

Feb. 1, 1944.

J. R. HARRIGAN

2,340,326

APPARATUS FOR COVERING PIPE

Filed May 18, 1942

4 Sheets-Sheet 1

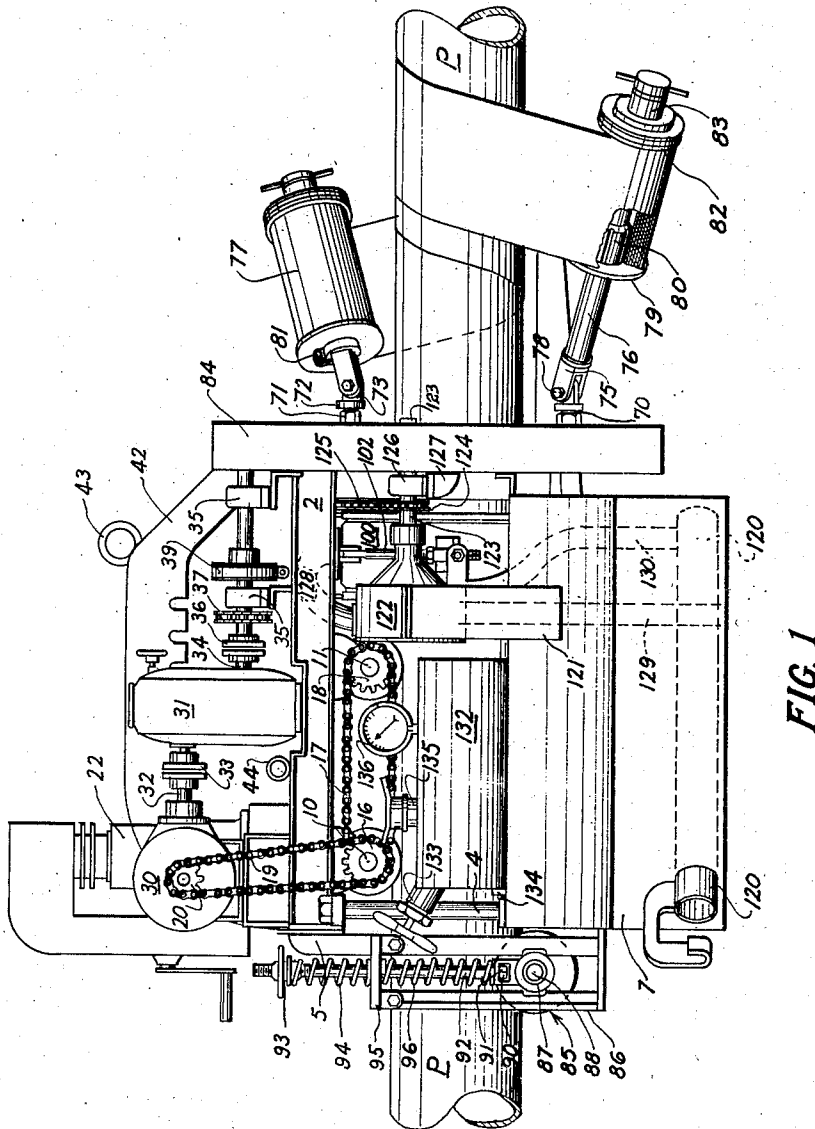


FIG. 1

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4 Sheets-Sheet 2

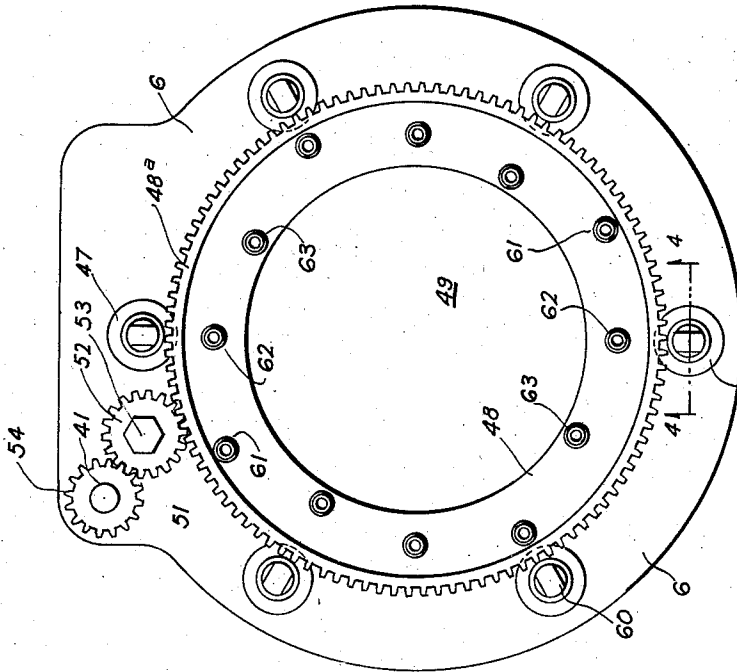


FIG. 3.

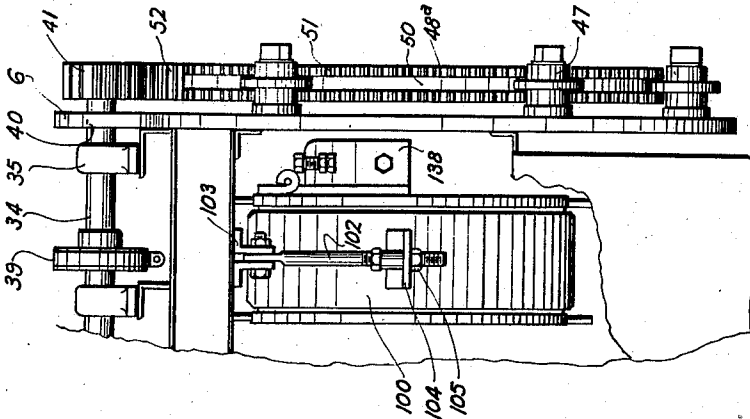


FIG. 2.

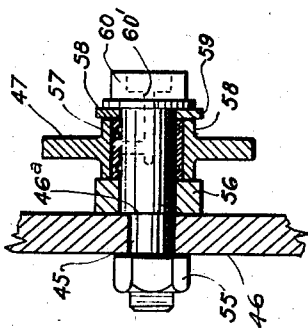


FIG. 4.

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4 Sheets-Sheet 3

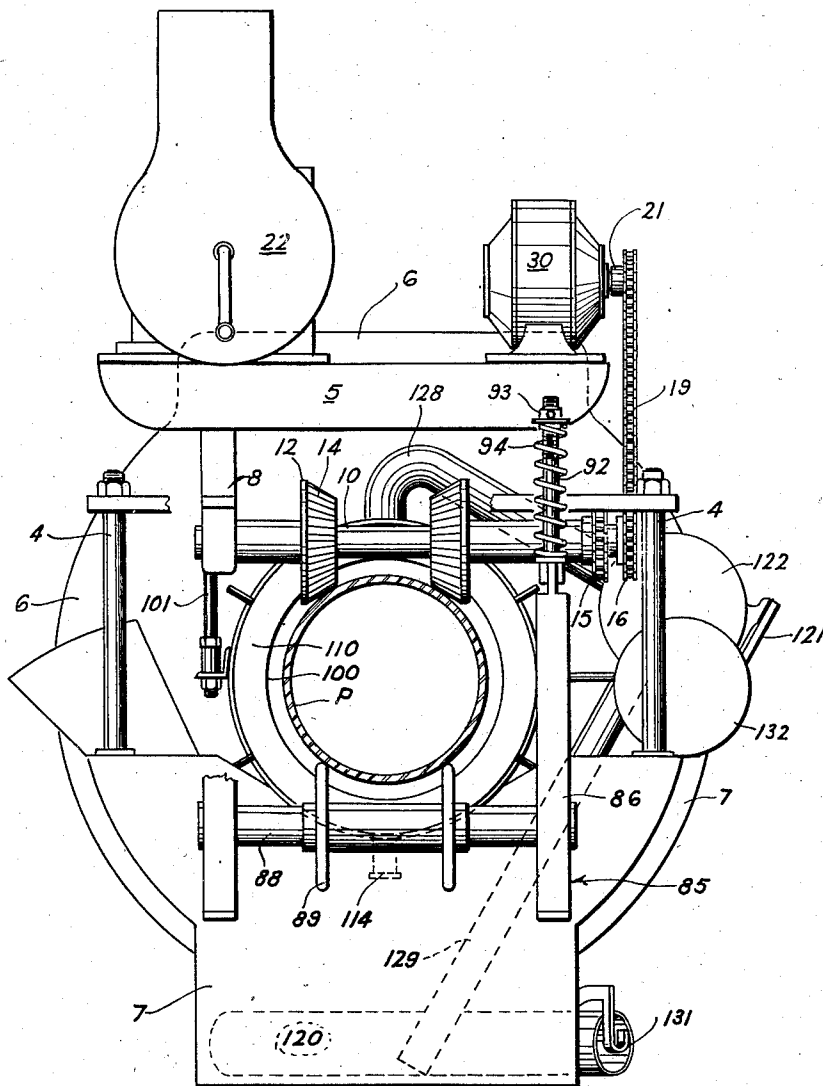


FIG 5

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4 Sheets-Sheet 4

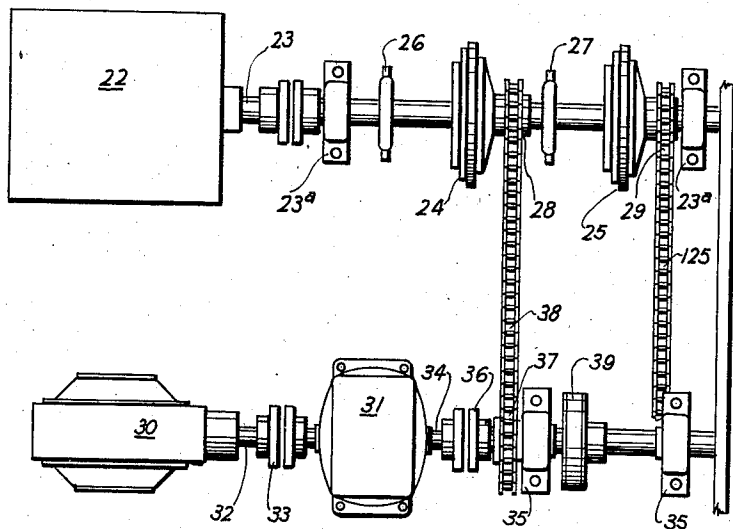


FIG. 6.

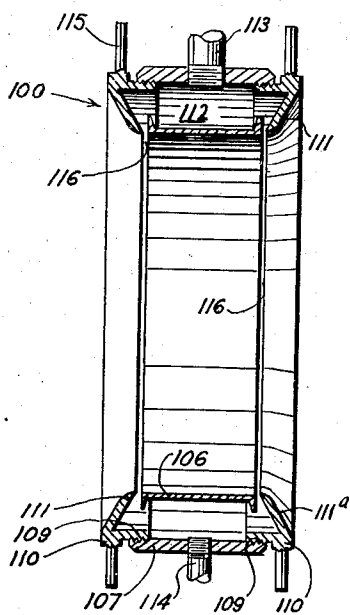


FIG. 7.

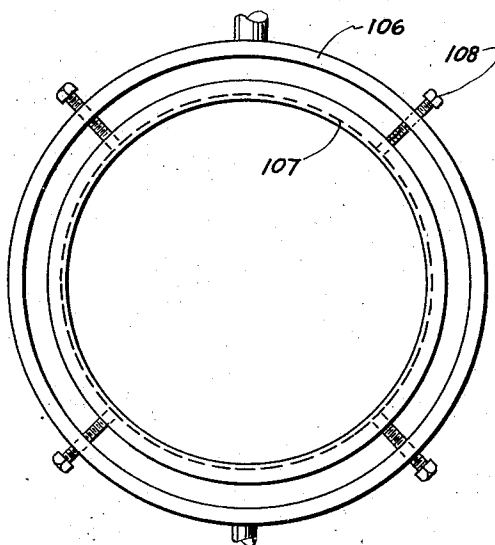


FIG. 8.

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APPARATUS FOR COVERING PIPE

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Application May 18, 1942, Serial No. 443,538

18 Claims. (Cl. 242—11)

This invention relates to the coating and wrapping of bodies, and more particularly but not by way of limitation to cylindrical bodies such as pipes, tubing and the like, with a protective covering of bituminous material and asbestos felt fabric, paper or the like.

The apparatus for automatically and mechanically coating and wrapping the pipe is constructed and arranged so as to travel along the pipe whereby the pipe is utilized as a track or support for the operating mechanism actuating the wrapping means. Furthermore, the apparatus contemplates means for spreading a coating of bituminous or other asphaltic material onto the pipe prior to its being wrapped and also after application of the wrapping material, if desired.

Many present day pipe coating and wrapping machines are top heavy, cumbersome and bulky in that in addition to the operating or actuating mechanism for the wrapping means, the coating supply tank and the coating means are carried above the frame supported by the pipe, such as the recent patents to J. D. Cummings No. 2,194,268 and 2,253,848. Furthermore, little consideration has been given to the radius of the circular path made by the wrapping arms spirally wrapping the asbestos felt, paper or the like. In view of this, during the operation of the machine the pipe must be elevated a substantial distance out of the ditch in order to provide sufficient space for circular movement of the wrapping rolls. In this connection it is necessary to continuously supply a tractor and hoist for maintaining the pipe in elevated position, out of the ditch, which obviously necessitates the use of extra equipment and operating personnel therefor.

It is an important object of this invention to provide a wrapping apparatus which reduces the radii of the circular path made by rotation of the wrapping rolls.

Another object of this invention is to provide an efficient wrapping apparatus whereby the speed between the wrapping means and the propelling means of the machine may be easily varied, particularly the use of a speed reducing means for decreasing the speed of the traction wheels when transgressing curves or bends in the pipe so as to maintain uniformity in the lap desired between the wrapping felt.

Another object of this invention is to provide an efficient wrapping apparatus whereby the wrapping arms may be adjusted inwardly or outwardly with respect to the pipe to be wrapped to reduce or increase the radius of the circular path made by the wrapping arms as well as al-

low for variations in the width of overlap desired.

And still another object of this invention is to provide an efficient wrapping apparatus having the gear means rotating the wrapper arms supported from its outer periphery, said gear in addition to reducing the radius of the path of the wrapping arms is allowed greater diameter in the bore of the gear for receiving the pipe, thus providing greater variation in the size of the pipe with which the apparatus can be used. This feature is also useful to allow the apparatus to readily pass over irregularities in the pipe such as fittings, couplings or the like without disturbing the movement of the machine or tearing the wrapping.

And still another object of this invention is to provide a combination coating and wrapping apparatus in which the mechanism is simple and compact where most of the weight of the machine is below the pipe thereby eliminating top heavy equipment and the need for a balancing pole to maintain the machine in equilibrium.

And still another object of this invention is to provide a combination pipe coating and wrapping machine wherein any desired thickness of coating is applied to the surface of the pipe with a minimum use of coating material, said coating being applied under pressure and discharged against the entire circumferential surface of a portion of the pipe at one time to allow a smooth layer upon which the spiral wrapping of protective material is superimposed.

Other objects and advantages of the invention will be evident from the following detailed description read in conjunction with the accompanying drawings which illustrate one form of my invention.

Referring to the drawings in detail:

Figure 1 is a side elevation of the invention.

Figure 2 is a fragmentary side view mostly in elevation, and with certain parts omitted for clarity.

Figure 3 is a front elevational view of the rotating gear shown in Figure 2.

Figure 4 is a sectional view taken on lines 4—4 of Figure 3.

Figure 5 is an end view taken from the front of the machine and mainly in elevation, and with certain parts omitted for clarity.

Figure 6 is a schematic fragmentary plan view for the power and drive mechanism.

Figure 7 is a vertical section of the coating shoe.

Figure 8 is an elevation thereof.

Referring to the drawings in detail, elements

of the machine are supported by a frame comprising longitudinal side members 2 spaced above the pipe P by upright end legs 4 at one end thereof and connected by a cross member 5. A substantially circular apertured plate 6 is secured to the members 2 at their opposite ends. Below the pipe a sump tank 7, extending substantially the length of the machine, is secured to the end members 4 and plate 6 for a purpose as will be hereinafter described. The longitudinal side members 2 support hanging bearings 8 in alignment transversely of the machine, and in which are journaled freely rotatable axles or shafts 10 and 11 upon which traction wheels 12 are rigidly mounted, said wheels having substantially beveled peripheries in order to conform with the contour of pipe P which they are adapted to straddle. The wheels are preferably provided with serrations or teeth 14 for a more efficient engagement with the pipe. One end portion of the shaft 10 is provided with a pair of toothed sprockets 15 and 16. A sprocket chain 17 connects sprocket 15 with a sprocket 18 fixed to the shaft 11. A sprocket chain 19 provides connection between sprocket 16 and a sprocket wheel 20 rigidly secured to a differential shaft 21 as will be hereinafter referred to.

Drive mechanism

Mounted on the forward portion and at one side of the machine (see Figures 1, 5 and 6) is a source of power such as an engine 22, preferably a light internal combustion type connected with a rotatable drive shaft 23. The shaft 23 is journaled above the frame in a plurality of spaced bearings 23A supported by a member 2. Cooperating with the crank shaft 23 is a pair of twin disc clutches 24 and 25 arranged in spaced relation to each other and adapted to be individually controlled by handles 26 and 27 for a purpose as will be hereinafter described. Each of the clutches 24 and 25 is provided with a shaft collar to which is secured respectively a toothed sprocket 28, 29 for a purpose as will be hereinafter set forth.

On the opposite side of the machine from the engine, a differential unit 30 is mounted on a side member 2. The unit 30 is connected with a variable speed reducing element 31 through a shaft 32 and coupling 33. An auxiliary drive shaft 34 in alignment with speed reducer 31 is supported on the frame by bearings 35, and is connected with the speed reducer through a coupling 36. A toothed sprocket 37 is non-rotatively secured to the shaft 34 and is connected with sprocket 28 through a chain 38.

A manually operated brake element 39 is provided on the shaft 34 for decreasing the rotation of shaft 34, especially on down grades, and to prevent accidental movement of the machine when stopped. The shaft 34 extends from the bearing 35 through an aperture 40 (Figure 2) provided in end plate 6, and has pinned, or otherwise rigidly secured on its outer end a drive gear 41.

From the foregoing, it will be apparent that operation of the engine 22 rotates shaft 23, and with clutch 24 thrown in by handle 26, rotates sprockets 28 and 38 to actuate shaft 34 and gear 41. Coupling 36 provides connection with gear reducer 31 and differential 30 to rotate shaft 21 of the differential, whereby sprockets 20, 15, 16 and 18 rotate traction wheels 12 to cause movement of the machine along the pipe P. The differential 30 can be any desired ratio and the

speed reducing element is adjustable for any desired speed depending upon the pipe size whereby the rotation of shaft 34 can be synchronized therewith to assure the desired overlap between the wrapping material as will be hereinafter set forth.

A strap or saddle member 42 is disposed longitudinally above the frame and is connected to the parts 5 and 6 substantially media of the end member 5 and the top of the end plate 6. A ring 43 is secured to the saddle 42 by welding or the like, and is adapted to receive any hoisting equipment for lifting the machine when desired. A cylindrical member 44 is secured to the side members 2 and is adapted to receive a "boom pole or the like" for balancing the machine when necessary.

Wrapping mechanism

Referring to Figures 2, 3 and 4, the end plate 6 is provided with a plurality of circumferentially spaced apertures 45, preferably but not limited thereto, six apertures spaced sixty degrees apart. Each of the apertures 45 is adapted to receive a shaft 46 carrying a roller 47 and these rollers support a rotatable gear 48. The gear 48 is provided with an aperture or bore 49 complementary to a similar bore (not shown) provided in end plate 6. It will be apparent that the pipe P supporting the machine extends through the bore 49 as clearly disclosed in Figure 1. The outer periphery of annular gear 48 is provided with annular members 48a at opposite sides of a circumferential groove 50 serving as a track for rollers 47, supporting the gear adjacent or substantially flush with one side of the end plate 6. The members 48a are provided with circumferentially disposed gear teeth 51. An intermediate gear 52 is journaled on a shaft 53 supported by plate 6 and intermeshes with the teeth 54 of gear 41, and teeth 51 of gear 48 to cause rotation of large gear 48.

Referring to Figure 4, the shaft 46 for each of the rollers 47 is secured to plate 6 by a nut 55. A spacer member or washer 56 is interposed between one side of plate 6 and the flanged body portion 57 of each roller 47. The portion of the shaft 46 extending through the aperture 45 is offset at 46a from the center line of the shaft to provide an eccentric adjustment for each of the rollers 47. A bushing 58 is disposed in the apertured flange 57 of the roller. A washer 59 is interposed between roller 47 and shaft head 60. The shaft or bolt 46 may have a passageway, as shown in dotted lines in Fig. 4, to receive lubricant or the like. The eccentric arrangement of the shaft 46 allows for variable adjustment of the rollers 47 radially inward or outward toward and away from the annular groove 50 of the gear 48. In this manner it will be seen that the gear can be adjustably supported on the plate 6 in a desired radial position with respect to the pipe P. Furthermore, the eccentric adjustments allows compensation for any wear and tear between rollers 47 and gear 48.

The central body portion of the gear 48 is provided with a plurality of sets of predeterminedly spaced threaded socket members 61, 62 and 63. From Figure 3, it will be apparent that four sets of three socket members are provided. Each of the socket members is adapted to receive a threaded pin or shaft 70 (Fig. 1) secured thereto by a lock nut 71. The outer end portion of shaft 70 is provided with an annular flange 72 having an apertured ear 73 disposed normal thereto. The ear 73 is disposed in an apertured yoke mem-

ber 75 forming one end of the spindle 76 carrying a wrapping roll 77. A bolt 78 secures the yoke 75 to the ear 73. The universal connection is such that the spindle may be adjusted to extend in any desired direction either rotatively or angularly and is secured in such adjusted position by the aforementioned locking means.

As clearly shown in Figure 1, the spindle 76 is adapted to receive an annular spool holder or ring 79 formed on a sleeve 80 adjustably secured by locking means 81 to the spindle 76. The spool 77 carrying convoluted wrapping material is supported on the spindle 76, sleeve 80 and a second spool holder 82. The spool holder 82 is secured in position by any suitable tension clamping or latching means 83 disposed on the outer end of the spindle.

From the foregoing it will be apparent that any one of preferably four (but not limited thereto) sets of socket members 61, 62 and 63 are utilized for receiving variable length spindles carrying a wrapping roll. In practice normally two spindles and wrapping rolls are disposed diametrically opposite each other on the gear ring, especially when using a covering such as asbestos felt or the like. However, the plurality of socket members allows for the support of as many as four rolls on the gear ring 48. This is desired when covering the pipe with both asbestos felt, and a super-imposed paper covering. Supporting the main gear 48 from the outside with rollers 47, allows the roll carrying spindles to be moved closer toward the pipe thereby reducing the circular path made by rotation of the rolls, and thus eliminating considerable elevation of the pipe out of the ditch. Furthermore, the socket members 61, 62 and 63 allow for variable positioning of the rolls toward the pipe. The wrapping spool spindles 76 through the universal connection can be adjusted so that the wrapping material from one roll leads the material drawn from the other roll by a slightly greater distance than the width of the wrapping material thereby applying successive overlapping convolutions of wrapping material to the pipe so that covering material from one spool will entirely overlap or overlie that supplied from the other spool. The amount of overlap is determined by the speed of movement of the apparatus along the pipe relative to the speed of rotation of the wrapping gear 48. The differential 39 and variable speed reducer cooperate to maintain this relation in unison thereby assuring a desired lap according to a particular adjustment of the rolls. Supporting the large gear 48 on its outer periphery with the eccentrically adjustable rollers 47 allows for a bore of greater diameter, so that the apparatus can be used on pipes of considerable variations in size. The eccentric adjustability of the rollers with respect to the gear 48 allows adjustment of the bore 49 in perfect alignment with the pipe P. The end plate 6 and gear 48 are covered by a shield 84 (Fig. 1).

The forward end of the frame is provided with a counterbalancing unit 85 (see Figures 1 and 5) comprising spaced bracket members 86 secured to the cross member 5 and sump tank 7 of the machine. The bracket members are each provided with a takeup bearing 87 supporting a shaft 88 upon which are journaled wheels 89 adapted to bear against the lower side of the pipe P. Each of the bearings 87 is provided with a cage 90 in which is disposed the head 91 of a rod 92 extending vertically upward through the bracket members. The upper portion of each rod 92 is thread-

ed and receives a threaded member 93. A helical spring 94 encircles each rod 92 and is anchored between member 93 and a plate 95 of the unit 85, while a second helical spring 96 encircles rod 92 and is anchored between the plate 95 and top of the cage 90. It will be apparent that adjustment of member 93 provides variable resilience to the wheels 89 to counterbalance any extra weight of the wrapping mechanism thereby maintaining the machine in perfect equilibrium along the pipe P.

Coating shoe

Referring to Figures 2, 5 and 7 an annular coating shoe 100 is suspended from side members 2 by threaded rods or spindles 101 and 102. The rods are adjustably connected to brackets 103 carried by the side members 2. The outer periphery of the shoe is provided with diametrically opposed brackets 104 to which the spindles 102 and 103 are adjustably secured by the clamping nuts 105. From the foregoing, it will be apparent that the annular shoe 100 can be radially adjusted with respect to the pipe P.

Referring to Figure 7 the coating shoe comprises a pair of cylindrical members 106 and 107 of different diameters, with inner cylinder 106 disposed in outer cylinder 107. The cylinders are secured in proper spaced relation by a plurality of circumferentially spaced bolts 108 (Fig. 8) extending through cylinder 107 and bearing against the outer periphery of cylinder 106 to allow radial adjustment between the cylinder members. The cylinder 107 is provided adjacent its edge portions with internal threads 109 for receiving threaded rings 110. Each ring is provided with an angularly disposed annular flange 111 having a beveled face 111a. The threaded connection of ring 110 with cylinder 107 allows adjustment of the flange toward and away from the edge of the inner cylinder 106. It will be apparent that two ring members 110 are utilized to provide a pair of adjustable circular coating slots as will be hereinafter referred to. Coating material enters the chamber 112 through a pipe 113 communicating with a rotary pump to be hereinafter referred to. A drain pipe 114 allows discharge of coating material from chamber 112 when the shoe 100 is not being utilized. The rings 110 are provided with spaced handles 115 to facilitate their adjustment. It will be noted that the hot bituminous material introduced through the pipe 113 is maintained under pressure in chamber 112 to be ejected or discharged through the circular slots 116, and flooding all surfaces of the pipe in planes at substantially right angles thereto as the machine moves along the pipe.

The circular edge of each flange 111 extends slightly beyond the inner surface of cylinder 106 so that the coating material will be sprayed inwardly toward the middle of shoe 100. Any desired adjustment of the rings 110 can be made in order to discharge the coating material through the circular coating slots and onto the pipe, thus applying a uniform thickness of coating over the entire surface of the pipe at one time and in the same plane. In this manner only a minimum amount of coating for any specified thickness is required. In order to positively assure elimination of any bubbles in the coated surface, the machine is equipped with a semi-circular spreader member 138 (Figure 2) suitably connected by hinging or the like to the rear of the coating shoe 100 and preferably sup-

ported by one of the rings 110. The spreader 138 is adapted to overlie the top surface of the pipe in spaced relation thereto for breaking up bubbles.

The dope or asphaltic coating material is maintained in the sump tank 7. A heating element 120 is preferably arranged diagonally across the sump tank for heating the coating to be applied to the pipe. Referring to Figure 5, the upper portion of one side of the sump tank is provided with a bracket 121 to which is secured the rotary pump 122. A stud shaft 123 extends from the pump and is provided with a tooth sprocket 124 connecting with the drive sprocket 29 by sprocket chain 125. The shaft 123 is journaled in a bearing 126 supported on a bracket 127 secured to the end plate 6. The shaft extends through the bearing 126 and an aperture (not shown) in plate 6 to the outside of gear 48, and the outer end portion of the shaft may be shaped to receive a wrench or other suitable tool used for manual rotation of the pump prior to operation of the machine when the coating material may be cold. A supply conduit 128 forms a continuation of the shoe inlet 113 and leads from the pump. A conduit 129 provides communication between the pump and the bottom of the sump tank 7, and upon rotation of the pump causes flow of the coating material from the sump tank into the pump and through pipe 128, into chamber 112. A conduit 130 may serve to conduct hot gases from the heat pipe 120 to the pump for heating the latter.

A fuel tank 132 is bracketed to one side of the sump tank 7 adjacent the pump 122. The fuel tank is provided with an air pump 133 and supplies fuel to a burner 131 (Fig. 5) arranged at the inlet of the heater 120. Any suitable conduit means (not shown) can provide communication between the fuel tank outlet 134 and the burner. The tank 132 is provided with a fuel inlet 135 and pressure gauge 136.

Operation

In operation of the drive mechanism by the motor 22 engagement of clutch 24 rotates shaft 34 causing rotation of the traction wheels 12 simultaneous with the rotation of the large gear 48 and paper roll 71. It will be apparent that the wrapping mechanism can be actuated separately and independent of the coating mechanism. Since it is sometimes desired to coat the pipe without any wrapping material applied over the coating, or to wrap the pipe without coating material being first applied, the machine has been constructed for separate and independent operations of the coating and wrapping mechanism. The more usual situation, however, is to coat and wrap the pipe concomitantly in a single operation of the machine. Thus, the machine is constructed combining the coating and wrapping mechanism for simultaneous operation. To provide simultaneous function of the coating shoe 100 and pump 122 it is only necessary to engage the clutch 25 through operating the handle 27 thereby causing rotation of sprocket 29 and stud shaft 123 for the pump 122. With the roll spindles 76 supported in a proper socket member and adjusted relative to the pipe P to provide any desired overlap, the engine is started to actuate the traction wheels for propelling the machine along the pipe P. As the machine travels along the pipe P heated asphaltic material is pumped from the sump tank 7, through conduit 128 and into chamber 112 of

shoe 100 and discharged through slots 116. Excess coating material falls back into the sump tank 7 where it is recirculated by pump 122 to the shoe 100 thereby eliminating any waste whatsoever in the coating material. The large gear 48 is rotated through shaft 34, gears 41 and 54 to cause circular movement of the predetermined number of spindles and wrapping rolls to spirally wrap the pipe at the rear of the machine. It will be apparent that the covering material may include more than one layer such as a primary layer of asbestos felt superimposed by a layer of paper or the like.

Changes may be made in the combination and arrangement of parts as heretofore set forth in the specification and shown in the drawings, it being understood that any modification in the precise embodiment of the invention may be made within the scope of the following claims without departing from the spirit of the invention.

What I claim is:

1. A pipe wrapping machine comprising a frame adapted to be self-propelled along a pipe, a rotatable ring gear adjustably mounted on the frame and surrounding the pipe, a plurality of sets of wrapping material spindle receiving means carried by the gear, each receiving means of a set being spaced a different distance from the center of the ring gear than any other receiving means of that set, and being adapted to support a wrapping spindle in position relative to the center of the ring gear.

2. A pipe wrapping machine comprising a frame adapted to be self-propelled along a pipe, a rotatable gear adjustable mounted on the frame and surrounding the pipe, a plurality of sets of wrapping material spindle receiving means carried by the gear, each receiving means of a set being spaced a different distance from the center of the ring gear than any other receiving means of that set, and being adapted to support a wrapping spindle in position relative to the pipe, a spindle operatively connected with one of said receiving means, and means for angularly adjusting the spindle relatively to the axis of said gear.

3. A pipe wrapping machine comprising a frame adapted to be self-propelled along a pipe, an annular member mounted on the frame and surrounding the pipe, a rotatable gear surrounding the pipe, means cooperating with the outer periphery of the gear for supporting the gear on the annular member, said means being eccentrically adjustable to cause movement of the gear radially of the pipe, and means for driving the gear in timed relation with the movement of the frame.

4. A pipe wrapping machine comprising a frame adapted to be self-propelled along a pipe, an annular member mounted on the frame and surrounding the pipe, a rotatable gear, means carried by the member and cooperating with the outer periphery of the gear for supporting the gear on the annular member, said supporting means being eccentrically adjustable to cause movement of the gear radially of the pipe, a wrapping material spindle carried by the gear, and means on the gear for supporting the spindle in variable positions with respect to the pipe.

5. A pipe wrapping machine comprising a frame adapted to be self-propelled along a pipe, an annular member mounted on the frame and surrounding the pipe, a rotatable gear, means carried by the member and cooperating with

the outer periphery of the gear for supporting the gear on the annular member, said means being eccentrically adjustable to cause movement of the gear radially of the pipe.

6. A pipe wrapping machine comprising a frame adapted to be self-propelled along a pipe, an annular member mounted on the frame and surrounding the pipe, a rotatable gear, means carried by the member and cooperating with the outer periphery of the gear for supporting the gear on the annular member, said means being eccentrically adjustable to cause movement of the gear radially of the pipe, means for driving the gear in timed relation with the movement of the frame, and means cooperating with the gear driving means to vary the speed of said driving means.

7. A pipe wrapping machine comprising a frame adapted to travel along a pipe, traction wheels carried by the frame and engaging the pipe to propel the frame thereon, a motor on the frame and adapted to drive the traction wheels, an annular member mounted on the frame and surrounding the pipe, an annular gear, means carried by the member and cooperating with the outer periphery of the gear for supporting the gear on the member, said means being eccentrically adjustable to cause movement of the gear radially of the pipe, means operable from the motor for driving the gear around the pipe synergetically with the movement of the frame on the pipe, and means cooperating with the last mentioned means to vary the speed of the gear.

8. A pipe wrapping machine comprising a frame adapted to travel along a pipe, traction wheels carried by the frame and engaging the pipe to propel the frame thereon, a motor on said frame and adapted to drive the traction wheels, an annular member mounted on the frame and surrounding the pipe, a rotatable gear, means carried by the member and cooperating with the outer periphery of the gear for supporting the gear on the member, said means being adjustable to cause movement of the gear radially of the pipe, a plurality of sets of variable positioned socket members carried by the gear, a wrapping material spindle disposed in a socket member for each set, and means operable from the motor for driving the gear around the pipe synergetically with the movement of the frame on the pipe.

9. A pipe wrapping machine comprising a frame adapted to travel along a pipe, traction wheels carried by the frame and engaging said pipe to propel the frame thereon, a motor on said frame and adapted to drive the traction wheels, an annular member mounted on the frame and surrounding the pipe, an annular gear, a circumferential groove in the gear, a plurality of rollers carried by the member and cooperating with the groove for supporting the gear on the member, said rollers being eccentrically adjustable to cause movement of the gear radially of the pipe, a set of variable positioned socket members carried by the gear, a wrapping material spindle adapted to be disposed in one of said socket members, and means operable from said motor for driving the gear around the pipe synergetically with the movement of the frame on the pipe.

10. A pipe wrapping machine, comprising a frame adapted to be self-propelled along a pipe and provided with eccentrically adjustable supporting means, a rotatable ring gear mounted

on said means and adapted to surround the pipe, said gear being adjustable by said means radially, whereby its axis may be displaced relatively to the pipe, means for rotating said gear, and a wrapping material spindle carried by the gear.

11. A pipe wrapping machine, comprising a frame adapted to be self-propelled along a pipe and provided with eccentrically adjustable supporting means, a rotatable ring gear mounted on said means and adapted to surround the pipe, said gear being adjustable by said means radially, whereby its axis may be displaced relatively to the pipe, means for rotating said gear, and a wrapping material spindle carried by the gear, said gear being provided with means to allow the spindle to be set at various positions relatively to the axis of the ring.

12. A wrapping machine comprising a frame adapted to be self-propelled along a pipe, a series of circularly arranged rollers supported by the frame and adjustable radially relatively to the circle, a rotatable ring gear carried by said rollers and adapted to have its center shifted by adjustment of said rollers, a wrapping material spindle carried by the gear, and means for driving the gear synergetically with the movement of the frame.

13. In a machine of the character described, a frame adapted to receive and travel along a pipe line, cross shafts operatively connected with the frame, rollers on the cross shafts adapted to travel along the pipe, one end of said frame being of annular form to surround the pipe, and the opposite end of the frame having corners, a prime mover positioned on one of said corners, a drive shaft extending along the top of the frame at one side thereof, a differential mounted on the other corner of the frame, a driven shaft connected to the differential and extending along the opposite side of the frame, a speed reducer mounted on the last mentioned side of the frame and operatively connected with the driven shaft for driving the latter, a third shaft extending along the last mentioned side of the frame and operatively connected with the speed reducer for driving the latter, power transmitting means connecting said drive shaft to the third shaft, power transmitting means connecting the differential to one of said cross shafts for driving it, a ring gear mounted on the annular end of the frame, and means operatively connecting one of said shafts to said ring gear for driving the latter.

14. A combination coating and wrapping machine comprising a frame adapted to be self-propelled along a pipe, a ring shaped coating shoe rigidly arranged at the central portion of the frame and adapted to substantially surround the pipe, said shoe having an internal coating material conduit and a coating discharge means for delivering the coating material in an annular stream onto the pipe, a coating supply reservoir carried by the frame below the shoe, means including a pump for feeding coating material from the reservoir to the conduit of the shoe, and means carried by the frame and arranged at one side of said shoe for applying a wrapping material onto the coated surface of the pipe.

15. A combination coating and wrapping machine comprising a frame adapted to be self-propelled along a pipe, a ring shaped coating shoe rigidly arranged at the central portion of the frame and adapted to substantially surround the pipe, said shoe having an internal coating

material conduit and a coating discharge means for delivering the coating material in an annular stream onto the pipe, a coating supply reservoir carried by the frame below the shoe, means including a pump for feeding coating material from the reservoir to the conduit of the shoe, means carried by the frame and arranged at one side of said shoe for applying a wrapping material onto the coated surface of the pipe, and means for driving the wrapping means around the pipe in timed relation with the movement of the frame along the pipe.

16. A combination coating and wrapping machine comprising a frame adapted to be self-propelled along a pipe, a ring shaped coating shoe rigidly arranged at the central portion of the frame and adapted to substantially surround the pipe, said shoe having an internal coating material conduit and a coating discharge means for delivering the coating material in an annular stream onto the pipe, a coating supply reservoir carried by the frame below the shoe, means including a pump for feeding coating material from the reservoir to the conduit of the shoe, and means carried by the frame and arranged at one side of said shoe for applying a wrapping material onto the coated surface of the pipe, said wrapping means being operative independently of said pump.

17. A combination coating and wrapping machine comprising a frame adapted to be self-propelled along a pipe, a ring shaped coating shoe rigidly arranged at the central portion of the frame and adapted to substantially surround the pipe, said shoe having an internal coating material conduit and a coating discharge means for delivering the coating material in an annular

stream onto the pipe, a coating supply reservoir carried by the frame below the shoe, means including a pump for feeding coating material from the reservoir to the conduit of the shoe, and means carried by the frame and arranged at one side of said shoe for applying a wrapping material onto the coated surface of the pipe, said wrapping means including a rotatable ring gear adjustably mounted on the frame and arranged coaxially with said shoe, and a plurality of wrapping material spindles carried by the gear and adapted to rotate therewith for spirally applying the wrapping material to the pipe.

18. A combination coating and wrapping machine comprising a frame adapted to be self-propelled along a pipe, a ring shaped coating shoe rigidly arranged at the central portion of the frame and adapted to substantially surround the pipe, said shoe having an internal coating material conduit and a coating discharge means for delivering the coating material in an annular stream onto the pipe, a coating supply reservoir carried by the frame below the shoe, means including a pump for feeding coating material from the reservoir to the conduit of the shoe, and means carried by the frame and arranged at one side of said shoe for applying a wrapping material onto the coated surface of the pipe, said wrapping means including a rotatable ring gear adjustably mounted on the frame and arranged coaxially with the shoe, a plurality of wrapping material spindles carried by the gear and rotatable therewith for applying wrapping material about the pipe, and means for supporting each of the spindles in variable positions with respect to the axis of the gear.

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