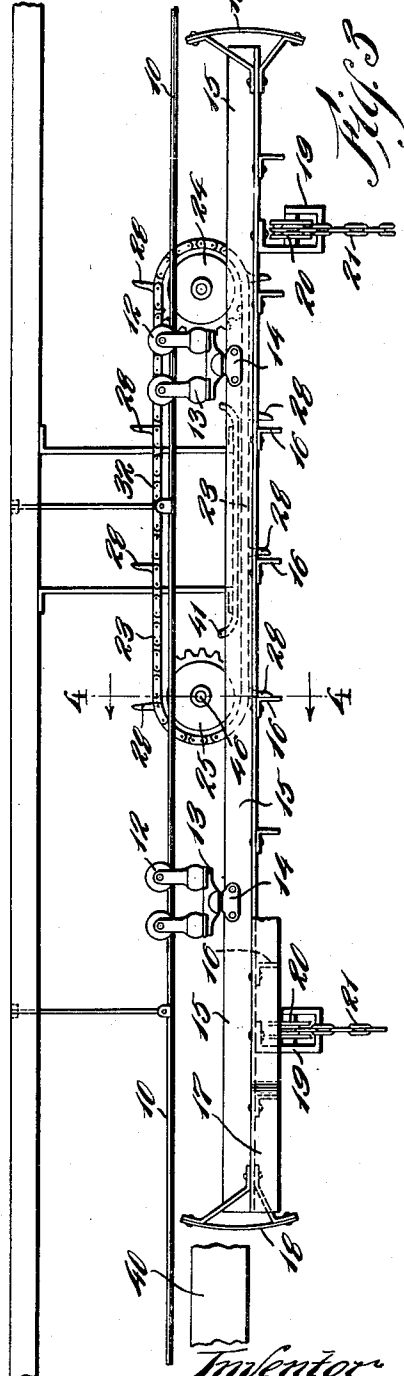
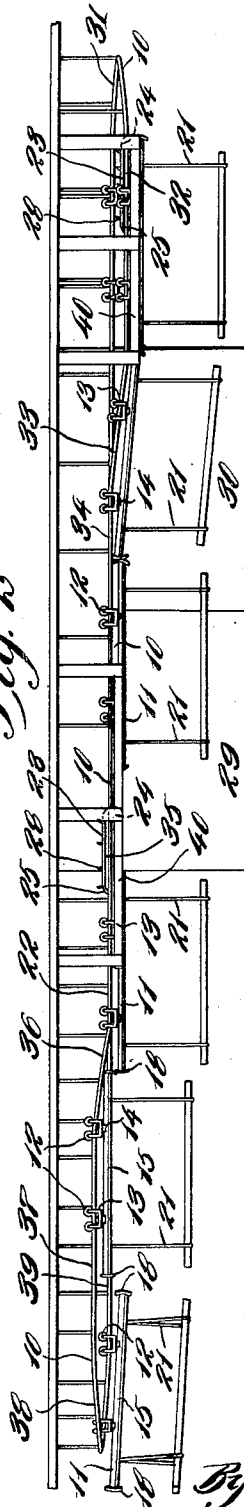
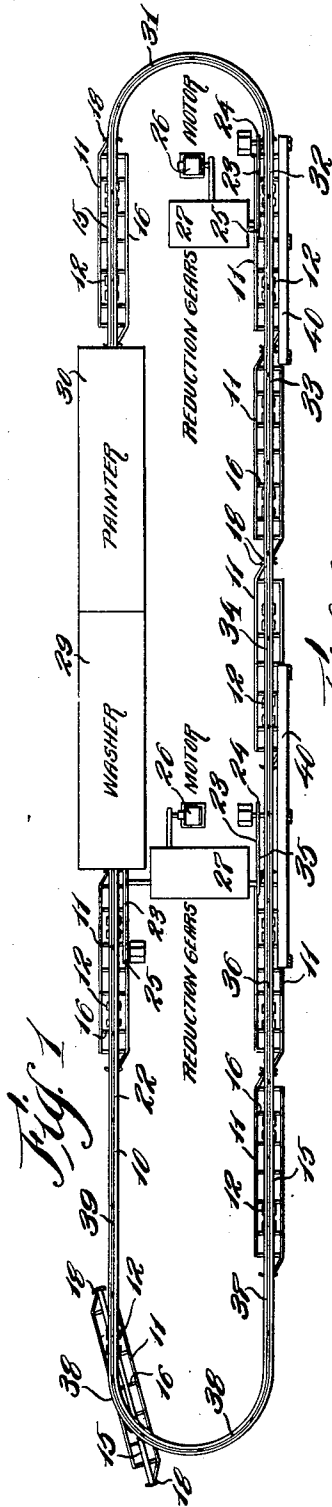


W. E. IRISH AND A. K. NOWAK.
ELEVATED CARRIER FOR HANDLING FRAMES AND THE LIKE.
APPLICATION FILED OCT. 8, 1919.

1,417,528.

Patented May 30, 1922.

2 SHEETS—SHEET 1.



Inventor
William E. Irish.
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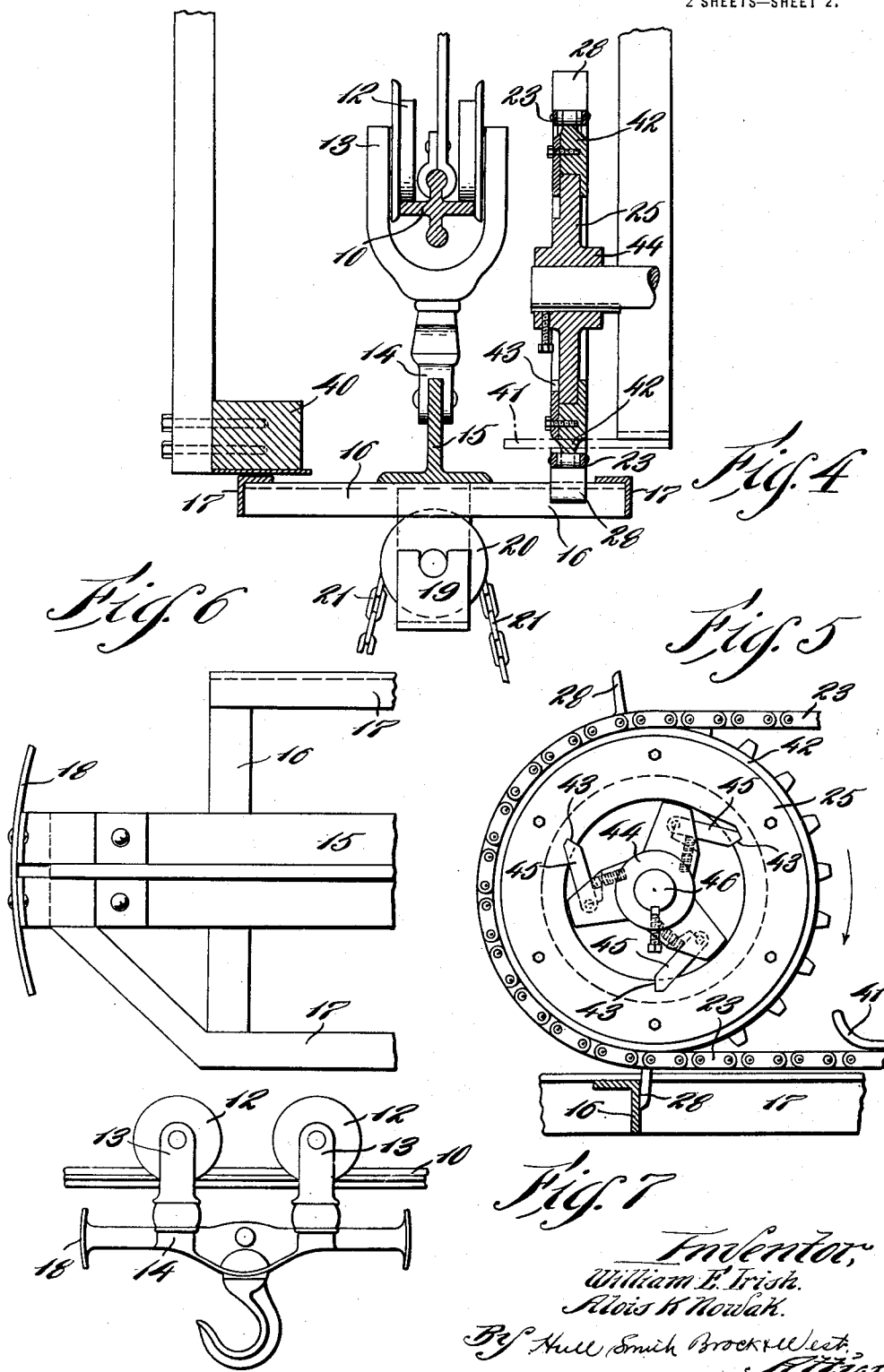
By Hull, Smith, Brock & West
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UNITED STATES PATENT OFFICE.

WILLIAM E. IRISH AND ALOIS KARL NOWAK, OF CLEVELAND, OHIO, ASSIGNORS TO
THE HYDRAULIC PRESSED STEEL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

ELEVATED CARRIER FOR HANDLING FRAMES AND THE LIKE.

1,417,528.

Specification of Letters Patent. Patented May 30, 1922.

Application filed October 8, 1919. Serial No. 329,326.

To all whom it may concern:

Be it known that we, WILLIAM E. IRISH and ALOIS KARL NOWAK, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Elevated Carriers for Handling Frames and the like, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention is a novel construction of elevated carrier designed for carrying automobile frames during the process of painting the same, but it will be understood that the invention is capable of use in connection with the carrying of various types of articles.

The object of the invention is to provide an elevated carrier, by means of which frames or other articles can be successively carried to various points or stations where operations are performed thereon, and then delivered at a point for unloading from the carrier, the track for the carriers being endless whereby the carriers can be used over and over for carrying the articles to the operating point.

Another object of the invention is to provide a carrier in which successive periods of rests will be had thereby, affording ample opportunity for the performance of the various operations; and a still further object of the invention is to provide a carrier capable of performing the desired operations and which will require the minimum amount of power, utilizing the movement of each carrier unit to transmit motion to the preceding unit.

With these, and certain other objects in view, the invention consists broadly in the employment of an endless track and a plurality of carriers movable upon said track in combination with independent moving devices or pushers arranged at predetermined points for moving the carriers along definite portions of the track.

The invention consists also in making the track of different levels and providing a pusher in advance of each elevation for the purpose of moving the carriers up said ele-

vation and along a definite stretch of level track.

The invention consists also in providing the carriers with longitudinal extensions so that said carriers can contact with one another and push one another along without permitting the articles carried to contact with one another; and the invention also consists in providing such longitudinal extensions with vertically extending end portions whereby contact between the carrier will be effected at all times irrespective of the differences in level between said carriers.

The invention consists also of certain details of construction and novelties of combination, all of which will be fully described hereinafter and set forth in the appended claims.

In the drawings forming a part of this specification, Fig. 1 is a diagrammatic top plan view of an elevated carrier embodying one form of our invention; Fig. 2 is a side elevation of the same; Fig. 3 is a detail view of one of the carriers and the pusher adapted to operate upon the same; Fig. 4 is a transverse sectional view on the line 4-4 of Fig. 3; Fig. 5 is a face view of the driving sprocket; and Fig. 6 is an enlarged detail plan of one end of the carrier frame. Fig. 7 shows a slight modification.

In the manufacture of automobile frames and similar articles fabricated from pressed sheet steel it is desirable, and often necessary, to paint or coat the metal frame or other article, in order to prevent rusting.

Before the coat of paint or other protective material can be applied it is necessary to remove all oil, grease or dirt which has accumulated upon the frame during its fabrication, and heretofore, so far as we are aware, a great amount of time and labor has been consumed in cleansing the frames and then coating or painting the same, inasmuch as it has been necessary to carry the frames to a suitable washing apparatus to remove the oil and grease and then dry said frames before applying the coating thereto, and these various operations separately performed, and effected by separate handling or moving from place to place, not only in-

volved a considerable amount of time and labor but also required considerable space.

The present construction of carrier was therefore devised to overcome these numerous objections and this has been done by providing an endless track and arranging thereon a plurality of carriers in which the frames or other articles can be suspended and started at one point upon the track and fed at proper speed first to the washing apparatus, then to the drying means, and then to the coating or painting device, and then carried along at proper speed over a definite distance to permit the drying of the paint or other coating during the interval of time that the elevated carrier, with frame or other article, require to arrive at the delivery point where the frame is removed from the carrier and another frame connected thereto; thereby rendering the operation of the carrier endless or continuous.

In the practical embodiment of the device thus briefly outlined, we employ an endless track 10 which may be of any suitable construction and suspended in any suitable manner, and it will be understood that this track can be arranged in the form of a straight or angled loop according to the character of the structure within which it is arranged. We have illustrated a straight loop as being the simplest form of apparatus.

Mounted upon the endless track 10, are the carriers 11, each comprising suitable trolleys 12, preferably arranged in pairs, each pair being connected by a yoke 13 from which depends a swiveled hanger 14; and rigidly connected to the depending hangers 14 is a T-bar 15 which constitutes the central longitudinal member of the carrier frame and whose length will be determined by the nature of the article to be carried. As a rule, automobile frames do not exceed fifteen feet in length and consequently, the carrier having an over all length of eighteen feet will be ample to carry frames sufficiently spaced to prevent contact, and also provide ample space for the various operations to be performed upon the article carried.

In addition to the central T-shaped member 15 the frame of the carrier comprises a plurality of cross pieces 16 formed of angle iron and attached to the central member or beam with one flange depending, these cross pieces 16 being arranged at definite intervals for a purpose hereinafter explained. Side pieces 17, also of angle iron are connected to the ends of the cross pieces 16 and at the opposite ends, these side pieces are extended and bent into alignment with the ends of the beam 15 and serve to support the vertically disposed bumper 18. These bumpers are preferably made of sheet metal and it will be noted that they have considerable breadth and height and are curved

from end to end thereby providing broad curved surfaces in order that the bumpers may contact with one another irrespective of the level or the angle of curve at which the contacting carriers may be traveling.

Any other form of carrier frame may be employed so long as the features of central longitudinal beam and the transverse cross pieces and the end bumpers are maintained.

A plurality of spaced clevises are connected to the central beam 15, (two being shown in the present instance) and each clevis has connected thereto a pulley 20 around which travels an endless chain or belt 21 in which the auto-frame or other article is suspended.

By arranging the article in this endless chain or belt, suspended from a pulley the article can be turned quickly and easily to any desired position so that all of the surfaces thereof can be thoroughly coated, painted or otherwise treated.

An automobile frame, or other article, is hung, in the pair of suspending chains depending from the carrier 11 and then the carrier is started along the level portion 22 of the track 10 which passes through a washer or other suitable form of cleansing apparatus, and in order to move the carrier along this stretch of the track, and also cause a train of carriers to be pushed along, we provide a pushing or moving device comprising an endless chain or belt 23, this chain or belt being arranged parallel with the track and adjacent thereto and traveling around sprockets 24 and 25, in the direction indicated by the arrow Fig. 5, the sprocket 25 being a power sprocket, deriving its power from an electric motor or other suitable source 26, there being reduction gears 27 interposed for reducing the speed, if desired.

The chain 23 is provided with a series of dogs 28 which engage the cross bars of the carrier frame and cause the said carrier frame to be moved along the track a distance equal to the length of the moving chain.

A second carrier with an automobile frame suspended therefrom is then moved along the track until the dogs upon the chain engage the cross bars of this second carrier and feed it forward, and this second carrier will contact with the first carrier and push the same along as it, the second carrier is being moved its initial distance by means of the pusher; and after the second carrier has been moved by the pusher as far as it can be advanced, a third carrier is brought into engagement with the pusher and it will be moved along pushing forward the first and second frames, the bumpers at the ends of the carrier frames contacting with each other, and in this manner the entire series of carriers is pushed along.

The suspended frame is first passed through a washer, indicated diagrammatically at 29, and then past the painting station indicated diagrammatically at 30. The

station is large enough to accommodate two or more frames and the paint is preferably applied by means of an air brush, although the frames may be dipped in a tank if desired. The step by step movement of the carriers is particularly advantageous where the paint is applied by workmen, since the intervals of rest permit the ready application of the paint to the various parts of the frame and makes easier the manipulation of the frames to bring the various parts thereof within reach of the paint applying devices. After the first frame emerges from the painter it is caused to travel by gravity down the inclined portion 31 of the endless track, and in practice this inclined portion of the track is preferably curved constituting as it does the end of the loop; and as the carrier completes its travel around the curved and downwardly inclined portion of the track, it is brought into engagement with a second pusher 32 constructed identically the same as the pusher previously described, and by means of this second pusher, which is independent of the first moving device, the carrier is caused to travel up the inclined portion 33 of the track upon or towards the level portion 34.

After the first frame emerges from the painter and travels down the incline to the second pusher 31, the second frame will follow the same course and will come into engagement with the second pusher and during the movement of the second frame it will come in contact with the end of the first frame and push the same along. The third frame will act in the same manner, so that by means of the second pusher or moving device the series of frames will be pushed along the incline 33 and the level portion of the track 34, and during these movements the painted or coated frame will have considerable time to dry; and at the end of the level portion 34 of track, the carrier is brought into engagement with another pusher or moving device 35, identical in construction with the pusher first described, and by means of this third pusher or moving device, the painted and dried frames are pushed up to the incline 36 to the elevated portion 37 of the track from which they travel by gravity around the downwardly inclined portion 38, arriving at the delivery point 39 where the frames are removed therefrom and the carriers moved along to the proper position for receiving other frames.

If desired, the power sprocket of the third pusher 35 can be mounted upon the same shaft as the power sprocket of the first pusher, inasmuch as these first and third pushers can usually be arranged opposite

each other, and we have so illustrated them, but it will be understood that the power sprocket of each pusher can receive its power from any suitable source.

It will thus be seen that by means of the endless track having portions thereof level and portions thereof upwardly inclined and portions thereof downwardly inclined, and that by having the carriers of such a length as to contact with one another at certain portions of their travel and that by means of separate and independent pushing devices, we are able to feed the automobile frames evenly through the washing and painting devices, carrying the frames around the bends of the loops by gravity and then feed the train of carriers along a definite stretch of track during which time the frames can dry and then deliver the dried frames one at a time by gravity at the end of the loop at which place the frame can be removed and the carrier moved along to receive another frame to be washed and painted. The upwardly inclined portions of the track are preferably made somewhat shorter than the carrier so that any pushed carrier will stop at the end of the pushing movement upon a level portion of track and will therefore not exert any backward thrust.

Inasmuch as the endless chain which carries the dogs is arranged parallel with the track and to one side of the central beam of carrier the engagement will be at one side of the center of said carrier and in order to prevent any possible tilting of the carrier which might effect a disengagement with the pusher we provide a guide strip 40, preferably of wood and faced with metal, and beneath which the opposite side of the frame bears during the passage of the carrier beneath the driving chain; and in order to prevent any buckling of the chain we arrange a shoe 41 which extends just above the lower flight of said chain and is spaced just far enough above said chain to permit the proper traveling movement of said chain but will arrest any upward or buckling tendency. The guide 40 and shoe 41 are suspended in any suitable manner.

The driving sprockets as shown in Figs. 4 and 5 comprise the toothed sprocket ring having ratchet faces upon the inner face thereof, said sprocket ring turning upon the hub portion 44 which is provided with a plurality of spring actuated pawls which engage the ratchet portions of the sprocket ring. The hub 45 is rigidly connected to the power shaft 46 and will turn the toothed sprocket ring in the direction of the shaft. By means of this construction, the sprocket ring will have a free running movement in one direction and consequently if one of the carriers should race into engagement with the driving chain there will be no undue strain placed upon the chain and sprocket

inasmuch as the sprocket will turn freely upon the central portion of the wheel and when the spring actuated pawls catch up with the sprocket portion, will continue to move the same in the proper direction for effecting the movement of the carrier.

It will thus be seen that we provide a simple and highly efficient form of device for moving a series of frames over a given course and during which time various operations can be performed thereon, the movement of said frames being accomplished with a minimum of labor, mechanism and power.

It will also be noted that by providing separate pushing devices and utilizing each carrier unit as a means for advancing the next preceding unit that a minimum amount of apparatus for each local pusher is required.

Furthermore by making the return bends of the track downwardly inclined, no power is required to move the carriers around said curves and by making the elevating portions of the track comparatively short in length, each carrier will be elevated by its local pusher to a position upon the level portion of the track so as to relieve all back thrust upon the apparatus.

It will also be observed that by allowing a certain interval of time between dispatching the carriers with the objects thereon, a corresponding interval of time will be allowed at the work stations for performing the various operations and hence such time interval in dispatching the carriers may be allowed to suit the particular work performed, thus assuring plenty of time at each work station for performing the various operations and at the same time preventing loss of time between carriers at the stations.

It is obvious that the track can be suspended in any suitable manner in order to accommodate surrounding conditions and it will be understood that the positions of the separate and independent pushers will be determined by the nature of the work to be performed upon the article carried.

It will also be understood that we have only illustrated one practical embodiment of our idea and that various changes and modifications can be made in the construction and arrangement of the several parts without departing from the broad principle of the invention as defined by the appended claims.

Having thus described our invention what we claim is:—

1. In an elevated carrier, the combination with an endless track having portions thereof level, portions thereof upwardly inclined, and portions thereof downwardly inclined, of carriers movable upon said track, independent moving devices for moving the carriers up the inclined portions of said track

and along the level portions thereof, and means associated with said moving device for absorbing any forward thrust imparted thereto by the forward movement of said carriers upon contact therewith.

2. In an elevated carrier, the combination with an endless track having portions thereof level, portions thereof upwardly inclined, and portions thereof downwardly inclined, of carriers adapted to move upon said track, said carriers having extended portions adapted to contact with one another, together with means arranged adjacent to and in advance of each upwardly inclined portion of the track and adapted to engage carriers at said points whereby said carriers are caused to move up the inclined portions and along the level portions of said track by means of said moving device, and means associated with said moving device for absorbing any forward thrust imparted thereto by the forward movement of said carriers upon contact therewith.

3. In an elevated carrier, the combination with an endless track, of a carrier adapted to travel upon said track, said carrier having a transverse member, and endless pusher chain adapted to engage said transverse member, a guidestrip arranged opposite the pusher chain and a shoe arranged above the lower flight of said chain for the purpose set forth.

4. In an elevated carrier of the kind described, the combination of a track, of a carrier movable upon said track said carrier including a frame having a longitudinal member and transverse members and endless chain provided with dogs, sprockets around which said chain travels, one of said sprockets being a hollow structure having a ratchet hub guidestrip arranged parallel with the endless chain and upon the opposite side of the longitudinal member and a shoe arranged above the lower flight of the endless chain, and means associated with said moving devices for absorbing any forward thrust imparted thereto by the forward movement of said carriers upon contact therewith.

5. In an elevated carrier, the combination with an endless track of a plurality of carriers arranged to travel thereon said carriers having their ends constructed for contact with one another and independent moving devices adapted to engage carriers at different points upon the track, and the movement of each carrier by said power device being transmitted to one or more carriers in advance thereof.

6. In a work supporting conveyor, a carrier, means for moving the carrier with successive intervals of rest and motion, means for varying the intervals of rest without varying the interval of motion.

7. In a work supporting conveyor, a car-

rier, a loading station, a work station, means for moving the carrier from the loading station past the work station, means for controlling the rate of movement of the carrier past the work station from the loading station.

8. In a work supporting conveyor, a carrier, a loading and carrier dispatching station, a work station, means for moving the carrier with intervals of rest and motion past the work station and means whereby the intervals of rest may be varied at will from the dispatching station.

9. In a work supporting conveyor, a carrier, a loading and carrier dispatching station, a work station, means for moving the carrier from the loading station past the work station and means whereby the rate of movement of the carriers past the work station is controlled by the dispatch of carriers from the loading station.

10. In a work supporting conveyor, a carrier, a loading and dispatching station, a work station, and means for moving the carriers step by step past the work station with intervals of rest corresponding to the intervals between the dispatch of successive carriers.

11. In a work supporting conveyor, a track, a series of carriers on the track, a work station, means adjacent the work station for engaging carriers one at a time and moving them toward the work station, means for feeding the carriers to the carrier engaging means one at a time at intervals whereby the carriers will be moved past the work stations step by step in abutting relation.

12. An endless conveyor comprising an elongated endless track, a loading and unloading station at one end of the conveyor, a carrier, automatic means for moving the carrier along the track from the loading station to the unloading station and means for free-

ing the carriers from the action of the moving means as they approach the unloading station whereby the movement of the carriers may be manually controlled at these stations.

13. In a work carrier, the combination with a track of a series of carriers on the track, a work station, means for feeding carriers one by one rapidly to the work station, means for moving the carriers slowly past the work station and means for moving the carriers one by one rapidly away from the work station.

14. In a work carrier, the combination with a track having level and downwardly inclined portions, a series of article carriers traveling on the track, means for moving some of the carriers end to end in abutting relation along the level portion and means for detaching the carriers one at a time from the row and starting them down the inclined portion.

15. In a work supporting conveyor, the combination with a plurality of work stations, a series of carriers, a loading station and unloading station for loading and unloading articles to be treated upon the carriers, means to move the carriers one by one rapidly from the loading station to the first work station, means to feed the carriers slowly past each of the work stations and means to move the carriers one by one rapidly from the last work station to the unloading station.

16. In an automobile frame conveyor, the combination with a work station, a carrier, means to move the carrier slowly past the work station and means upon the carrier for rotatably supporting the frame.

In testimony whereof, we hereunto affix our signatures.

WILLIAM E. IRISH.
ALOIS KARL NOWAK.