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SELF-LEVELLING MOTOR MOUNT FOR ADJUSTABLE MATERIAL ELEVATORS

Filed May 18, 1959

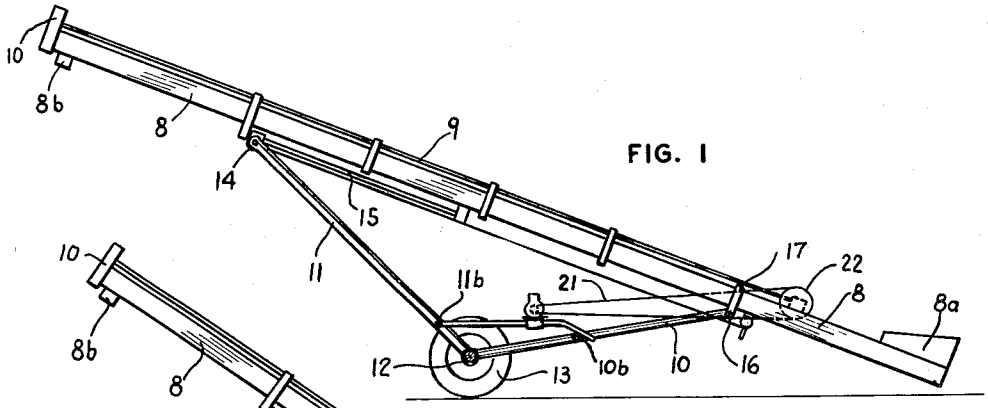


FIG. 1

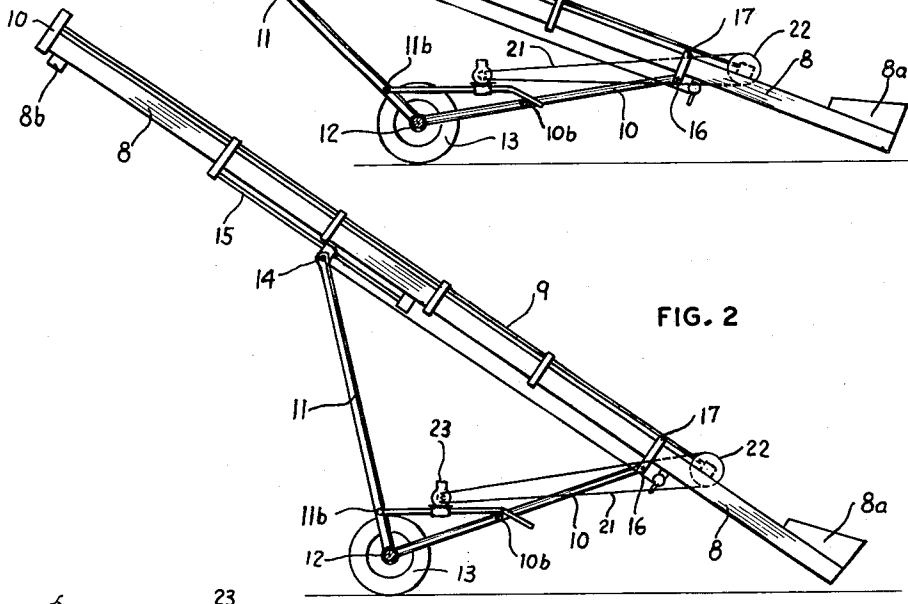


FIG. 2

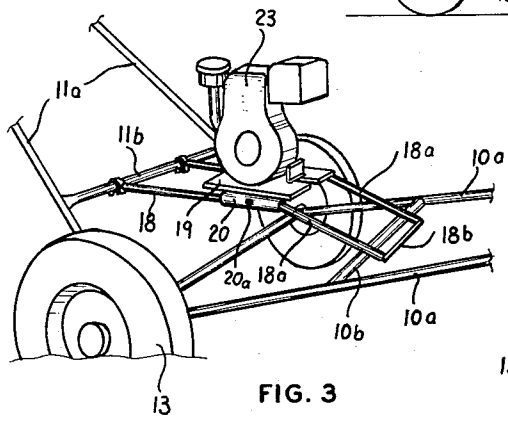


FIG. 3

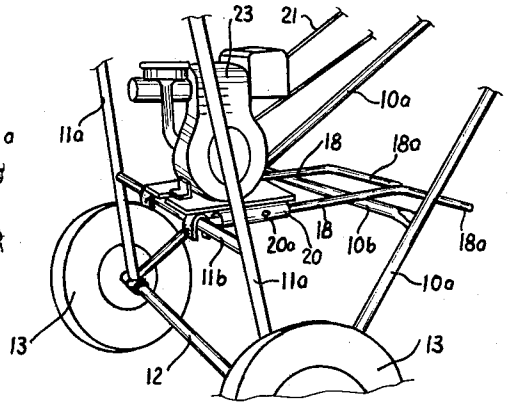


FIG. 4

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SELF-LEVELLING MOTOR MOUNT FOR ADJUSTABLE MATERIAL ELEVATORS

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This invention relates to an improved motor mount particularly designed for use with vertically adjustable grain elevators.

While the structure disclosed and claimed in United States Patent No. 2,811,239, granted October 29, 1957, to Hubert A. Tintes, has operated very satisfactorily it is somewhat expensive to manufacture and is subject to a number of construction, assembly and maintenance problems.

It is an object of the present invention to provide an extremely simple yet highly efficient motor mount for use with vertically adjustable material elevators which is specifically designed to maintain the motor mounted thereon in a level orientation relative to the ground regardless of the adjusted position of the elevator supporting arm structures.

It is another object of the present invention to provide a motor mount frame structure horizontally pivoted at one end to one of a pair of supporting arm structures and supported in sliding relation on the other arm structure with the portion of the motor mount support disposed in slidable engagement with said second arm structure being inclined out of the plane of the motor mount portion of the mounting frame to maintain a motor carried by said mount in level position regardless of the adjusted angle of divergence between said elevator supporting frames.

It is still another object to provide an extremely simple yet highly efficient motor mount frame with a motor mounting carriage slideably mounted thereon and carried by the swingably mounted elevator supporting frame to permit the angle of divergence therebetween to be easily and quickly adjusted being supported in a manner to maintain the motor mounting carriage in level position throughout the range of adjustment between said arm structures.

These and other objects and advantages of this invention will more fully appear from the following descriptions made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views, in which;

FIG. 1 is a central vertical sectional view of a material handling elevator embodying my invention and showing the elevator in lowered position;

FIG. 2 is a similar view showing the elevator in partially raised position;

FIG. 3 is a perspective view of my motor mount frame showing the elevator supporting arms in spread-apart lowered position; and

FIG. 4 is a perspective view of the structure shown in FIG. 3 with the arms in contracted relation to raise the elevator into elevated position.

As illustrated in the accompanying drawings, I provide an auger-type elevator having an elongated hollow tubular casing with the intake hopper 8*a* at the lower end thereof and a discharge spout 8*b* at the upper end thereof. A conveying auger of conventional design (not shown) is mounted within said tube 8 to carry material therethrough in the usual manner. A drive shaft 9 extends along the outside of the casing 8 and drives said auger as by a suitable drive connection mounted within the housing 10 at the upper end of the casing. A pair of elevator supporting arm structures such as the reach arm 10 and the lift arm 11, are pivotally mounted on a wheeled axle 12 having the wheels 13 journalled on the ends thereof.

The lift arm structure 11 is formed from a pair of upwardly converging frame elements 11*a* respectively journalled at their lower ends in spaced-apart relation on the axle 12 and are pivotally connected at their upper ends to a sliding carriage assembly 14 which is slidably mounted on a track 15 carried by the casing 8.

The reach arm structure 10 is also an A-frame generally similar to the lift arm structure 11 and has a pair of upwardly converging frame elements 10*a* journalled in spaced-apart relation on the axle 12 as best shown in FIGS. 3 and 4. The upper ends of the frame elements 10*a* are mounted on a fixed pivot 16 connected to a bracket 17 mounted on the lower portion of the tubular casing 8.

A cross bar 11*b* is rigidly connected between lower intermediate points of the lift arm elements 11*a* and a cross bar 10*b* is rigidly connected between lower intermediate points of the reach arm elements 10*a* as best shown in FIGS. 3 and 4. The elevation of the two cross members 10*b* and 11*b* is generally similar when the two arm structures 10 and 11 are in raised, contracted position as best shown in FIG. 4; however, the cross member 10*b* is disposed somewhat lower than cross member 11*b* when said arm structures are in expanded widely-divergent position as best shown in FIGS. 1 and 3.

In the form of the invention illustrated, the lift arm structure 11 is slidably mounted at its upper end on track 15 as previously described. This permits the angle of divergence between the bars 10 and 11 to be adjustably varied and thus facilitates adjustment of the angle of inclination of the elevator tube 8 and the elevation of the discharge spout 8*b* at the upper end of said tube. It is apparent that this adjustment of the elevation of the elevator will vary the elevation of cross bar 11*b* on which the forward ends of the frame members 18 are pivotally supported. Adjustment of the elevator tube 8 will vary the elevation of the cross bar 10*b* but to a much lesser extent than the respective variations in the elevation in the lift arm cross bar 11*b*. The difference in the respective elevations between the supporting cross bars 10*b* and 11*b* at the various points of adjustment of the arm structures 10 and 11 must be compensated for in order to maintain the motor mounting carriage in substantially level orientation. In my present invention this is accomplished by the rearwardly extending inclined portions 18*a* of frame member 18 which are designed to produce this compensation and maintain the forward portions of the frame members 18 in substantially level position for all adjusted positions of the arm structures 10 and 11. The cross bar 10*b* forms a guiding and supporting structure and the inclined frame elements 18*a* provide a track structure which rides in sliding relation on said guiding structure 10*b*. It will be apparent from a consideration of FIGURES 1 and 2 that the lift arm cross bar 11*b* will rise and fall more rapidly than the reach arm cross bar 10*b*, particularly during the stages of adjustment from extreme lowered position to partially elevated position. Therefore means must be provided for elevating the intermediate portion of said frame members 18 to maintain said frame in a level orientation. In the form of my present invention illustrated, this is accomplished by the inclined portions 18*a*. It is, however, apparent that this inclined sliding rail and guiding assembly could be modified by providing an inclined guiding track on the lift arm in which the forward ends of the straight frame members 18 would ride. In other words, my invention lies in the simplicity of the direct sliding relationship between the frame elements 18 and supporting guides

carried by the reach arm structure **10** which equalize the rate at which the rear end of the frame members **18** are raised and lowered with respect to the forward ends thereof during adjustment of the arm structures **10** and **11**.

The motor mounting frame has a pair of longitudinally disposed frame elements **18** mounted at their forward ends on the cross bar **11***b* as by anchoring clamps, and has a motor mounting carriage **19** slidably mounted thereon as by the sleeves **20** best shown in FIGS. 3 and 4. The rear portion of the frame members **18** are inclined downwardly to form positioning sliding elements **18***a* which provide a track structure which is mounted in slidable relation on a suitable guiding and supporting structure which is formed by the rear reach arm cross bar **10***b*. The rear ends of the inclined portions **18***a* are connected by a cross frame member **18***b* as best shown in FIG. 3, to form a rigid mounting frame unit.

The drive shaft **9** in the form shown is driven by a belt **21** and driven pulley **22** by any suitable source of rotary power as the gasoline engine **23** illustrated. In order to maintain driving tension on the belt **21**, the position of the motor **23** must be shifted on the frame members **18** and suitable means for locking the carriage **19** in the desired adjusted position are provided such as the set screw **8***a* extending through one of the sleeves **20** for locking engagement against the frame member **18**.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention which, generally stated, consists in the matter set forth in the appended claims.

What is claimed is:

1. An adjustable height elevator conveyer comprising a pair of upwardly divergent supporting arm structures pivotally mounted at their lower ends to permit the angle of divergence therebetween to be adjustably varied, an elongated elevator conveyer mechanism carried by the upper portions of said arm structures, a motor mounting frame extending between intermediate portions of said arm structures and supported thereby, a first end of said frame being pivotally supported on a first of said arm structures and the second end portion of said frame being slidably mounted with respect to a second arm structure and supported thereby, said second end portion being inclined from the end and toward the center thereof, the sliding relationship between said second arm structure and said frame and the degree of said incline being constructed and arranged to produce equal raising and lowering of both ends of said frame during adjustment of the angle of divergence between the two arm structures to maintain said frame substantially level at all stages of adjustment.

2. The structure set forth in claim 1 in combination with a rail structure rigidly connected with the free end of said frame and a supporting guide-way slidably engaging said rail structure and being supported by the second arm structure.

3. The structure set forth in claim 1 in combination with a motor mounting carriage being slidably mounted on said frame with means for positively anchoring said carriage in a desired adjusted position.

4. The structure set forth in claim 3 and said frame members being particularly characterized in that said frame comprises a pair of elongated straight tubular sections, and a pair of tubular sleeves being slidably mounted on said sections and mounting said carriage in slidable relation to said frame.

5. An adjustable height elevator conveyor comprising a pair of upwardly divergent arm structures pivotally mounted at their lower ends for swinging movement on a common substantially horizontal axis to permit the angle of divergence therebetween to be adjustably varied, an elongated elevator conveying mechanism carried by the upper portions of said arm structures, a motor mounting frame extending between intermediate portions of said arm structures and supported thereby, the front end of said frame being pivotally supported on the forward arm structure and the rear portion of said frame being slidably mounted with respect to the other arm structure, a supporting guide-way carried by said second arm structure and slidably engaging said frame, a rail structure inclined downwardly from said frame for engagement with said guide-way during at least certain stages of the adjustable range of divergence between said two arm structures, the angle of said incline being arranged to elevate the rear end of said frame with respect to the forward end thereof during the adjustment and thus maintain said frame in substantially level orientation during all stages of said adjustment.

6. The structure set forth in claim 5 and said rail structure comprising a pair of downwardly inclined supporting elements and said guide-way comprising a cross rod mounted on said second arm structure to provide a simplified self-leveling motor mounting frame.

References Cited in the file of this patent

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