

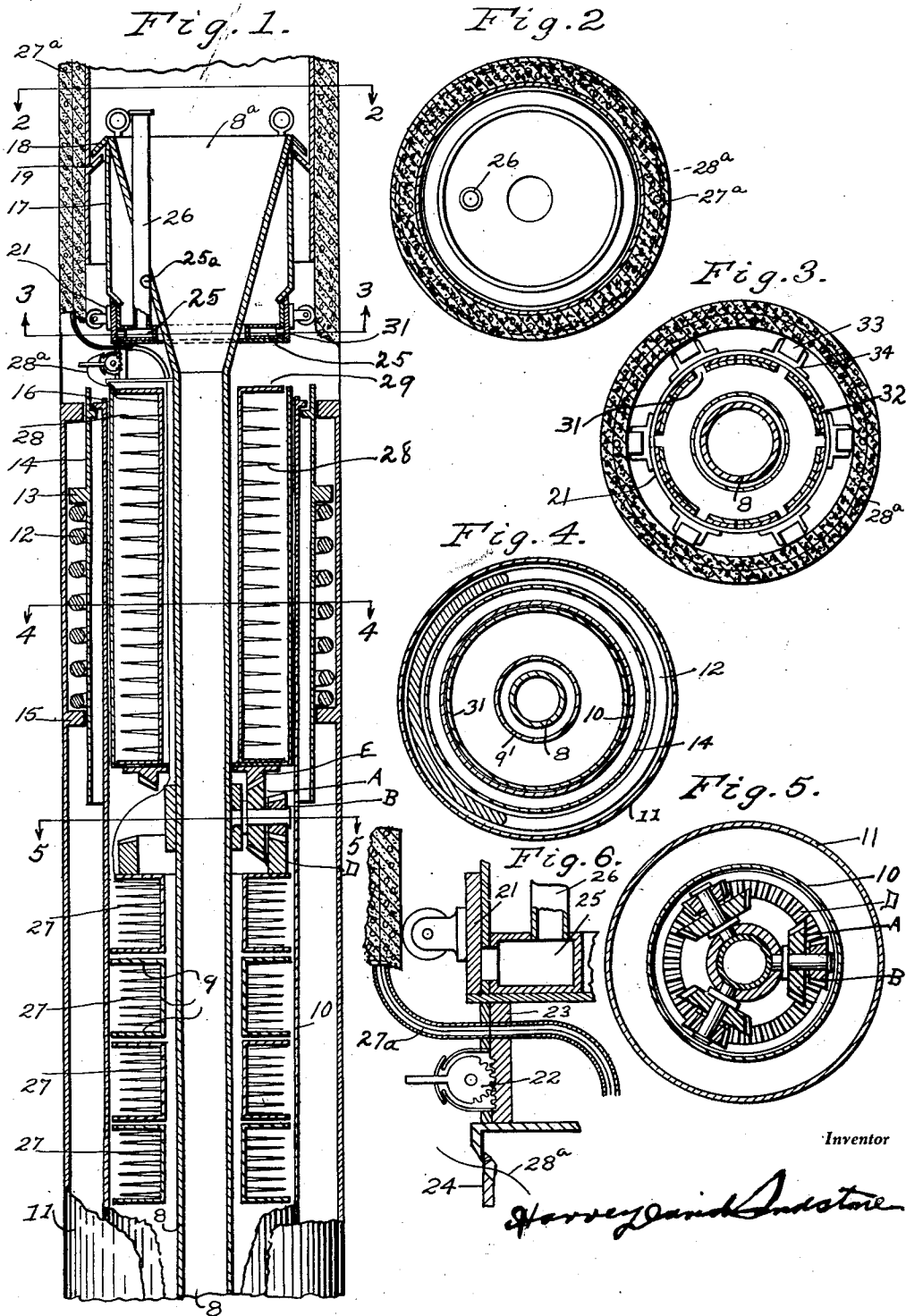
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H. D. SANDSTONE

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CASING LINER

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UNITED STATES PATENT OFFICE

HARVEY DAVID SANDSTONE, OF LOS ANGELES, CALIFORNIA

CASING LINER

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This invention relates to a method and means for lining tunnels, ditches and casing wells with a cementitious material with or without reinforcing.

5 The invention comprises a tubular body, having a tubular member extending there-through. Within said member are mounted wire containing spools that furnish the vertical or parallel reinforcing and the upper
10 vertical spool which furnishes the spiral or circular reinforcing.

This invention also comprises a device for distributing cement, concrete or any kind of plastic material to form a casing or to fill up
15 any spaces or breaks that may occur in the course of construction of said casing and a tubular form to mold or shape and protect the plastic material until it sets, is provided, which is actuated in timed relation with the
20 distributing device.

An object of this invention is the novel method of casing a well with a concrete lining with or without reinforcing.

25 Another object is that this mechanism may begin its lining operation either at the top of the well or the bottom which is already dug, or either end of tunnels, ditches, or pipe lines.

30 Another object is simplicity in construction and operation, enabling it to be used with a flexible conduit as a cement conveyor enabling the operator to apply thin coatings of cementitious materials on the return trip, which can not be accomplished when a string
35 of casing or pipe is used, necessitating the breaking of joints in the drill stem to raise or lower the equipment.

40 The invention is not limited to the specific construction shown herein, and it is understood that forms of embodiment other than those shown may be employed without departing from the invention or from the principles herein disclosed and embodied in the mechanism herein set forth and claimed.

45 The accompanying drawing illustrates the invention.

Figure 1 is a diagrammatical view of the invention, showing the working parts thereof.

50 Figure 2 is a section on line 2—2, Fig. 1, showing the completed reinforced casing.

Figure 3 is a cross section on line 3—3, Fig. 1, showing the roller release band, conveyor tube, cement distributor and completed casing in the making.

Figure 4 is a section on line 4—4, Fig. 1, 65 showing spiral reinforcing spool, within the distributing shuttle.

Figure 5 is a section on line 5—5, Fig. 1, showing the bevel geafs used in revolving the 70 shuttle.

Figure 6 is an enlarged view showing the releasing and placing of the reinforcing wires, and the cutters for same.

The invention comprises a tubular member 8, forming axis for the wire containing
65 spools 9, which are revolvably mounted thereon and said member 8, being provided with a funnel shaped top as at 8a, 10 indicates a casing that forms a housing for the reinforcing spools and 11 forms the outer
70 shell which encases all the mechanism pertaining thereto.

Within the shell 11, and at its upper end is located a spring cushion, 12, interposed between flanges 13 and 15, which absorbs all
75 shocks from the actuating sleeve 14.

The funnel shaped top 8a, is provided with a hooped flange 18, which grabs the flange 19, of the follower 17, to lower the follower as the mechanism is lowered into the well. 80

Roller release band 21, is shown in a compressed or closed position, retarding or closing the outlet cement ports, while the drill is being lowered to its working position, and to which band 21, has connected and holds the ends of the reinforcing wires, and which band, when coming to the end of the laid casing slips off of said end expands and fastens itself into the dirt walls of the well, this operation opens the discharge ports allowing the cement to flow and holds the reinforcing wires firmly and allowing the mechanism to proceed. When it is necessary to raise the equipment the handle of ratchet 22, comes in contact with the cement casing which is laid, throwing the handle downward closing the cutters 23, and 24, and releasing the reinforcing wire ends 27a, and 28a, distributor 25 places the cement into the forms, associated therewith is release 100

valve 25a, which releases the cement from the hose when pulling up, which receives the cement through conveyor 26, connected with the source of supply not shown.

27 indicates the vertical reinforcing placed on spools 9, in Fig. 1, 27a, shows the vertical wire reinforcing going through the cutters and into the cement casing, Fig. 6.

The upper spool 29, contains the spiral or horizontal reinforcing material 28, which is revolvably mounted in actuated shuttle 30, and is payed out into the cementitious material by the rotary motion of the shuttle as at 28a.

To actuate the spools 9, and 29, in timed relation with one another a series of reduction gears are used, comprising gear A, meshing with ring gear E, fixed to the bottom of shuttle 30, to rotate same, the gear B, meshes with larger ring gear D, that is fixed to the top end of spools 9, which are rotated by the pulling or reinforcing wires 27, which are fastened by their loose ends to the expanding ring roller band 21, Fig. 3, which also shows rollers 33, and fastenings 34, and the split in the band 32, allowing the band to expand as soon as the rollers reach the end of the cement casing and is freed and lodges itself in to the dirt well walls and holds tightly the ends of reinforcing wires 27, to which it had been fastened while at the top of well before descending.

The distributor 25, is provided with a series of ports 31, which are placed equally around the periphery of the distributor as shown in Fig. 3.

In operation this device is lowered or started in to the hole already made, the roller release band is placed around the cement port openings and held in place until the end of the finished casing is reached or as at the beginning or starting point is released at once, as it is composed of expanding material, it instantly releases itself and is firmly lodged into the sides of the openings to be cased, holding the ends of all reinforcing wires, and the device is now ready to proceed.

As the device is lowered into the opening to be cased, the cementitious material is forced through a flexible conductor from the source of supply into the cement distributor, and out through its ports into the spaces between the follower or form 17, and the formation walls of the well, the follower

being of ample length to protect the green cement while curing.

The tubular member 8, being hollow allowing the passage of foreign matter in case the well is full of liquid, thus eliminating any danger of the foreign matter coming in contact with the cementitious matter before it is set.

What I claim is:

1. The method of lining well bores which contemplates the continuing application to the wall of the well bore of a cementitious mixture ahead of the continuing downward progress of a suitable core or form, and simultaneously introducing reinforcing material into such cementitious material as it is being applied to such wall.

2. The method of casing a well which comprises constantly progressing therein a tubular form or core having a lesser diameter than such well, progressively discharging a cementitious mixture ahead of the form so that it will occupy the space existing between the form and the wall of the well bore, compelling the progressing form to pass over and support the discharged mixture for an interval during the preliminary setting thereof, and simultaneously unreeling reinforcing members into said mixture as it is being so discharged.

3. The method of casing a well which comprises constantly progressing therein a tubular form or core having a lesser diameter than such well, continuously discharging a cement mixture ahead of the progressing form in a manner that for an interval it becomes confined between the form and the wall of the well; and simultaneously, with the discharge of the cement, weaving therewith reinforcing wires.

4. The herein described method of casing a well which comprises continuously progressing a core downward in the well, continuously supplying a cement mix at the bottom of the core so that it is forced between the core and the wall of the well by the downward movement of such core, and simultaneously weaving flexible reinforcing members into the cement mix as it is being discharged at the bottom of the core.

Signed at Los Angeles, Los Angeles County, California, this 14th day of March, 1929.

HARVEY DAVID SANDSTONE.