

Oct. 9, 1928.

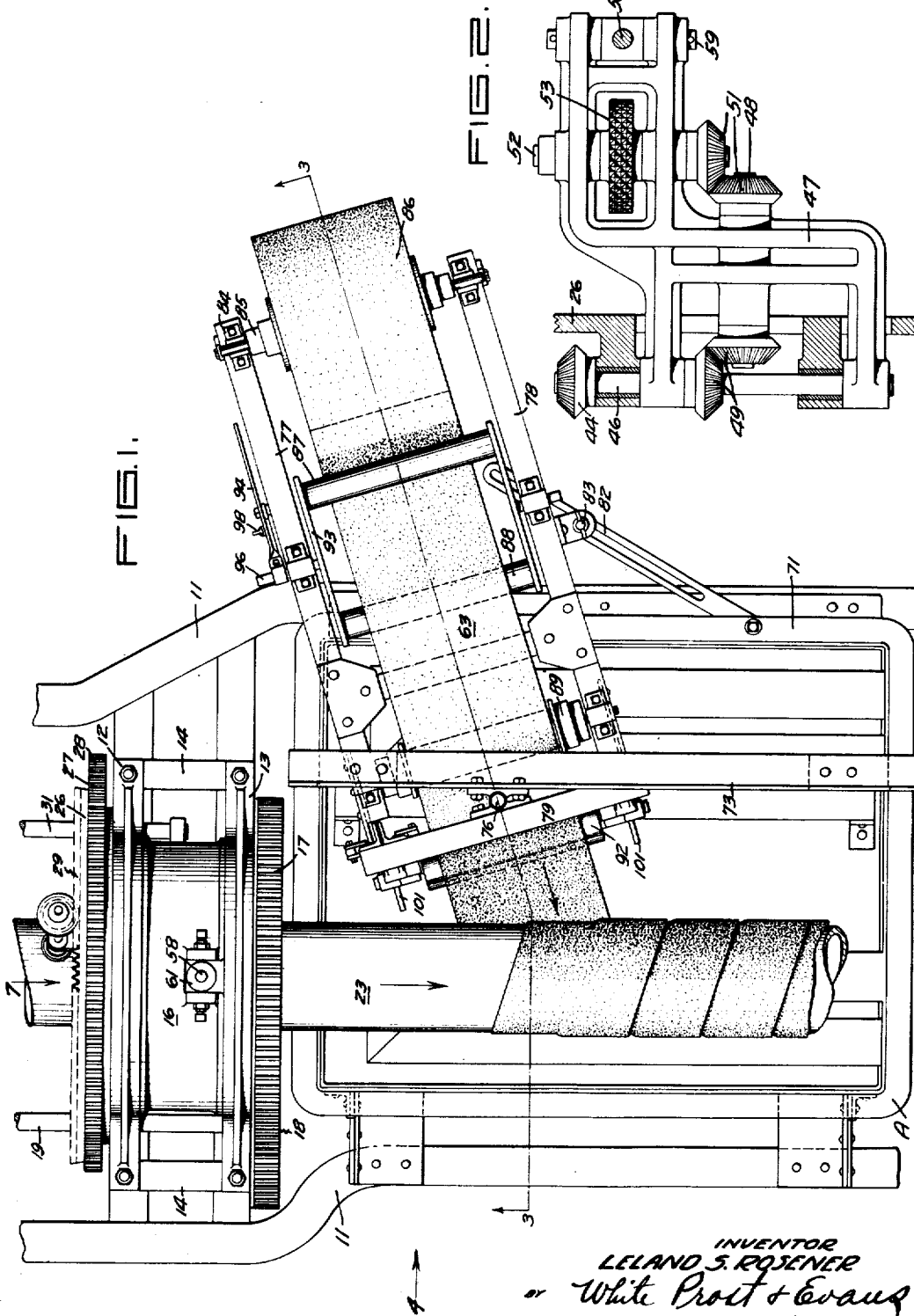
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L. S. ROSENER

PIPE WRAPPING MACHINE

Filed July 28, 1924

4 Sheets-Sheet 1



Oct. 9, 1928.

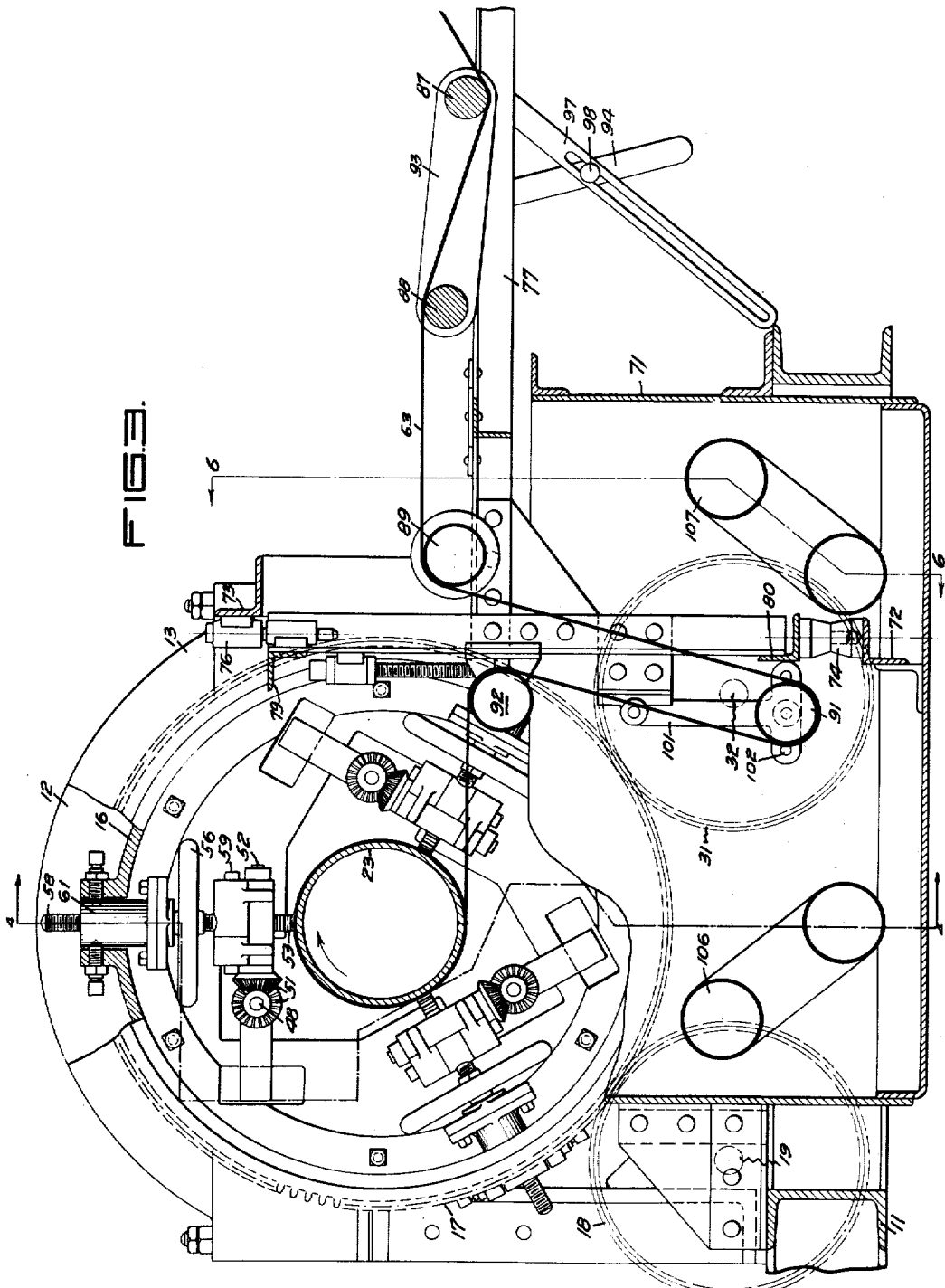
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PIPE WRAPPING MACHINE

Filed July 28, 1924

4 Sheets-Sheet 2



INVENTOR
LELAND S. ROSENER
BY White Print & Co. HIS ATTORNEYS

Oct. 9, 1928.

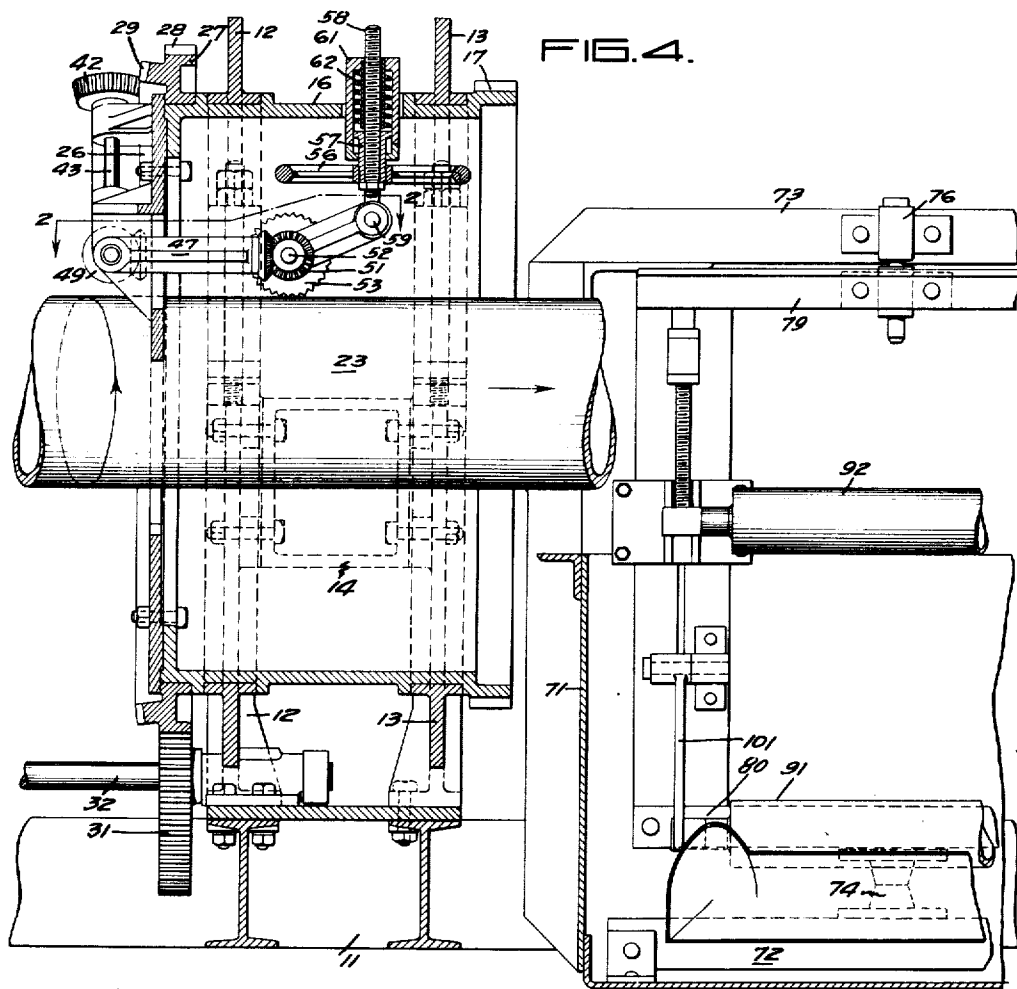
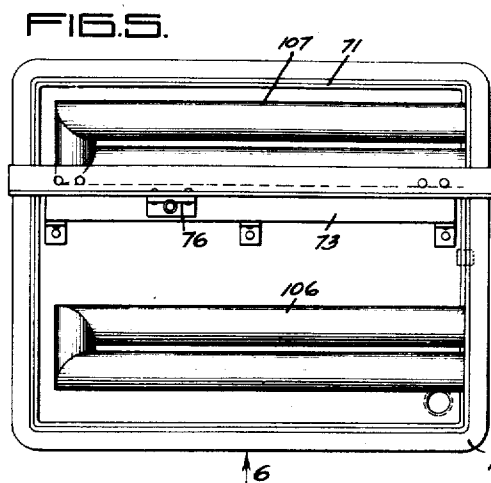
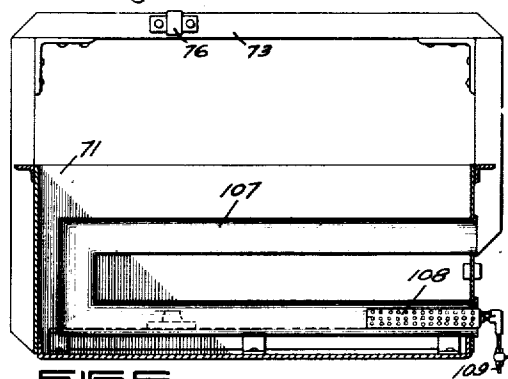
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Filed July 28, 1924

4 Sheets-Sheet 3



INVENTOR
LELAND S. ROSENER

BY *White Probst & Evans*
HIS ATTORNEYS:

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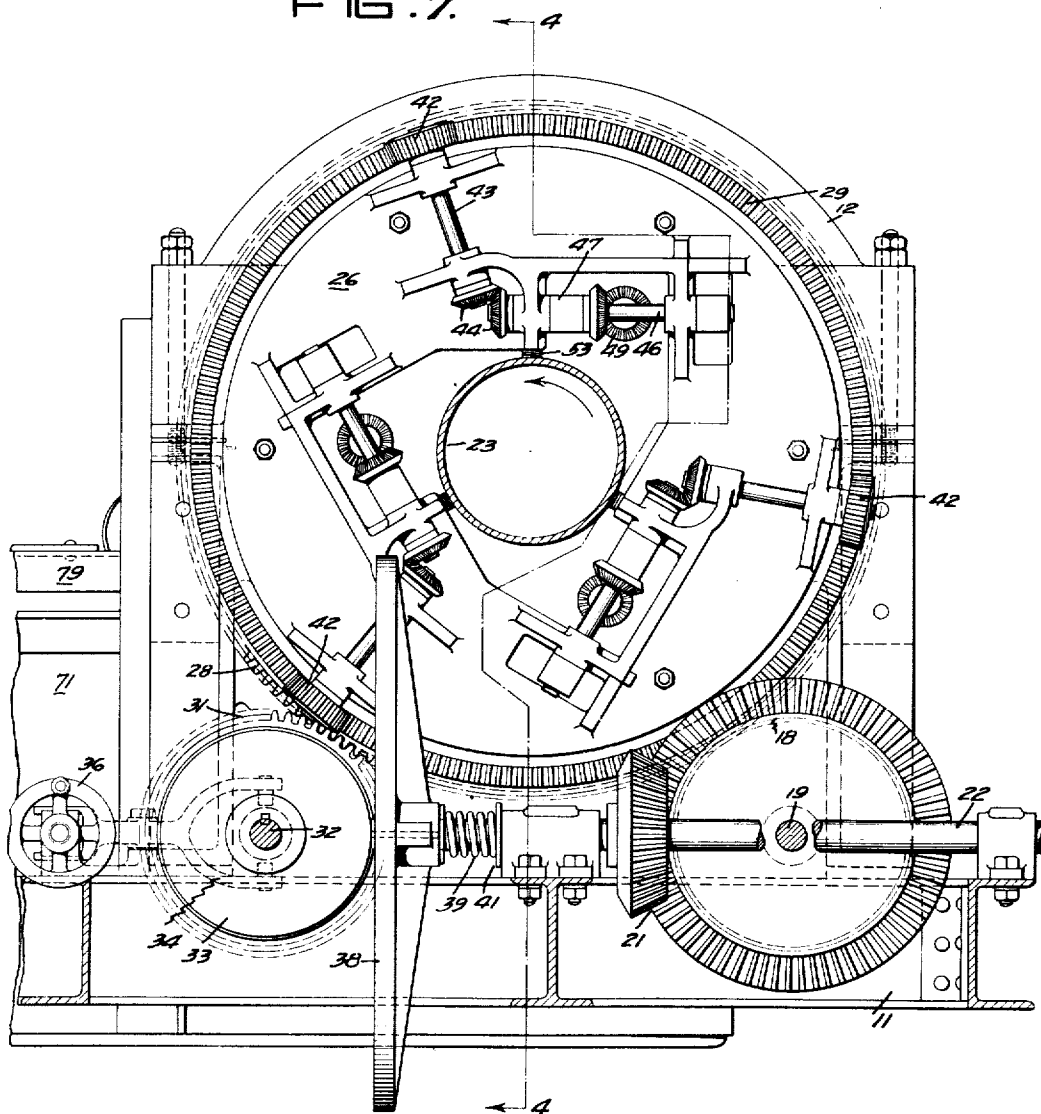
L. S. ROSENER

PIPE WRAPPING MACHINE

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4 Sheets-Sheet 4

FIG. 7.



INVENTOR
LELAND S. ROSENER
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UNITED STATES PATENT OFFICE.

LELAND S. ROSENER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE PARAFFINE COMPANIES, INC., OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF DELAWARE.

PIPE-WRAPPING MACHINE.

Application filed July 28, 1924. Serial No. 728,551.

My invention relates to devices for winding strips of covering material upon cylindrical or other bodies and especially to pipe wrapping machines. One of the objects of the invention is the provision of a pipe wrapping machine in which the feed rollers which propel the pipe thru the machine are mounted in a frame journaled for rotation about the axis of the pipe held therein.

Another object of the invention is the provision of a pipe wrapping machine in which the ratio between the speed of rotation and the speed of longitudinal movement of the pipe may be readily adjusted to determine the pitch of the spiral strip of covering material as it is rolled upon the pipe.

Another object of the invention is the provision of a pipe wrapping machine capable of easy adjustment to handle different sizes of pipes.

My invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of my invention. It is to be understood that I do not limit myself to the showing made by the said description, as I may adopt variant forms of the invention within the scope of the claims.

Referring to the drawings:

Figure 1 is a plan view of the wrapping machine showing a piece of pipe being wrapped. The ends of the supporting frame and the driving mechanism are omitted to shorten the figure.

Figure 2 is a plan view of the frame for mounting the feed rollers. The plane in which the view is taken is indicated by the line 2—2 of Figure 4.

Figure 3 is an elevation partly in vertical section of my pipe wrapping machine. The plane in which the view is taken is indicated by the line 3—3 of Figure 1.

Figure 4 is a vertical longitudinal sectional view, the plane of section being indicated by the line 4—4 of Figure 3. The arrow 4 in Figure 1 also indicates the direction of the view.

Figure 5 is a plan view of the tank, but on a smaller scale than in Figure 1. The reference letter "A" is placed adjacent the same corner in both views.

Figure 6 is a vertical sectional view thru the tank and one of the heating flues. The direction from which the view is taken is indicated by the arrow 6 of Figure 5 and the plane of section indicated by the line 6—6 of Figure 3.

Figure 7 is an end elevation taken in a direction opposite to that of Figure 3 and as indicated by the arrow 7 of Figure 1.

In terms of broad inclusion my invention comprises a machine for winding upon a pipe a strip of material saturated or coated with a suitable waterproof material, thus giving the pipe a durable, protective sheathing. The end of the strip which is passed thru a saturant material is applied at an angle to the pipe and the pipe then rotated and at the same time fed forwardly so that the strip is drawn thru the coating material and upon the pipe. The pipe is supported in the machine upon feed rollers which slowly rotate to propel the pipe thru the machine. The rollers are mounted in a frame journaled for rotation so that the pipe is rotated at the same time that it is being fed thru the machine. Means are provided for correlating the speed of the feed rollers with the speed of rotation of the frame in which the rollers are mounted, so that the ratio between the two movements of the pipe may be suitably adjusted into accord with the desired spiral of the strip covering. By adjusting the speeds so that the progression of the pipe thru the machine is slow relative to the speed of rotation, the wrapping may be applied in two or more layers, and by increasing the progressive speed relative to the rotary speed, the strip may be laid with flush edges or slightly lapping. Means are also provided for handling the strip of covering material thru the tank containing the saturant and for delivering the strip of covering material to the pipe at the proper angle.

More particularly my machine comprises a supporting frame 11 of any suitable type. Since my machine is usually used in the open at the location where the pipe is to be used the frame 11 may constitute the main frame members of a vehicle. If the machine is to be used at a fixed point such frame members constitute part of the foundation support.

Securely mounted on the frame 11 are the bearings 12 and 13 preferably braced by the block 14 as shown in Figure 4. Journaled within the bearings 12 and 13 is a cylindrical frame 16, one end of which is provided with gear teeth 17, adapted to mesh with the driving gear 18, fixed on the shaft 19, which is driven thru the bevel gear 21 from the power shaft 22, suitably connected to any source of power. The rotatable frame 16 is thus positively driven from the power shaft 22.

Means are provided on the cylindrical frame for centrally holding the piece 23 of pipe to be wrapped, and feeding its longitudinally thru the machine. Bolted to the end of the cylindrical frame opposite the gear 17, is a plate 26, the peripheral edge of which forms part of the bearing for the gear ring 27, provided with spur gear teeth 28 and bevel gear teeth 29. This gear ring is adapted to be rotated on the cylindrical frame by means of the gear 31, in mesh with the teeth 28 and fixed on the shaft 32. Also fixed on the shaft 32 is a friction wheel 33, adapted to be moved longitudinally of the axis of the shaft 32, by a pivoted yoke 34, controlled by suitable adjusting devices such as the handled screw 36 threaded into the yoke. The friction wheel 33 engages the friction disk 38 splined on the end of the shaft 22, and spring-held against the friction wheel 33, by a spring 39, interposed between the friction disk and a flange 41 on the shaft 22. By moving the friction wheel toward and from the center of the friction disk the speed of rotation of the gear ring 27 relative to the speed of rotation of the cylindrical frame 16 may be closely regulated.

Meshing with the gear teeth 29 of the gear ring and driven thereby are a plurality of gears 42, each one of which is fixed on and drives a shaft 43, connected by the bevel gears 44 with and driving the shaft 46. Both of the shafts 43 and 46, as set shown in Figure 7, are journaled in bearing lugs formed on the plate 26. Pivottally mounted on each shaft 46 is a frame 47 shown in plan in Figure 2 and in side elevation in Figure 4. Journaled in each frame 47 is a shaft 48, connected at one end by the gears 49 with the shaft 46, and at the other end connected by the gears 51 with a shaft 52, also journaled in the frame 47 and carrying the toothed feed roller 53. Preferably there are three frames 47, and hence three feed rollers spaced 120° apart.

Since each frame 47 is pivottally mounted to swing about the axis of a shaft 46, the feed rollers are movable toward or from the axis of rotation of the cylindrical frame 16 in accordance with the size of pipe held by them. This adjustment is controlled by the hand wheels 56 thru the hub 57 of each of which passes a threaded spindle 58 connected at its lower end by means of the pivot pin 59 to the end of the frame 47. Each hand wheel hub and spindle are slidably mounted in a box 61,

pivoted on the frame 16 in an axis parallel to the axis of the pivot pin 59, so as to permit the small swinging movement of the box, spindle and hand wheel which occurs during adjustment of the companion frame 47. In order to provide for resilient pressure of the feed rollers 53 on the pipe, a spring 62 is interposed between each box 61 and the end of the companion hand wheel hub. By turning the hand wheel to extend the spindle 58 toward the center, the companion frame 47 is moved, together with the feed roller mounted therein, toward the center. Movement of the hand wheel in the opposite direction to retract the spindle will carry the frame 47 outwardly. It is therefore possible by moving the three hand wheels to accurately position the feed rollers 53 with reference to the pipe to be wrapped.

From the above it will be clear that although each of the feed rollers 53 is movable with its frame 47, it is positively driven thru the gears and shafts explained, from the gear ring 37, and that the speed of rotation of this ring relative to the speed of rotation of the frame 16 is variable by adjustment of the friction wheel 33. Thus the speed of the feed rollers 53 may be regulated so that the pipe is advanced thru the machine at such a speed relative to the rotation of the pipe with the cylindrical frame 16 that the wrapping strip 63 is applied in the desired spiral.

Means are provided for passing the wrapping strip thru a suitable saturant or coating material such as liquid asphalt. Fixed on the frame members 11 is a tank 71, having a bar 72 extending across the bottom thereof, and a second bar 73 suitably supported on the tank vertically above the bar 72. Fixed in alinement on the bars 72 and 73 respectively are the blocks 74 and 76, between which a frame comprising the members 77, 78, 79 and 80 is pivottally supported so that the frame may be swung from side to side into the desired angular position with the longitudinal axis of the pipe being wrapped. The adjusted angular position of the frame is fixed by a slotted link 82, pivoted to the edge of the tank and adjustably locked to the frame by means of the screw 83.

Arranged on the ends of the frame members 77 and 78 are open half bearings 84 adapted to receive the ends of the arbor 85, upon which a supply roll 86 of covering material is wound. From the supply roll the strip of covering material is threaded between the tensioning rollers 87 and 88, over the roller 89, down into the saturant or coating material in the tank, and around the roller 91, then upwardly over the roller 92 to the pipe. The tensioning rollers 87 and 88 are mounted on a frame including the side bars 93, which is pivottally mounted on the frame members 77 and 78. The position of the rollers is controlled by the lever 94, fixed on

the stud shaft 96, which in turn is fixed to the frame 93. A slotted link 97 adjustably connected to the lever 94 by the thumb screw 98 provides means for holding the lever in the adjusted position.

In order to facilitate passing the strip over the roller 91, it is journaled on a pair of links 101 pivoted on the frame members 80. In the operation of the device, the normal tension on the strip as shown in Figure 3 will retain the roller 91 in its lower position. When the strip is to be threaded over the rollers, a suitable hook is inserted in the aperture 102, in the offset end of the links 101, and the roller pulled upwardly so as to permit the strip to be passed under it, and then lowered again into the saturant material.

Means are provided for maintaining the saturant material in a heated condition. Extending into the tank from the side walls thereof are preferably two U-tubes 106 and 107 as shown in Figures 3, 5 and 6. Arranged in the lower leg of each of these tubes is a fuel burner 108 of conventional type supplied with fuel thru the valve controlled conduit 109. The hot products of combustion, passing thru the flues thus provided, heat the walls of the tubes and maintain the saturant material in a heated and fluid condition.

In using my machine, one end of a piece of pipe is placed within the feed rollers which are properly adjusted for tension, and the strip started by hand. The other end of the pipe is supported on any suitable rests, not shown, and as the pipe progresses thru the machine, other lengths may be joined on by the usual union, the resilient mounting of the feed rollers permitting them to roll over the unions without damage.

I claim:

1. In a machine for wrapping cylindrical objects, a frame, feed rollers journaled on said frame, means for rotating said rollers, and means for rotating said frame to rotate the object being wrapped.

2. In a machine for wrapping cylindrical objects, a frame, means for rotating the frame, feed rollers journaled on said frame, means for rotating said rollers, and means for adjusting the rollers relative to the axis of rotation of the frame.

3. In a machine for wrapping cylindrical objects, a frame, means for rotating the frame, feed rollers journaled on said frame, means for rotating said rollers, and means for varying the rotational speed of said rollers relative to the rotational speed of said frame.

4. In a machine for wrapping cylindrical objects, a rotatable frame, feed rollers journaled on said frame and supporting the object to be wrapped, a driving shaft, means connecting said frame for rotation with said shaft, and means including speed varying means for connecting said rollers for rotation with said shaft.

5. In a machine for wrapping cylindrical objects, a frame, feed rollers journaled on said frame, means for rotating said rollers, means for rotating said frame to rotate the object being wrapped, and means for feeding the wrapping material to said object.

6. In a machine for wrapping cylindrical objects, a frame, feed rollers journaled on said frame, means for rotating said rollers, means for rotating said frame to rotate the object being wrapped, means for feeding the wrapping material to said object, and means for treating the wrapping material with a saturant.

7. In a machine for wrapping cylindrical objects, a frame, means for rotating the frame, feed rollers journaled on said frame, means for rotating said rollers, a tank adapted to contain a saturant or coating material, and pivotally mounted means for feeding the wrapping material thru said saturant or coating material to said object.

8. In a machine for wrapping cylindrical objects, a frame, means for rotating the frame, feed rollers journaled on said frame, means for rotating said rollers, a tank adapted to contain a saturant or coating material, pivotally mounted means for feeding the wrapping material thru said saturant or coating material to said object, and means for heating said saturant or coating material.

9. In a machine for wrapping cylindrical objects, a frame, means for rotating the frame, feed rollers journaled on said frame, means for rotating said rollers, means for varying the rotational speed of said rollers, relative to the rotational speed of said frame, a tank adjacent said frame, and means adjacent the tank and movable with respect thereto for feeding the wrapping material to said object thru said tank.

10. In a machine for wrapping cylindrical objects, a frame, means for rotating the frame, feed rollers journaled on said frame, means for rotating said rollers, means for varying the rotational speed of said rollers relative to the rotational speed of said frame, a tank adjacent the frame and adapted to contain a fluid, guide rolls bodily movably disposed in said tank and over which rolls the wrapping material is adapted to be passed, and means for heating the fluid in the tank.

11. In a machine for wrapping cylindrical objects, a frame, means for rotating the frame, feed rollers journaled on said frame and supporting the object to be wrapped, means for rotating said rollers, and means for varying the rotational speed of said rollers relative to the rotational speed of said frame.

12. In a machine for wrapping cylindrical objects, a frame, means for rotating the frame, feed rollers journaled on said frame and supporting the object to be wrapped,

means for rotating said rollers, means for varying the rotational speed of said rollers relative to the rotational speed of said frame, and means for feeding the wrapping material to said object.

13. In a machine for wrapping cylindrical objects, a base frame, a hollow cylindrical frame journaled on the base frame, a driving shaft journaled on the base frame and geared to the cylindrical frame, feed rollers journaled on said cylindrical frame, and driving connections between said feed rollers and said driving shaft.

14. In a machine for wrapping cylindrical objects, a base frame, a hollow cylindrical frame journaled on the base frame, a driving shaft journaled on the base frame and geared to the cylindrical frame, feed rollers journaled on said cylindrical frame, a ring gear journaled on said cylindrical frame, means for driving said ring gear from said driving shaft, and means for driving said rollers from said ring gear.

15. In a machine for wrapping cylindrical objects, a base frame, a hollow cylindrical frame journaled on the base frame, a driving shaft journaled on the base frame and geared to the cylindrical frame, feed rollers journaled on said cylindrical frame, a ring gear journaled on said cylindrical frame, means including speed varying devices for driving said ring gear from said driving shaft, and means for driving said rollers from said ring gear.

16. In a machine for wrapping cylindrical objects, a base frame, a hollow cylindrical frame journaled on the base frame, a driving shaft journaled on the base frame and geared to the cylindrical frame, a feed roller, a swing frame pivotally mounted on the cylindrical frame and in which said feed roller is journaled, means for adjusting the position of said swing frame, and driving connections between said feed rollers and said driving shaft.

17. In a machine for wrapping cylindrical objects, a base frame, a hollow cylindrical frame journaled on the base frame, a driving shaft journaled on the base frame and geared to the cylindrical frame, a feed roller, a swing frame pivotally mounted on the cylindrical frame and in which said feed roller is journaled, means for adjusting the position of said swing frame, a ring gear journaled on said cylindrical frame, means for driving the ring gear from the drive shaft, and means for driving the feed roller from the ring gear.

18. In a machine for wrapping cylindrical objects, a base frame, a hollow cylindrical frame journaled on the base frame, a driving shaft journaled on the base frame and geared to the cylindrical frame, a feed roller, a swing frame pivotally mounted on the cylindrical frame and in which said feed roller is

journaled, means for adjusting the swing frame and resiliently holding it in adjusted position, and driving connections between said feed rollers and said driving shaft.

19. In a machine for wrapping cylindrical objects, means for rotating and axially moving the object, means for guiding a strip of wrapping material to the object and movable to vary the angle between the strip and the object, and means for varying either of the rotary and axial speeds of the object relative to the other.

20. In a machine for wrapping cylindrical objects, a support, means for producing relative rotation and relative axial movement between said support and said object, and means on said support for guiding a strip of wrapping material to the object and movable to vary the angle between the strip and the object.

21. In a machine for wrapping cylindrical objects, a support, means for producing relative rotation and relative axial movement between said support and said object, means on said support for guiding a strip of wrapping material to the object and movable to vary the angle between the strip and the object, and means for varying the speed relation between said rotary and axial movements.

22. In a machine for wrapping objects, a support, means for rotating the object to be wrapped, means to move the object axially of said first-mentioned means, a driving shaft journaled on said support, a driving connection between the rotating means and the driving means, a driving connection between the means to move the object axially and the driving means, a speed changing mechanism interposed in one of the driving connections and means for guiding a strip of wrapping material to the object and movable to vary the angle between the strip and the object.

23. In a machine for wrapping objects, means to feed wrapping material to the object, a frame, feed rollers journaled on said frame, driving means for rotating said rollers, said frame being also rotated to rotate the object by said driving means, and means included in said driving means to vary the helix of the winding upon the object.

24. In a machine for wrapping objects, means to feed wrapping material to the object, a frame, driving means for rotating the frame, feed rollers journaled on said frame, driving means for rotating said rollers, and means included in one of said driving means to vary the helix of the winding upon the object.

25. In a machine for wrapping objects, a base frame, a cylindrical frame journaled on the base frame, a driving shaft journaled on the base frame and geared to the cylindrical frame, feed rollers journaled on said cylin-

drical frame, the feed rollers being driven from the driving shaft through a speed changing mechanism. 10

26. In a machine for wrapping objects, a base frame, a cylindrical frame journaled on the base frame, feed rollers journaled on the cylindrical frame, a driving shaft journaled on the base frame, a driving connection be-
tween the cylindrical frame and the driving shaft, a driving connection between the feed rollers and the driving shaft and a speed changing mechanism interposed in one of the driving connections.
In testimony whereof, I have hereunto set my hand.

LELAND S. ROSENER.

DISCLAIMER

1,686,929.—*Leland S. Rosener*, San Francisco, Calif. PIPE-WRAPPING MACHINE.
Patent dated October 9, 1928. Disclaimer filed July 16, 1936, by the assignee, *The Paraffine Companies, Inc.*

Hereby enters this disclaimer to claims 19, 20, and 21 of said patent.
[*Official Gazette August 18, 1936.*]

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