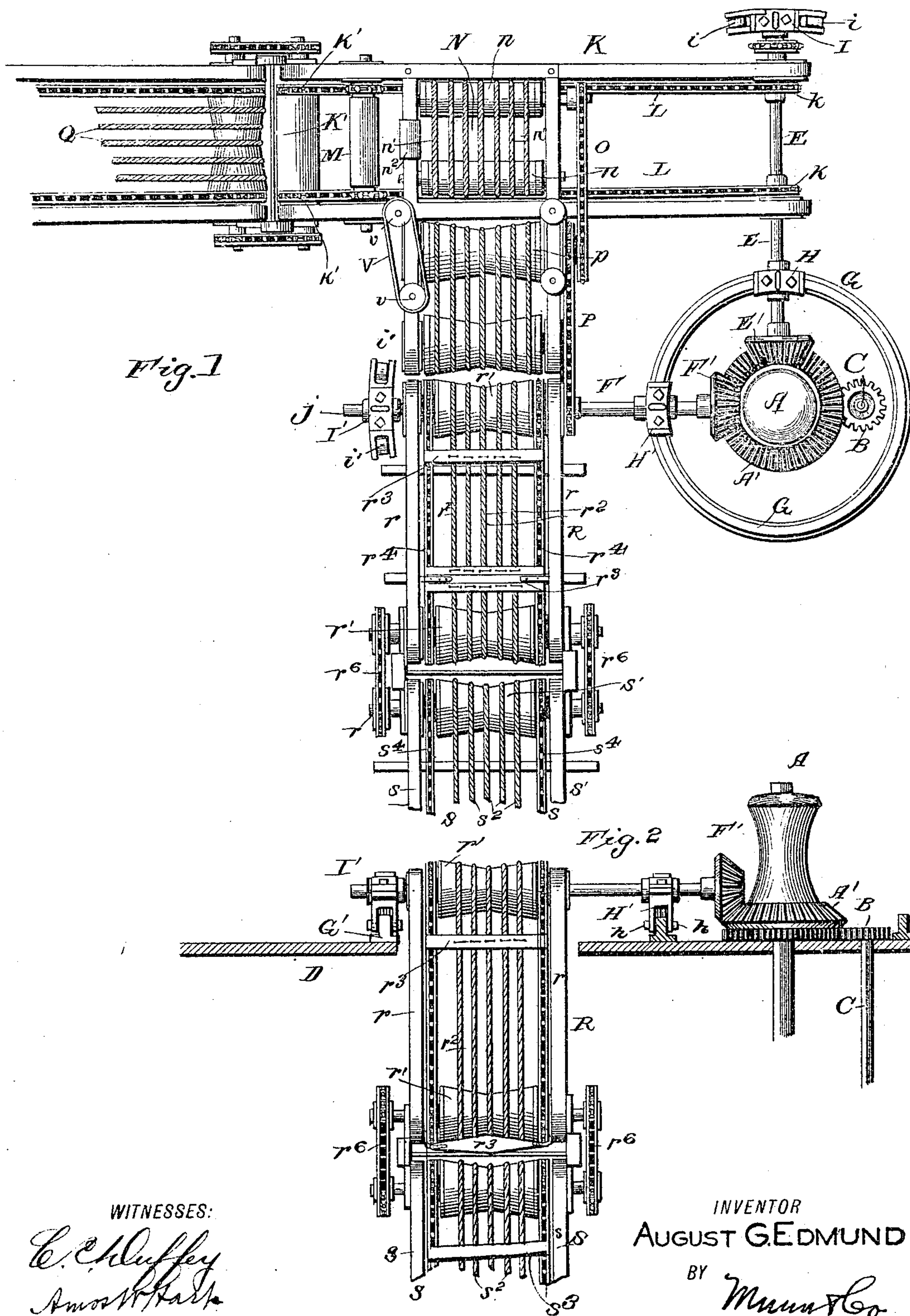
No. 807,916.

PATENTED DEC. 19, 1905.

A. G. EDMUND.  
ELEVATOR AND CONVEYER.

APPLICATION FILED MAR. 28, 1905.

3 SHEETS—SHEET 1.



WITNESSES:

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*Amos W. Hart*

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BY *Munn & Co.*  
ATTORNEYS

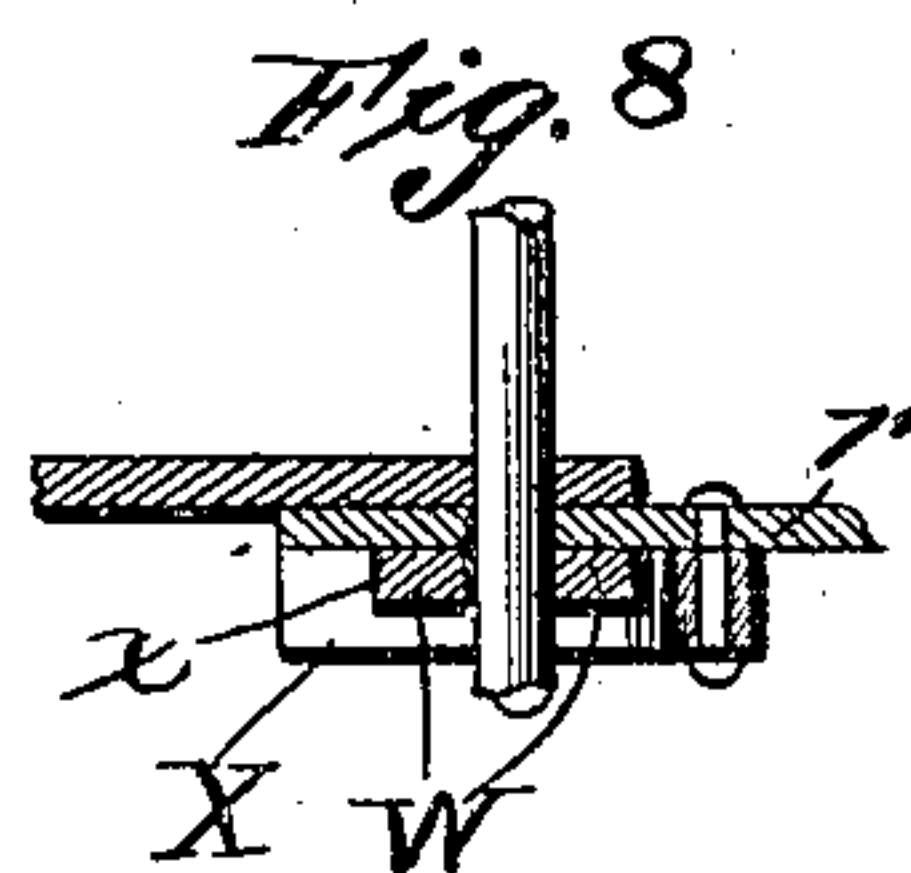
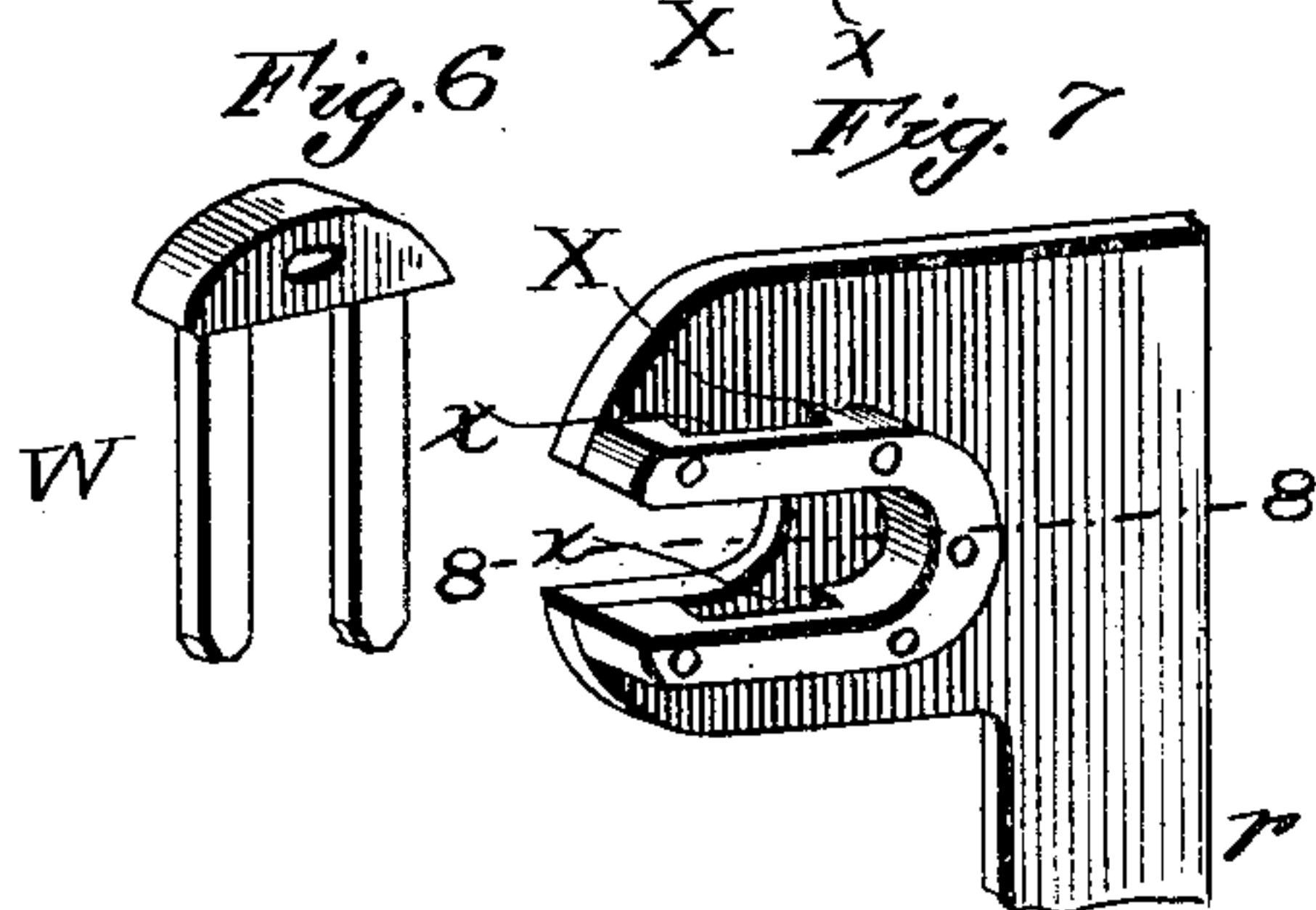
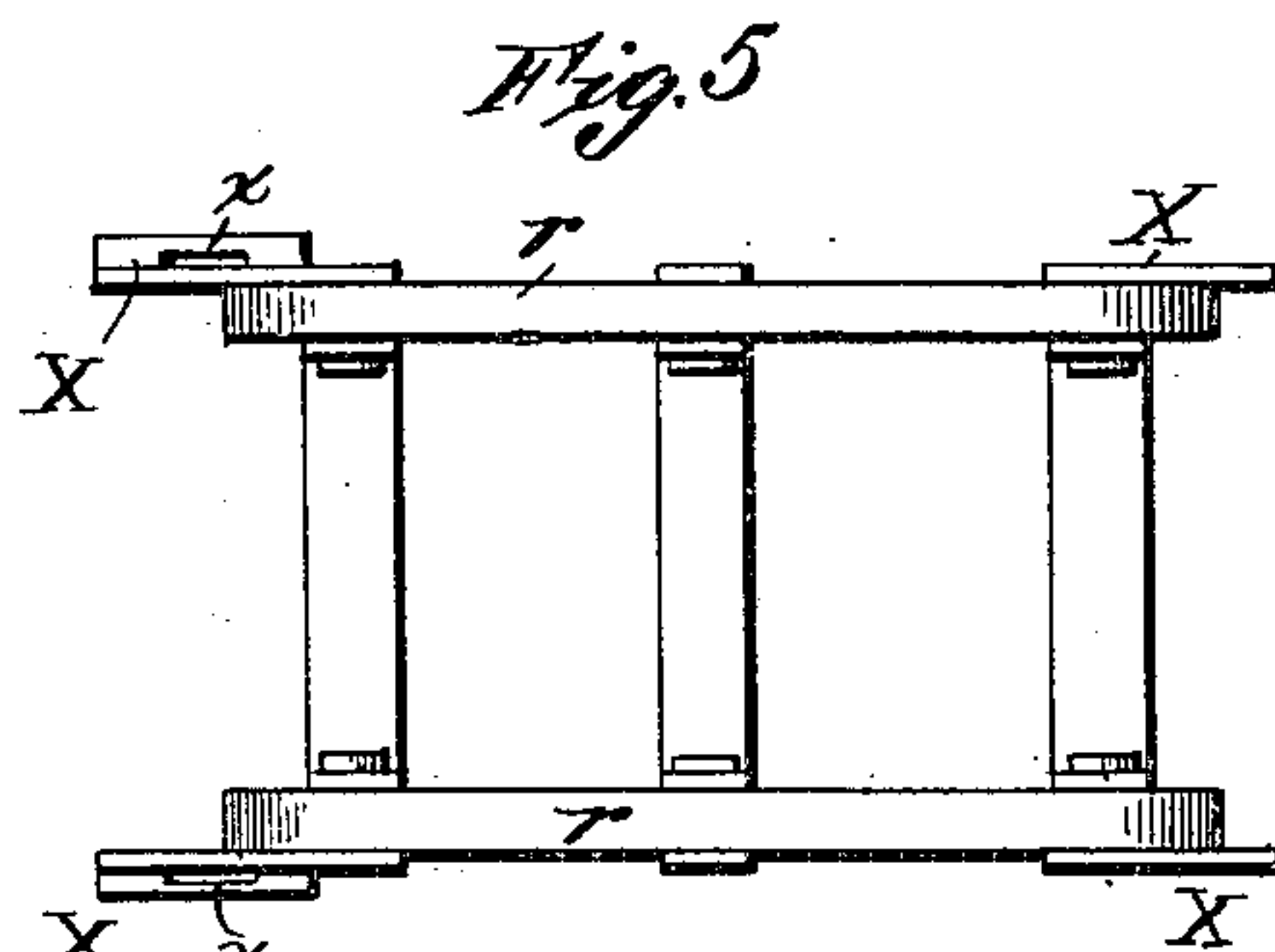
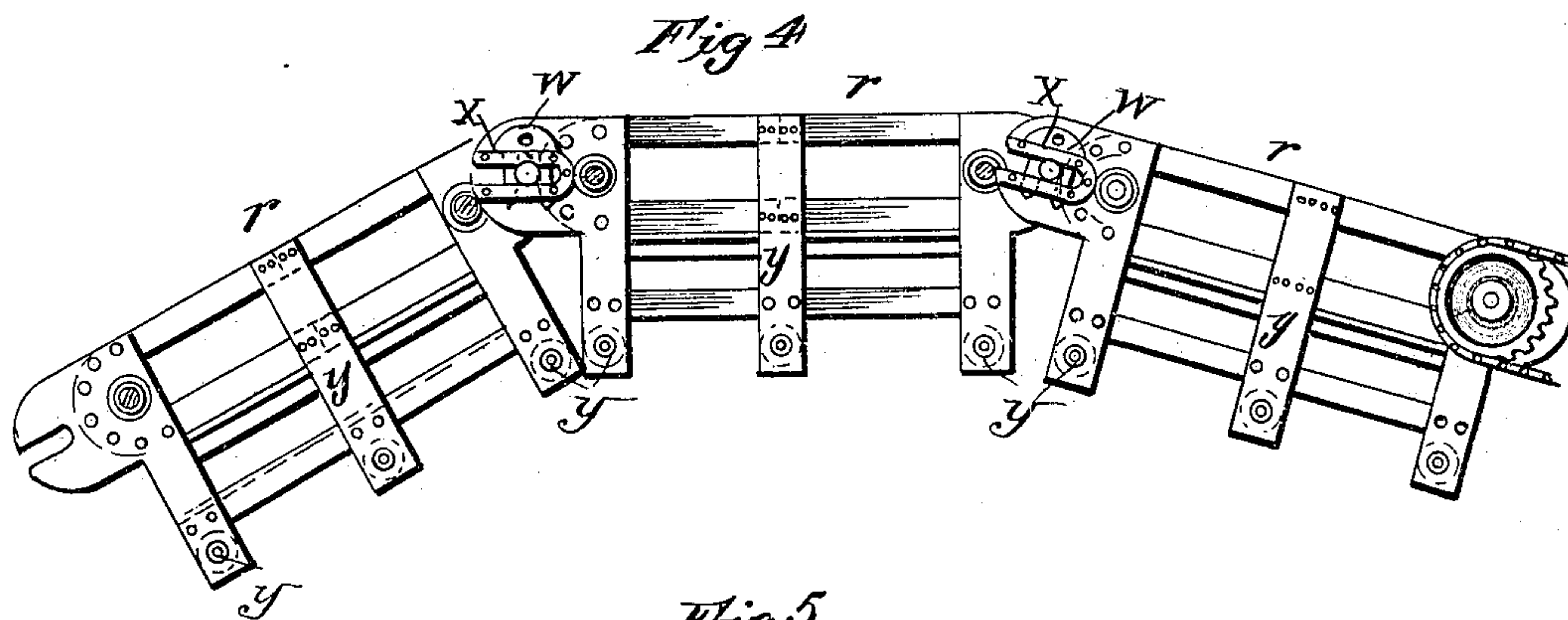
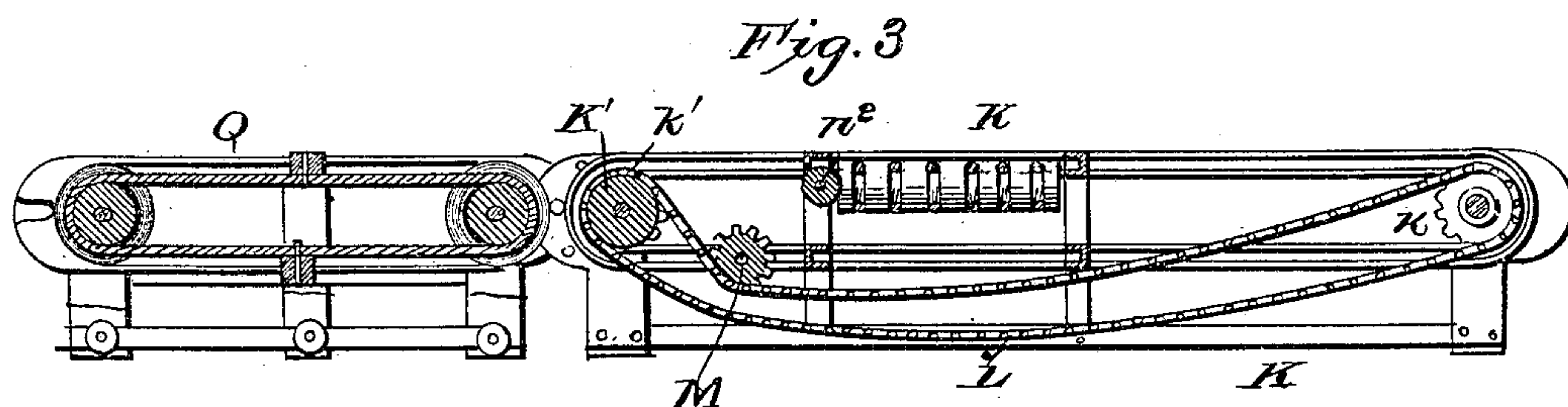
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3 SHEETS—SHEET 2.



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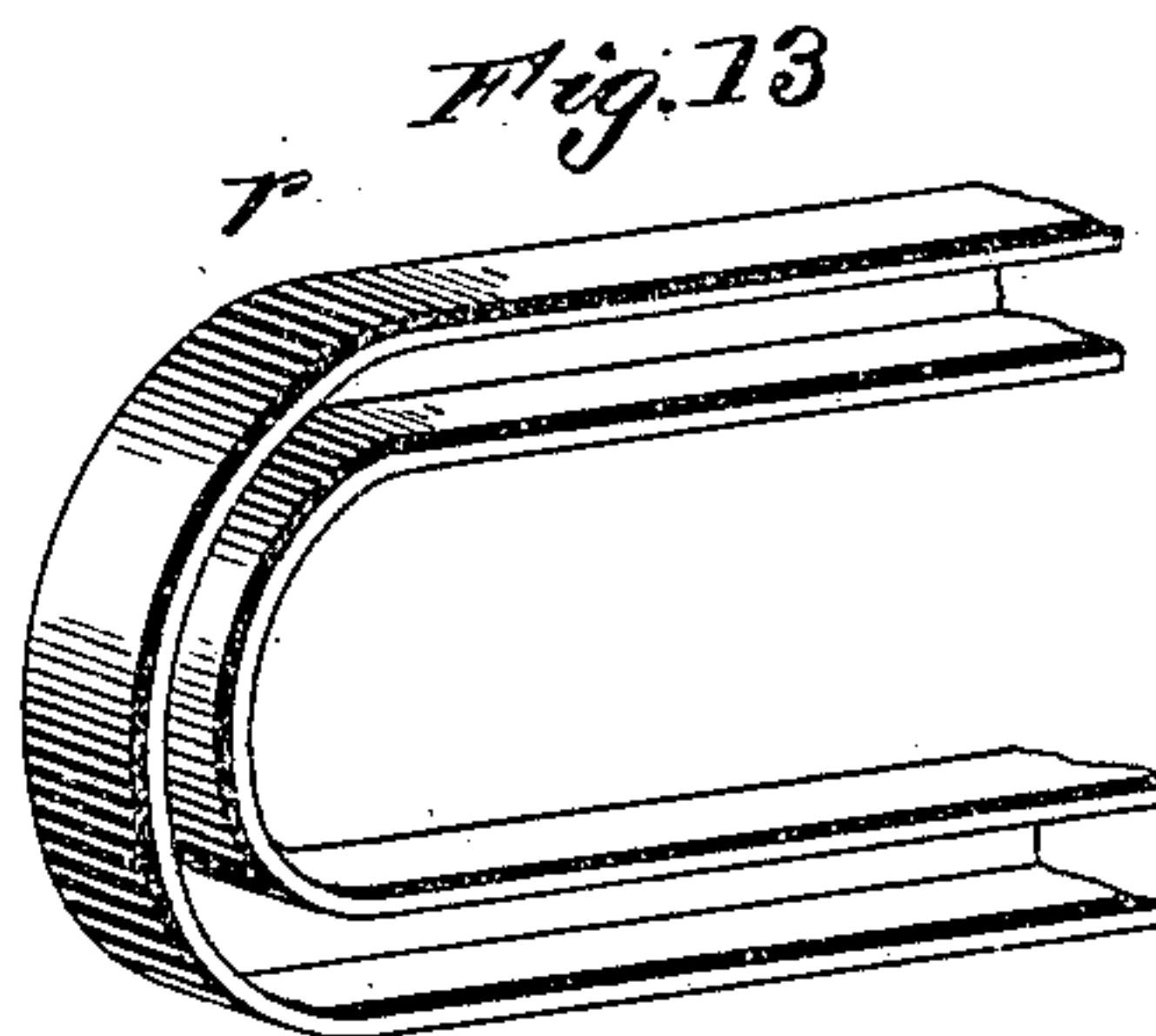
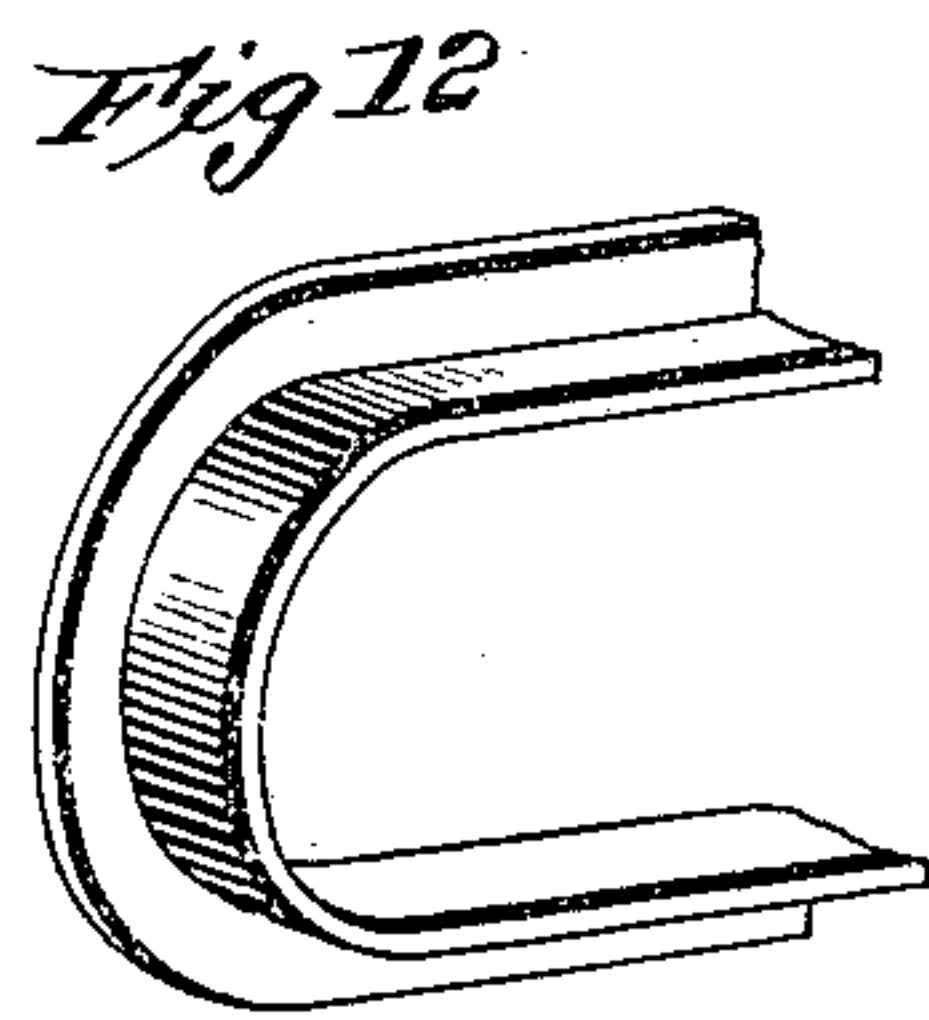
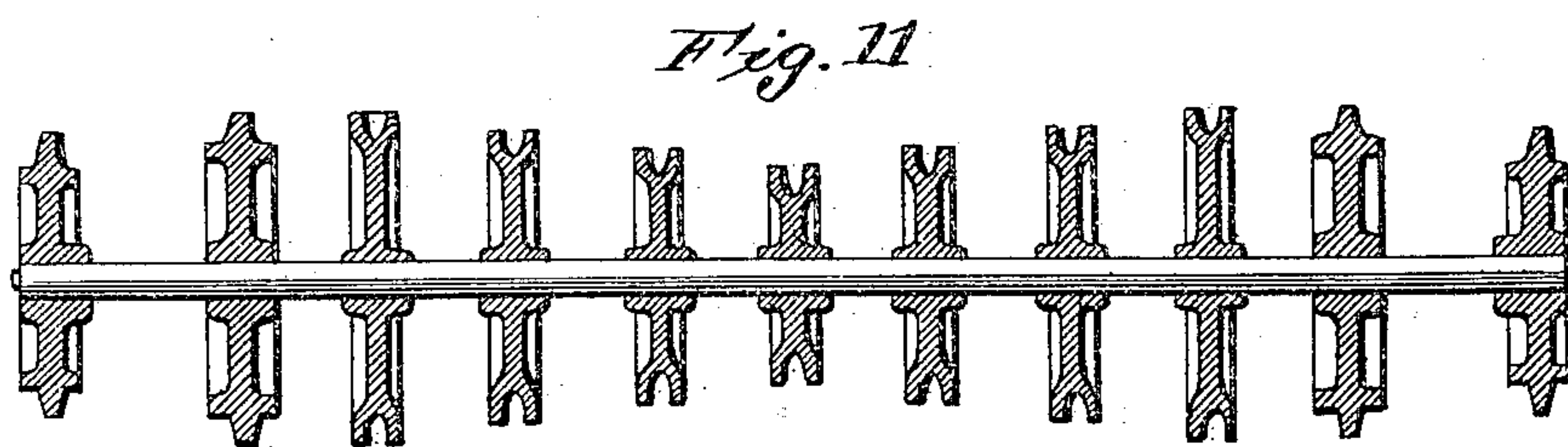
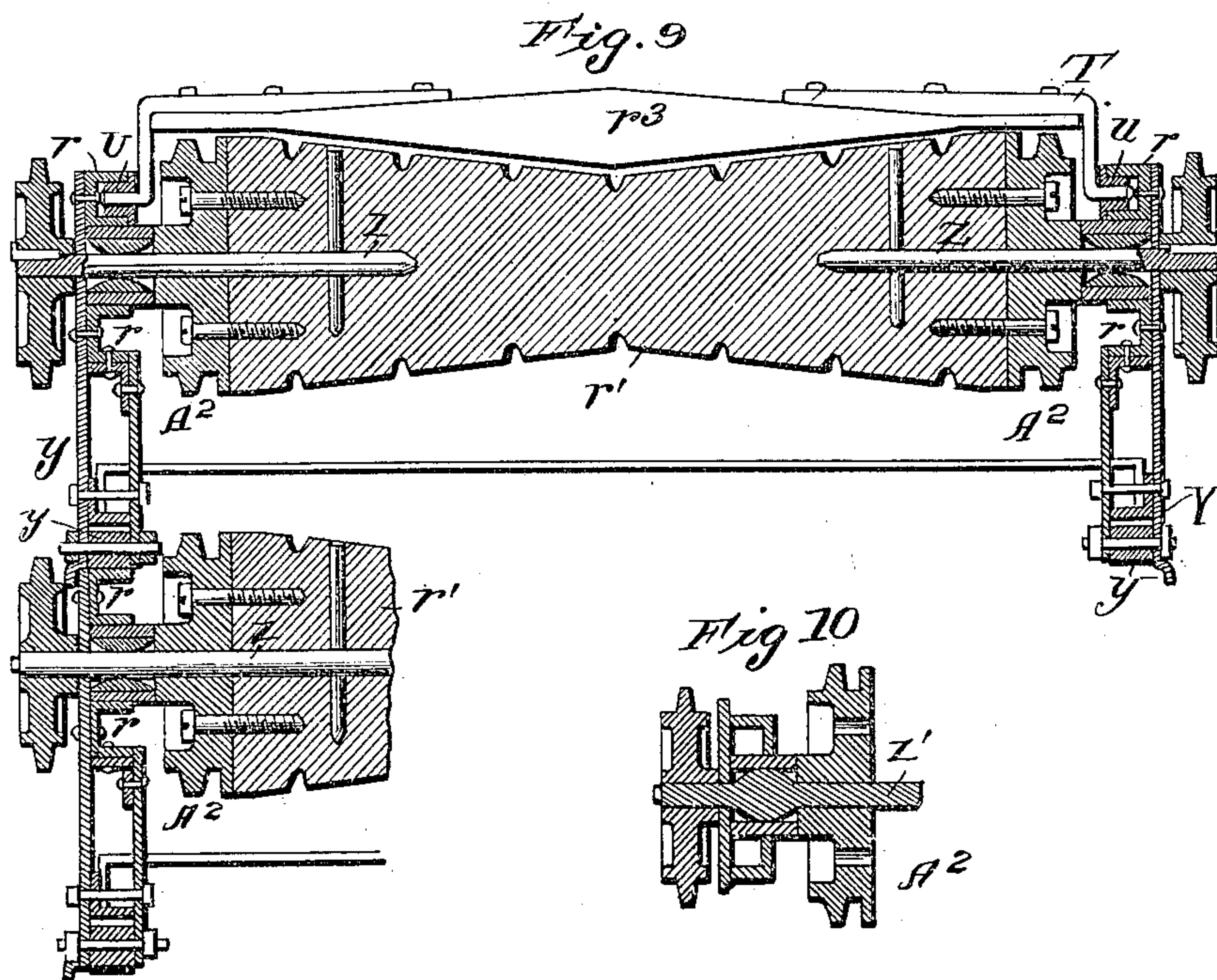


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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

AUGUST GEORGE EDMUND, OF VICKSBURG, MISSISSIPPI.

## ELEVATOR AND CONVEYER.

No. 807,916.

Specification of Letters Patent.

Patented Dec. 19, 1905.

Application filed March 28, 1905. Serial No. 252,491.

*To all whom it may concern:*

Be it known that I, AUGUST GEORGE EDMUND, a citizen of the United States, residing at Vicksburg, in the county of Warren and State of Mississippi, have made certain new and useful Improvements in Elevators and Conveyers, of which the following is a specification.

My invention is an improvement in elevators and conveyers particularly adapted for loading and unloading steamboats, barges, and other craft and also for use for other analogous purposes.

The details of construction, arrangement, and combination of parts are as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view illustrating the elevator and conveyer. Fig. 2 is a vertical section of the same. Fig. 3 is a longitudinal vertical section of portions of the conveyer which are flexibly connected. Fig. 4 is a side view of an elevator or conveyer section flexibly connected. Fig. 5 is a plan view of the frame of one of the sections or trucks constituting a part of the conveyer and elevator. Fig. 6 is a perspective view of a fastening for connecting adjacent trucks, and Fig. 7 is a perspective view of the portion of the frame to which said fastening is applied. Fig. 8 is a transverse section illustrating the arrangement of the fastening by which adjacent trucks are connected. Fig. 9 is a vertical section illustrating the construction and arrangement of the double-cone end rollers of a conveyer-section and also the arrangement of one truck upon another. Fig. 10 is a detail section illustrating a modification of the bearings for the double-cone rollers. Fig. 11 is an illustration of a substitute for the double-cone rollers. Fig. 12 is a perspective view illustrating the end of one form of side bar forming a part of a truck-frame. Fig. 13 is a similar view illustrating another form of such side bar.

Referring in the first instance to Figs. 1 and 2, A indicates a capstan, which may be supposed to be arranged upon a deck of a boat or barge or other craft, and B is a pinion geared therewith, its shaft C passing down through the deck D and in practice connecting with a donkey or other form of auxiliary engine by which it is operated. Two horizontal shafts E and F are arranged at right angles to each other horizontally and provided with pinions E' and F', that mesh with the master or driving bevel-gear A', attached to

the base of the capstan A. A circular track G is arranged upon the deck D and securely bolted thereto concentric with the axis of the capstan A. The respective shafts E and F pass through bearings H H', that are adapted for adjustment on the circular track G, and their outer ends are held in other bearings I I', which in turn are adapted for adjustment on segmental tracks G', arranged coincident with the track G. It is apparent that by this construction and combination of parts the shafts E F may be shifted around the capstan while still kept at right angles to each other and that to effect this it is only necessary to loosen or unclamp the bearings H H' and I I' and move them around on the tracks G G'. For clamping the several bearings to the T-shaped tracks G G' screws h (see Fig. 2) may be employed, the same passing through the side flanges of the bearings which embrace the track, as shown. As shown in Fig. 1, antifriction-rollers i may be provided for the bearing I' and the same adapted to run on the track or directly on the deck. The shaft E serves to operate a series of horizontal conveyer-sections, and the shaft F similarly serves to operate a series of conveyer-sections that may be extended down from the deck to the wharf or any other point where freight is to be delivered. As shown in Figs. 1 and 3, the first section K of the horizontal conveyer, which in this instance is supposed to be arranged upon the deck D, is differently constructed from the other sections—that is to say, sprocket-wheels k are mounted on the shaft E and similar sprocket-wheels k' are mounted on a roller K' at the other end of the section. Endless chains L run on these sprockets and pass intermediately underneath a transverse roller M, by which the chains are held out of contact with an overhead conveyer, (indicated at N, Fig. 1.) This conveyer N is arranged horizontally and composed of two parallel grooved rollers n and a series of parallel cords, ropes, or chains n', that run on the rollers and are arranged in the grooves thereof. One of the rollers n is driven by a sprocket wheel and chain connection O, extending to the double-cone roller p of an adjacent conveyer-section P. To the left-hand end of the conveyer-section K is flexibly connected a conveyer-section Q, which is constructed substantially like the section P before referred to. In fact, all the succeeding sections of the elevator and conveyer will be practically the same. Thus the conveyer-section R (see Figs. 1 and



2) is composed as to its frame of two parallel side bars  $r$ , double-cone end rollers  $r'$ , having a series of circumferential grooves, a series of cords, ropes, or chains  $r^2$ , that run on the rollers in the grooves thereof, a series of transverse bars  $r^3$ , which are applied to the several ropes  $r^2$  and secured by loops, clevises, or clamps of any desired form. The two rollers  $r'$  are connected by sprocket-chains  $r^4$ , so that the lower roller is driven from the upper one, which is mounted on shaft  $F$ , driven by capstan-gear  $A'$ . The different conveyer-sections are flexibly connected by means which will be hereinafter described and also by sprocket-chains  $r^6$ , that run on sprocket-wheels applied to the projecting ends of the shafts of adjacent cone-rollers. In other words, the adjacent ends of the different sections or trucks of the elevator and conveyer are flexibly connected and the cone-rollers and ropes of the adjacent sections are operatively connected by sprocket-gearing, so that when one is driven the adjacent one is driven, and so on throughout the series. The letter  $S$  indicates the section or truck adjacent to the first one,  $R$ , of the descending series and the letters  $s$ ,  $s'$ ,  $s^2$ ,  $s^3$ , and  $s^4$  indicated parts which correspond to those previously described and referred to by letters  $r$ , &c. As shown in Figs. 2 and 3, the cross-bars  $r^3$  and  $s^3$ , which are attached to and travel with the several ropes  $r^2$  around the double-cone rollers  $r'$  and  $s'$ , are practically diamond-shaped in cross-section, or in the form of a gradually-extended ellipse, thus corresponding on each side practically to the longitudinal outline of the double-cone rollers. To the ends of all or at least a series of these cross-bars are attached angle-irons  $T$ , which are bent inward and then outward, so that their free ends may serve as journals for flanged rollers  $U$ , that run on the grooved side bars  $r$  or  $s$  of the respective conveyer-sections or trucks. As shown in Fig. 12, these bars may be right-angular in cross-section, or, as shown in Fig. 13, they may be trough-shaped in cross-section. In the first case the rollers would run on the outer side of the right-angular bar and in the other case in the trough of the bar, as will be readily understood.

The invention has now been sufficiently described to permit the general operation to be understood. Suppose the capstan  $A$  to be located upon the deck of a boat or barge and the conveyer-sections  $K$   $N$   $Q$   $P$  to be arranged horizontally on the deck  $D$ , while the sections  $R$   $S$ , &c., form a descending series extending to the wharf at which the boat or barge is moored. It will be seen that any form of freight which may be placed upon the conveyer-section  $Q$  will be automatically transferred by it to the conveyer-section  $K$ , and thus onto the transverse conveyer  $N$ , which will in turn deliver it upon the adjacent conveyer-section  $P$ , so that it will pass to the section  $R$ , and thus to section  $S$ , and

be finally delivered upon the wharf. In order to prevent accidental dislodgment of the freight in passing from the transverse conveyer  $N$  to the adjacent conveyer  $P$ , I arrange a belt  $V$  upon pulleys  $v$ , whose axes are vertical and so arranged that the belt is placed at an angle, and thus serves as a fender or guard at the junction of the two conveyer-sections  $N$   $P$ .

As a means of forming a strong, cheap, and detachable connection between the adjacent frames of the conveyer-sections or trucks I employ a two-pronged pin  $W$ , (see Fig. 6,) which is adapted to enter slots in a  $U$ -shaped bracket  $X$ , attached to the ends of the side bars of the sections or trucks. As will be seen by reference to Figs. 4, 7, and 8, the axles or journals of the rollers arranged at the ends of the conveyer-sections are received by the  $U$ -shaped brackets  $X$ , and the slots  $w$  coincide therewith, and then the two-pronged pin  $W$  being inserted in the slots  $w$  of the brackets passes on opposite sides of the axle or journal, thus securing it and in part forming a bearing therefor. In Fig. 4 I show a series of conveyer-sections or trucks flexibly connected by this means and inclined at angles to each other. It will be seen that the vertical bars  $Y$ , composing part of the frames of the several conveyer-sections, are provided with rollers  $y$ , and by reference to Fig. 9 it will be further seen that these rollers  $y$  are adapted to run on the top portions of the side bars of a conveyer-section. In other words, by the provision of the rollers  $y$  and their arrangement in connection with the vertical frame-bars  $Y$  each conveyer-section or truck is adapted to be run upon another, the rollers  $y$  in such case running upon the upper parallel bars of the frame, which is a feature of great advantage in packing the conveyer for shipment or storage. As further indicated in Fig. 9, each double-cone roller is provided with a stub-shaft or short journal  $Z$ , that projects through a flanged metal head  $A^2$ , secured to the end of the roller. Such shaft  $Z$  has its bearing in the end of a side bar of a conveyer-section and carries a sprocket-wheel, as before indicated. Thus all the double-cone rollers of the several conveyer-sections or trucks are fixed in position as regards the frame of the section, the rollers being free to rotate, as before described. In order to prevent binding of the shaft-bearing when the conveyer-sections are on an uneven or inclined surface, I prefer to construct the bearings of the several shafts  $Z$  so as to permit a certain degree of rocking or oscillation. Thus, as shown in Fig. 9, the metal heads  $A^2$  are provided with a boxing having an internal annular rib which in cross-section presents the form of a double cone, while in Fig. 10 I illustrate a reverse arrangement, the shaft  $Z$  having a swell which in cross-section presents the form of a double cone. Thus in either



case a slight rocking movement is provided for.

It will be understood that the double-cone rollers cause the ropes that run thereon to be 5 dished, so to speak, toward the middle, which arrangement obviously tends to hold freight in central position while being transported, whereas if the rollers were cylindrical the ropes would be in the same plane and some 10 supplemental means would be necessary to hold the freight in place thereon. It will be further seen that the elliptical form of the cross-bars corresponding to the form of the double-cone rollers is important, in that a com- 15 paratively large surface is opposed to and adapted to come in contact with the freight placed on the ropes.

It will be apparent that the apparatus may be employed as conveniently for loading as 20 unloading. Thus while in Fig. 1 I have illustrated and described the apparatus as being operated for discharging freight from a boat or other vessel by reversing the rotation of the capstan A the apparatus will convey freight 25 on board and that its direction of travel will be changed when it reaches the conveyer-section N. It will be further understood that the sections that extend along the deck may be multiplied as the distance requires and also 30 that the sections which extend to the wharf will be multiplied correspondingly to the point at which freight is either to be discharged or taken on board. In brief, the apparatus may be extended at a greater or less distance in 35 either direction for loading or unloading at different distances from a central point. It will be further understood that my invention is applicable not only for loading or unloading with relation to a wharf, but that the sections 40 may be extended up the bank or along the bank of a river, so that the apparatus is particularly adapted for use on the Mississippi, the Ohio, and other rivers where freight is loaded or unloaded from a sloping bank. While the ap- 45 paratus is particularly adapted for the use specified, it is to be understood that it may be applied equally as well on land alone in connection with elevators, storehouses, &c., for loading or unloading freight of any descrip- 50 tion, such as kegs, barrels, boxes, cotton bales or bags, lumber, &c. It is also to be understood that a belt can be used on rollers as a substitute for ropes, and it will also be understood that with each one of these elevators or 55 conveyers, which may consist of a series of sections, a driving-roller may be placed, one end having a shaft long enough to receive a belt-pulley outside of the outer sprocket-wheel, and a belt from a nearby engine may 60 be connected to this pulley on roller-shaft to run the elevator, since not every steamer or barge has a capstan or any other suitable machinery for operating an elevator. The said section can be placed at either end or center 65 or any place between the first and last sections

to suit the place for the engine and boiler or motor.

What I claim is—

1. The combination of a motor, horizontal rotary shafts geared therewith and extending 70 at right angles therefrom, conveyers connected with and operated by said shafts, and extending in different directions, the conveyers being formed of a series of sections which are flexibly connected and each section compris- 75 ing a frame having parallel side bars, and means arranged within the same for carrying and conveying freight, the several sections being provided with means for operatively connecting the movable carriers of said sections, 80 substantially as described.

2. In an elevator and conveyer for the purpose specified, the combination with a motor, of rotary shafts geared therewith and extend- 85 ing at right angles, two main conveyers operatively connected with the respective shafts, and a conveyer-section N applied to one of such main conveyers, and provided with a carrier operating at right angles therewith but in line with the other conveyer, substan- 90 tially as described.

3. In an elevator and conveyer for the purpose specified, the combination with a motor, of rotary shafts geared therewith and extend- 95 ing at right angles, two main conveyers operatively connected with the respective shafts, a conveyer-section N applied to one of such main conveyers, and provided with a carrier operating at right angles therewith but in line 100 with the other conveyer, and a belt arranged at the junction of the main conveyers and adapted to serve as a guard for freight passing from one to the other, substantially as described.

4. The combination with a motor-shaft and 105 auxiliary shafts extending therefrom at right angles to each other, of two main conveyers operatively connected with the respective shafts, and a shifting carrier N arranged upon one of the conveyers and in line with the other 110 conveyer, and means connecting the latter with such shifting carrier for driving it in the manner described.

5. The combination with a motor-shaft and 115 a track arranged concentric therewith, of an auxiliary shaft geared with the first-named shaft and having a bearing adapted for adjustment on the track, and means for clamping it thereto, substantially as described.

6. The combination with a motor-shaft, and 120 an auxiliary shaft geared therewith, and extended horizontally, and two arc-shaped tracks arranged concentrically with the motor-shaft and spaced apart, and bearings for the auxiliary shaft which are applied to the respec- 125 tive tracks, and adapted for adjustment thereon, and means for clamping them in any required position, substantially as described.

7. The combination with a motor-shaft, two 130 arc-shaped tracks arranged concentrically



therewith and spaced therefrom, and bearings for the auxiliary shaft which are adapted for adjustment on the tracks, and rollers forming part of such bearings and adapted to run  
5 on the tracks, and means for securing the bearings in any selected position, substantially as described.

8. The combination with a conveyer-section, comprising a rigid frame having side  
10 bars whose ends are semicircular, as described, double-cone rollers journaled in the ends of the frame, a series of ropes running on said rollers, and cross-bars applied to the ropes and their inner sides shaped to the contour of  
15 the rollers, such bars having end portions and rollers journaled thereon and traveling on the

side bars of the frame, substantially as described.

9. A conveyer-section comprising a rigid frame having side bars with semicircular ends, 20 and a carrier arranged therein, the said frame having downward extensions or legs provided with rollers which are adapted to run on the said bars of another section, whereby several sections may be arranged one upon another 25 for convenience of storage or transportation, substantially as described.

AUGUST GEORGE EDMUND.

Witnesses:

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