Jan. 10, 1956 M. S. GREELEY ET AL 2,730,228

AUTOMATIC TRIPPER FOR BELT CONVEYORS

Filed March 19, 1952 4 Sheets-Sheet 1

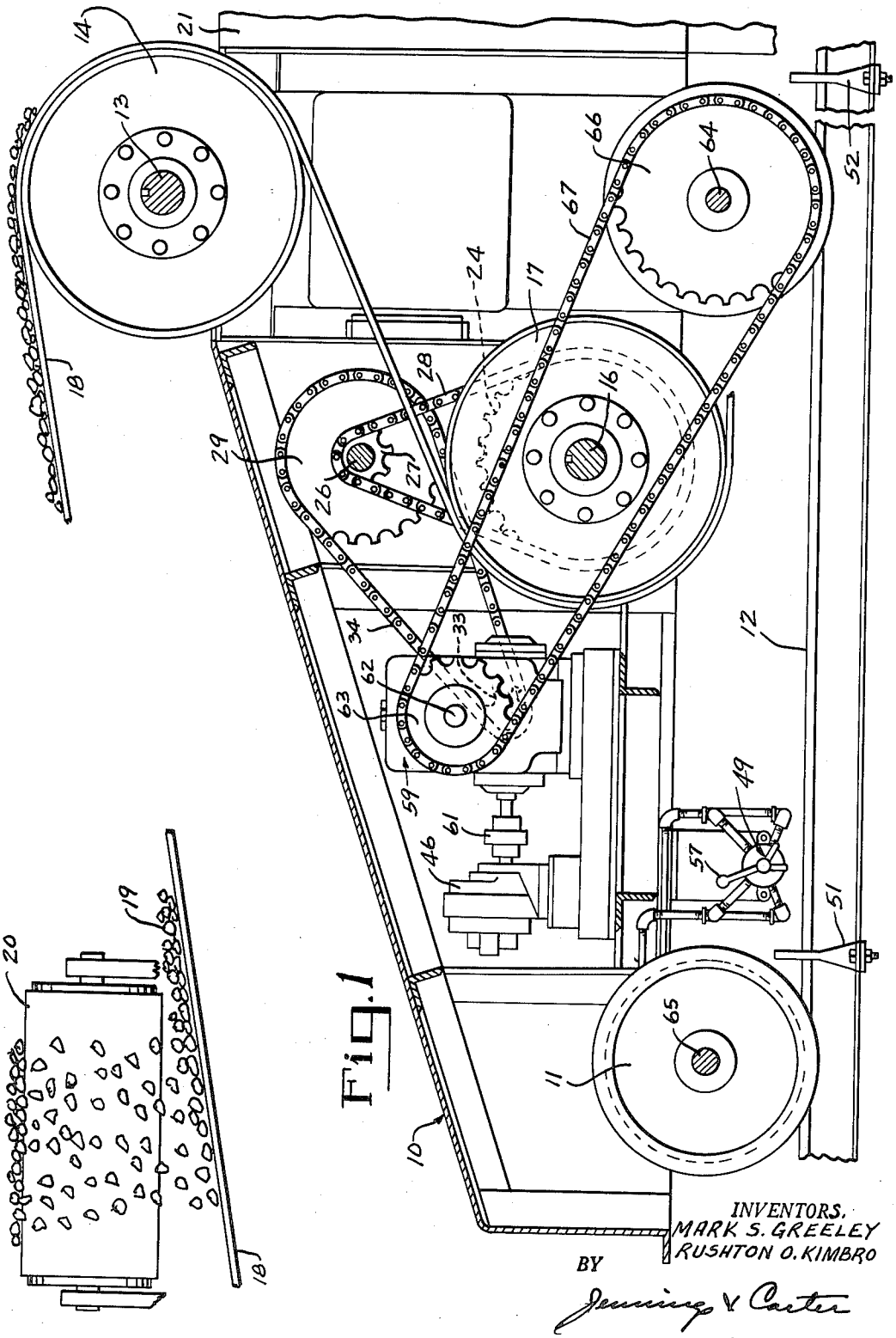


Fig. 1

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4 Sheets-Sheet 2

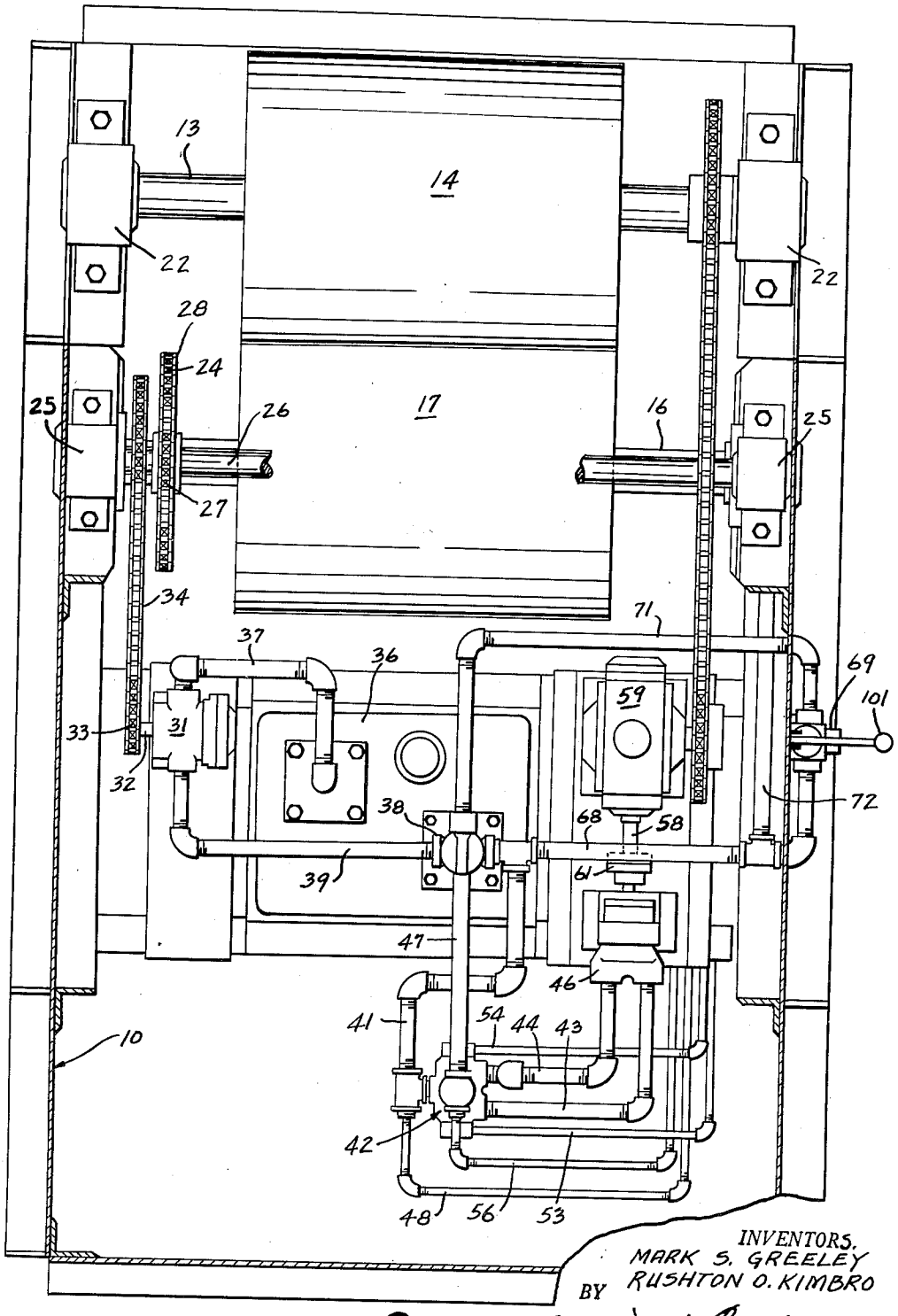


Fig. 2

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AUTOMATIC TRIPPER FOR BELT CONVEYORS

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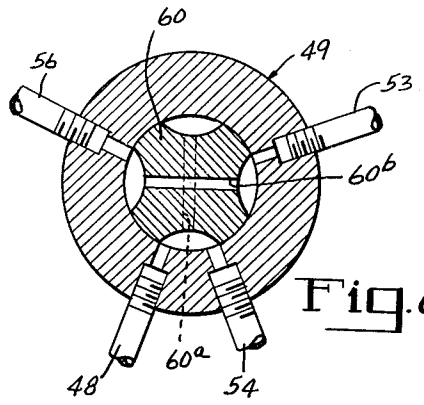


Fig. 6

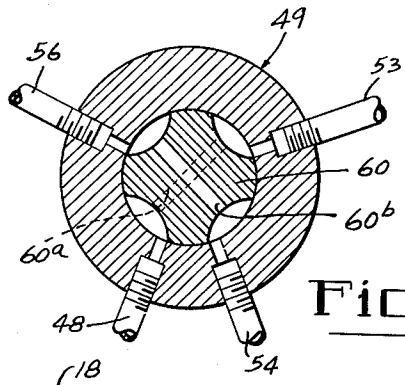


Fig. 7

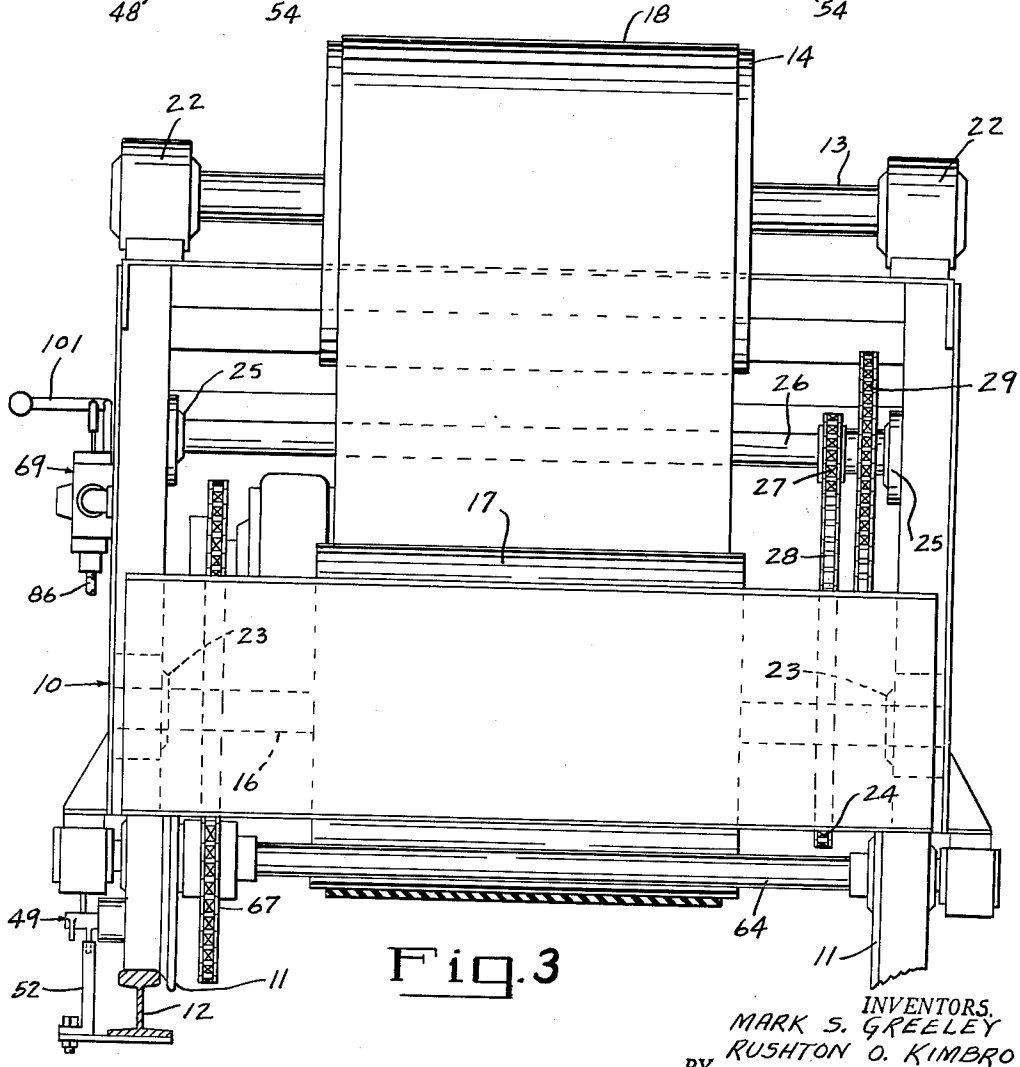


Fig. 3

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4 Sheets-Sheet 4

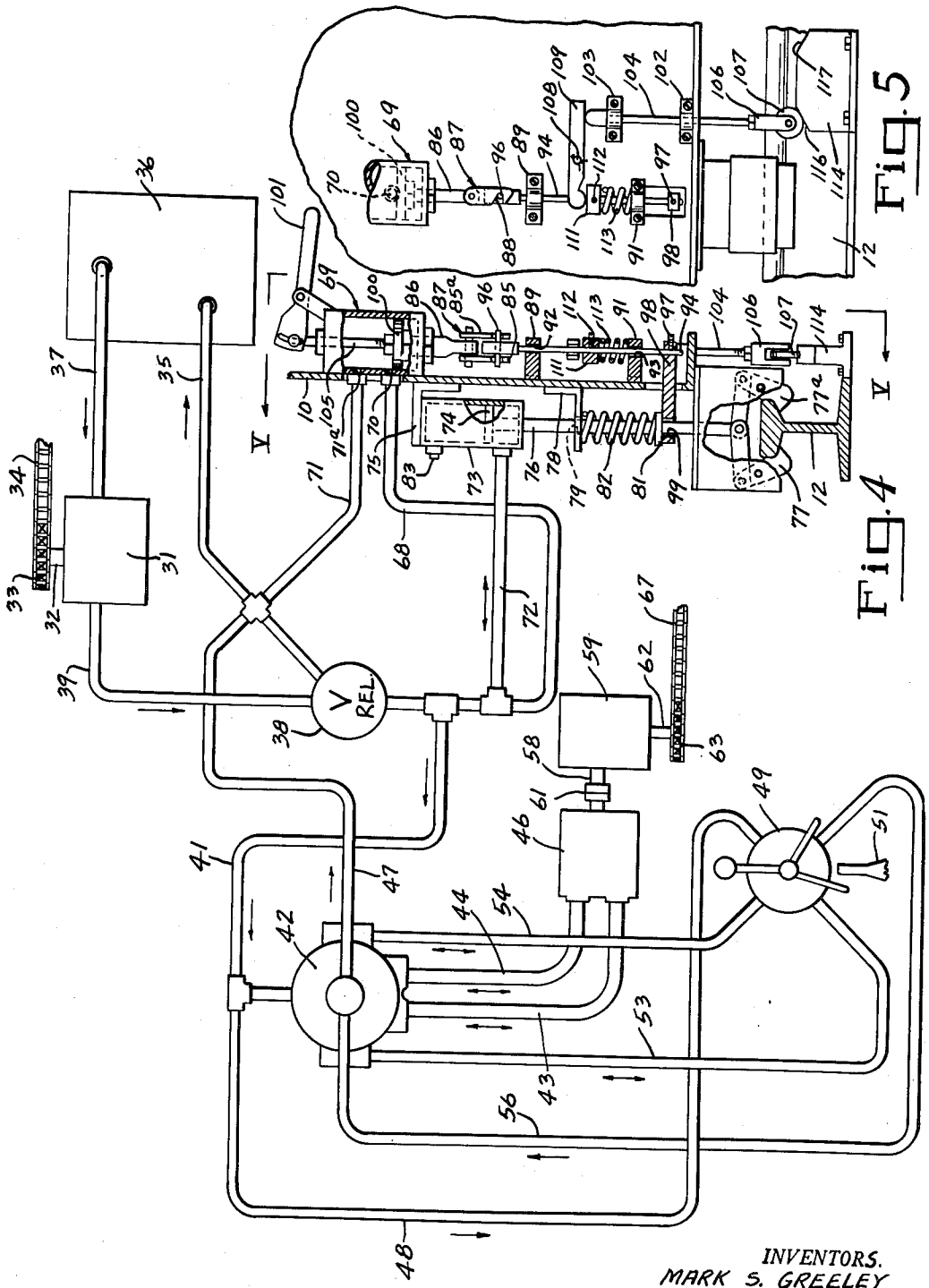


Fig. 4

Fig. 5

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2,730,228

AUTOMATIC TRIPPER FOR BELT CONVEYORS

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Application March 19, 1952, Serial No. 277,468

12 Claims. (Cl. 198—186)

This invention relates to an automatic tripper for belt conveyors and has for an object the provision of fluid pressure means for propelling, stopping and reversing the movement of the tripper.

Another object of our invention is to provide an automatic fluid pressure actuated belt conveyor tripper embodying improved means for actuating a rail gripping brake member in event there is a pressure failure or a break in the hydraulic or pneumatic lines.

Another object of our invention is to provide an automatic tripper of the character designated having reversing means incorporated therewith which shall be operated by adjustable limit means positioned along the track upon which the tripper moves.

A further object of our invention is to provide a fluid pressure actuated tripper having associated therewith braking means adapted to be energized upon contact with a stationary member positioned along the track upon which the tripper moves, thus limiting the distance the tripper will move along the track and preventing the tripper from getting out of control when there is a pressure failure, or in the event the conveyor belt hangs in any part of the tripper.

A more specific object of our invention is to provide an automatic tripper of the character designated including means for regulating the pressure in the hydraulic or penumatic lines, thus keeping a constant pressure in the lines at all times, and including means for automatically stopping the tripper in event the pressure falls below a predetermined amount.

Heretofore in the art to which our invention relates, trippers have been propelled either mechanically or electrically. The mechanical type is usually propelled by coupling power from the conveyor belt through the tripper head and bend shafts and a clutching system to the tripper axle, or by an arrangement of friction wheels on the head and bend shafts coupled to the tripper axle. In order to operate such systems automatically a series of levers, cams, links and weights, are used to engage one clutch and at the same time disengage another. Accordingly, there are several adjustments that must be made and maintained in order to obtain satisfactory operation since the wearing of the clutch facing constantly changes these adjustments. Furthermore, since the operation is usually of a trigger action type, close maintenance is necessary in order to keep all the mechanism in operating condition. When the clutches are both in a neutral position the tripper is a free rolling body, and the belt has a tendency to roll the tripper toward the conveyor head pulley. The tripper thus gains velocity in the direction of belt travel, approaching the belt speed as a limit. The same action results when a belt hangs in any part of the tripper, such as results from a broken pulley shaft. Run-away trippers have in the past caused considerable damage to installations.

While electrically operated trippers have been satisfactory in operation, the electric power must be fed to them either by trolleys or by an automatic cable reel. An installation of this type is much more expensive than the mechanically operated type. Also sparking of trolleys and reel brushes are a hazard in some installations, thus preventing this type of tripper from being accepted for all types of installations. Furthermore, the electric type trippers, so far as we are aware, are provided with no means for preventing the tripper from being dragged along its track by the belt in the event a shaft is broken, or if for any reason the belt should become fastened to the tripper.

We overcome the above mentioned difficulties by providing automatic hydraulic or pneumatic means for propelling, stopping and reversing the tripper as it moves along its tracks.

Briefly our invention comprises means for taking the propelling power directly from the conveyor belt. The power taken from the conveyor belt is utilized to drive a fluid pressure pump which may be either a hydraulic or pneumatic pump and which in turn provides fluid under pressure for propelling a fluid pressure motor. The motor is operatively connected to an axle of the tripper, thereby driving the tripper along its track. The reversal of the tripper is obtained by mounting a four-way pilot valve on the tripper in position to engage a stationary projecting member positioned along the side of the track upon which the tripper moves. The pilot valve reverses the direction of movement of the tripper by reversing the direction of flow of the fluid through the motor. Our tripper also includes a braking member which is operable upon release of pressure in the pressure system or when the tripper passes beyond a predetermined point along the track.

Apparatus embodying features of our invention is illustrated in the accompanying drawings forming a part of this application in which:

Fig. 1 is a side elevational view of the tripper partly broken away and in section;

Fig. 2 is a plan view thereof partly broken away and in section and showing the belt removed;

Fig. 3 is a front elevational view thereof;

Fig 4 is a diagrammatic view showing the hydraulic or pneumatic pressure lines employed and the means for braking the tripper;

Fig. 5 is a detailed view taken generally along the lines V—V of Fig. 4; and,

Figs. 6 and 7 are detail sectional views of the four-way pilot valve.

Referring now to the drawings for a better understanding of our invention, we show a tripper frame indicated generally by the numeral 10. The frame is mounted on wheels 11 which travel along tracks 12. Mounted for rotation adjacent the upper forward end of the frame 10 and extending transversely thereacross is an upper shaft 13 having secured thereto a pulley 14. Mounted for rotation on, and extending transversely across, the frame 10 at a point inwardly of and below the shaft 13, is a bend shaft 16, having secured thereto a pulley 17. Passing around the pulleys 14 and 17 and having a reverse lap-portion therein is a conveyor belt 18, which is employed to convey any suitable material, such as coal, sand, gravel, limestone, and the like. The material to be conveyed is indicated generally at 19 and is transported to the conveyor belt 18 by a second belt 20. Secured to the forward end of the tripper frame 10 is a suitable hopper 21 arranged to receive the material conveyed by the belt 18 and adapted to discharge the same into a suitable bin or bins at the sides of the track 12 or back onto the belt for discharge over the head end. The shaft 13 is rotably mounted in suitable bearings 22 and the shaft 16 is rotatably mounted in suitable bearings 23.

Secured to the bend shaft 16 and spaced laterally of the pulley 17 is a sprocket 24. Mounted for rotation on

the frame 10 above the bend shaft 16 in bearings 25 is a counter-shaft 26 having secured thereto a sprocket 27. The sprockets 24 and 27 are connected by means of a drive chain 28. Sprocket 24 is larger in diameter than sprocket 27, thus causing the counter-shaft 26 to rotate at a higher speed than the bend shaft 16. Also secured to the counter-shaft 26 is a sprocket 29. Mounted on the frame 10 rearwardly of the counter-shaft 26 is a fluid pressure pump 31 having a drive shaft 32. For the purpose of this description the pump 31 is shown as a hydraulic pump. Secured to the shaft 32 is a sprocket 33 driven from the sprocket 29 through a drive chain 34. As shown in Fig. 1, the sprocket 33 is smaller in diameter than the sprocket 29, thus causing the pump drive shaft 32 to be driven at a higher speed than the counter-shaft 26. By providing these speed increases between the shaft 16 and the shaft 26 and between shaft 26 and shaft 32, we are enabled to employ conventional types of hydraulic pumps which must run at a relatively higher speed than the tripper bend shaft 16.

The in-take side of the hydraulic pump 31 communicates with a reservoir or tank 36 by means of a pipe 37. The out-put side of the hydraulic pump 31 communicates with a pressure relief valve 38 of any well known design by means of a pipe 39. The pressure relief valve 38 is set at a predetermined operating pressure so that the hydraulic pump maintains a pressure equal substantially to the pressure built up when the tripper is moving along the track with the belt 18, which is the lowest speed of the pump 31. When the tripper is moving along the track 12 opposite the direction of belt travel, the pump 31 operates at a higher speed, but the pressure relief valve 38 by-passes the excess fluid to the reservoir 36 through pipe 35, thereby holding the hydraulic operating circuit at a constant pressure in both directions of tripper travel.

The pump 31 delivers fluid under pressure through the valve 38 and a pipe 41 to a four-way pilot operated valve 42, of any well known design. Mounted on the tripper frame 10 in position to receive fluid under pressure from the four-way pilot operated valve 42 selectively through conduits 43 and 44 is a conventional hydraulic motor 46. To move the tripper in one direction, the fluid is delivered to the hydraulic motor 46 through pipe 43, and the fluid is delivered from the motor through pipe 44 back to the four-way valve 42, thence through a pipe 47 and pipe 35 to the tank 36 at atmospheric pressure. The pipe 47 thus serves as an exhaust line for the valve 42. To reverse the tripper, the pilot operated valve 42 is actuated to reverse the flow of fluid through the pipes 43 and 44 and hydraulic motor 46.

Communicating with pipe 41 is a pipe 48 which supplies fluid under pressure to a conventional four-way pilot valve 49 which operates the valve 42. Dogs 51 and 52, see Fig. 1, are placed at desired limits along the tripper track 12 for engaging the valve 49 and thus reversing the direction of tripper travel. The four-way pilot valve 49 communicates with opposite sides of the pilot-operated valve 42 by means of pipes 53 and 54, and communicates with the tank 36 by means of a pipe 56 and pipes 47 and 35. In the position shown in Fig. 7, valve 49 conducts fluid from pipe 48 to pipe 53 thence to one side of the pilot-operated valve 42 to operate the same. Fluid from the opposite side of the valve 42 and the fluid in the pipe 54, is conveyed through valve 49 to the pipe 56 and thence through pipes 47 and 35 to tank 36 at atmospheric pressure. The pipe 56 is in effect an exhaust line for the valve 49. When the pilot valve 49 is tripped to the opposite position, as shown in Fig. 6, pressure is reversed through pipes 53 and 54, thus operating the valve 42, and causing a reversal of the fluid flow through the motor 46 and a reversal of the direction of tripper travel along the track 12. The pilot valve 49 has a blocked center portion 60 and does not release pressure at one side of the valve 42 until it is in position to apply pressure at the opposite side thereof. Also, when the valve 42 is in the center position all of its ports are closed. In other words, there is no reversal of fluid until the operation of the valves is complete. Accordingly, there is no lag in the operation of the reversing mechanism as there is when mechanical means are employed to reverse the tripper. The blocked center portion 60 is provided with a cross connection 60*a* which conveys the fluid from pipe 48 to pipe 53, and a cross connection 60*b* which conveys the fluid to the pipe 56 from either of the pipes 53 or 54 that is not connected to the supply pipe 48.

The hydraulic motor 46 drives an input shaft 58 of a worm gear speed reducer 59 through a flexible coupling 61. The speed reducer 59 has a low speed shaft 62 which is secured to a sprocket 63. The wheels 11 of the tripper are mounted on axles 64 and 65 and secured to the axle 64 is a sprocket 66. The sprocket 63 drives the sprocket 66 through a chain 67. While we show the sprocket 66 as being mounted on the axle 64 it will be apparent that the sprocket could be mounted on axle 65, thereby driving the tripper through axle 65. The speed reducer arrangement between the hydraulic motor 46 and the tripper axle 64 or 65, as the case may be, is employed so as to make it possible to use conventional types of hydraulic or pneumatic motors.

Communicating with the pressure relief valve 38 is a pipe 68 which connects with a port 70 in the lower end of a valve chamber 69. A pipe 71 communicates with the upper end of the valve chamber 69 through a port 71*a*. In normal operation, the valve chamber 69 prevents the flow of fluid from the pipe 68 to the pipe 71 which latter communicates with pipe 35. When for any reason it becomes necessary or desirable to stop movement of the tripper along the track, a valve member 100 in the valve chamber 69 is moved downwardly by means of a handle 101 which is connected to the valve member by a rod 105, thus connecting pipe 68 to pipe 71 and permitting the fluid to flow back to the tank 36 at atmospheric pressure. With the valve member 100 in the position just described there is no driving force for propelling the tripper.

A pipe 72 connects pipe 68 to a fluid pressure cylinder 73 which is mounted on the tripper frame 10 by means of a suitable bracket 75. Operating within the cylinder 73 is a piston 74 having a downwardly extending piston rod 76. Mounted at the lower end of piston rod 76 are a pair of gripping arms 77 and 77*a* which are adapted to engage the rail 12 upon downward movement of the piston rod 76. Mounted on the frame 10 below the cylinder 73 is a bracket 78 having an opening 79 therein for receiving the piston rod 76. A shoulder 81 is provided on the piston rod 76 below the bracket 78. Surrounding the piston rod between the bracket 78 and the shoulder 81 is a compression spring 82. An exhaust port 83 is provided at the upper end of the cylinder 73 for releasing back pressure therefrom as the piston 74 is moved upwardly by the fluid pressure received from line 72.

As long as there is fluid of sufficient pressure within the cylinder 73 acting on the piston 74, the shoulder 81 on the rod 76 is forced upwardly against the compression spring 82 and the rail gripping arms 77 and 77*a* are in the inoperative position. If for any reason there is a release of pressure, such as would result when the handle 101 moves the valve member 100 from between the ports 70 and 71*a* or when there is a break in the hydraulic or pneumatic lines, or when a pump driving chain is broken, the compression spring 82 forces the piston rod 76 downwardly and moves the rail gripping arms into engagement with the rail 12.

If the drive chain 67 should break, the tripper becomes a free rolling body on the track so long as the pressure in the cylinder 73 is sufficient to hold the gripping arms 77 and 77*a* in the released position. How-

ever, as the tripper gains velocity as it moves along its track in the direction of belt travel, the relative velocity of the conveyor belt around the pulley **17** decreases, thereby driving the pump **31** at a slower speed. As a result, the hydraulic pressure from the pump **31** decreases and the hydraulic motor then speeds up under a no-load condition, thus further reducing the hydraulic pressure. By having a proper balance of pressure exerted by the spring **82** and piston **74** for normal operating conditions, the gripping arms are automatically set upon release of pressure before the tripper would have gained sufficient speed to cause any damage to the tripper and conveyor apparatus.

The valve member **100** is connected to a downwardly extending rod **86** and connected to the lower end of rod **86** is a releasable connecting member **87** having downwardly extending legs **85** and **85***a*. Each of the downwardly extending legs is provided with a recess **88** adjacent the lower end thereof. Mounted on frame **10** beneath the connecting member **87** are a pair of vertically spaced brackets **89** and **91** having openings **92** and **93** therein respectively, for receiving a vertical rod **94**. Extending laterally from the rod **94**, adjacent to the upper end thereof, is a pin **96** which is adapted to fit in the recess **88** thereby releasably connecting the rod **86** to the rod **94**.

Secured to the lower end of the rod **94** by means of a set screw **97** is a bracket **98**. An opening **99** is provided in the outer end of the bracket **98** for slidably receiving the lower end of the piston rod **76**. When there is a release of pressure in the line **72** the rod **76** moves downwardly to operate the gripping arms **77** and **77***a*, and the shoulder **81** engages the bracket **98** thereby moving the rods **94** and **86** downwardly and permitting fluid to flow through the valve chamber **69**. With the valve member **100** in position to connect pipe **68** to pipe **71**, the fluid is recirculated to the tank **36** as hereinbefore described through pipe **35**. It will be apparent that if air pressure is employed instead of hydraulic pressure, the pipes **47**, **71** and **35** would not be necessary and exhaust ports could be substituted therefor.

Mounted on the frame **10** and spaced laterally from the lower portion of rod **94** are a pair of vertically spaced brackets **102** and **103**. Slidably mounted in the brackets **102** and **103** for vertical movement is a rod **104** having mounted adjacent the bottom thereof a U-shaped bracket **106**. Mounted for rotation in the U-shaped bracket **106** is a roller **107**. Extending outwardly from the frame **10** between the upper end of rod **104** and rod **94** is a pin **108**. Pivotally mounted on the pin **108** is a bar **109** having one end thereof engaging the top of the rod **104** and the other end thereof engaging a collar **111** which is secured to the rod **94** by means of set screw **112**. Surrounding the rod **94**, between bracket **91** and the collar **111** is a compression spring **113** which biases the rod **94** upwardly and positions the valve member **100** between the ports **70** and **71***a* thus blocking the flow of fluid through valve chamber **69**. Positioned outwardly of each of the dogs **51** and **52** is a bracket **114** having inclined surfaces **116** and **117** in position to be engaged by the roller **107**. As the roller **107** engages the inclined surface of the bracket **114**, the rod **104** is moved upwardly, pivoting the arm **109** and causing the collar **111** and the rod **94** to be moved downwardly. Upon downward movement of the rod **94** the valve member **100** is positioned below the ports **70** and **71***a* causing the fluid to recirculate to the tank **36** thus releasing pressure within the cylinder **73**. Upon release of pressure in the cylinder **73**, the spring **82** moves the rod **76** downwardly thereby causing the gripping arms **77** and **77***a* to engage the rail **12** as shown in Fig. 4. It will thus be seen that by providing the brackets **114** outwardly of the dogs **51** and **52** and the pressure release means associated therewith there is no possibility of the tripper

running away. In other words the brackets **114**, roller **107**, rod **104**, and the linkage to valve chamber **69** provides an extra safety device which prevents the tripper from running away. After the rod **104** has been moved upwardly by the bracket **114**, it is necessary to disengage the rod **94** from the rod **86** before the tripper can be placed into operation again. The rods **86** and **94** are disengaged by moving the connecting member **87** out of engagement with the pin **96**. The rod **86** is then moved upwardly by the handle **101**, thus positioning the valve member **100** between the ports **70** and **71***a* and blocking the flow of fluid from pipe **68**. The pressure is then built up in the system and the tripper is moved away from the bracket **114**. As the pressure builds up in the cylinder **73** the rod **76** and shoulder **81** are raised thus releasing pressure on the bracket **98** and permitting the spring **113** to force the rod **94** upwardly. When the rod **94** is thus moved upwardly the pin **96** falls into the recess **88** thereby connecting the rods **94** and **86**.

When the valve member **100** is moved manually to connect the ports **70** and **71***a* the spring **113** cannot force the valve member **100** into position between the ports **70** and **71***a* due to the fact that the fluid is recirculated to the reservoir **36** thus releasing pressure in the cylinder **73** and causing the spring **82** to hold the bracket **98** and rod **94** in the down position. It will thus be seen that the handle **101** would have to be actuated to place the apparatus back into operation.

From the foregoing it will be seen that we have devised an improved automatic tripper which has all the advantages of the trippers heretofore employed and one which requires very little maintenance and adjustments to keep the same in operation. By providing pneumatic or hydraulic means for propelling the tripper along the track and automatic means for stopping the tripper in the event there is a pressure failure, we have eliminated the chances of a tripper running away. Also, by providing automatic means for reversing the flow of fluids through the propelling motor upon a predetermined distance of tripper travel, there is a reversal of the tripper along the track without the necessity of having to employ electrical or mechanical clutch means for reversing the same.

While we have shown our invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and we desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What we claim is:

1. The combination with a conveyor belt tripper frame mounted on wheels and having pulleys journaled thereon around which a conveying belt passes and which are driven by said belt, of a fluid pressure pump mounted on said frame in driven relation with one of said pulleys, means supplying fluid to said pump, a fluid pressure motor mounted on said frame and connected in driving relation with said wheels, conduits communicating with opposite sides of said motor, a four-way valve having an exhaust port and communicating with said conduits and said pump, said valve being operable to introduce fluid selectively under pressure to the motor through one of said conduits and discharge fluid through the other of said conduits and said exhaust port, and a four-way pressure operated pilot valve communicating with said pump and with the four-way valve to be operated for actuating the same upon a predetermined distance of tripper travel, said pilot valve having an exhaust port and being constructed and arranged for the operation thereof to be completed before there is a change of flow in the valve to be controlled.

2. The combination set forth in claim 1 in which the pilot valve is provided with a blocked center portion having

cross connections which convey fluid under pressure selectively from a source of supply to opposite sides of the four-way valve to be operated and exhaust the fluid from the four-way valve to be operated opposite the side thereof that pressure is applied.

3. The combination with a conveyor belt tripper frame mounted on wheels for rotation along rails and having pulleys journaled thereon around which a conveying belt passes and which are driven by said belt, of a fluid pressure pump mounted on said frame in driven relation with one of said pulleys, means supplying fluid to said pump, a fluid pressure motor mounted on said frame in driving relation with said wheels, conduits conveying fluid under pressure from said pump selectively to opposite sides of the motor, a pressure relief valve in one of said conduits maintaining a constant pressure therein, a rail gripping member attached to said frame and extending downwardly therefrom in position to engage one of said rails, and means actuating said rail gripping member upon a predetermined decrease of pressure in said conduits and concomitantly actuating other means which release the pressure in said conduits.

4. The combination with a conveyor belt tripper frame mounted on wheels for rotation along rails and having pulleys journaled thereon around which a conveying belt passes and which are driven by said belt, of a fluid pressure pump mounted on said frame in driven relation with one of said pulleys, means supplying fluid to said pump, a fluid pressure motor mounted on said frame in driving relation with said wheels, conduits conveying fluid under pressure from said pump selectively to opposite sides of the motor, a pressure relief valve in one of said conduits maintaining a constant pressure therein, a rail gripping member attached to said frame and extending downwardly therefrom in position to engage one of said rails, a cylinder mounted on the frame, said cylinder communicating adjacent the bottom thereof with the conduits supplying fluid under pressure and being provided with an exhaust port adjacent the top thereof, a piston in said cylinder, a piston rod connecting said piston to the rail gripping member, and means associated with said rod adapted upon a predetermined decrease of pressure in said cylinder to bias said rod downwardly and actuate said rail gripping member.

5. The combination set forth in claim 4 in which the means for biasing the rod downwardly upon a predetermined decrease of pressure in the cylinder comprises a bracket secured to the frame below the cylinder and having an opening therein slidably receiving said rod, a shoulder on said rod beneath said bracket and a compression spring surrounding said rod between said bracket and said shoulder.

6. The combination with a conveyor belt tripper frame mounted on wheels for rotation along rails and having pulleys journaled thereon around which a conveying belt passes and which are driven by said belt, of a fluid pressure pump mounted on said frame in driven relation with one of said pulleys, means supplying fluid to said pump, a fluid pressure motor mounted on said frame in driving relation with said wheels, conduits conveying fluid under pressure from said pump selectively to opposite sides of the motor, a pressure relief valve in one of said conduits maintaining a constant pressure therein, a rail gripping member attached to said frame and extending downwardly therefrom and operable to engage one of said rails upon a predetermined decrease of pressure in said conduits, a valve chamber mounted on the frame and having a pair of vertically spaced ports therein, one of said ports being in communication with the conduit conveying fluid under pressure and the other being an exhaust port, a valve member in said chamber disposed to block the flow of fluid therethrough when positioned between said ports and to exhaust said fluid when moved to connect said ports, and means moving said valve member to connect said ports, upon a predetermined distance of tripper travel.

7. The combination set forth in claim 6 in which the means for moving the valve member to connect said ports comprises a rod attached to said valve member and an operating handle attached to said rod for moving the same.

8. The combination set forth in claim 6 in which the means for moving the valve member to connect said ports comprises a rod attached to the valve member and extending downwardly therefrom, a second rod mounted on said frame for vertical movement and positioned laterally of the first mentioned rod, a collar on the first mentioned rod, a link pivotally mounted on the frame between said rods and having one end engaging the top of said collar and the other end thereof engaging the top of said second rod, and means at the lower end of said second rod adapted to be actuated upon a predetermined distance of tripper travel and move the said second rod upwardly.

9. The combination set forth in claim 8 in which a compression spring surrounds the first mentioned rod beneath the collar and a spring abutment is mounted on said frame in position to engage the bottom of said spring, said spring biasing the valve member upwardly to block the flow of fluid through the valve chamber.

10. The combination set forth in claim 8 in which the first mentioned rod is divided into detachable sections.

11. For use in actuating a rail gripping member of a conveyor belt tripper mounted for rotation along rails and propelled by a fluid pressure unit which is driven by a moving conveyor belt, a cylinder mounted on said tripper above one of said rails, a conduit connecting the fluid pressure unit to the cylinder adjacent the bottom thereof, there being an exhaust opening adjacent the top of said cylinder, a piston in said cylinder, a piston rod connecting said piston to said rail gripping member, and means adapted upon a predetermined decrease of pressure in said cylinder to bias said rod downwardly and actuate said rail gripping member.

12. For use in actuating a rail gripping member of a conveyor belt tripper mounted for rotation along rails, a cylinder mounted on said tripper above one of said rails, a conduit supplying fluid under pressure to the cylinder adjacent the bottom thereof, there being an exhaust opening adjacent the top of said cylinder, a piston in said cylinder, a piston rod connecting said piston to said rail gripping member, means adapted to bias said rod downwardly and actuate said rail gripping member upon a release of pressure in said cylinder, a valve chamber mounted on the tripper and having a pair of vertically spaced ports therein, one of said ports being in communication with said conduit supplying fluid under pressure and the other being an exhaust port, a valve member in said valve chamber disposed to block the flow of fluid therethrough when positioned between said ports and to exhaust said fluid when moved to connect said ports and means moving said valve member to connect said ports upon a predetermined distance of tripper travel.

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