March 24, 1936. C. W. FULLER 2,034,755

IMPROVEMENT IN COATING DEVICE

Filed Oct. 29, 1931 2 Sheets-Sheet 1

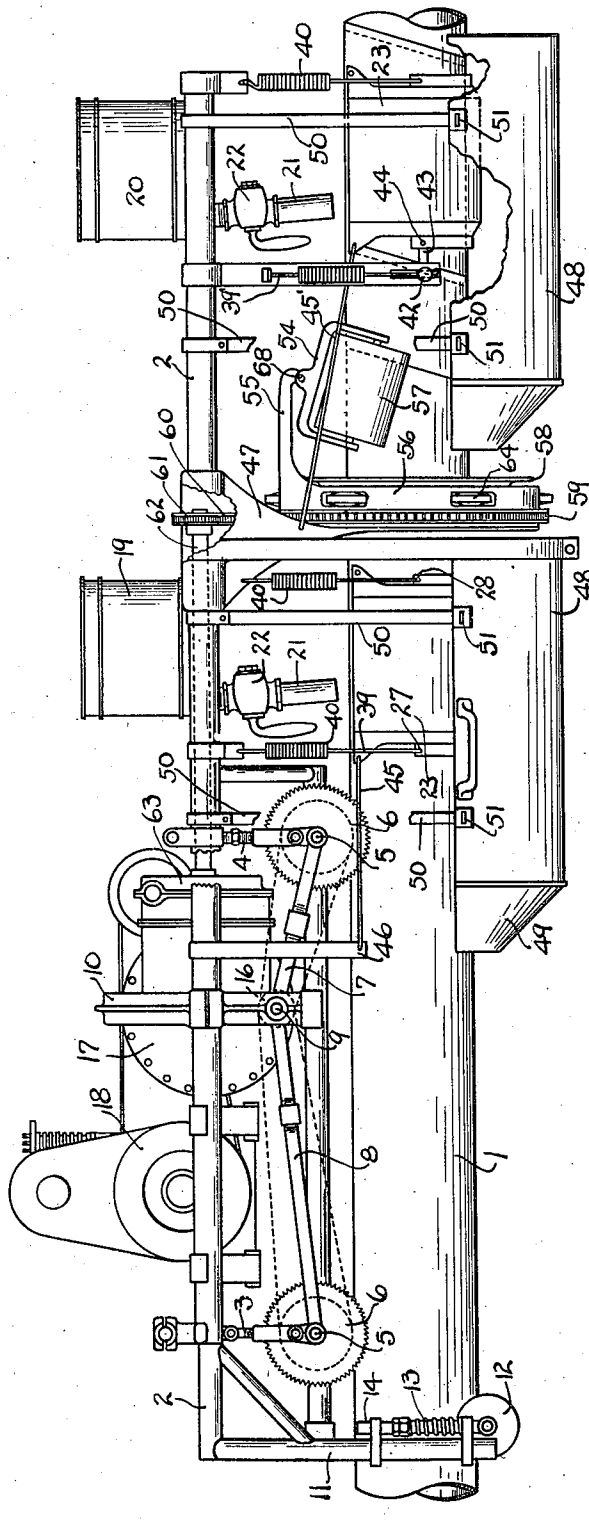


Fig 1

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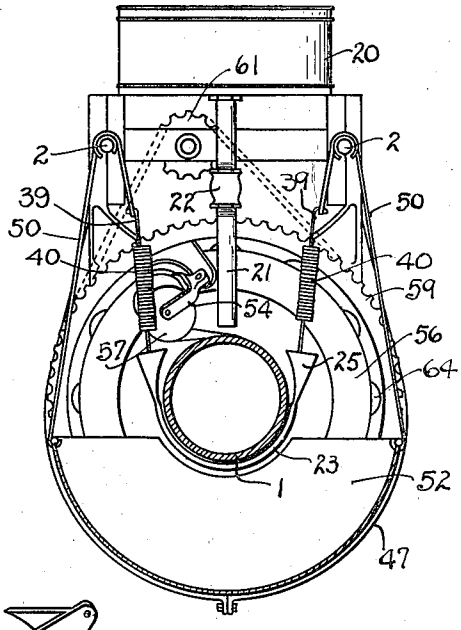


Fig 2

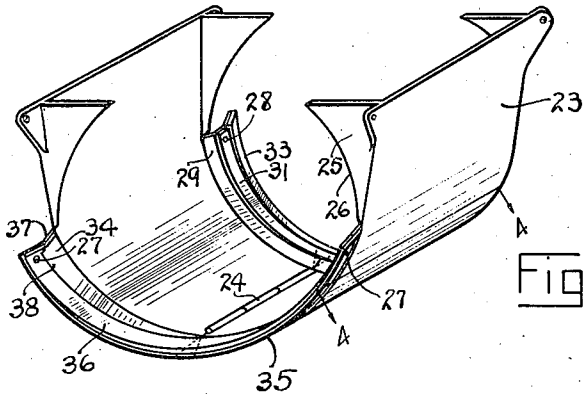


Fig 3

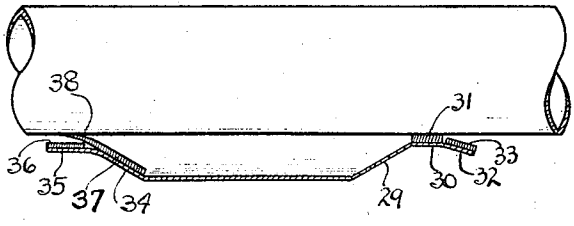


Fig 4

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Patented Mar. 24, 1936 2,034,755

UNITED STATES PATENT OFFICE

2,034,755

IMPROVEMENT IN COATING DEVICE

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Application October 29, 1931, Serial No. 571,790

5 Claims. (Cl. 91—30)

My invention relates to machines for coating pipe, and has particular application to the protection of pipe employed for conducting water, gas, oil, and the like, and which has to be laid underground and to be thus subject to corrosion and deterioration.

This invention is an improvement upon the device shown in the prior application filed by me jointly with Eugene L. Rolfs on April 4, 1929, Serial No. 352,451 (Patent No. 1,990,711). The present invention has to do particularly with the means for applying the coating material.

It is an object of the invention to provide a particularly effective means for applying the coating to the pipe while the machine is travelling along the pipe as a track.

The invention also includes the particular structure of the shoe by means of which the coating material is applied to the pipe, giving the said material an even and smooth distribution and employing an exceedingly simple and economical structure.

The invention resides in the particular arrangement and construction of the apparatus whereby the protecting of the pipe is accomplished.

In the drawings herewith, Fig. 1 is a side view in elevation, with certain parts broken away, illustrating the assembled machine whereby my invention is operated.

Fig. 2 is an end view in section, through the rearward end of my device.

Fig. 3 is a perspective view showing the wiping shoe which I employ, and Fig. 4 is a view longitudinally of the wiping shoe and showing the same adjacent the pipe, the section of the shoe being taken approximately on the line 4—4 of Fig. 3.

As in the prior invention disclosed in the application above referred to, my device is employed in connection with a frame-work adapted to travel upon the pipe. In Fig. 1 the pipe is shown at 1. The machine which I employ includes a frame-work comprising two parallel longitudinal frame members 2, spaced above the pipe by upright legs or posts 3 and 4. Said legs are mounted upon the longitudinal frame members and are adjustable thereon. They support axles 5 upon which traction wheels 6 are mounted. Said wheels are shaped to conform to the curvature of the pipe and are toothed to engage therewith and move the frame along the pipe. The axles 5 are connected by rods 7 and 8 to a central shaft 9 transversely of the frame. Said shaft 9 is supported upon a U-shaped support 10 extending across the upper part of the frame.

At the forward end of the frame is a pair of downwardly extending legs 11 which project downwardly to a point below the normal level of the pipe and have mounted thereon rollers 12 which are positioned to engage on the under side of the pipe and are held against the pipe by springs 13 mounted on the shafts 14 to which the rollers are connected. These features are no part of the present invention, and need not be described in detail.

The wheels 6 are driven from a sprocket wheel 16 upon the shaft 9, said shaft being rotated from the transmission within the housing 17 connected for operation to the motor 18 which is preferably a small internal combustion motor.

Toward the rear of the power mechanism which has been described, I mount two spaced containers 19 and 20. Each container is intended to hold a supply of coating material such as paint or asphalt, and a discharge pipe 21 on each of these containers acts to discharge the coating material upon the pipe. There is a hand-operated valve 22 in each of these discharge pipes whereby the supply of coating material to the pipe may be regulated.

Below each of the discharge pipes is a shoe or tank 23, the particular construction of which may best be seen in Figs. 3 and 4. Each shoe is made up of two sections hinged together at one side as shown at 24, so that the device may be more readily placed in position about the pipe. The two sections are preferably made of sheet metal, the free ends of which are provided with guards 25, the inner edge 26 of which is curved to conform to the curvature of the pipe, it being understood, however, that these guards do not fit closely against the pipe, but act only to prevent loss of coating material through splashing and the like. The ends of each of the sections are provided with openings 27 and 28 whereby the same may be supported and moved along the pipe.

At the forward or advancing end of the shoe the wall is inclined upwardly at 29 and an arcuate or cylindrical section 30 is formed which is to be spaced closely adjacent the lower side of the pipe and has mounted thereon pads 31 of soft material, such as leather or other resilient material, to engage against the pipe as a guide or gauge and prevent loss of the material. Forwardly of the cylindrical portion 30 the shoe is formed with a lip 32 inclined away from the pipe and having a pad of compressible or resilient material 33 thereon. It is to be understood that the

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flaring forward end 32 of the shoe is to engage beneath couplings or obstructions on the pipe and direct the shoe away from the pipe to allow the shoe to clear the obstruction.

At the rearward end of the shoe the end is inclined upward toward the pipe at 34, and it then is extended along parallel with the pipe at 35 and has a pad of resilient material 36 thereon. Along the inner wall of the section 34 of the shoe is a strip of flexible wiping material 37 which may be leather or other suitable composition, and said strip extends inward to contact with the pipe and has a wiping lip 38 which acts to spread the coating material evenly along the surface of the pipe.

As will be seen from Figs. 1 and 2, the shoe is supported at each end by a rod 39 having a spring 40 therein so that the shoe will be adapted to hug the pipe yieldingly but will allow the passing of the coupling upon the pipe as will be understood. The upper end of each of the rods 39 is hooked into an opening in brackets connected with the side members 2 of the frame.

In the case of the rearward shoe, the forward rod 39' is connected at its lower end to a post 42 formed on the end of an arm 43 secured at 44 to the forward end of the shoe. This arrangement is to allow a support for the shoe not interfered with by the adjacent structure upon the frame. The two shoes have, each of them, a forwardly extending pull rod 45 or 45' thereon, the forward shoe having said rod connected at the end of an arm 46 extending downwardly from the frame. The rearward pull rod 45' is connected with the bracket 47 on the frame. The pull rods act to move the shoes along the pipe as the frame progresses thereon. Beneath each of the shoes is a pan 48, the forward end of which is inclined toward the pipe as shown at 49. Each pan is supported by downwardly extending straps or plates of sheet metal 50 which engage about the frame member 2 at their upper ends and are hooked within openings 51 in the upper edges of the pan. The rearward end of each pan is closed by a wall extending upwardly nearly to the pipe as shown at 52 in Fig. 2. These pans will catch such coating material as overflows around the ends of the shoes in the operation of the device.

The roll of wrapping material is mounted upon a yoke 54, secured at the outer end of an arm 55, which arm is secured upon a circular frame or drum 56 surrounding the pipe. The roll of wrapping material 57 is rotatable upon a spool supported in the yoke 54. Said yoke is connected by a universal joint 58, to the arm 55, and may be adjusted to the desired angle relative to the pipe so that when the drum 56 is rotated, the strip of wrapping material will be unreeled from the spool upon the pipe. The drum 56 is mounted for rotation upon the circular frame member 58 formed upon the supported bracket 47. Said bracket extends downwardly around the lower side of the pipe and forms a bearing support for the drum. Said drum has a large peripheral gear or sprocket wheel 59 thereon, which is engaged by a sprocket chain 60 operatively connected with a sprocket wheel 61 on the end of the drive shaft 62. Said drive shaft is extended forwardly and connected with the gear case 63 and cooperating with the usual transmission operated by the motor 18. The drum 56 has rollers 64 which bear against the frame 58 in the rotation of the drum.

When the device is assembled into the position shown in Fig. 1, it is mounted upon the pipe to be coated and wrapped, in the position shown. The operation of the motor will cause the traction wheels 6 to be rotated, to move the frame longitudinally along the pipe at the desired speed. As the device is thus traversed longitudinally upon the pipe the coating material is discharged from the pipe 21 upon the upper surface of the pipe and will spread laterally over the upper surface and will run downwardly into the shoes 23. Each shoe will be practically full of coating material and as the frame progresses along the pipe the material will be wiped smoothly on the sides of the pipe by means of the wiper 38. If the discharge of the material is properly adjusted very little leakage will occur from the shoes into the pans 48.

After the pipe has been coated from the forward one of the shoes it will be wrapped with a layer of material through the rotation of the drum 56 about the pipe carrying with it the roll of wrapping material which is unreeled smoothly against the outer surface of the pipe in an overlapped relation. When thus wrapped further coating material will be applied to the outer surface of the wrapping, and then the pipe will be ready for laying in a ditch.

By means of the two wiping shoes I am thus enabled to apply the coating uniformly to the pipe with a minimum of apparatus. The pipe will be found to be smoothly and evenly coated with material without the necessity of the usual rotating brushes or like means of applying the coating upon the pipe. My device is particularly adapted for field work where the pipe has been connected together for laying of the pipe line. The device may travel upon the pipe as a track and apply the coating and wrapping material rapidly and smoothly along the pipe at a minimum of expense and labor. The advantages of this construction will be apparent.

It will be seen that the curved portion constituting the bottom of the shoe is maintained continuously in spaced relationship to the bottom of the pipe, so that there may be always a layer of liquid protecting material of substantial thickness between the curved portion and the bottom of the pipe, when the pipe wrapping device is in operation. This structure is to be distinguished from one in which the curved portion of a cradle-like member is alternately dropped from and then raised against the bottom part of a pipe or in which the curved portion is continuously rubbed against the pipe.

It will be evident, also, that the flexible or yieldable elements 37 and 31, extending from the shoe to the pipe, serve to close a reservoir defined in part by the curved portion of the shoe and adapted to receive liquid coating material, for the application of which to the outside of a pipe the machine is particularly designed.

What I claim is:

1. A device for applying protective material to the outside of a pipe including a shoe shaped to surround the lower side of the pipe and to constitute a reservoir adapted to hold continuously a thick layer of coating material in contact with the bottom of the pipe, a flexible closure member at the forward end of said shoe to engage the pipe and maintain the shoe in spaced relation to the pipe, a wiper at the rearward end of said shoe curved and positioned to engage the lower side of said pipe, and means to yieldably support and move said shoe along the pipe.

2. A device for applying protective material to the outside of a pipe including a shoe shaped

to surround the lower side of the pipe and to contain a coating material, a flexible closure member at the forward end of said shoe to engage the pipe, an outwardly flaring guide lip at the forward end of said closure member to guide said shoe over inequalities upon the pipe, a wiper at the rearward end of said shoe curved and positioned to engage the lower side of said pipe, and means to support and move said shoe along the pipe.

3. A device for applying protective material to the outside of a pipe including a shoe made up of two sections of sheet material hinged together and curved to engage about the pipe, means to yieldably support and move said shoe along the pipe, means to discharge liquid coating material therein, and means at the rearward end of said shoe to smoothly apply the coating material to the pipe.

4. A device for applying coating material to the outside of a pipe, comprising a frame and means for causing relative movement between the pipe and frame, a tank having a semi-cylindrical portion supported by said frame to surround the lower portion of the pipe, guide means carried by the tank for engaging the pipe to maintain the tank in spaced relation to the pipe, yieldable means engaging said tank for maintaining the guide means in contact with the pipe, and means for discharging liquid coating material upon said pipe and into said tank, whereby the pipe is coated during the relative movement of the frame and pipe.

5. A device for applying coating material to the outside of a pipe, comprising a frame and means for causing relative movement between the pipe and frame, a tank having a semi-cylindrical portion supported by said frame to surround the lower portion of the pipe, guide means carried by the tank for engaging the pipe to maintain the tank in spaced relation to the pipe, yieldable means engaging said tank for maintaining the guide means in contact with the pipe, means for discharging liquid coating material upon said pipe and into said tank, whereby the pipe is coated during the relative movement of the frame and pipe, and means carried by the tank for wiping the pipe and maintaining the coating in the tank.

CHARLES W. FULLER.