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CONVEYOR

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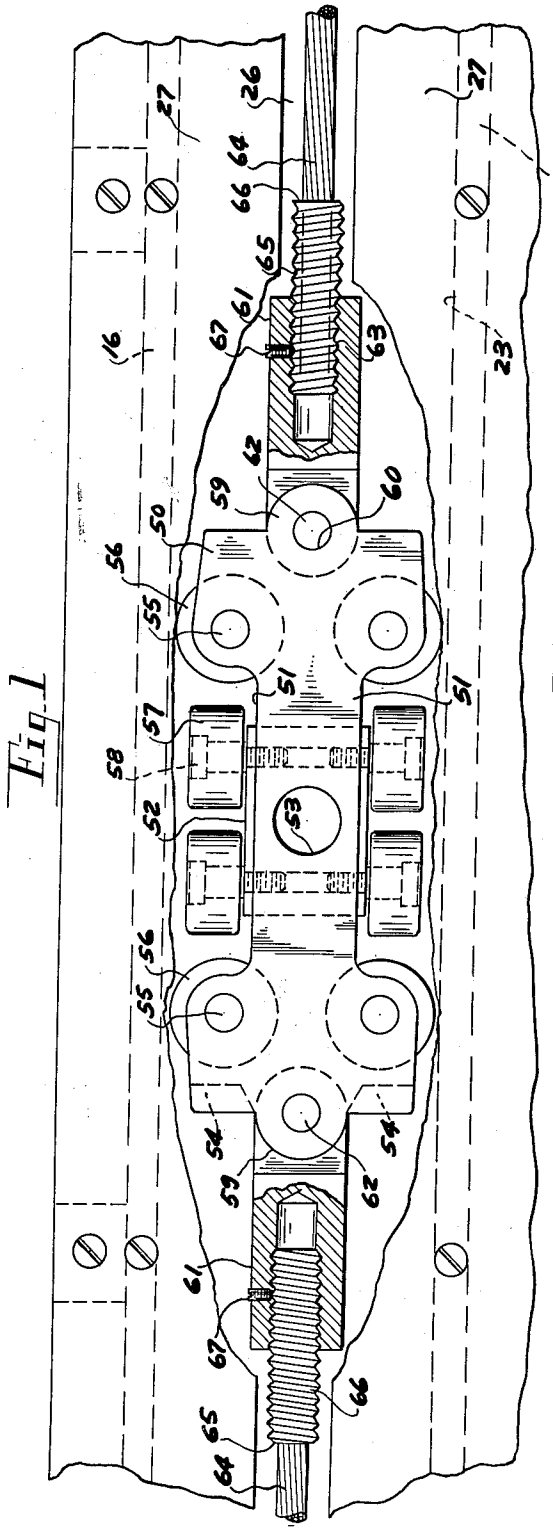


Fig. 1

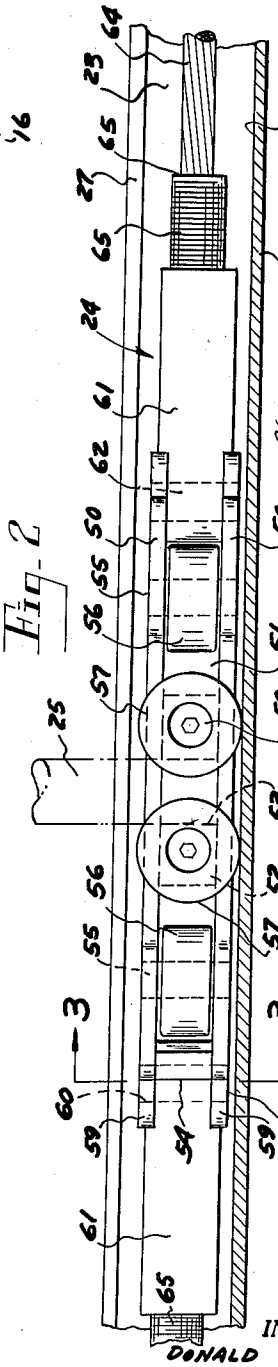


Fig. 2

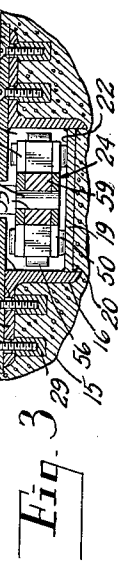


Fig. 3

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CONVEYOR

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The present invention relates to conveyors, and more particularly to an in or on floor conveyor.

It is the object of the present invention to provide a novel track assembly for an in or on floor conveyor, together with novel guide means for the movable flights of the said conveyor.

It is a further object of the present invention to provide a novel form of flight mechanism movable within the conveyor track for the purpose of transmitting movable objects over the floor of a building upon or within which the present conveyor mechanism is assembled.

It is a further object of the present invention to provide a novel form of in or on floor conveyor construction employing a series of wire rope elements interconnecting the respective conveyor flights, and taking the place of the conventional conveyor chain for this purpose.

It is the further object of the present invention to provide a novel assembly of the wire rope connecting elements with the respective movable flights of the conveyor mechanism.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawings in which:

FIG. 1 is a fragmentary plan view of a portion of conveyor track with the conveyor flight movably positioned therein, with a portion of the track broken away, for illustration of the flight mechanism.

FIG. 2 is a side elevational view thereof with a portion of the track broken away and sectioned, for illustration.

FIG. 3 is a central transverse section of FIG. 1, on a reduced scale.

It will be understood that the above drawing illustrates merely a preferred embodiment of the invention, and that other embodiments are contemplated within the scope of the claims hereinafter set forth.

Referring to the drawings, one form of layout of the present conveyor track is illustrated in FIGS. 1, 2 and 3.

A straight section 11 of said track is shown in FIG. 3, it being understood that the track for the conveyor may achieve any desired shape or configuration, depending upon the needs of the user.

Track Structure

The track is shown in detail in FIG. 3, as embedded within the concrete floor 15 and including the upright flanges 16 embedded into the concrete. Said flanges terminate at their upper ends in the right angular plates 17, also embedded in the concrete. Said plates are apertured at 18 to receive the securing fasteners 28 which project down through the coplanar top plates 27 for threaded engagement within the locking lugs 29 embedded within the concrete and centered with respect to apertures 18.

Bottom plate 19 is horizontally disposed between the upright plates 16 and at its opposite longitudinal edges fixedly secured thereto as by the welds 20, to thus define with the overlying top plates 27 longitudinally spaced apart as at 26, the compartment or elongated continuous chamber 21 in which the conveyor flights are movably positioned and guided.

The top surface 22 of bottom plate 19 provides a support over which the longitudinally spaced flights of the conveyor mechanism hereinafter described are movably mounted, being also guided by the carrier upright walls

23, forming a part of the plate 16, one of said flights being designated generally at 24, FIG. 3, and being shown on an enlarged scale, FIGS. 1–2.

As described hereafter, the said conveyor mechanism is movably positioned through the elongated channel 21, FIG. 3, and has a central block 52 forming a part thereof, vertically apertured at 53 to operatively receive the spring biased upright pin 25 schematically shown, which depends from the carriage or other object upon the surface F to be moved thereover, said pins being removably disengageable from the conveyors 24, as desired.

The top plates 27 of the conveyor assembly are spaced apart or otherwise slotted at 26 to permit longitudinal movement of the upright pin 25 under the drive of the conveyor flight 24.

The conveyor assembly or flights, generally indicated at 24, FIG. 3, are shown in detail in FIGS. 1 and 2 and include the horizontally disposed vertically spaced formed plates 50 which have elongated narrow portions 51 intermediate their ends, spaced apart by the rectangular block or body 52 vertically apertured at 53 and suitably secured together as a rigid unit either by fasteners or by welding, for illustration.

The respective opposite ends of the plates 50 have interposed therebetween and fixedly secured thereto, the upright spacers 54. The upright dowel pins 55 project through plates 50 and intermediate their ends journal and support the horizontally disposed rollers 56 which respectively nest between the plates 50 and project laterally outward thereof adjacent their opposite ends and their opposite sides, and are normally spaced a small distance from the interior upright walls 23 of the conveyor guide channel providing a means by which the conveyor flight is centered therein with the said rollers 56 adapted for operative engagement with the said interior walls 23 for guiding the flight therebetween during its longitudinal movements throughout the length of conveyor assembly.

Additional upright wheels 57 are arranged in pairs upon opposite sides of the conveyor flight adjacent the elongated narrow portion 51 thereof and journaled thereon by the transversely extending stripper bolts 58 which project into the block 52 upon its opposite sides, the wheels being suitably journaled and providing a moving support for the conveyor flights, operatively engaging the floor 22 of the bottom plate 19 forming a part of the guide means of the conveyor assembly, as best shown in FIGS. 2 and 3 to provide a means of movably mounting said conveyors with a minimum of friction within the said guide means.

The central bosses 59, vertically apertured at 60, project from the opposite ends of the respective plates 50 and are adapted to cooperatively receive the eye lugs 61 which are pivotally connected thereto by the upright pin 62. The said eye lugs provide a means of interconnecting the respective flights of the complete conveyor assembly employing a series of cable or wire ropes 64 of a predetermined length and spacing apart and interconnecting the respective flights 24 forming a part of the conveyor assembly.

In the preferred embodiment of the invention, the eye lugs 61 have axial interiorly threaded bores 63 and threadedly receive the exteriorly threaded heads 65, which are swedged or otherwise fixedly mounted upon the respective opposite ends of the short lengths of wire rope 64 as at 65. The lengths of wire rope 64 of predetermined length, have a cylindrical head 65 at their opposite ends fixedly secured thereto, one such head is shown as at 65 with a right hand thread.

It is contemplated that the head at the opposite end of the wire rope be provided with a left hand thread,

whereby rotation in one direction of the rope element **64** will cause its respective heads **65** to thread into the corresponding eye lugs **61** of an adjacent pair of flights of the conveyor assembly. Set screws **67** are provided through the said eye lugs for operative frictional engagement of the threaded end of the said head **65** for fixedly retaining said heads within the eye lugs, and thus completing the assembly of the respective flights **24** forming a part of the present conveyor assembly.

It is contemplated that there will be a considerable number of said flights longitudinally spaced from each other at uniform distances and interconnected by the respective wire rope elements **64—65**.

Power Drive

A suitable power means is transmitted centrally of the series of flights of the conveyor assembly, substantially in alignment with the longitudinal center line of the flight and the corresponding center line of the wire rope connectors therebetween.

In other words, the power is transmitted through the longitudinal center of the load. The individual flight, as shown in FIG. 3, is connected to a load by means of the retractable pin **25**, which depends from the load movably mounted upon floor surface F. Thus the power is transmitted to the respective flights of the conveyor along the center line thereof as distinguished from the cantilever type of action which is employed in the conventional type of chain conveyors and wherein the driving chain is well below the part of the conveyor assembly which carries the load as much as five inches, for illustration. In the present construction, the floor trucks, which are movably mounted thereover, have the depending spring biased pins **25**, which extend down into the central bore **53** of the conveyor flight, FIG. 1.

There are a number of advantages in the cable type conveyor assembly wherein the cable elements or wire ropes are employed for interconnecting the respective flights of the conveyor, as distinguished from chain conveyors wherein the chain is continuously operating in shear and eventually develops a permanent elongation of the chain due to wear of the respective parts and the connections.

On the other hand, the cable connections between the respective flights of the present conveyor are always operating in tension and have a constructional elasticity permitting elongation of the cable element as the drive power is transmitted. Thus the cable element which interconnects the said flight and the next succeeding flight therebehind is temporarily stretched; however, just as soon as the particular flight becomes disengaged from the dog which drove it, the said cable due to its constructional elasticity, automatically retracts to its original preformed length and accordingly there is no permanent elongation in the cable, and accordingly furthermore, no need for a takeup mechanism as is always the case in the use of chain conveyors.

Another advantage in the present construction over the chain conveyor type is that the present conveyor employs only twenty-five percent of the depth normally required in a chain operation. Applicants' conveyor can operate on a floor or in a floor, and may employ a height of 2½ inches overall as compared with a minimum of 7 inches in the case of chain conveyors.

The additional advantage above mentioned is the fact that the power transmission is along the center line of the conveyor flights, and also in alignment with the load pin depending from the trucks movably mounted upon the floor surface and driven in a predetermined path by the conveyor assembly for a more efficient operation than the cantilever type of power transmission employed in chain conveyors.

In the case of a sprocket chain type of conveyor, there is constant wear of the pins and the links in the chain with resulting elongation, until the sprocket chain elements no longer engage the drive sprocket and must be scrapped. With the chain operated type of conveyor, a takeup must be used from time to time. However, in the cable connected type of assembly, the individual cable elements which interconnect the respective flights, as indicated at **64**, are preformed so that when an individual link arrives at the drive source, the entire load is applied temporarily to that link and it is temporarily stretched within its elastic limit.

The characteristic, however, of the use of the wire rope connection is that immediately after disengagement of the power drive from the conveyor flight, the said cable element contracts, and accordingly, there is provided a built-in takeup in every link due to the constructional elasticity of the cable elements employed interconnecting the flights of the conveyor to thus provide a more efficient operation and to eliminate the need of takeup mechanism.

At the same time the particular type of cable connections with the respective flights of the conveyor assembly are such that spacing may be accurately adjusted and regulated between flights as required, setting up the assembly.

Having described our invention, reference should now be had to the following claims.

We claim:

1. In a floor conveyor, an elongated guide channel including bottom and side support walls, a conveyor assembly movable within said channel, said assembly comprising a pair of elongated vertically spaced plates, a body interposed between the ends of and fixedly interconnecting said plates, longitudinally spaced pairs of vertically disposed wheels journaled upon opposite sides of said body extending below said plates and movably mounted upon said bottom support wall, additional pairs of horizontally disposed wheels spaced between and journaled upon said plates adjacent their front and rear ends and projecting laterally thereof normally spaced inwardly of said side support walls and adapted for intermittent cooperative engagement therewith, cable means extending from opposite ends of said assembly, and means on said assembly aligned with said cable means for releasable engagement with a load connected element.

2. In a floor conveyor, an elongated guide channel including bottom and side support walls, a conveyor assembly movable within said channel, said assembly comprising a pair of elongated vertically spaced plates, a body interposed between the ends of and fixedly interconnecting said plates, longitudinally spaced pairs of vertically disposed wheels journaled upon opposite sides of said body extending below said plates and movably mounted upon said bottom support wall, and additional pairs of horizontally disposed wheels spaced between and journaled upon said plates adjacent their front and rear ends and projecting laterally thereof normally spaced inwardly of said side support walls and adapted for intermittent cooperative engagement therewith, vertically apertured centrally disposed bosses projecting from opposite ends of said plates, in vertical registry, and a longitudinally aligned eye lug at opposite ends of said plates, at their one ends respectively projected between said bosses and pivotally connected therewith and at their opposite outer ends having axial bores therein.

3. In a floor conveyor, a pair of elongated vertically spaced plates, a body interposed between the ends of and fixedly interconnecting said plates, longitudinally spaced pairs of vertically disposed wheels mounted upon opposite sides of said body extending below said plates and adapted to be movably mounted upon a bottom support wall, additional pairs of horizontally disposed wheels spaced between and journaled upon said plates at their front and rear ends respectively and projecting laterally thereof, vertically apertured centrally disposed bosses

projecting from opposite ends of said plates longitudinally thereof, and a longitudinally aligned eye lug at each end of said plates, each eye lug projecting between a corresponding pair of apertured bosses at one end and pivotally connected thereto with the opposite end of each eye lug having an axial bore.

4. In a floor conveyor, a guide channel including bottom and side support walls, and a plurality of longitudinally spaced conveyor assemblies movably positioned within said guide channel, each conveyor assembly comprising an elongated body, vertically disposed wheels journaled upon opposite sides of said body extending therebelow and movably mounted on said bottom support wall, longitudinally spaced pairs of horizontally disposed wheels journaled adjacent the front and rear ends of said body and projecting laterally thereof, normally spaced inwardly of said side support walls, eye lugs at opposite ends of said body extending longitudinally thereof and pivotally connected at their one ends to said body, the other ends of each eye lug having an axial bore, a unit length flexible cable element interposed between a pair of conveyor assemblies, a cylindrical head secured upon the ends of each cable element, and projected into and secured within the bores of said eye lugs between an adjacent pair of conveyor assemblies.

5. In the floor conveyor of claim 4, the bores of said eye lugs being interiorly threaded, said heads being threaded into said bores adjustably to regulate the spacing between conveyor assemblies.

6. In the floor conveyor of claim 4, there being a vertical bore centrally disposed through said body, in longitudinal alignment with said cable elements, adapted to receive a load connected element.

7. In a floor conveyor, an elongated guide channel including bottom and side support walls, a conveyor assembly movable within said channel, said assembly comprising an elongated load engaging body, a pair of upright wheels journaled on opposite sides of the body and extending therebelow, movably mounted upon said bottom support wall, and additional pairs of horizontally disposed wheels journaled upon the respective front and rear ends of said body and projecting laterally thereof normally spaced inwardly of said side support walls, and adapted for intermittent cooperative engagement therewith, vertically apertured centrally disposed bosses projecting from opposite ends of said body longitudinally thereof, and a longitudinally aligned eye lug at opposite ends of said body pivotally connected at one end to said body bosses respectively and at its opposite end having an axial bore.

References Cited in the file of this patent

UNITED STATES PATENTS

790,828	Gunckel	May 23, 1905
1,000,106	Morris	Aug. 8, 1911
1,420,115	Lange	June 20, 1922
2,604,974	Daigle	July 29, 1952
2,642,176	Deburgh	June 16, 1953
2,981,203	Parker et al.	Apr. 25, 1961