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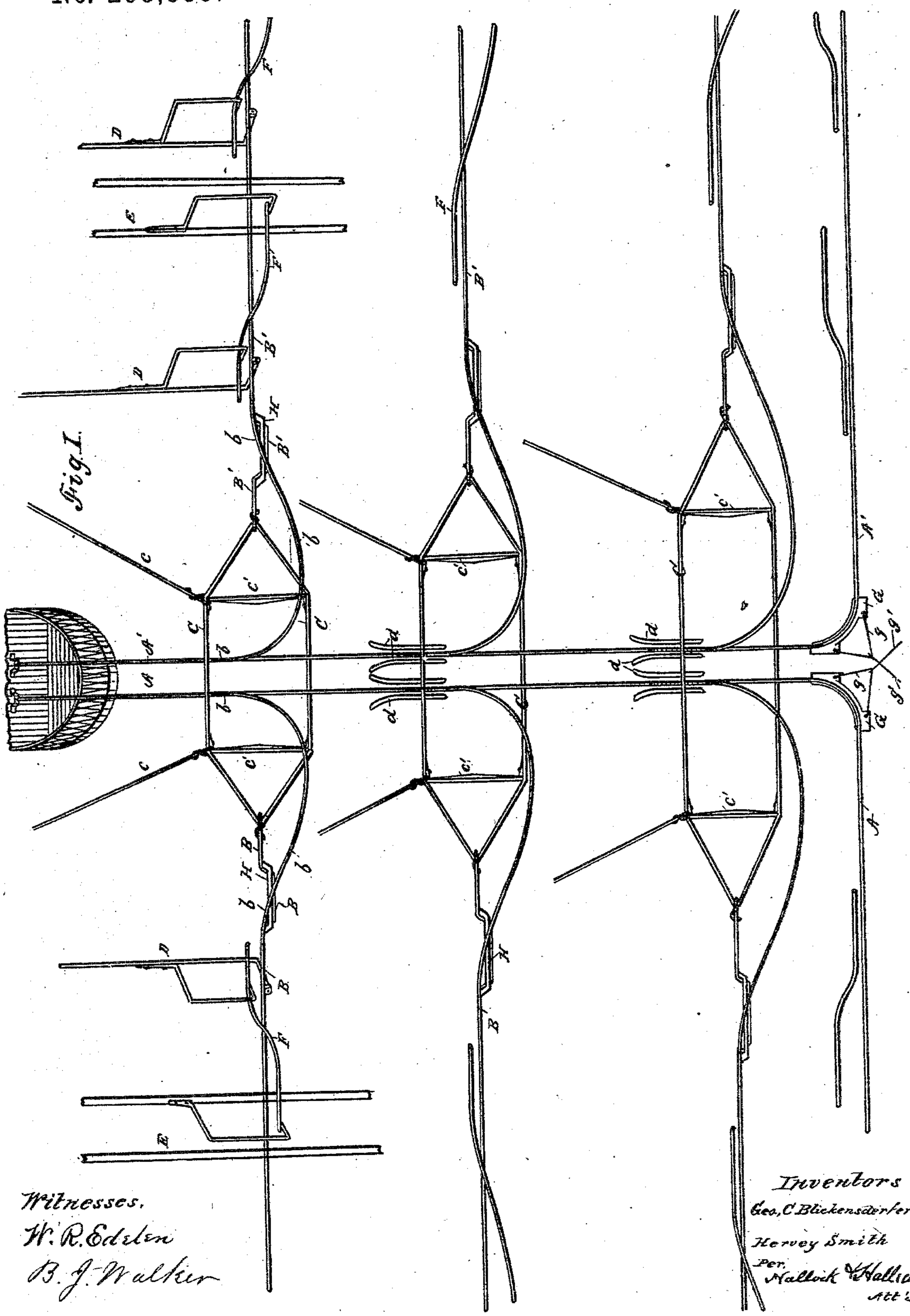
G. C. BLICKENSDERFER & H. SMITH.

CONVEYER APPARATUS.

No. 295,339. Patented Mar. 18, 1884.



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(No Model.) 5 Sheets—Sheet 2.

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CONVEYER APPARATUS.

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Fig. 9.

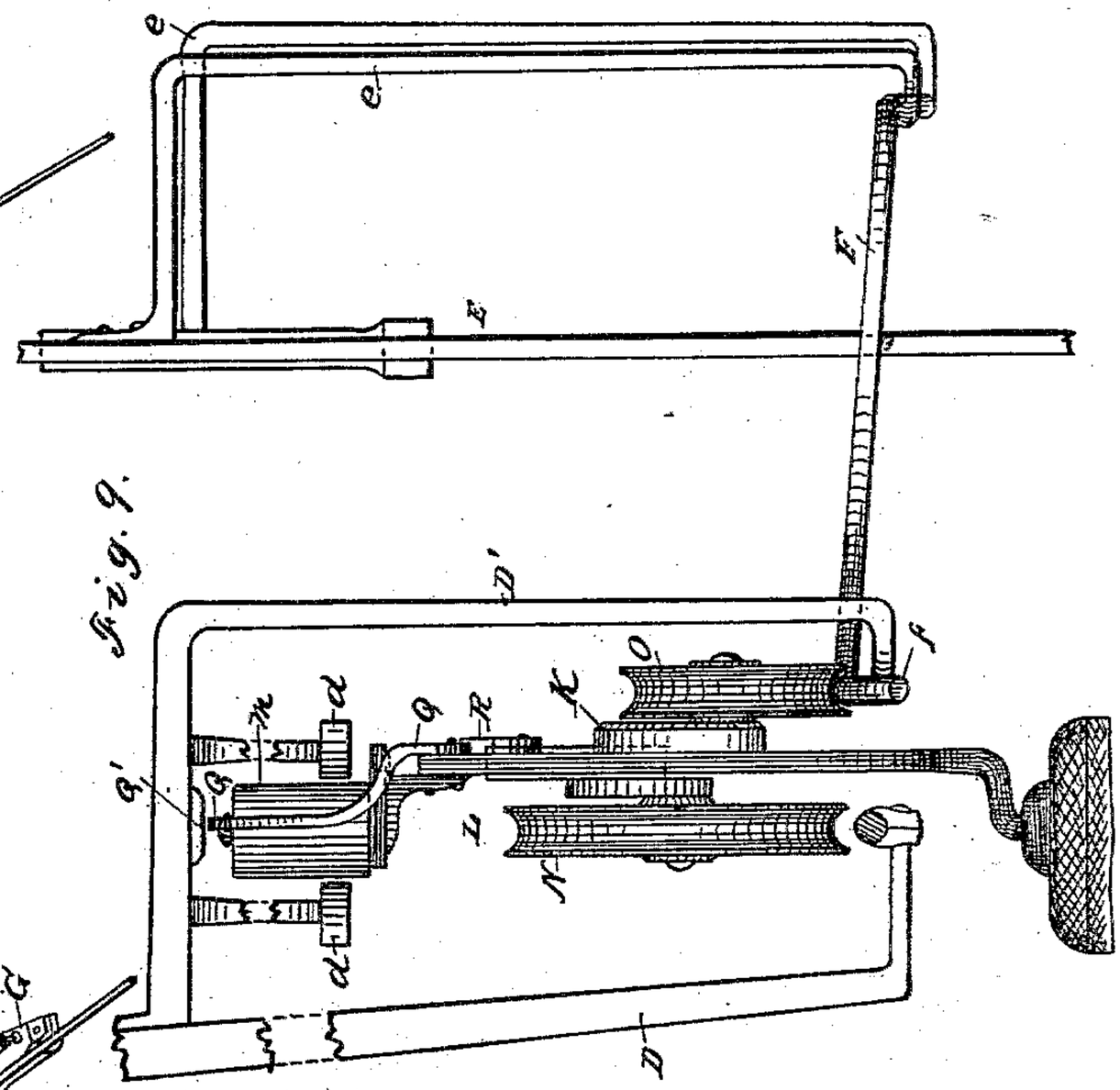

Fig. 2.

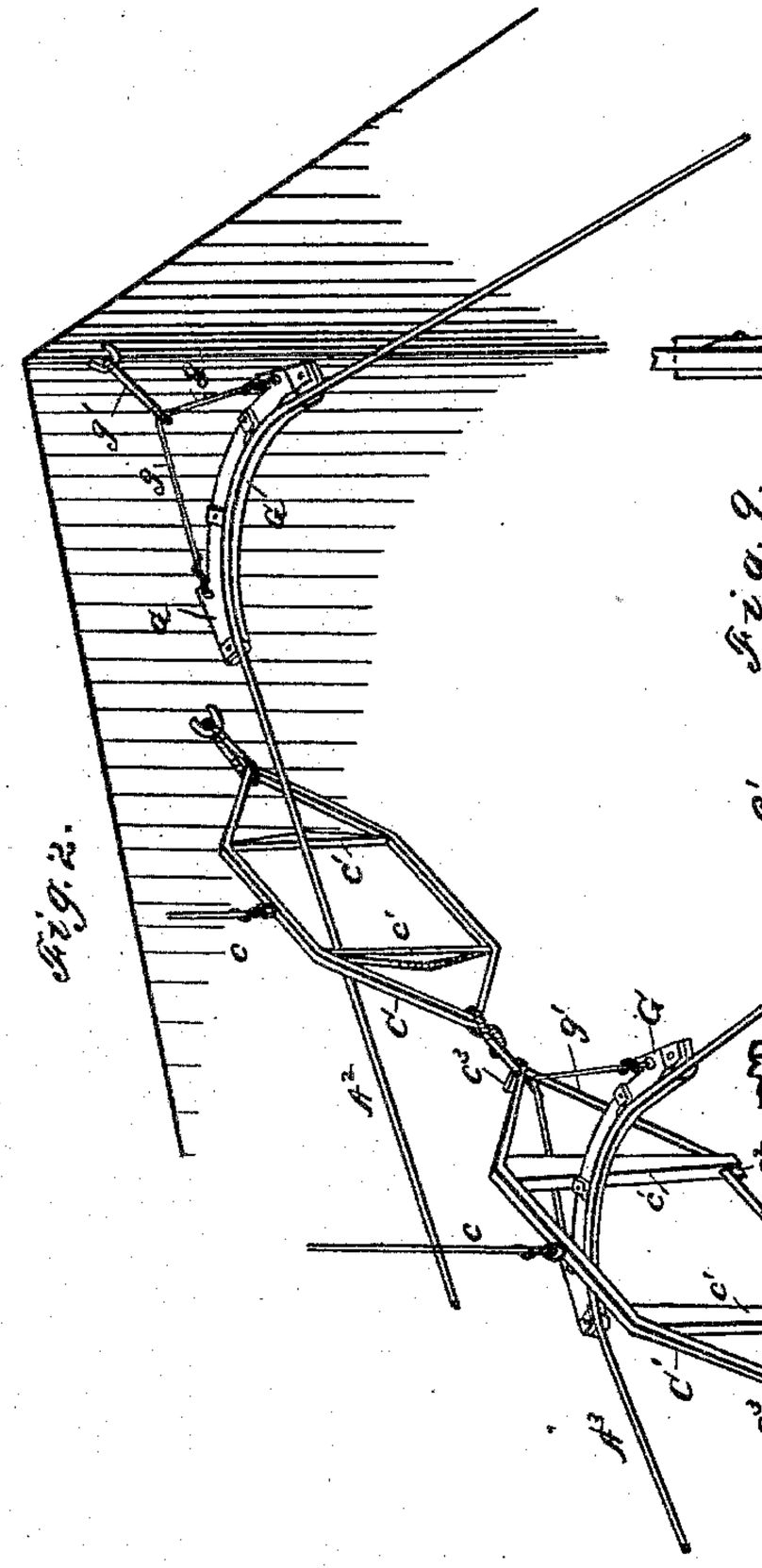

Fig. 11.

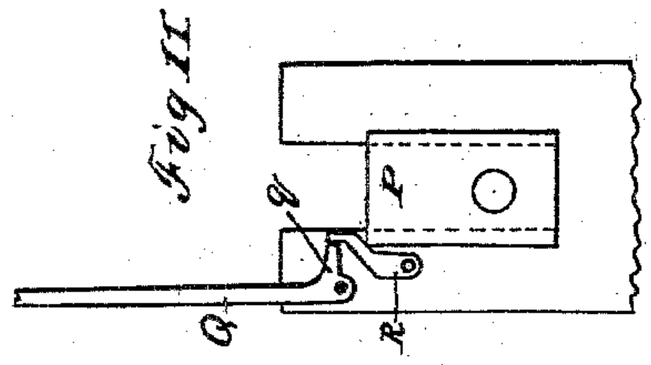

Fig. 10.

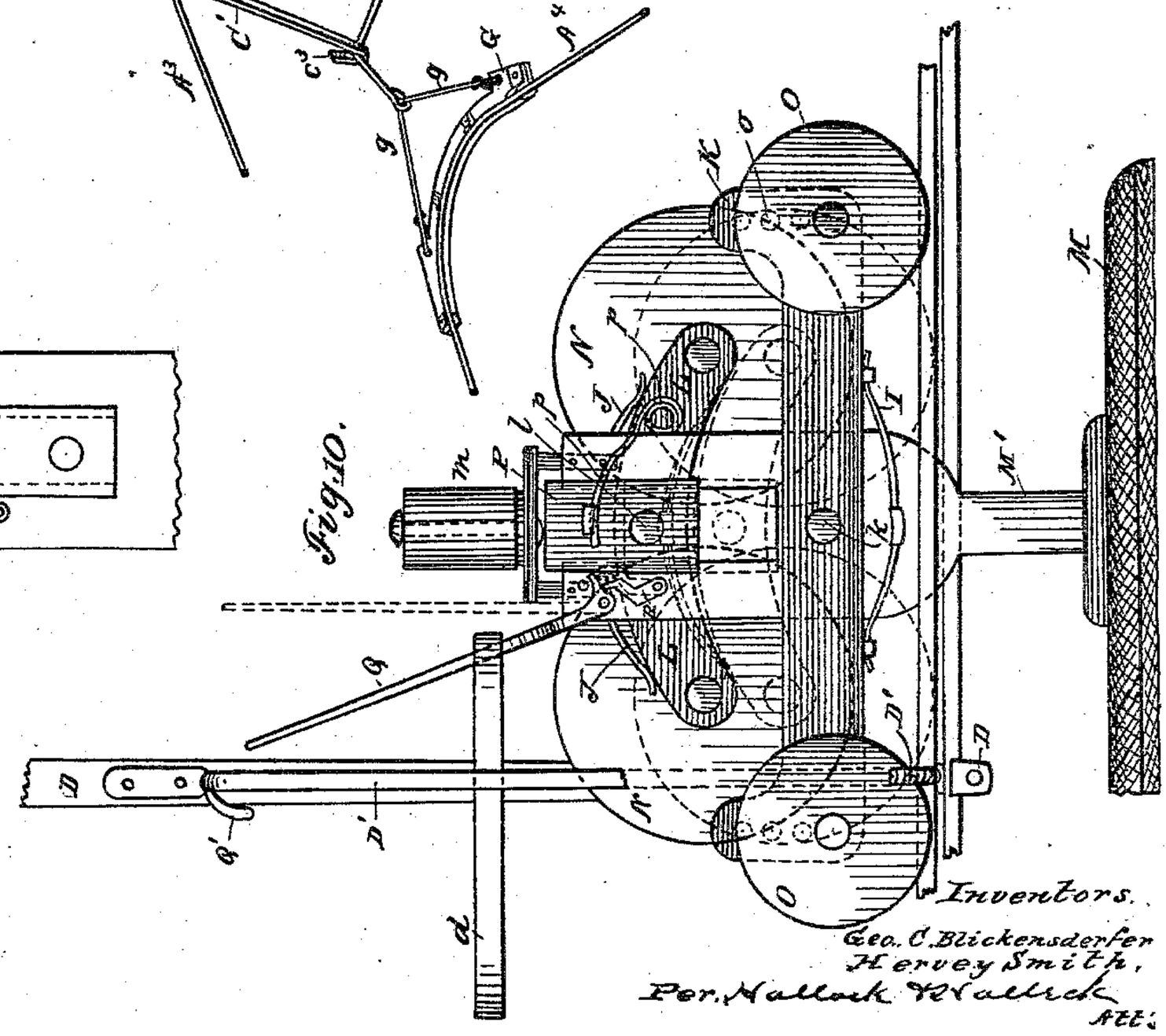

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Fig. 3.

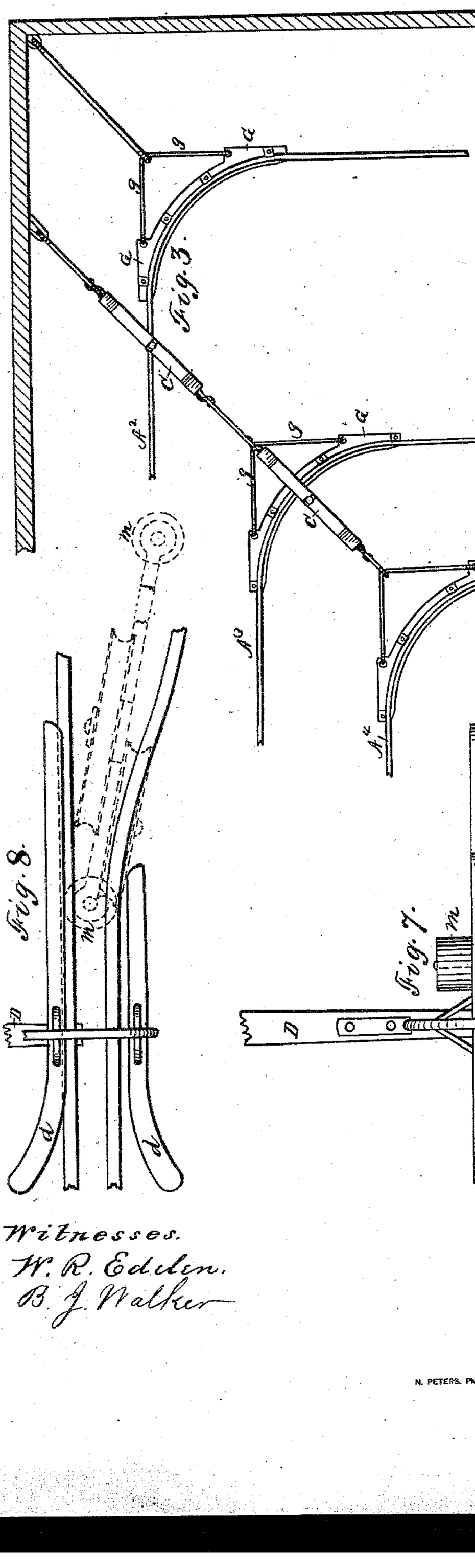

Fig. 4.

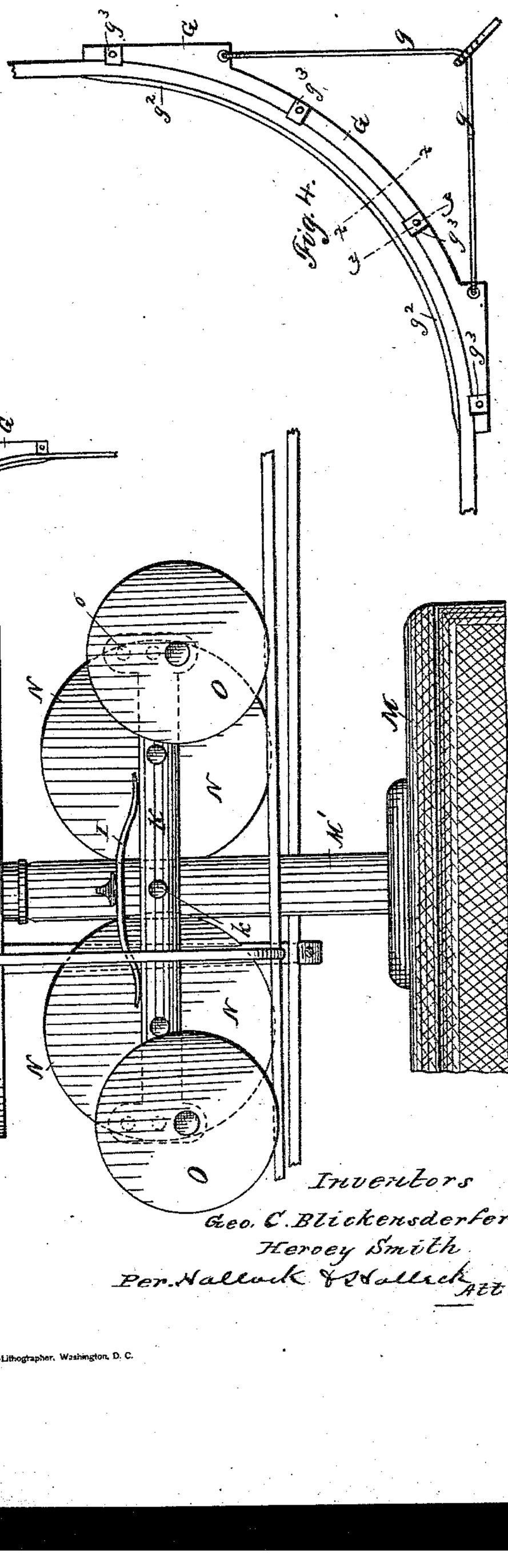

Fig. 5.

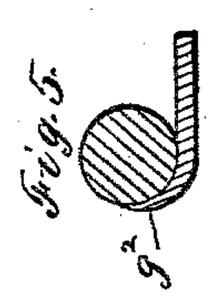

Fig. 6.

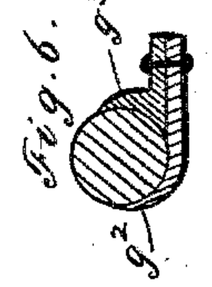

Fig. 8.

Fig. 7.

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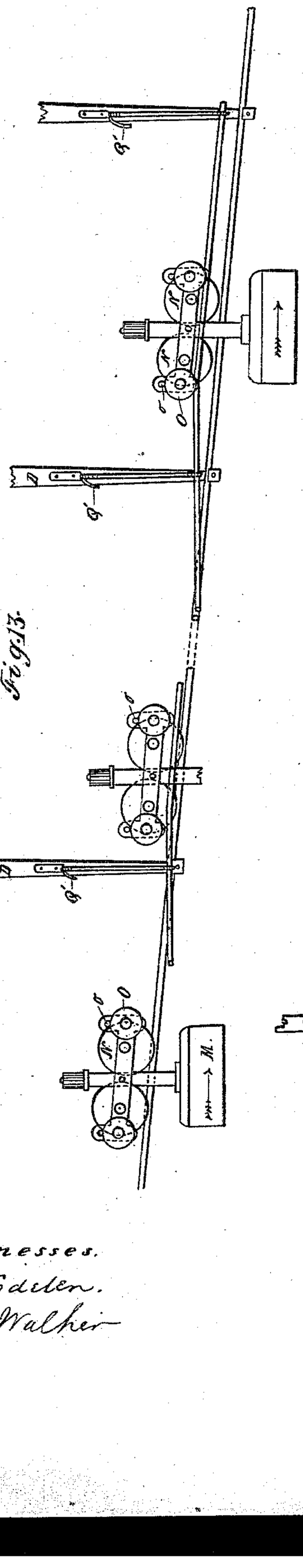

Fig. 13.

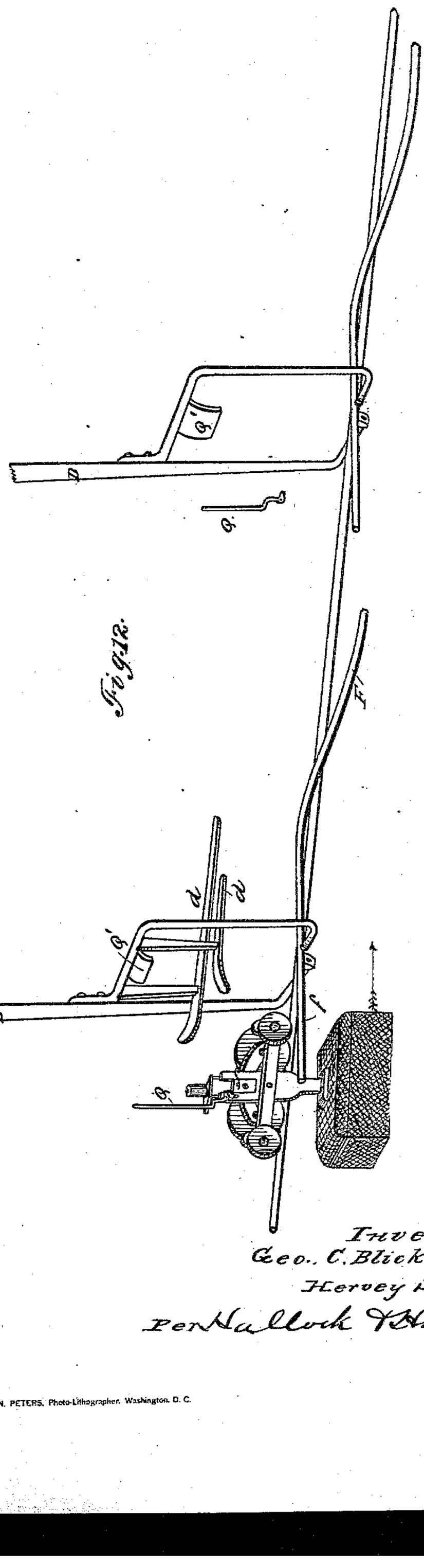

Fig. 12.

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CONVEYER APPARATUS.

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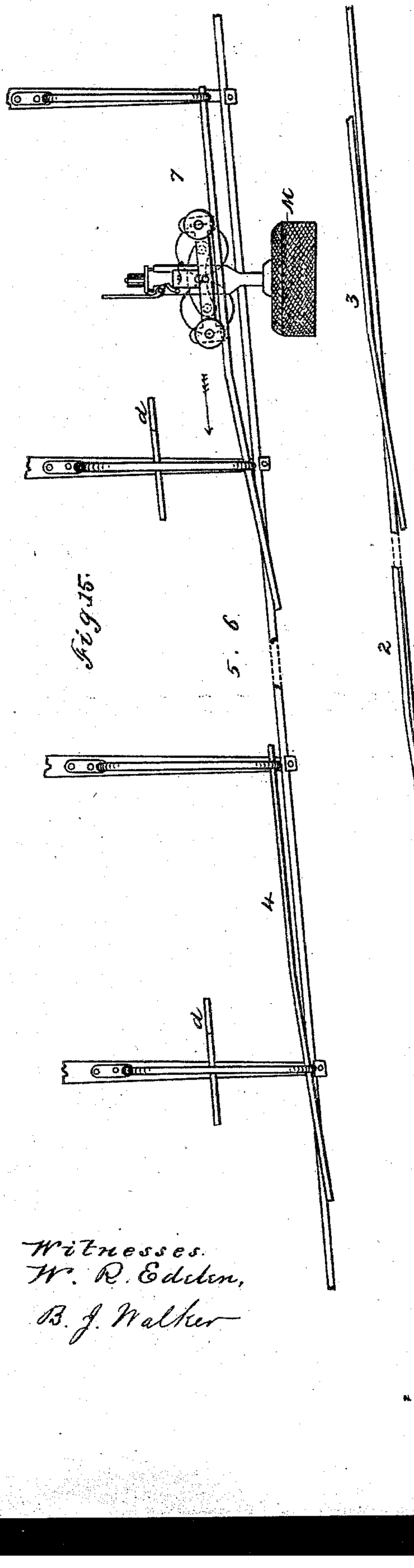

Fig. 15.

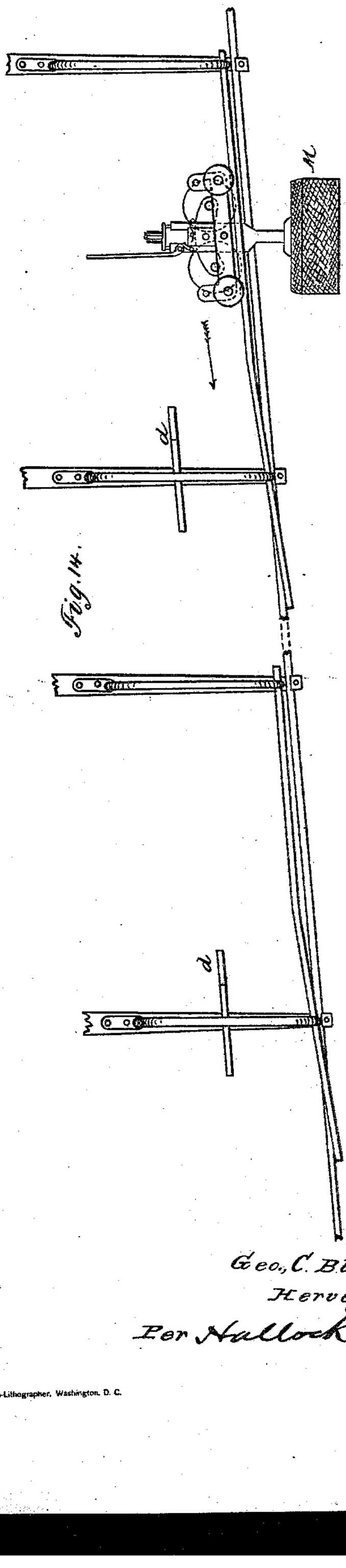

Fig. 14.

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UNITED STATES PATENT OFFICE.

GEORGE C. BLICKENSDERFER AND HERVEY SMITH, OF ERIE, PA.

CONVEYER APPARATUS.

SPECIFICATION forming part of Letters Patent No. 295,339, dated March 18, 1884.

Application filed February 15, 1884. (No model.)

To all whom it may concern:

Be it known that we, GEORGE C. BLICKENSDERFER and HERVEY SMITH, citizens of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Conveyer Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to conveyers, such as conveyers of packages in stores and other similar purposes.

The invention consists in improvements in the construction and arrangement of the tracks; the manner of arranging the wheels on the cars; the manner of tripping one set of wheels when the car is to be switched, and, finally, the arrangement of the switch-tracks.

We have recently filed three applications for patents for conveyer apparatuses. In all of these prior applications we have shown the switches arranged in a vertical plane with the main track, and the cars having two or more sets of wheels arranged one above the other, one of which set was for the main-line and the other for the switch tracks. In this instance we show the switch-tracks arranged at one side of the main track, and the sets of wheels on the car are placed side by side. In our first prior application we showed the wheels which run on the main track provided with means for being tripped and thrown off the track to one side at the time the car is to run onto a switch. In this case we show the same wheels provided with means for tripping them and throwing them up vertically off of the track when the car is to run onto a switch. We also show a car with the wheels arranged side by side, which are not provided with means for tripping, but are provided with means for adjusting the switch-wheels at various positions vertically, so that they shall correspond with the position of the switch to which the car is destined. In our said previous applications we have shown various means for providing a curve track where the main track passes the corners by angular bends. In this case we show means for carrying the main track around a corner by a properly-curved bend, and holding the same so that it serves as a track around the curve, and so that it can be drawn taut at any time. In our last prior application we showed in a limited manner an arrangement for suspending branch or intersecting tracks, and there stated that said construction would constitute the subject-matter of a subsequent application. We now here fully illustrate and will fully describe that feature of our invention.

The accompanying drawings show our invention, as follows:

Figure 1 is a perspective view looking down upon a system of direct and branch lines of track, with switches, &c. Fig. 2, Sheet 3, is a similar perspective, showing a system of parallel tracks and the manner of sustaining them at a corner. Fig. 3, Sheet 2, is a plan view of the matter shown in Fig. 2. Fig. 4 is a plan view of the construction of a curve. Figs. 5 and 6 are respectively sections on the lines *x x* and *y y* in Fig. 4. Fig. 7 is a side view of a car that has just taken to switch. Fig. 8 is a plan view of a switch-point, and by dotted lines part of a car running-gear is shown passing onto switch. Fig. 9 is an end view of a switch, and shows a car just entering it. Fig. 10 is a side view of a car running-gear which has its main wheels provided with means for tripping them and lifting them off the track vertically, and shows such car as just entering a switch. Fig. 11 is a detail of the trigger of the tripping device. Fig. 12 is a perspective view of a line with switches arranged by the side of the line and a car with its two sets of wheels placed side by side, and the car shown is provided with a tripping device. Fig. 13 is a side elevation of the matter seen in Fig. 12, with modifications. Figs. 14 and 15 are side elevations of the track by which cars are sent to the cashier's desk, (those shown in Figs. 12 and 13 being the track that runs to the salesmen's stations,) and shows the switches for putting the cars onto the track.

The system of tracks shown in Fig. 1 is such as would be required for a large store with counters in tiers. There are two systems, in fact, one being the main track A and branches B, and the other the main track A′ and branches B′. The main tracks run from the cashier's desk across the room, and then curve

and run parallel with the branch tracks. The switches shown in this figure are like those shown in our former applications; but that is not material, as any form of switch may be used. The essential feature of this construction is the frames C C, &c., by which the branch tracks are supported, so as to allow the cars not destined for them to pass them, and so that the said lines may be drawn taut across the full width or length of the room and adjusted to proper grade. The same frames are also used to support the corners or curves of parallel lines, as seen in Figs. 2 and 3. A modified construction of the said frame is shown and marked C′ in Fig. 2, Sheet 3. The branch lines B and B′ are tied to the frames, or they may be both formed of one wire, which would be deflected around one side of the frame, as shown in C′, Fig. 2. A short distance from the frames a deflecting-iron, H, is put on the line, which deflects the line down and up, and affords a fastening for the end of the curve *b*, which leads around the end of the frame and through it, and ends in the manner of a switch over the main line. The deflecting and attaching iron H is like the iron shown in our first application for attaching curve tracks to main tracks. A transfer-switch such as we show in our last prior application might be used to transfer cars from the main line to the branches. We do not here wish to be limited to any particular kind of a switch curve or transfer in the relation shown, nor do we wish to be limited to any particular construction of frame for forming an opening for the main line to pass by the branch. We here show two forms, C and C′, and in our last prior application we showed still another form. The forms here shown will be most commonly used, as they require no guying down to the floor. They may be guyed to the ceiling by wires *c c*, or secured by hangers. The frames may be made of cast metal or of wrought, and when in the form of those marked C, and the side pieces are sufficiently strong, the cross-pieces *c′ c′* may be omitted. They may be of any shape desired. The only requirement is that they form a large enough opening to allow the car to pass along the main line through them. In the form shown at C′, Fig. 2, the guy-wire *g′* (which would be the wire B B′, if that form had been shown in Fig. 1) passes through the hooks c^3 and the notches c^2, and forms the under side of the frame. In Figs. 2 and 3 these frames are shown on a guy-line for the purpose of allowing cars on intermediate parallel lines to pass the guy. This guy-line is to support the inner lines at their angles, and they contain the curve-irons G, so that the cars in passing through these frames are running around a curve. The function, primarily, of the frames is the same here as in Fig. 1—viz., to form an opening for the cars past an intersecting line. It will often happen that the angles of the inner lines will not come in line with the angle of the outer line. In Figs. 2 and 3 we show the manner of erecting in such a contigency. This manner of supporting the inner lines will only be used, probably, where it is not convenient to use ordinary hangers, like D.

G is the angle or curve iron. It will be made generally of light cast metal. It is a curved plate with a flange, g^2, turned upon its inner side. This flange is not as high as the thickness of the wire forming the track, but it turns up far enough to hold the track; and a clip, g^3, on the other side of the track, together with the flange g^2, forms a clamp to hold the track. The upper part of the track is left free for the car-wheels to pass over it. The line or track can be drawn taut by loosening the clips without being removed from the angle-iron G. Openings through the plate back of the track are provided for attaching the guys *g*. By the use of this device a strictly continuous curved taut-wire track can be had. This is in contradistinction to the use of a separate piece of track at the curves.

M is the car, and M′ is the upright attached to the car, on which the running-gear is attached.

O are the secondary or switch track wheels, and N are the main-track wheels.

In the form of running-gear shown in Fig. 7, both sets of wheels are attached to one cross-bar, K, and the wheels O may be adjusted so that their tread will be in different planes from the tread of the wheels M by changing their pivots or journals in holes *o* in the end of the bar K. The bar K is pivoted on the pin *k*, that enters the standard M′, and an equalizing-spring, I, allows the car to hang vertically while the wheels are on an inclined track, but prevents a swaying of the car on the pivot *k*. The object in having the switch-wheels O adjustable as to height is to gage the cars for certain switches. The switches are arranged on the side of the track enough removed therefrom to allow the standard M′ to pass freely between them and the main line; but as the switches are removed as to number from the cashier's desk they are adjusted at different heights successively, and the switch-wheels on the cars destined to a certain switch are adjusted so their tread is the same distance above the tread of the main wheels as the switch is above that main track; therefore that car will pass all the intermediate switches without its switch-wheels coming in contact therewith; but when it reaches that switch its switch-wheels will come into tread on that switch. Back of the points of the switches their tracks grade up as they curve off slightly, and thus the main wheels are lifted off the main track, and the car runs wholly on its switch-wheels, and off onto the switch. But such an arrangement of the switch-wheels cannot be used to advantage where there are many switches on one line, for the switch-wheels would have to be adjusted too high on cars destined to the most remote switches; so

we have provided a tripping device for lifting up the main wheels, which may be used when there are too many switches on a line to make the car just described impracticable. The car just described may be used for the nearest switches and the one about to be described on the remote switches on the same line; or it may be used for all the switches.

A side elevation of the running-gear of this car may be seen in Fig. 10, and an end elevation in Fig. 9, and a perspective in Fig. 12. In this running-gear each set of wheels is connected with a separate bar, K being the bar on which the switch-wheels are adjusted, and L the bar on which the main wheels are adjusted. Each of these bars is pivoted on the upright M′, and each has a compensating-spring, I and J, respectively; but the cross-bar L, which carries the main wheels, is not strictly attached to the post M′, but to a block, P, which is adjusted to slide up or down in a crotch or a slot on the post M′. The spring J is also attached to this block P, so that it offers no resistance to the action of the block in the slot. A spring, *p*, engages with a lug on the side of the block P, and will keep the block up unless it is locked down by the catch and trigger R Q, which is shown holding it down in Fig. 11, while in Fig. 10 the catch and trigger are shown as sprung, and the spring *p* is holding the block up, or, in other words, the main wheels N are shown tripped and the car is resting on the switch-wheels O. In a car thus constructed the wheels O may be adjustable or not. As shown in Fig. 10, they are so adjustable, there being a series of holes, *o*, in the bar K for that purpose. The only object in having them so adjustable is that if there are graded switches on the line the wheels can be so set as to miss all of them; or they may be so set as to take the car onto such a switch without using the trigger. If all the switches on the line are intended to receive the tripping cars, then they may all be of one height—that is, they may be graded alike—for the means for throwing the cars onto the switches will be the fingers Q′, which spring the triggers Q. These fingers we show as depending from the switch-hangers D′; but they may be otherwise arranged. These fingers lie near the track at the remoter stations, the most remote being the lowest, and the triggers Q are made to correspond, so that a car destined for a remote switch will pass the nearer switches without being sprung. This is clearly shown in Fig. 12.

The operation of the trigger and catch Q and R will be easily understood from Figs. 10 and 11, in the latter of which they are shown as set and in the former as sprung. We do not wish, however, to be limited to the precise construction of catch and trigger here shown, as there are many forms of catch and trigger that may be used in this connection equally as well.

Fig. 12 shows switches of even grade for tripping cars, while Fig. 13 shows switches of differing grade for non-tripping cars. If both kinds of cars are used on a line; and the switches for the non-tripping cars are nearest the cashier's desk, then the switch-wheels O on the tripping-cars must be adjusted high enough to pass the most elevated switch. Both kinds of switches may be used, and they may be mingled all along the line; but the most remote non-tripping switches must have the highest grade. If all the tripping-switches are placed nearest to the cashier's desk, they can all be arranged in the same horizontal plane, as the main track and the two sets of wheels of the cars can have their treads arranged in the same horizontal plane.

Fig. 14 shows shipping-switches for tripping cars which have their wheels arranged with their tread in the same horizontal plane.

Fig. 15 shows a series of shipping-switches on a line whereon non-tripping and tripping cars are both used, and it has been drawn under the supposition that the tripping cars go to the most remote switches. When non-tripping cars are used, the shipping-switches have to be graded to correspond with the receiving-switches, so as to bring the main wheels N out over the main track. It will therefore be seen that the shipping-switches from 1 to 7 are placed at successively-increasing heights. The last one, 7, is supposed to be the shipping-switch at a tripping-station, and that all the succeeding switches or stations 8 9 10, &c., are tripping-stations, and so they will all be of the same height as 7; but 7 has had to be placed higher than the preceding stations 4 5 6, because its car, although a tripping car, has had to have its switch-wheels O elevated enough to pass the preceding receiving-switches, and consequently its shipping-switch must be high enough above the main-track grade or plane to bring the main wheels out over the track. This is clearly seen in Fig. 15.

Fig. 8, Sheet 2, is a plan view of a switch-point, and shows the arrangement of guides *d d*. In all our previous applications we have shown guides at the switch-points and a friction-roller, *m*, on the car. In this case the guides do more than to guide the cars and prevent them swaying as they pass the switch, for here we show the guide opposite the switch prolonged so as to hold the car from tipping as it begins to bear its weight on the switch-wheels until it gets fairly onto the switch. The dotted lines in this figure are intended to show a car with a friction-roller over each of the switch-wheels—that is, a friction-roller, *m*, both fore and aft, so as to keep the car from tipping until fairly on the switch. It should be stated here that the switch-wheels are at one side of the center of gravity of the car, and hence as the car gets onto the switch it tips or lurches somewhat, but not enough to throw it from the track, and, as the switches are short, it has not far to run in that condition. If wanted, a guide can be placed all along the switch, just leaving room for cars to get past

on the main line, and thus preventing tipping at all.

What we claim as new is—

1. In a conveyer apparatus, substantially as herein shown, the combination, with a direct or main track, of branch tracks which are connected with frames, substantially as shown and described, which span the main track and afford an opening for the uninterrupted passage of the cars along the main line, as set forth.

2. In a conveyer apparatus, substantially as herein shown, the combination, with a direct or main track, of branch tracks having frames thereon, which span the said main track for the purposes mentioned, and transfer tracks or switches which lead from said branch tracks and connect with said main track, substantially as shown and described.

3. In a conveyer apparatus, substantially as shown, the combination of the main track A, branch track B, spanning-frame C, transfer-track *b*, and connecting-iron H.

4. In a conveyer apparatus, substantially as shown, the combination, with two or more substantially parallel tracks, of a guy for holding one or more of said tracks at their curves, which is provided with a frame or frames for spanning such of said tracks as the said guy intersects, so that cars can pass along said intersected track or tracks uninterruptedly, as set forth.

5. In a conveyer apparatus, substantially as shown, the combination, with the tracks thereof, of a spanning-frame, substantially as herein shown and described, and for the purposes set forth.

6. In a conveyer apparatus, the combination, with a track formed of a taut wire, of the angle-iron G, properly curved, and adapted, substantially as shown, to hold the track from below and leave its upper portion free for the passage of cars.

7. In a conveyer apparatus the track of which is formed of a continuous taut wire, the combination, with said track at points where it changes its direction, of a supporting-iron which is properly curved, and provided along its curve with means, substantially as shown, for grasping the said taut-wire track and holding it at a proper curve without obstructing or interfering with the tread or face of said track.

8. In a conveyer apparatus, substantially as shown, a track running in various directions, formed of a continuous taut wire, which passes angles or corners by proper curves and without break, splices, or angular bends, and at all points has its upper surface exposed as a tread or face, as shown.

9. In a conveyer apparatus, substantially as shown, the combination, with a taut-wire track, of the angle-hanger G, properly curved, and having the flange g^2 and clips g^3, as shown, and for the purposes mentioned.

10. In a conveyer apparatus, substantially as shown, the combination, with a taut-wire track, of the angle-hanger G, curved properly, and the guys *g g*, attached to said angle-hanger.

11. In a conveyer apparatus, substantially as shown, the combination, with a main track and a car having two sets of wheels, arranged side by side, of a switch-track placed by the side of the main track, so as to engage the set of wheels on the car not used on the main track, substantially as herein shown.

12. In a conveyer apparatus, substantially as shown, the combination, with a main track and a series of switches having their points arranged by the side of said main track, and successively raised at different heights above the plane, of the main track, of a car having two sets of wheels, arranged side by side, one for running on the main track and the other on the switch-tracks, which latter are adjustable vertically, so as to bring them at a desired height above the tread of the set which run on the main line, as and for the purposes mentioned.

13. In a conveyer apparatus, substantially as herein shown, the combination, with a main track and switch-tracks arranged by the side of said main track, of a car having two sets of wheels, one for running on the main line, and provided with means, substantially as shown, whereby they may be tripped up off of said track, and the other for running on the switch-tracks, which are provided with means, substantially as shown, whereby they may be adjusted so as to bring their tread in different horizontal planes.

14. In the running-gear of a car for a conveyer apparatus, substantially as shown, the combination of the wheels O O and N N, arranged, respectively, on the bars K and L, the latter of which is mounted so as to be moved vertically by a spring when released from a holding-catch, substantially as and for the purposes mentioned.

15. In the running-gear of a car for a conveyer apparatus, substantially as herein shown, the combination, with the slotted post M′, of the block P, bar L, carrying the wheels N, spring *p*, catch R, and trigger Q, substantially as and for the purposes mentioned.

16. In the running-gear of a car for a conveyer apparatus, substantially as herein shown, the combination, with the post M′, of the bar on which the wheels are connected, pivoted to said post, and a compensating-spring attached to said post and bearing on said bar each side of said post, substantially as and for the purposes set forth.

17. In a conveyer apparatus, substantially as shown, the combination, with a main and a switch track lying side by side, and a car with two sets of wheels lying side by side, one of which sets is for use on the main track and the other on the switch-track, the former of which are adjusted upon a bar which will move up when released by the movement of a trigger, which extends above said car, as shown, of a finger, Q′, adjusted above said track and

in position to come in contact with said trigger when the car is opposite said switch.

18. In a conveyer apparatus in which the switch-tracks lie beside the main track and the switch-wheels on the cars lie beside the main wheels, the combination, with the said switch and car, of a friction-roller on the car, and guides *d*, at the switch-point of which guides the one opposite or across the main track from the switch extends along the track beyond the switch-curve, as shown, and for the purposes mentioned.

19. In a conveyer apparatus, substantially as shown, the combination, with a car having its main and its switch wheels lying side by side, and the said switch-wheels adjustable vertically, of two main tracks, one leading from and the other to the central station or cashier's desk, and switches at stations for each of said lines, which are graded in different planes above said lines successively as the said stations are serially removed from the said central station.

In testimony whereof we affix our signatures in presence of two witnesses.

GEO. C. BLICKENSDERFER.
HERVEY SMITH.

Witnesses:
JNO. K. HALLOCK,
ROBERT H. PORTER.