

No. 751,885.

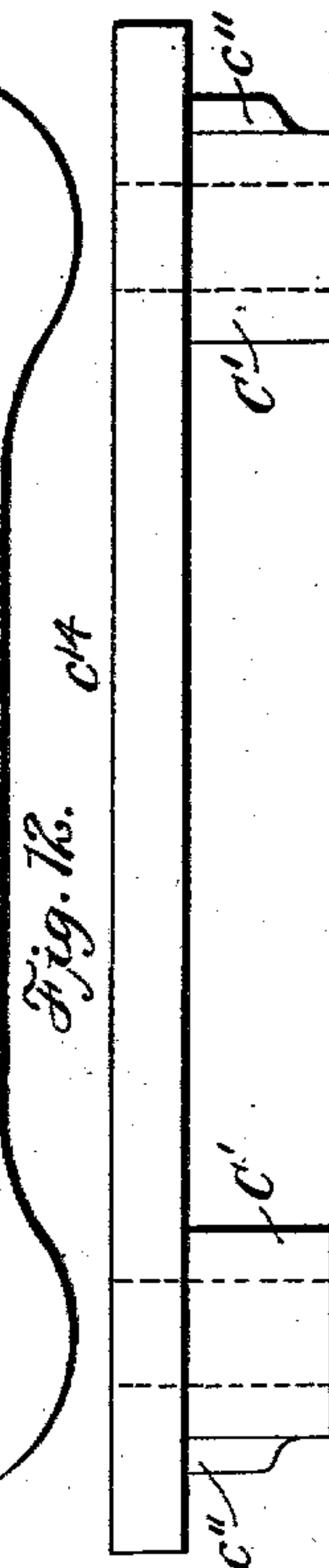
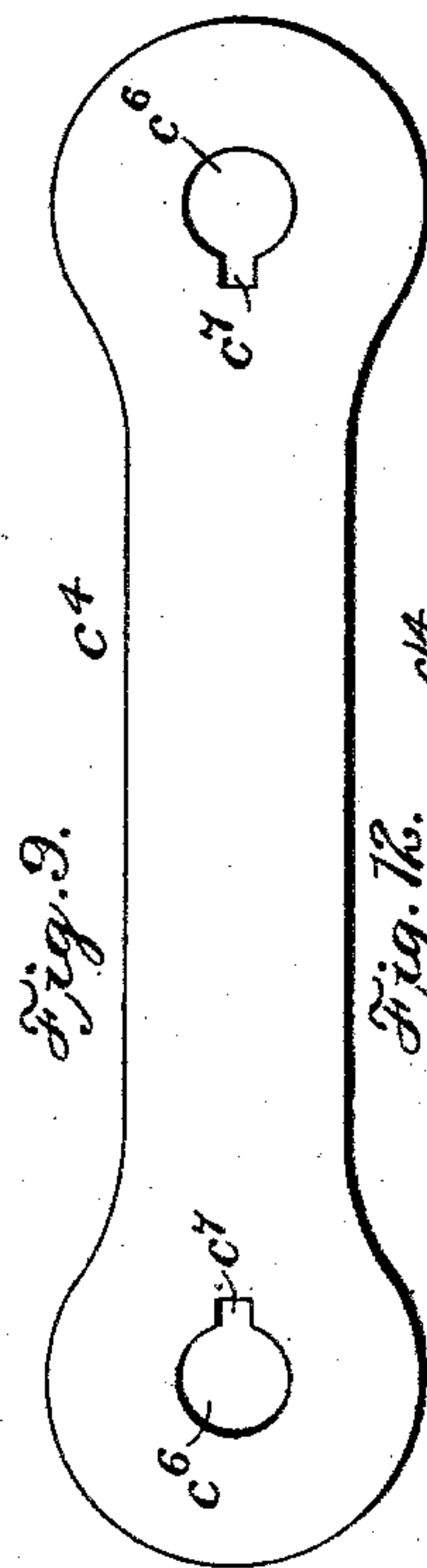
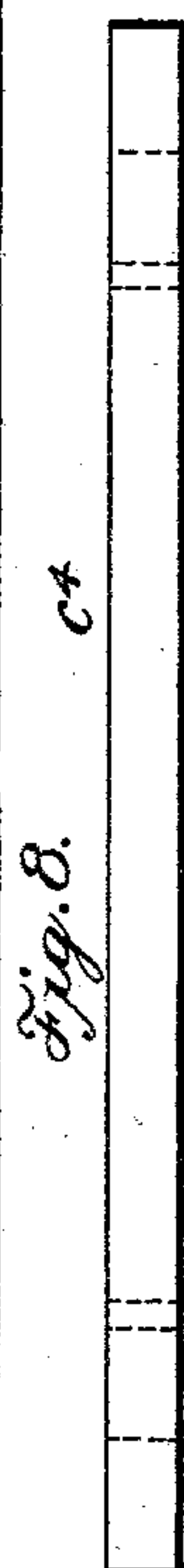
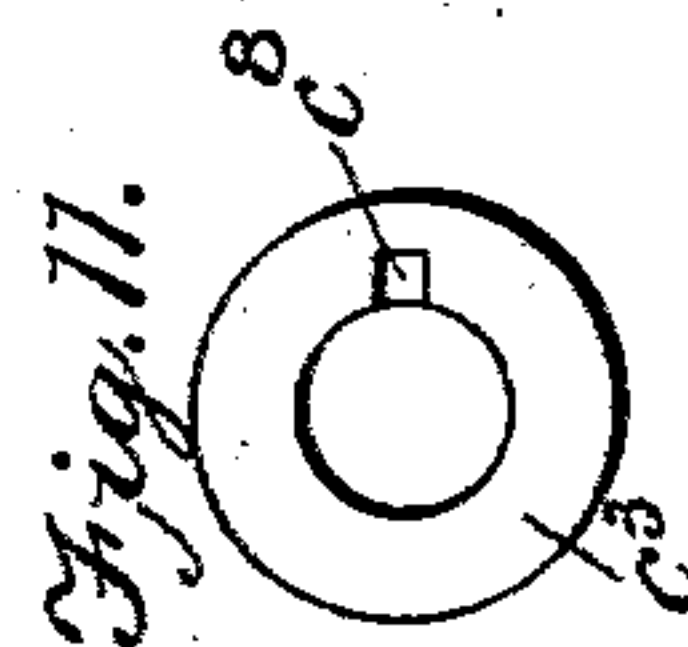
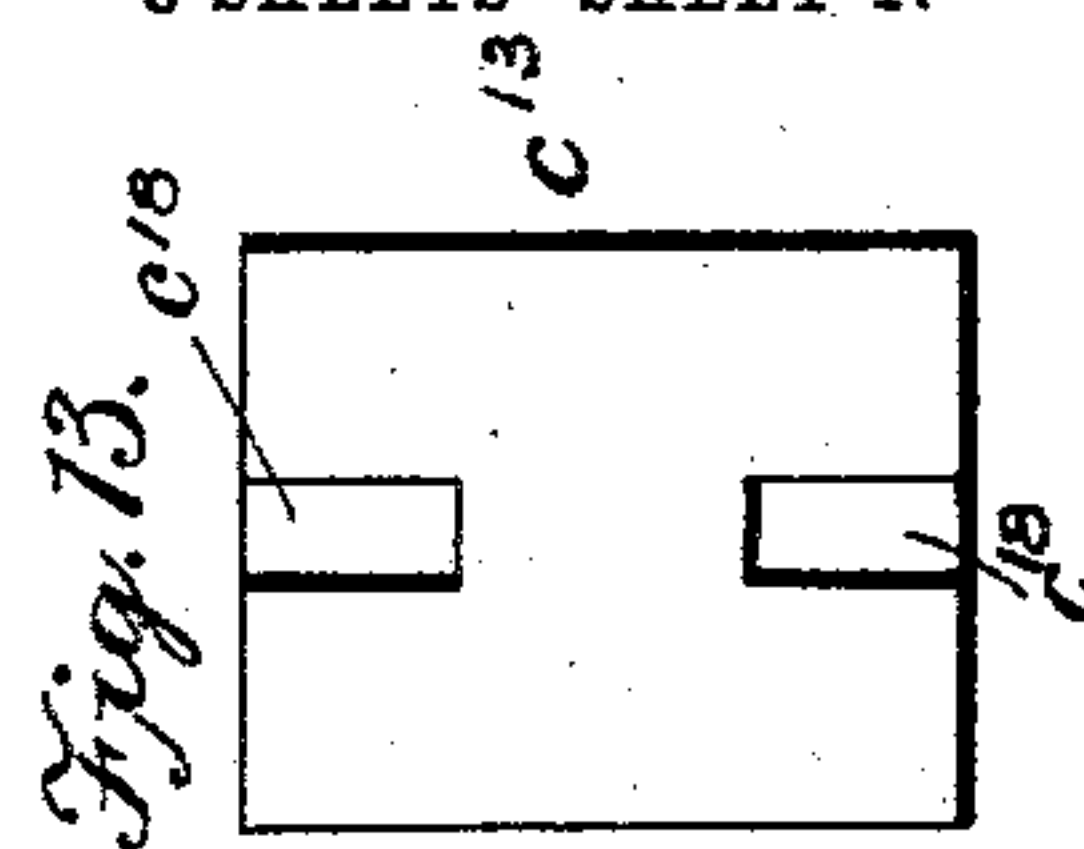
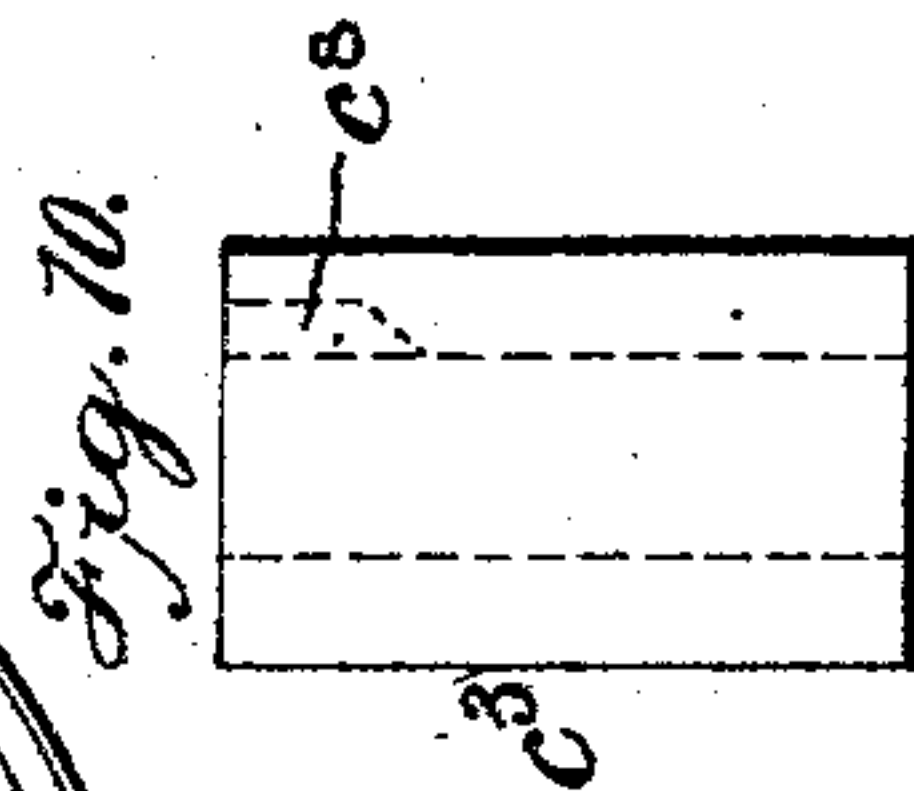
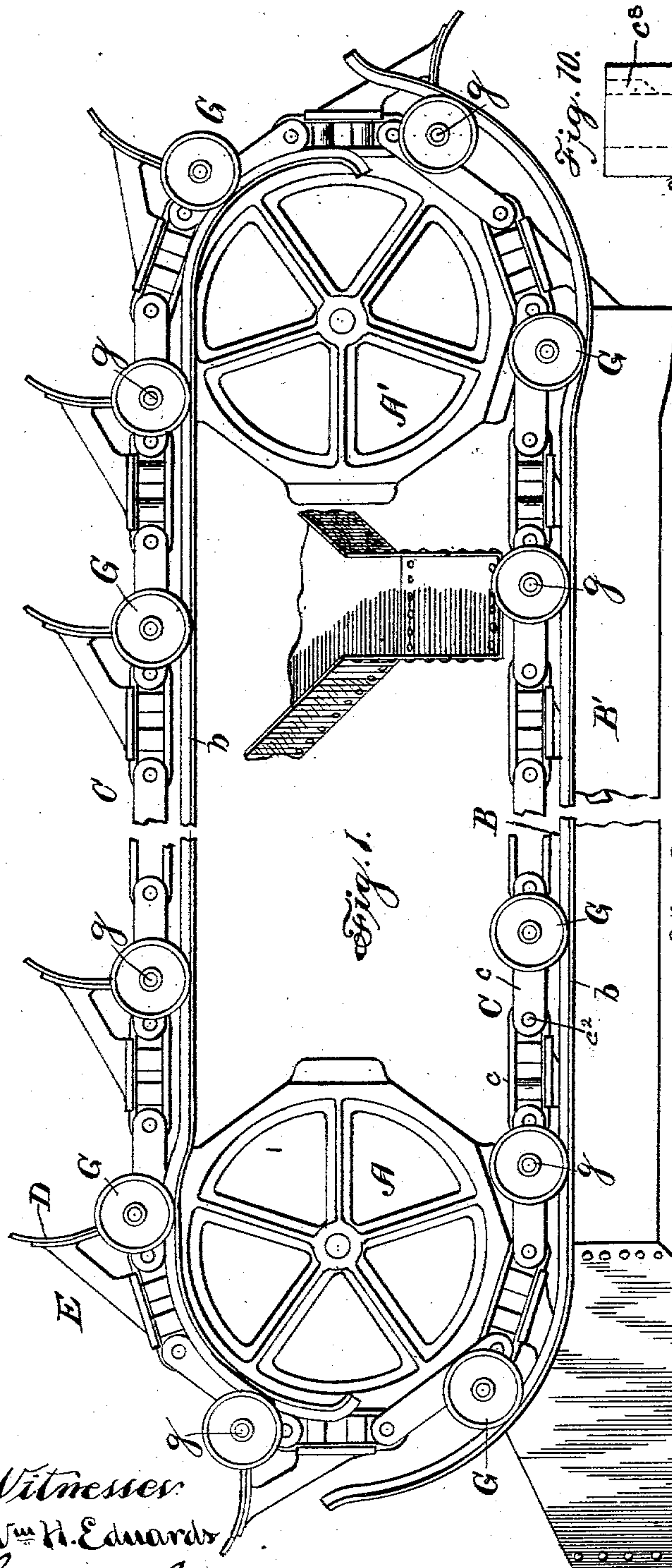
PATENTED FEB. 9, 1904.

A. J. WEBSTER.
CONVEYER.

APPLICATION FILED SEPT. 18, 1897.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
Wm H. Edwards
George Buckler

Inventor
A. J. Webster
by

H. H. Bliss atty

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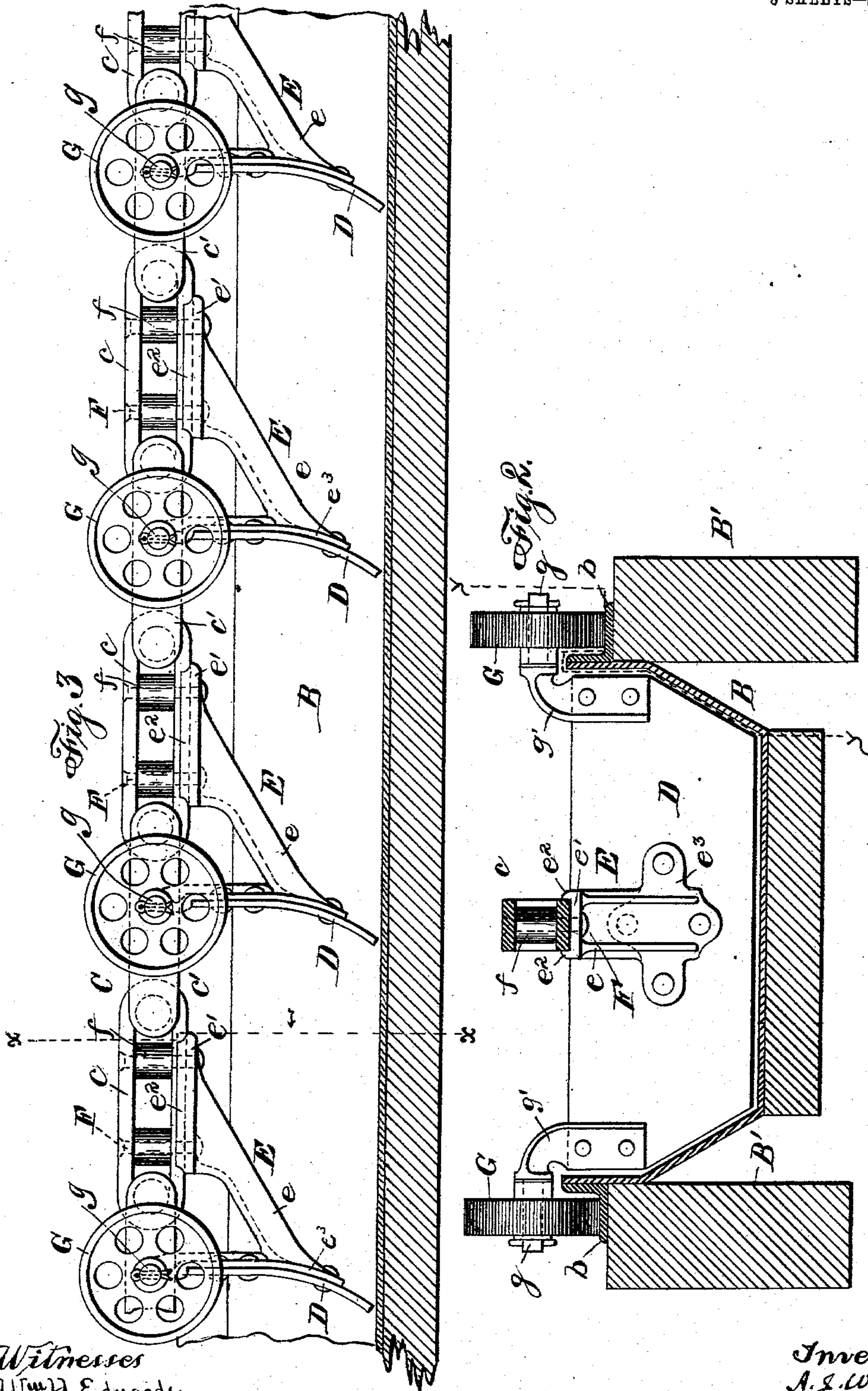
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3 SHEETS—SHEET 2.



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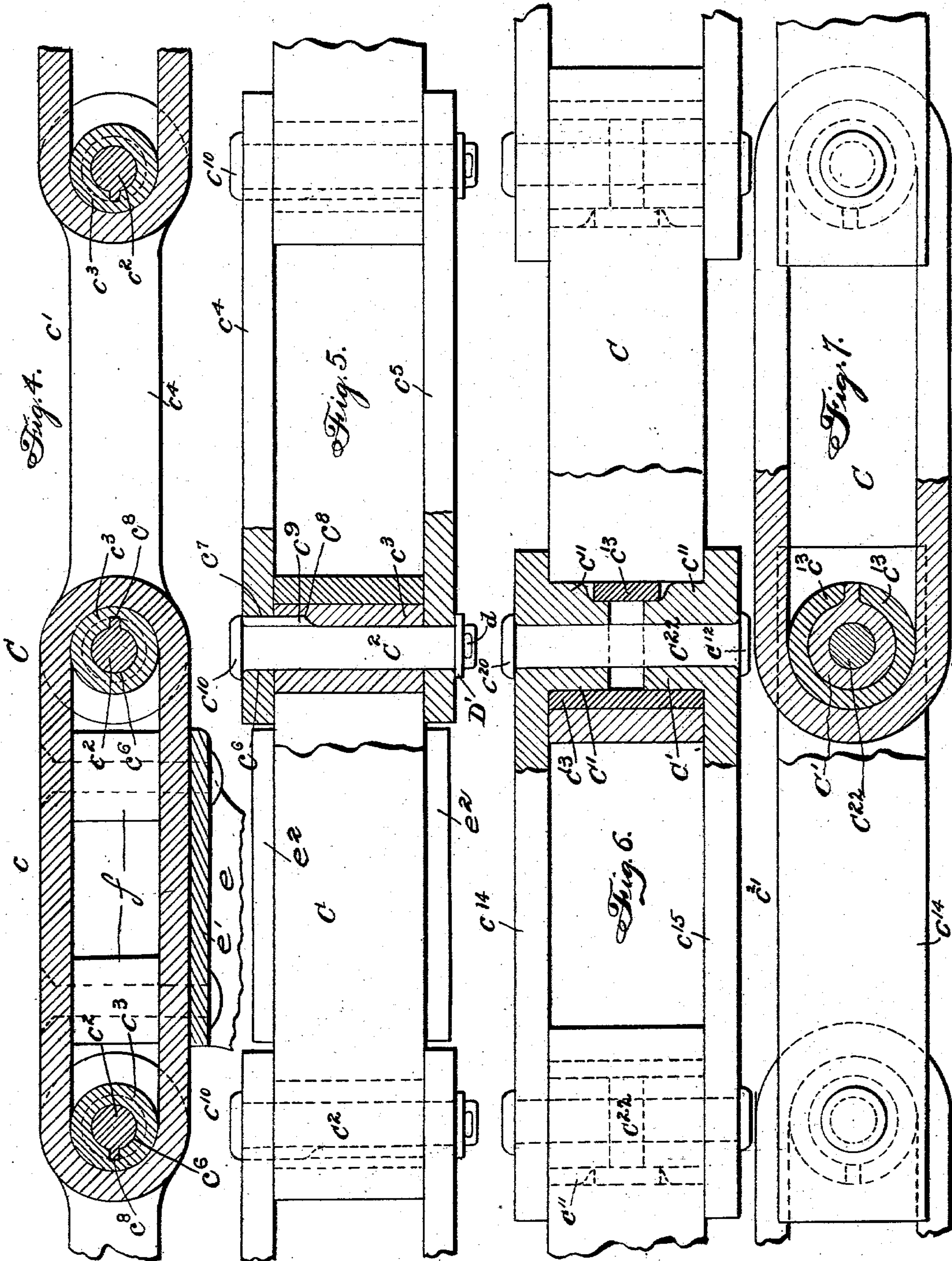
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3 SHEETS—SHEET 3.



WITNESSES:-

Wm. H. Edwards
George Buckler

INVENTOR:-
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H. H. Bliss ATTY:-

UNITED STATES PATENT OFFICE.

ALFRED J. WEBSTER, OF COLUMBUS, OHIO, ASSIGNOR TO JOSEPH A. JEFFREY, OF COLUMBUS, OHIO.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 751,885, dated February 9, 1904.

Application filed September 18, 1897. Serial No. 652,173. (No model.)

To all whom it may concern:

Be it known that I, ALFRED J. WEBSTER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Conveyers; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of a sufficient portion of a conveyer to illustrate the manner of embodying my improvements. Fig. 2 is a cross-section on the line $x x$ of Fig. 3. Fig. 3 is a side elevation, on a larger scale than Fig. 1, of a portion of the lower run of the conveyer, the trough in which the conveyer moves being shown in longitudinal section. Fig. 4 is an enlarged view in section of part of the conveyer-chain. Fig. 5 shows the same in plan with part in cross-section. Fig. 6 shows a modification of the chain. Fig. 7 is a side view of that in Fig. 6, partly in section. Fig. 8 is an edge view, and Fig. 9 a face view, of one of the bars shown in Figs. 4 and 5. Fig. 10 is a side view, and Fig. 11 an end view, of one of the spacing and wearing devices shown in Figs. 4 and 5. Fig. 12 is an edge view of one of the bars shown in Figs. 6 and 7, and Fig. 13 is a side view of one of the spacing and wearing devices shown in Figs. 6 and 7.

In the drawings I have shown my improvements as being applied to a conveyer of the sort used for advancing coal or similar material along a trough.

It is well known to those acquainted with conveyers of the styles now in use that serious difficulties have been experienced when they are employed for the transportation of heavy materials, such as coal and the like. Generally the chains are provided with flights or scrapers, each flight being secured to the link by means of an attachment on the link, consisting of a bar or plate integral therewith and adapted to have the flight or scraper bolted

thereto. The resistance to the flights or scrapers is very great, and as they are supported practically at one edge only this resistance results in a severe strain upon the chain-links and a constant breakage of the parts. In order to have the carrier or power-propelling part of sufficient strength, it has been generally necessary to employ two chains, or where one has been used the links have had to be made unduly large and heavy.

One of the objects of the present invention is to so construct the parts of the chain by which power is applied and also the parts which support the flight or scraper and to so connect the several parts that the pushing or propelling power can be imparted to the scraper and to the load to greater advantage than when it is attached in the ordinary manner or when use is made of the ordinary chains.

A A' indicate the driving and the driven wheels which actuate and support the conveyer. As there is only one chain in the apparatus there is but a single wheel at each end.

B indicates the trough which supports the coal or other material that is being transported.

C is the chain referred to. As shown, it consists of loop-links c and bar-links or strap-links c' , the ends of which have pintles c^2 and bushings c^3 seated in the curved ends of the loop-links c . In order to have great strength in the chain and at the same time avoid its being rapidly cut or worn, I construct these parts as follows: By referring to Figs. 4 and 5 it will be seen that the links c are formed of straps or bars of wrought iron or steel, which are bent into the form shown and welded. They may, however, be cast or otherwise made by drilling or cutting from solid metal. The links c' comprise the two side bars $c^4 c^5$, each of which has at each end an aperture c^6 . In the side bar c^4 each aperture c^6 communicates with a small groove c^7 . The bushing or thimble c^3 is cylindrical and has a longitudinal aperture for the pintle, and at one end this aperture is widened or communicates with the slot c^8 . The pintle c^2 has a main body part, a fin or web c^9 , and a head 10. The fin or web c^9 is adapted to fit in the groove c^7 in the side bar c^4 and is long enough to also enter the

groove c^8 in the bushing or thimble. The head c^{10} bears against the outside of the side bar c^4 . The pintle is locked at the opposite end either by riveting or by a key, as at d .
 5 When the latter is used, it is well to employ a washer, as at D' . When the chain is made in the way described, the said parts $c^4 c^5$, the pintle, and the bushing can be drop-forged, and thus made exceedingly strong and hard.
 10 The bushing is locked against rotation upon the pintle, and the pintle is locked against rotation in the link c' . Secondly, the side bars $c^4 c^5$ are prevented from being cut by rotating around the pintle, and the general wearing-surface of articulation between the links $c c'$ is greatly enlarged, such surface amounting to the larger part of the cylindrical surface of the large bushing or thimble.

In Figs. 6 and 7 a modification is shown.
 20 In this case the forming of the web or fin on the pintle is avoided, and when the side bars $c^{14} c^{15}$ are drop-forged each has pressed upon it a web or fin c^{11} , and the bushing or thimble c^{13} has a slot c^{18} formed in each end. The side bars $c^{14} c^{15}$ are forged to have perforated bosses C' extending inward from their inner faces and adapted to be seated in the aperture in the bushing. After the parts have been put together the pintle C^{122} is riveted to provide
 25 a head c^{12} at the end opposite to that at c^{20} .

Either of these forms of chain insures great strength for the conveyer and permits the use of heavily-loaded flights.

The chain is mounted centrally of the trough
 35 B, the latter being supported on bars or beams B' , and upon the tops of the latter track-rails b are placed. The ways or tracks formed by these rails b are parallel with the trough B and are outside thereof. This permits the use
 40 of a flight of a size and shape to entirely fill the trough in a transverse direction and permits of the supporting and steadying devices for the flights being arranged entirely outside of the trough, which devices in the construction shown consist of the wheels or rollers G.
 45 These ways or tracks are preferably flanged, so that the flanges operate as guides to cause a proper centering of the flights within the trough, and the flanges of the ways are preferably arranged between the ways or tracks
 50 and the trough, though if they were arranged along the outer edges of the tracks they would still operate to properly center the flights.

The flights or scrapers are each indicated by
 55 D. Each extends downward from the chain on the transverse lines not of the link to which it is attached, but of a link in front thereof. Preferably the loop-links c are utilized for the attachment of the flights, the attachment part
 60 being indicated as a whole by E. It has a forward and downward inclined arm e and at the rear upper end has a plate e' with flange e^2 . The flanges lie by the side of the link, and the latter is bolted or riveted to the plate e' . As
 65 shown, the rivets F pass through the top and

bottom parts of the loop-link, and around the rivets and between the said parts of the link are placed the bracing and spacing thimbles f . At the forward lower end of the inclined arm e there is a plate e^3 , which is preferably concave on the front face. Against this the flight or scraper D is placed and is secured thereto by bolts. By examining the drawings it will be seen that the pushing-arm e is applied to the scraper at a point relatively near the lower end of the latter, the aim being to have it bear directly behind or a little below the load of the scraper. Consequently the power is applied in such way that the action instead of being that of a drive is that of a push, and the strain upon the attachment and upon the chain is greatly lessened. Then in order to overcome the increasing tendency of the flight or scraper to be depressed I support it largely independent of the chain by rollers or trolley-wheels G. These are preferably mounted in the vertical planes of the scraper, and their stud-axes g are shown as having downwardly-turned plates g' , which are bolted to the flights. By these the weight and strain is taken from the chain and is supported by the track-rails b , leaving nothing for the attachments to do but to apply the pushing force.

In conveyers in which the material-transporting devices, such as flights, are attached to a single line of chain such chain is subject to violent strains, which tend not only to rapidly wear the joints or articulations thereof, but also to break the chain at the articulating points. I have therefore in the embodiment of my invention herein shown not only provided means for steadying and supporting the flights at their edges, but have also devised a form of chain possessing great strength and so constructed as to very largely obviate or overcome these difficulties incident to conveyers. This I do by constructing certain of the links of the chain with side bars and with enlarged removable journals which are connected with the side bars in such way that they turn therewith, and with such links combine others which are constructed with bearings arranged to fit the said journals, the two kinds of links being united by pintles. It will thus be apparent that the articulating parts of a chain thus constructed are large and strong and the wearing incident to the articulation of the links is entirely removed from the pintles. The material which is moved by conveyers of this character is often of a gritty nature and tends rapidly to cut out and wear the joints of the chain. By providing enlarged journals and bearings, such as described, the inconveniences and objections incident to the wearing and cutting of the joints are materially reduced, as the wear is slow owing to the fact that it is distributed over relatively large surfaces, and, further, by making the wearing-journals removable I make it possible to replace a part which has become badly

worn without the necessity of discarding the entire link.

While I have herein referred to the parts at D as "flights" or "scrapers," it will be understood that there can be modification with respect to their shape and character, inasmuch as at this date it is well known that use can be made in conveyers of rods or fingers and other forms of material-transporting devices, and it is to be understood that I do not limit myself to the precise form of material-transporting device which I have selected for illustration.

What I claim is—

1. In a conveyer, the combination of the flights, a chain secured to the flights, the wheels supporting the flights independently of the chain, and the pushing-arms connected to the flights, substantially as set forth.

2. In a conveyer the combination of the flights, the chain secured to the flights, the wheels supporting the flights independently of the chain, and the push-bars extending backwardly from the flights and secured to the chain, substantially as set forth.

3. In a conveyer, the combination of the series of flights, the chain, the supporting-wheels for the flights, and the pushing-arms each connected to a chain-link in rear of the link next adjacent to its flight, substantially as set forth.

4. In a conveyer, the combination with a chain of a flight, a supporting-wheel in the plane of the flight transverse of the chain, a pushing-bar connected to the flight and extending backward to points in rear of the wheel, and secured to the chain, substantially as set forth.

5. In a conveyer, the combination of a flight, a chain comprising a series of link-sections, each section having a link, c , and a link c' , a supporting-wheel for the flight transversely opposite to the link c' , said link being disconnected from the wheel, and a pushing-bar extending backward from the flight to the link c , substantially as set forth.

6. In a conveyer, the combination with the flights, of a chain having the links, c , c' , the link c' being formed of separable side bars and the link c being a continuous loop, the pintle connecting the links, and the bushing concentric with the pintle and detachably locked to the link, c' , substantially as set forth.

7. In a conveyer, the combination with the flights, of a chain having the links c , c' , the link c being a loop, and the link c' being formed of two separable side bars, the bushing, in the curved end of the loop-link, c , the pintle at the axis of the bushing, and means for locking the side bars of the link c' to the bushing against rotation, substantially as set forth.

8. In a conveyer, the combination of a chain, a series of flights or scrapers each lying in the transverse planes of a chain-link, but disconnected therefrom and a push-bar connected to

the flight and to a link in rear of that adjacent to the flight, whereby the chain-links immediately adjacent to the flights are free to rise and fall independently thereof, substantially as set forth.

9. The combination with the chain of the series of flights, and a push-bar for each flight connected to the chain at points in rear of the link adjacent to its flight and means for supporting each flight independently of the chain, substantially as set forth.

10. The combination of a chain, a series of flights secured thereto, a trough, and means connected to the flights independent of the chain and arranged outside of the trough for centering the flights in the trough, substantially as set forth.

11. The combination of the strap-metal loop-links, the intermediate links each formed of two parallel side bars, one of the side bars being formed with a non-circular opening in its end, a pintle formed with a web or fin fitted to the said non-circular opening in the side bar, a spacing and wearing piece also fitted to and locked on the pintle, and the material-transporting devices connected with and moved by the chain formed of the said links, substantially as set forth.

12. In a conveyer, the combination, with the material-transporting devices, of a chain adapted to move the said transporting devices comprising a link formed of two parallel side bars, one of the side bars being formed with a non-circular opening near its end, a pintle for uniting said side bars and having a projection arranged to fit the said non-circular opening in one of such side bars, a detachable wearing piece or journal adapted to fit upon the pintle and locked thereon against rotation, and an adjacent strap-metal loop-link having a bearing in which the said journal or wearing piece fits and articulates, substantially as set forth.

13. In a conveyer the combination of a chain, a series of flights secured to the chain and arranged transversely thereof and extending beyond the edges of the chain in opposite directions, a trough in which the flights travel, and the means for supporting and steadying the flights, carried by the latter independently of the chain and extending beyond the outer edges thereof and of the trough, substantially as set forth.

14. In a conveyer, the combination of a chain, a series of flights secured thereto, a trough in which the flights move, ways or tracks arranged outside the trough, flanges separating the said ways from the trough, and supports for the flights traveling upon the said ways, substantially as set forth.

15. In a conveyer the combination of a chain, a series of flights secured thereto and extending laterally to each side of the chain, a trough in which the flights move, ways or tracks arranged outside the trough and parallel therewith, supports for the flights arranged to

travel upon the said ways or tracks, and guiding-flanges arranged along the edges of the tracks to center the flights in the trough, substantially as set forth.

- 5 16. In a conveyer the combination of a chain, a series of flights secured thereto and extending laterally to each side of the chain, a trough in which the flights move, supporting and
10 guiding wheels carried by the flights independently of the chain, ways or tracks ar-

ranged outside of the trough and parallel therewith upon which the said wheels travel, and the flanges arranged between the ways and the trough, substantially as set forth.

In testimony whereof I affix my signature in 15
presence of two witnesses.

ALFRED J. WEBSTER.

Witnesses:

CHAS. HUTCHINS,

HENRY B. DIERDORFF.