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BELT TIGHTENING MEANS FOR ENGINE UNITS

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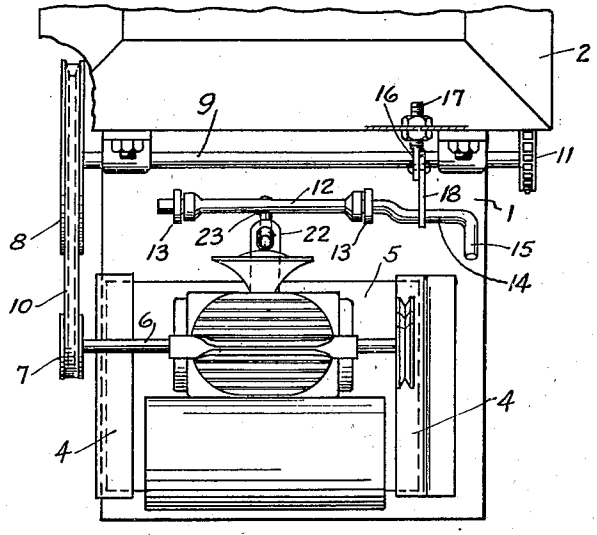


Fig. 1

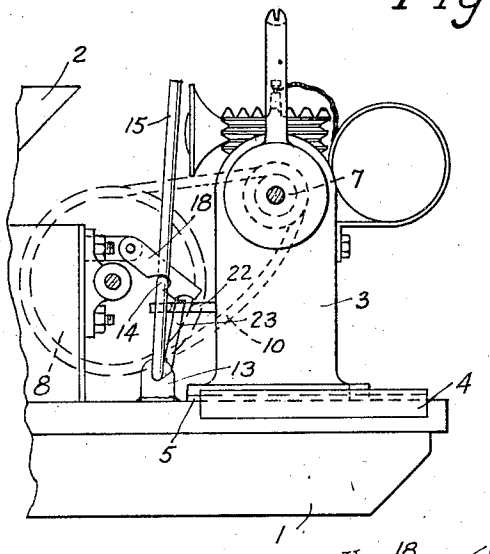


Fig. 2

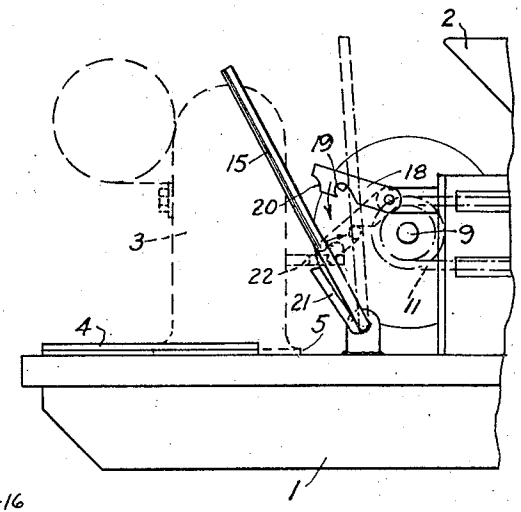


Fig. 3

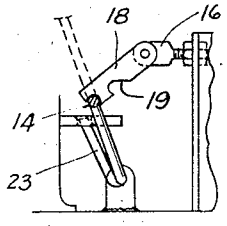


Fig. 4

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BELT TIGHTENING MEANS FOR ENGINE UNITS

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8 Claims. (Cl. 74—242.13)

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A primary object of my present invention has been to devise a simple and efficient mechanism for tightening the driving belt connection between an engine or like motor and a machine designed to be driven by such engine.

My improvements herein set forth are designed primarily to be used in conjunction with a portable engine adapted to be used for operating the conveyor belt of a portable conveyor, such as may be carried on a coal truck, or used for other conveying purposes as for instance the conveying of plastic concrete or aggregates of different kinds.

In the carrying out of my invention I utilize a small portable explosive engine adapted to be positioned upon and removed from the driving end of the frame of the conveyor unit. The engine is equipped with a driving pulley adapted to be connected by a belt with the driven pulley of the conveyor. The instrumentalities of my invention are manually operable, after emplacement of the engine on the conveyor frame, to move the engine into a position in which the conveyor belt may be readily looped over the driving pulley of the engine and the driven pulley of the conveyor unit. Said instrumentalities are adapted to engage with the engine so as to actually move the latter to a position near the conveyor driven pulley for facilitating the emplacement of the belt connection, and thereafter to move the engine, after the belt is in position on the driving and driven pulleys, to a position in which the belt is tightened for driving action. By the use of my invention it is unnecessary to employ any conventional type of clutch device since the engine may be placed in position on the conveyor frame and started into operation while the belt is slack as it extends over the driving and driven pulleys, and then when the engine is started the mechanical devices of my invention may be operated manually to move the engine to tauten the belt and cause the driving forces of the engine to be transmitted through the belt to the driven pulley of the conveyor device.

It is contemplated, of course, that the manually operable instrumentalities of my invention may be employed in conjunction with other machines than conveying units, the employment of the invention in conjunction with the latter being simply one preferred embodiment of the invention.

Included in my invention are means for latching the engine in its first position in relation to the conveyor or equivalent frame so that the engine is held with the driving belt slack while

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the operation of starting the engine is performed. The said latching means of my present improvement is utilized to perform an additional function, namely, for locking or holding the engine after its movement to effect tightening of the belt for driving effect, in the position in which the driving pulley of the engine will be positively held so that the driving belt will remain tight for transmitting the driving effect of the engine to the conveyor or other suitable machine which is to be used in connection with such engine.

The detail features of my invention will be more readily understood upon reference to the following specification and the accompanying drawings, in which:

Figure 1 is a top plan view of the engine plant end of a conveyor unit showing the receiving hopper for the conveyor belt broken away and illustrating the disposition of the small motor or engine on the adjacent end of the conveyor frame; also showing the driving belt as when tightened, and the operating devices of my invention in their positions wherein the engine is locked to maintain the tight condition of said belt.

Figure 2 is a fragmentary view in side elevation showing primarily the parts illustrated in Figure 1, with the engine positioned inwardly toward the hopper of the conveyor, the driving belt shown in its slack position on the driving and driven pulleys illustrated in dotted lines along with the belt, and the latching means engaged with the manual operated crank device so as to hold the engine positively in the position illustrated while the engine is started and preliminary to the tightening of the belt.

Figure 3 is a view similar to Figure 2, but illustrating the crank operating lever as when it is locked in its operated position for effective tightening of the belt.

Figure 4 is a fragmentary view bringing out somewhat more clearly the action of the latch in locking the operating lever in the position in which the latter is shown in Figures 1 and 3.

Referring now to the several figures of the drawings, I will describe the construction of the parts of my invention and the operation thereof under practical operations of service. The number 1 denotes the machine or conveyor frame involving a base extension and generally in regard to a conveyor construction supporting the hopper 2. An engine designated at 3 is adapted to be positioned on the frame base 1 at an end of the conveyor unit, the latter being only partially shown. Attached to the frame member 1 are

spaced plate guides 4 comprising largely mere angle plates and between which the base 5 of the motor 3 is adapted to slide. The motor is equipped with the drive shaft 6 adapted to be connected by a driving pulley 7 to a driven pulley 8 on the driven shaft 9 of a conveyor unit, and an ordinary belt 10 will be employed for connecting said pulley. The driven shaft 9 of the machine or conveyor unit is adapted to be connected by a suitable sprocket and the chain 11, as seen in Figure 1, with the conveyor roll shafts, not shown, about which the conveyor belt of the portable conveyor to which my invention is especially adapted, passes. On the frame member 1, between the shaft 9 and the motor 3, is located a manually operable shaft 12 mounted in suitable bearings 13 on the part 1, and said shaft is provided with an upwardly extending crank arm 14 at the outer end of which is provided the hand lever 15. An arm 16 is attached by means of a nut-held adjustable threaded shank 17 to the end portion of the conveyor frame 1 adjacent the hopper 2. Said arm 16 pivotally supports the pivoted latch 18 provided with the locking notch 19 and the adjacent holding notch 20.

Extending from the crank shaft 12 intermediate the bearings 13 thereof is an approximately vertical arm 21, and this arm passes through an opening in a plate or arm 22 which extends inwardly and from the engine or motor unit 3.

The arm 22 is an actuating arm for effecting movement of the motor or engine unit 3 and with the above construction of parts of my improvement set forth I will now describe the operation thereof in actual use.

It is contemplated, especially in cold weather, that the engine 3, which is small and portable, shall be carried in the cab of the truck, usually a coal truck, in conjunction with which the coal conveyor unit of my described construction will be employed. Describing ordinary usage, when the truck is ready to be unloaded for delivering coal to a suitable site or into the window of a coal storage place or cellar, the conveyor unit, including the frame 1, its hopper, and the endless belt conveyor employed in conjunction therewith will be removed from the truck and placed in position so that the hopper 2 is beneath the delivery chute of the truck. Thereafter the engine 3 is taken out of the cab of the truck and placed in position on the frame member 1 similar to the arrangement in Figures 1, 2 and 3. The lever 15 of the crank shaft 12 is then manipulated so that the actuating arm 23 on the shaft 12 will be caused to enter the opening in the arm 22, somewhat after the manner shown in Figure 2, wherein the lever 15 has been pulled so as to pull the engine 3 toward the hopper 2 of the conveyor into the position illustrated in the last mentioned figure. The latch 18 has its notch 19 now engaged with the crank arm 14 of the shaft 12 and the engine is thus positively locked with the parts arranged substantially as in Figure 2 of the drawing. The belt 10 may now be placed over the pulleys 8 and 7 and will of course be slack, as illustrated in dotted lines of Figure 2, so that the operator may readily start the engine 3 by using a pull cord, crank, or any other suitable starting means depending on the type of engine used. The engine 3 having been started and being in operation, the operator will now grasp the lever 15 and pull outwardly thereon or in a direction away from the hopper 2, thereby causing the engine 3 to slide in such direction under the manual force applied to said lever 15, and due to the fact that the actuating arm 23 of the shaft 12 bears against the member 22 for the above purpose. When the lever 15 has been pulled outwardly in the manner shown, the belt 10 will become tightened, and the driving action of the driving pulley 7 operated by the engine shaft 6 will be transmitted to the driven pulley 8 and will thus cause the conveyor operated from the shaft 9 to move for the delivery action of the conveyor belt, not illustrated.

For all practical purposes therefore, it will be seen that by the operation of the manual means 15 and its associated parts these means are really employed as instrumentalities for effecting driving connection between the engine 3 and the machine unit employed in conjunction with such engine, whether such unit is a conveyor or some other type of operating machine. In other words, I do not wish to be limited necessarily to the employment of my mechanism in conjunction with coal or other types of conveyors because the principle of operation of my invention is equally adapted to many different types of machines in conjunction with which an engine may be utilized for transmitting driving forces to the particular type of machine.

Of course, when the engine has been utilized for discharging the load of coal or other material by means of the conveyor unit to which I have referred, it will be apparent that the lever 15 may be manipulated to the position illustrated in Figure 3 and the engine 3 then readily detached from the guide 4 and removed from the machine unit in conjunction with which it has been employed.

The purpose in providing the notch 20 is to enable the crank arm 14 to be held by the latch 18 in a position maintaining the engine against movement with the belt 10 under tension or tight for providing the driving connection between the pulleys 8 and 7.

By employing the threaded shank 17 for the arm 16 that supports the latch 18, this arm may be adjusted slightly in positions at limits in opposite directions, and thereby correspondingly effect a suitable adjustment of the latch 18 for its cooperative engagement with the crank arm 14 of the shaft 12.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a machine unit, guide means thereon, an engine comprising a base removably engageable with said guide means so as to be displaced from the machine unit and including a driving pulley, an operable arm carried by the engine, an operating device on the machine unit including a shaft, a lever to turn said shaft, a moving arm on the shaft detachably interlocked to the said operable arm to move the engine when the lever is actuated, holding means detachably engageable with the shaft to hold the engine stationary in the guides, a pulley on the machine unit, and a belt to connect said pulleys.

2. In combination, a machine unit, guide means thereon, an engine comprising a base removably engageable with said guide means so as to be displaced from the machine unit, and including a driving pulley, an operable arm carried by the engine, an operating device on the machine unit including a crank shaft, a lever to turn said shaft, a moving arm on the shaft detachably interlocked to the said operable arm to move the engine when the lever is actuated, latch means detach-

ably engageable with the crank of said shaft to hold the engine stationary in the guides in a belt loose position and otherwise engageable with the crank aforesaid to hold the engine in belt tightening position, a pulley on the machine unit, and a belt to connect said pulleys.

3. In combination, a machine unit, guide means thereon, an engine comprising a base removably engageable with said guide means so as to be displaced from the machine unit, and including a driving pulley, an operable arm carried by the engine, an operating device on the machine unit including a shaft, a lever to turn said shaft, a moving arm on the shaft detachably interlocked to the said operable arm to move the engine when the lever is actuated, said shaft having a crank separate from the moving arm thereof, a swinging latch on the machine unit having a part to engage the crank to hold the engine positioned in a belt loosening position, and having another part engageable with the crank to hold the engine in a belt tightening position, a pulley on the machine unit, and a belt to connect said pulleys.

4. In combination, a machine unit, guide means thereon, an engine comprising a base having an actuating arm thereon constructed to freely slide into and out of positions within the guide means, an operating device for manually moving the engine base slidably in the guides and equipped with an arm having quickly detachable interlocking connection with said actuating arm on the engine base to permit the latter to be displaced from the guides and taken off of the machine unit, and holding means for maintaining the engine base against movement while temporarily positioned in the guides, a driving pulley on the engine, a driven pulley on the machine unit, and a removable belt connecting the pulleys.

5. The combination set forth in claim 4, in which the holding means is a manually operable latch pivoted to the machine unit and has separate latching parts usable independently to connect with the engine in either of two positions, and an adjustable member on the machine unit to support the said latch.

6. In combination, a machine unit, driven mechanism mounted thereon, a readily removable engine on said unit, mounting means on the unit for removably and movably supporting the engine in place thereon, detachable means for drivingly interconnecting the engine to the driven mechanism when the engine is emplaced on said unit, an operable arm carried by the engine, an operating device on the machine unit including a shaft, a lever to turn said shaft, and a moving arm on the shaft detachably interlocked to said operable arm to move the engine when the lever is actuated.

7. In combination, a machine unit, guide means thereon, an engine comprising a base removably engageable with said guide means so as to be displaced from the machine unit and including a driving pulley, an operable arm carried by the engine, an operating device on the machine unit including a shaft, a lever to turn said shaft, a moving arm on the shaft detachably interlocked to the said operable arm to move the engine when the lever is actuated, a pulley on the machine unit, and a belt to connect said pulleys.

8. In combination, a machine unit, driven mechanism mounted thereon, a readily removable engine on said unit, mounting means on the unit for removably and movably supporting the engine in place thereon, detachable means for drivingly interconnecting the engine to the driven mechanism when the engine is emplaced on said unit, an operable arm carried by the engine, an operating device on the machine unit including a shaft, a lever to turn said shaft, a moving arm on the shaft detachably interlocked to said operable arm to move the engine when the lever is actuated, said operating device including a crank on said shaft, and latch means detachably engageable with said crank to hold the engine stationary respecting the machine unit with the means for drivingly connecting the engine to the driven mechanism in inoperative condition, and said latch means being otherwise engageable with the crank aforesaid to hold the engine in condition wherein the detachable means for drivingly connecting the engine to the driven unit is in operative driving condition.

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