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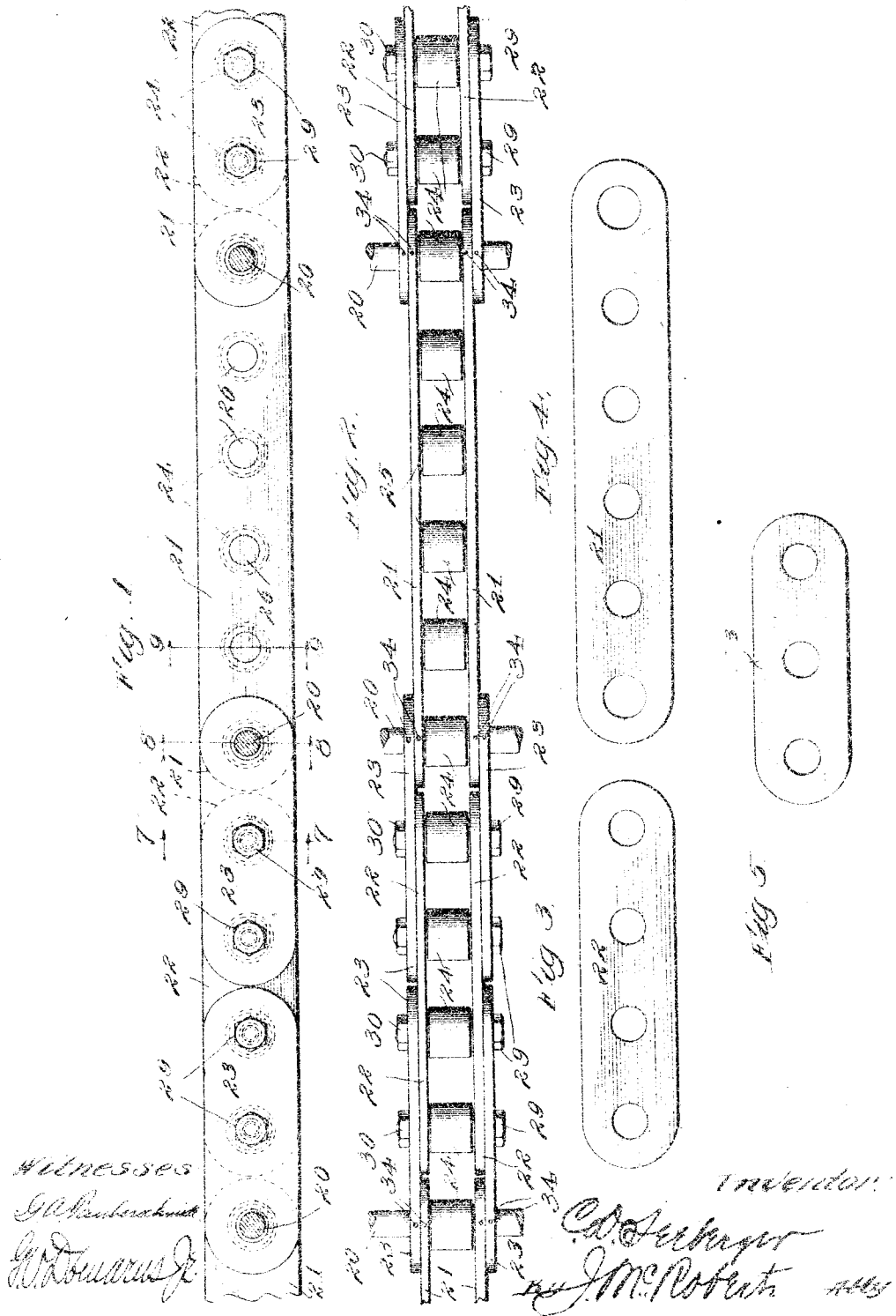
DRIVE CHAIN.

APPLICATION FILED JAN. 3, 1912. RENEWED NOV. 16, 1914.

1,127,684.

Patented Feb. 9, 1915.

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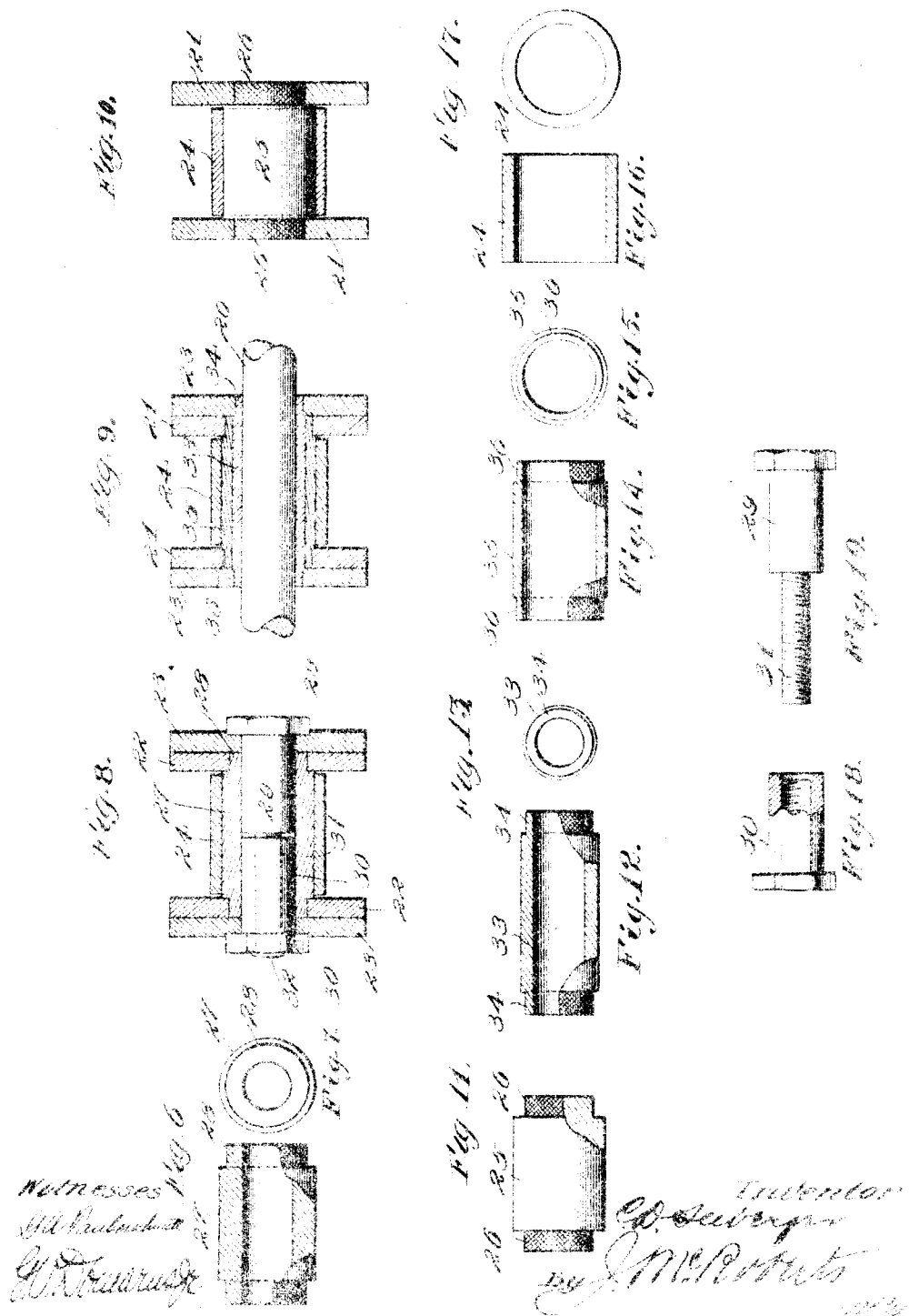


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2 SHEETS--SECRET 2



UNITED STATES PATENT OFFICE.

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DRIVE-CHAIN.

1,127,684.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES D. SEEBERGER, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Drive-Chains, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to certain new and improved features in driving chains for traveling conveyers or carriers adapted to transport passengers and freight, and which are especially designed for such devices as travel on an incline between different levels or floors in the form of moving stairways, though they may be employed in carriers for horizontal runs.

The objects of the invention are to provide certain improvements in the drive linkage for such carriers to prolong the life of the links by avoiding the wearing flat of the pins or teeth and taking all the wear at one line, and to make the articulations permanent and proof against meddlers.

With these and other objects in view as will appear from the detailed description, the invention consists in the arrangements and organizations of parts hereinafter particularly described and then stated in the appended claims.

In the accompanying drawings which illustrate an embodiment of the several features of the present invention:—Figure 1 is a view partly in section and partly in side elevation of a section of linkage for a traveling carrier or conveyer and exemplifying the features of my present invention; Fig. 2 is a top view of the parts shown in Fig. 1; Figs. 3, 4, and 5 are side views of the several side-bars constituting the side members of the links; Fig. 6 is a detail sectional view of one of the bushings; Fig. 7 is an end view of the bushing of Fig. 6; Figs. 8, 9, and 10 are sectional views on the correspondingly numbered section lines of Fig. 1; and Fig. 11 is a detail view partly in section of one of the fixed cross-rods or pins; Fig. 12 is a similar view of one of the hollow bushings of the axles or through-rods; Fig. 13 is an end view of the bushing of Fig. 12; Fig. 14 is a detail view partly in section of one of the larger hollow bushings of the axles; Fig. 15 is an end view of the bushing of Fig. 14; Fig. 16 is a sectional view of one of the rollers of the axles and cross-pins; Fig. 17 is an end view of the roller of Fig. 16; Fig. 18 is a detail view partly in section of one of the nuts, and Fig. 19 is a side view of one of the headed bolts.

Referring to the drawings the numeral 20 indicates a series of through-rods or axles to which a series of transporting sections of the carrier are suitably connected, these sections being preferably in the form of steps each consisting of a suitable tread and riser and running on tracks supported upon a suitable frame, these several parts being of suitable form and arrangement as now well understood in the art and being driven in unison by suitable driving mechanism engaging the rack links connecting the axles or through-rods.

The conveyer or carrier is adapted to travel in upper and lower legs or runs, and when extending between different levels or floors is preferably arranged so that the steps or sections are in step-like formation on the incline and with their tread-surfaces horizontal at each landing.

The links consist of side members and cross members forming the teeth for the driving wheel. The side-bars or shroud-plates 21 and 22 are of different lengths for alternate links, the former 21 being preferably of a length to provide six passages or holes and the former four passages spaced equidistant apart from their centers. The articulating side-bars or pivot-plates 23 are uniform with the others but are of a length to provide three passages spaced the same distance between their centers as the passages in the other bars or plates. The adjacent ends of the bars or plates 21 and 22 are connected by these articulating or pivot-plates 23, the plates 21 and 22 being alternately arranged so that the through rods or axles will be equally spaced apart, it being obvious that the plates 23 connected to the ends of the plates 22 will space the several axles the same distance apart as shown in Figs. 1 and 2.

The cross-members providing the rack teeth with which a suitable driving sprocket or pinion (not shown) engages are in the form of rollers 24, preferably of hardened steel, rotatably mounted between the side-bars. The methods of mounting the rollers differ at different points on the links. At the intermediate perforations in the plates

21 the rollers 24 are rotatably supported upon fixed cross rods or pins 25 having a reduced portion 26 forming a shoulder at each end, the reduced portions being seated in the perforations in the side bars 21, this construction being shown in detail in Fig. 9. The rollers 24 associated with the side bars 22 are mounted upon fixed hollow rods or pins or bushings 27 having a reduced portion 28 forming a shoulder at each end, the reduced portions being seated in the perforations in the side plates 22, this construction being shown in detail in Figs. 6 and 7, the ends of the reduced portions being flush with the outer faces of the plates 22. The articulating side bars or pivot plates 23 are connected to the side bars 22 by means of headed pins or bolts 29 passing through the bores of the fixed bushings 27 and engaging corresponding nuts 30, the nuts being preferably somewhat elongated and extended to pass into the bores of the bushings and of the same size as the body of the bolt in order to provide corresponding bearings for the perforations or openings in the articulating side bars 23 and the bolts having reduced ends or shanks 31 adapted to have screw threaded engagement with the bores of the nuts and of sufficient length to pass there-through when the parts are assembled as shown in Fig. 7 to be upset or headed over as at 32 to lock the parts together. The heads of the nuts and bolts are preferably countersunk in the bars 23. The articulating side bars or pivot plates 23 are connected to the through rods or axles 20 and serve to flexibly connect the link members. Each axle or through-rod is surrounded with a fixed hollow bushing 33 having a reduced portion 34 forming a shoulder at each end, the reduced ends entering the perforations or openings at or near the ends of the pivot plates 23, and the ends being flush with the outer faces of these plates. Each bushing 33 is surrounded by an associated larger hollow bushing 35 having a reduced portion 36 forming a shoulder at each end, and the reduced portions serving as bearings for the side bars 21, and the ends of the reduced portions 36 of the bushings 35 are flush with the outer faces of the links 21, and the bushings 35 receive the associated rollers 24. The construction and arrangement of these several parts is shown in detail in Fig. 8. The rods or pins 25 and the bushings 27, 33, and 35 are of hardened steel and are fixed in place in their associated side bars or plates to prevent their rotation and to connect the parts together; this may be done by any suitable means, for example the reduced ends of the pins and bushings may be knurled as shown in Figs. 9, 10 and 12, and assembled in the openings on their corresponding side-plates or links under pressure, or the reduced ends of the pins and bushings

may be provided with a flat face or portion engaging a correspondingly shaped hole in the side bars, or the parts may be riveted, any suitable means to prevent these parts from turning in their plates being within the purview of my invention. The articulating side bars 23 are connected to the outer faces of the side bars 22 at two points as shown in Figs. 1 and 2, and consequently the bolts and nuts of these connections hold the projecting ends of the bars 23 in alignment with the bars 22.

From the disclosure it is apparent that the drive linkage is made up of alternate lengths of simple and compound links, the former being composed of the side bars 21 and their cross-members, and the latter being composed of the side bars 22 and 23 and their cross-members, and that the bars 23 of the compound links form the articulating or pivot members between the two sets of links by means of their bushings 33 rotating on the through-rods upon which the simple links also swing or turn by their bushings 35 rotating freely on the bushings 33, as is clear from Fig. 8. This provides the necessary flexibility for the linkage to pass the curves in a complete circuit of travel of the carrier.

The form and size of various parts may of course be changed and varied within the scope of my invention: for example, the parts connecting the members of the compound links may be split as shown at Fig. 14 or the bolts may be of uniform size throughout their lengths and receive ordinary nuts on their ends; and other changes may be made in the several parts without departing from the purview of my invention. The linkage may of course be associated with its carrier in any suitable manner, as a single length may be employed at the center of the through-rods or a length may be disposed at each end of the rods. The links may be provided with oil holes for lubrication as indicated at 34 which may be supplied by any suitable means, the oil perforations of course extending to the end openings in which the axles or connecting members are located.

Having described my invention, I claim:—

1. In a drive-linkage, alternate simple and compound links of equal length, each simple link composed of side bars having a through-rod in each end and a series of intermediate cross-members, and each compound link composed of side bars having cross-members and pivot plates rigid on the cross-members and projecting in pairs beyond the ends of the side bars to pivotally receive the through-rods of adjacent simple links.

2. In drive-linkage, alternate simple and compound links, each simple link composed of side bars having a through-rod in each

- end and a series of intermediate cross-members, each compound link composed of side bars shorter than the first side bars and pivot plates shorter than the second side bars and extending in pairs beyond the ends thereof to receive the through rods of adjacent simple links, and bolts on the shorter side bars upon which the associated pivot plates are rigidly mounted.
3. In drive-linkage, two pairs of side bars and a pair of pivot plates of different lengths, the side bars having cross-members, the pivot plates being rigidly mounted on the cross-members of the shorter side bars and projecting beyond said bars, and through-rods in the ends of the longer side bars and on which the projecting ends of the plates are pivoted.
4. In drive-linkage, a plurality of equally spaced axles, alternate simple and compound links, each simple link composed of side bars having an axle in each end and a series of intermediate cross-members, each compound link composed of side bars shorter than the first side bars and pivot plates shorter than the second side bars and extending in pairs beyond the ends thereof to receive the axles of adjacent simple links, and bolts on the shorter side bars upon which the pivot plates are rigidly mounted.
5. In drive-linkage, a plurality of equally spaced axles, alternate simple and compound links, each simple link composed of side bars having end perforations to receive a pair of axles and a series of intermediate perforations, a series of cross-pins in the intermediate perforations, and a roller on each axle and pin, and each compound link composed of side-bars having a series of opposite perforations, through-bolts in the perforations and a roller on each bolt, and opposite pairs of pivot-plates rigid on the bolts and pivoted on adjacent axles.
6. In drive linkage, a series of links each having two side bars having perforations, cross-members in the intermediate perforations, a plurality of spaced axles in the end perforations of alternate links, and intermediate pivot plates fixed to the other links and pivotally connected to an axle of an adjacent link to articulate the links together.
7. In a drive-linkage, a series of links each having two side bars having a series of opposite perforations, cross-members fixed in the perforations, through-rods in the end perforations of alternate links, and intermediate pivot plates fixed to the other links and pivotally connected to the through-rod of an adjacent link to articulate the links together at the through-rods.
8. In a drive-chain link, a pair of side bars having a series of opposite perforations, bushings fixed in the perforations, rollers on the bushings, bolts passing through the bushings and bars, and two pairs of side bars rigid on the bolts and projecting respectively beyond the opposite ends of the first side bars.
9. In a drive-chain link, a pair of side bars having a series of opposite perforations, bushings fixed in the perforations, rollers on the bushings, bolts passing through the bushings and bars, and a second pair of side bars on a plurality of bolts at each end of the first side bars and projecting beyond them.
10. In drive-linkage, a link having two side bars having a series of opposite perforations, a bushing in each end perforation, a series of cross pins each having a reduced portion forming a shoulder at each end and secured in the intermediate perforations in the bars, axes projecting through the end bushings of the side bars, a second link having a bushing freely mounted in said first bushing, cross-members on the second link, and rollers on the cross-members, bushings, and pins.
11. In drive-linkage, a link composed of relatively long side bars having through-rods in its ends and intermediate cross-members, a link composed of relatively short side bars and end bars having cross-members, the end bars being pivoted on the through-rods, and a roller on each rod and cross-member.
12. In drive-linkage, a link composed of relatively long side bars having through-rods loosely mounted in its ends and intermediate cross-pins, and a link composed of relatively short side bars and end bars having cross-pins, the end bars being pivoted on the through rods, and a roller on each rod and pin.
13. In drive-linkage, a link composed of relatively long side bars having bushings fixed in its ends and intermediate cross-members, and a link composed of relatively short side bars and end bars having cross-members, the end bars having bushings fixed in their ends and having swinging engagement with the first bushings, and rollers on the bushings and cross-members.
14. In drive-linkage, a series of simple links each having two side bars having a series of opposite perforations, bushings fixed in the end perforations, a series of cross pins each having a reduced portion forming a shoulder at each end and secured in the intermediate perforations in the bars, a series of compound links each composed of a pair of side bars provided with a series of opposite perforations and two pairs of end bars provided with corresponding perforations, bolts connecting the bars of the compound links, the end perforations of the end bars having bushings articulated with the bushings of the simple links, through rods in the articulated bushings, and rollers on the bushings, bolts and pins.

15. In drive-linkage, a series of simple links each having two side bars having a series of opposite perforations, bushings fixed in the end perforations, a series of cross pins each having a reduced portion forming a shoulder at each end and secured in the intermediate perforations in the bars, a series of compound links each composed of a pair of side bars provided with opposite perforations and having bushings fixed therein and two pairs of end bars provided with corresponding perforations, bolts passing through the last named bushings and connecting the bars of the compound links, the end perforations of the end bars having bushings articulated with the bushings of the simple links, through-rods in the articulated bushings, and rollers on the bushings and pins.
17. A system of linkage, comprising a plurality of pairs of shrouds of different fixed lengths, and pairs of end-plates and through-rods flexibly jointing the shrouds.
18. A system of linkage comprising a plurality of pairs of shrouds of different fixed lengths having a plurality of cross-members, and pairs of end-plates and through-rods flexibly jointing the shrouds.
19. A system of linkage comprising a plurality of pairs of shrouds of different fixed lengths having a plurality of roller cross-members, and pairs of end-plates and through-rods flexibly jointing the shrouds.
- In testimony whereof I affix my signature in presence of two witnesses.
- CHARLES D. SEEBERGER.
- Witnesses:
E. I. AUSTELL,
R. H. PEPPER.