July 16, 1957 H. BUTCHER, SR 2,799,387

BALE ELEVATOR STRUCTURE

Filed Jan. 8, 1954 3 Sheets-Sheet 1

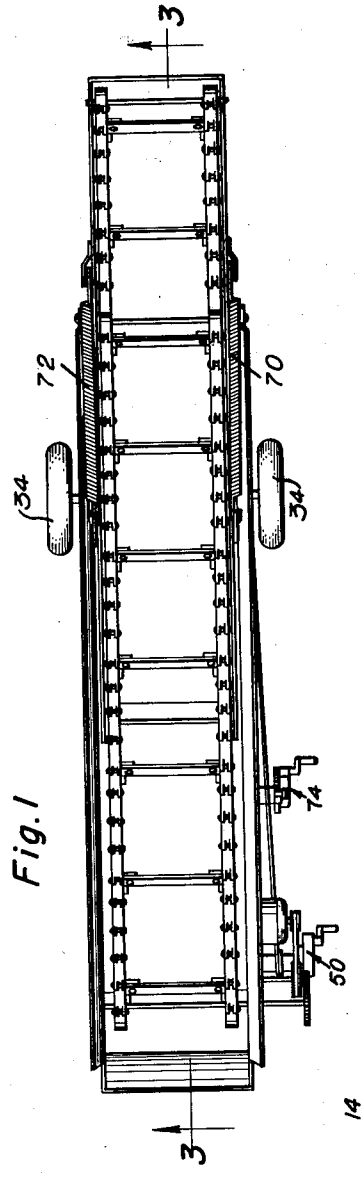


Fig. 1

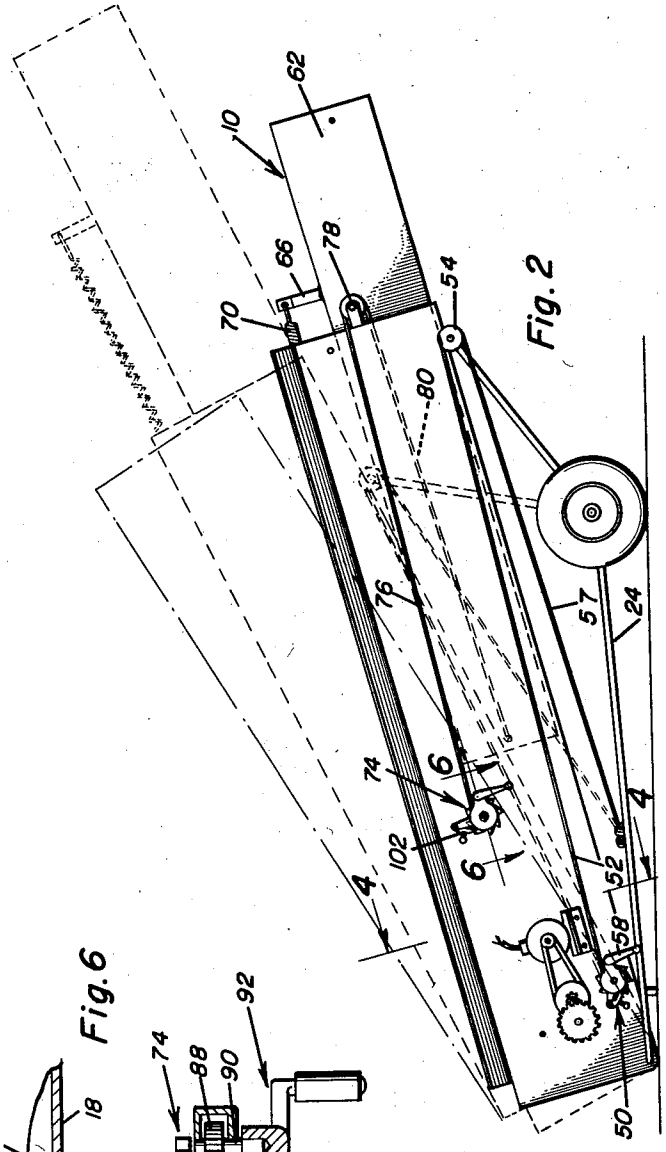


Fig. 2

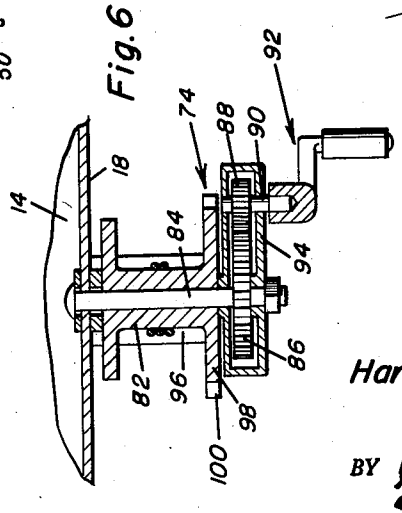


Fig. 6

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BALE ELEVATOR STRUCTURE

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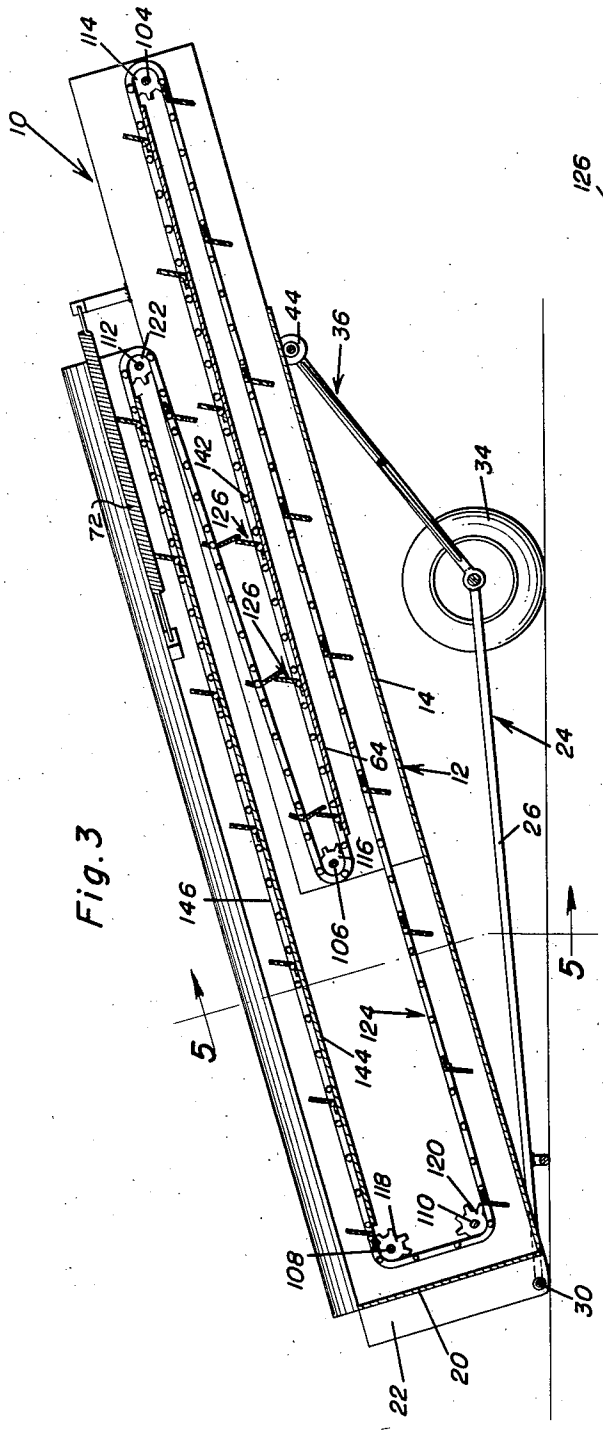


Fig. 3

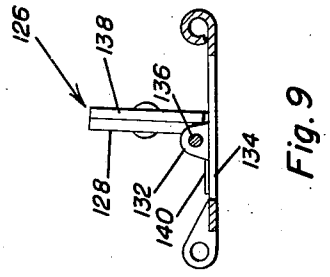


Fig. 9

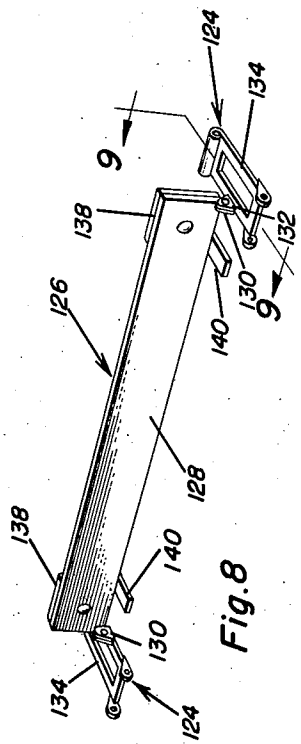


Fig. 8

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Fig. 5

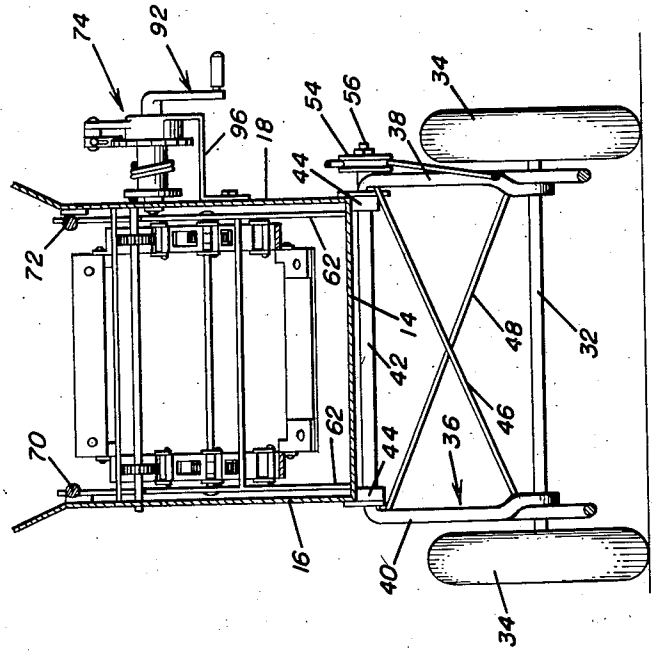


Fig. 4

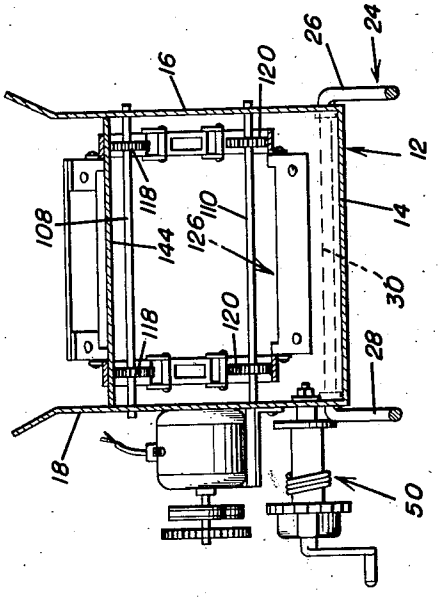
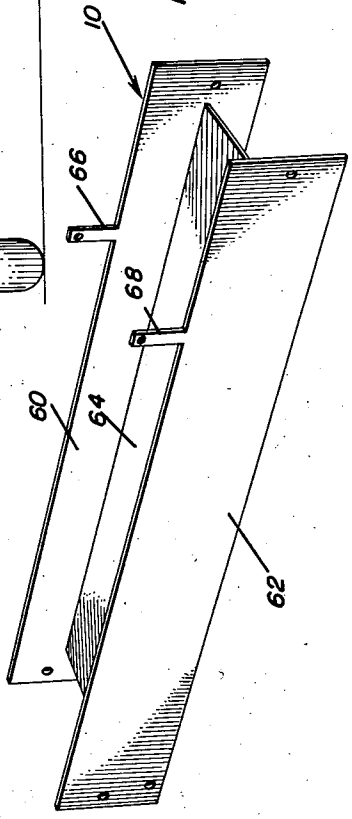


Fig. 7



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2,799,387

BALE ELEVATOR STRUCTURE

Harry Butcher, Sr., Millerton, Pa.

Application January 8, 1954, Serial No. 402,866

1 Claim. (Cl. 198—120.5)

This invention relates generally to conveyor mechanism an pertains more particularly to an improved form of bale elevator structure.

A primary object of this invention is to provide an improved bale elevator mechanism, which consists essentially of inner and outer frame assemblies, telescopically interengaged and provided with a single endless flexible conveyor mechanism and means for selectively extending and collapsing the inner frame with respect to the outer frame.

Another object of this invention is to provide a mechanism in conformity with the foregoing object, wherein means is provided for raising and lowering the extensible end of the assembly.

Still another object of this invention is to provide an improved form of bale elevator structure having inner and outer mutually extensible frame members and a single endless flexible conveyor assembly which consists of a pair of spaced endless chain members interconnected by paddle or blade elements pivotally connected thereto, the inner and outer frame being provided with means for maintaining certain of the panels in upright, conveying position while the remainder of the blades or paddles are permitted to swing freely such that the entire assembly may be made of extremely compact design.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a plan view of the assembly;

Figure 2 is a side elevational view of the assembly, showing various of its positions in dotted lines;

Figure 3 is a longitudinal vertical section taken substantially along the plane of section line 3—3 in Figure 1;

Figure 4 is a transverse vertical section taken substantially along the plane of section line 4—4 in Figure 2;

Figure 5 is another vertical transverse section taken substantially along the plane of section line 5—5 in Figure 3;

Figure 6 is an enlarged horizontal section taken substantially along the plane of section line 6—6 in Figure 2;

Figure 7 is a perspective view of the inner frame assembly;

Figure 8 is a perspective view of one of the blade or paddle members;

Figure 9 is a vertical section taken substantially along the plane of section line 9—9 in Figure 8.

Referring now more particularly to the drawings, it will be noted that the improved bale elevator structure consists essentially of an inner frame, designated generally by the reference character **10**, telescopically received in an outer frame designated generally by the reference character **12**. The outer frame consists of a bottom wall **14** having spaced upstanding side walls **16** and **18** secured thereto or integrally formed therewith and an end wall **20**. As seen most clearly in Figure 3, the end wall **20** is

spaced slightly inwardly from the rearwardly projecting end portion **22** of the side walls **16** and **18**. A support member indicated generally by the reference character **24** is of U-shaped configuration presenting the spaced leg members **26** and **28** interconnected by a bight portion **30** which extends through the aforementioned side wall projection **22**, the same being rotatably received therein. The free ends of the legs **26** and **28** journal the axle member **32** which is provided at its opposite ends with the wheel members **34** for movably supporting the entire assembly.

An elevating assembly indicated generally by the reference character **36** is of U-shaped configuration having spaced arm members **38** and **40** interconnected at one end by a bight portion **42** underlying the bottom wall **14** of the outer frame **12** and provided thereon with generally hat-shaped roller members **44** which simultaneously engage the undersurface or bottom wall **14** of the frame **12** and the opposed side walls **16** and **18** thereof in the manner shown most clearly in Figure 5. The free ends of the arms **38** and **40** visibly receive the axle **32** and suitable cross brace members **46** and **48** may be provided for rigidifying the elevating assembly. A windlass assembly, indicated generally by the reference character **50** is secured adjacent the rear end of the frame **12** and a cable member **52** issues therefrom in the manner shown and is trained about a pulley **54** journaled on a shaft member **56** secured to the elevating frame **36** and the cable then extends in flight **57** to a point of attachment on the support assembly **24**. A suitable ratchet assembly is associated with the windless **50** and it will be manifest that manipulation of the crank **58** thereof will effect swinging of the elevator assembly **36** in a vertical plane to raise and lower the forward end of the frame **12** as indicated by the dotted lines in Figure 2.

As seen most clearly in Figure 7, the inner frame assembly **10** consists of a pair of spaced parallel side plate members **60** and **62** interconnected by a transverse plate member **64**, the opposite ends of which terminate short of the corresponding ends of the side plates **60** and **62**, as shown. The dimensions of the inner frame **10** are such that the side plates **60** and **62** are disposed closely adjacent the side walls **16** and **18** of the outer frame **12** when the two frame members are telescopically engaged and it will be seen that the upper edge of the side plates **60** and **62** are provided with vertical extension ears **66** and **68** apertured at their free ends to receive the tension springs **70** and **72**, the opposite ends of which are suitably secured to the outer frame such that the two frame members are normally urged to a collapsed position. For the purpose of selectively extending the inner frame, a windlass assembly indicated generally by the reference character **74** is provided on one side wall of the outer frame and a cable **76** associated therewith is trained over a pulley **78** journaled at the forward end of the outer frame, the cable then extending in the flight **80** to a point of attachment at the rearward end of the inner frame, such that manipulation of the windlass will extend the inner frame **10** in opposition to the springs **70** and **72** for positioning the bale elevator as desired.

Referring now more particularly to Figure 6 wherein the details of the windlass **74** are shown, it will be seen that this assembly consists of a drum member **82** suitably tethered to the shaft **84** extending through the side wall **18** of the outer frame and provided at its free end with a gear member **86** meshing with a pinion **88** on shaft **90** to which the handle assembly **92** is secured. A casing **94** journals the free end of shaft **84** and also journals the shaft **90**, as will be readily apparent, this housing or casing being rigidly secured to the side wall **18** by means of the bracket portion **96**. One flange **98** of the drum **82** is provided with ratchet teeth **100** with which a

pawl **102** is engageable to prevent the springs **70** and **72** from returning the frame asesmblies to collapsed position until such time as the pawl mechanism is released.

As seen most clearly in Figures 3–5, the conveyor assembly is formed by providing shaft members **104** and **106** at the opposite ends of the inner frame **10** and a pair of vertically spaced shaft members **108** and **110** at the rearward end of the outer frame as well as the shaft member **112** at the forward end of the outer frame in the manner shown. Each of the shaft members carries a pair of sprocket members, **114**, **116**, **118**, **120** and **122**, respectively, disposed adjacent and inwardly of the respective side members of the inner and outer frames. An endless chain member **124** is associated with each set of sprockets in the manner shown most clearly in Figure 3.

As shown most clearly in Figures 8 and 9, the chain members **124** are interconnected by a plurality of blade or paddle assemblies **126**, which incorporate the elongated paddle plate **128** extending between the chain elements and having ears **130** at opposite ends thereof adjacent corresponding ears **132** on the individual link **134** of the chain by means of which a pin member **136** pivotally connects the paddle assemblies between the chain. The opposite ends of the paddle plate are additionally provided with suitable brackets **138** having laterally bent and laterally projecting cam arms **140**, the purpose of which will be presently apparent.

As seen most clearly in Figure 3, the guide plate member **64** of the inner frame **10** is located with respect to the sprockets **114** and **116** such that the flight **142** of the chain member which extends therebetween is disposed immediately thereabove such that as the paddle assemblies **126** pass thereover, the cam arms **140** will engage on the upper surface of the guide plate **64** to maintain the paddle blades in substantially vertical position for properly engaging the bale to be carried by the assembly. Likewise, a guide plate **144** is disposed between the opposed side walls **16** and **18** of the outer frame **12** to closely underlie the flight **146** of the chain assembly which extends between the sprockets **118** and **122** to maintain the associated paddle blades in vertical position during their travel therebetween. All the remaining paddle blades are permitted to swing or pivot freely between the chain assemblies. This construction is very important inasmuch as it permits the vertical height of the conveyor or bale elevator assembly to be materially reduced as will be readily apparent from a study of Figure 3. In this respect, it will be noted that the bottom wall **14** of the outer frame may be disposed much more closely to the lower flight of the chain assemblies than is shown in Figure 3 even to the extent that this lower flight rests upon the bottom wall **14**.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claim.

What is claimed as new is as follows:

A bale elevator assembly comprising an outer conveyor frame, an inner conveyor frame telescopically received in said outer frame, a pulley rotatably mounted at each end of said outer frame and a pulley rotatably mounted at each end of said inner frame, an endless flexible element trained over said pulleys, means for driving one of said pulleys, means for selectively extending said inner frame from the outer frame, a plurality of longitudinally spaced blades pivotally connected to said flexible element, and means on said inner and outer frames for maintaining those blades disposed between the pulleys at the opposite ends of the respective frames in an upright position, said last mentioned means including an elongated plate on each of said frames, said plates underlying those flights of the flexible element extending between the pulleys at the opposite ends of the respective members, a U-shaped support member having a bight portion, one end of said outer frame being journaled on said bight portion of said support member, an axle journaled between the free ends of said support member, an arm pivotally secured to said axle at one end and having its other end provided with a roller, said roller engaging the under surface of said outer frame adjacent its other end, and means for swinging said arm about said axle for raising and lowering said other end of the outer frame.

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