

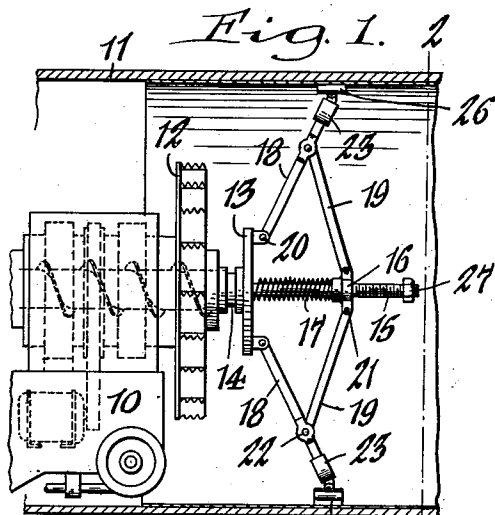
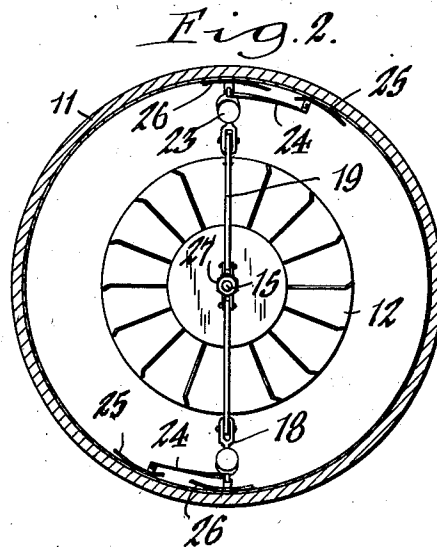
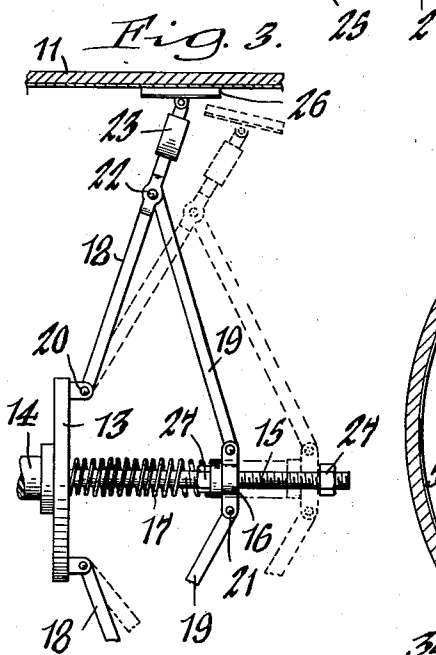
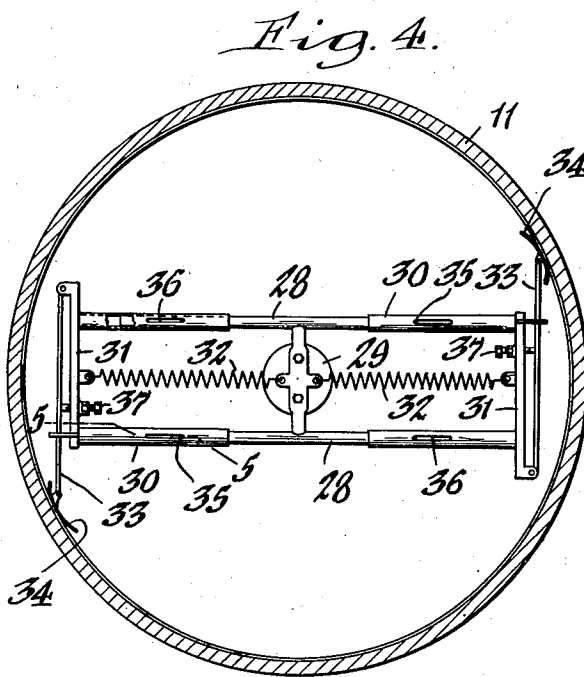
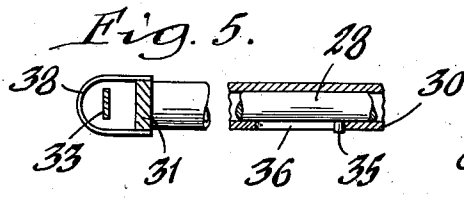
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TROWELING MECHANISM FOR PIPE COATING APPARATUS

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TROWELING MECHANISM FOR PIPE COATING APPARATUS

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8 Claims. (Cl. 25—38)

This invention relates generally to the art of coating steel pipe lines or conduits with a lining of protective material, such as concrete or the like, but more particularly to improvements in the troweling mechanism for smoothing down the material after its application to the pipe wall.

It has for one of its objects to provide a rotatable troweling mechanism for this purpose which is automatically adjustable toward and from the pipe wall as determined by centrifugal force in accordance with the speed of rotation imparted to such mechanism.

Another object of the invention is to provide a trowel structure which is simple and sturdy in construction, reliable and efficient in operation, and whereby the desired pressure of the trowels over the coating material may be uniformly applied and maintained.

Other features of the invention reside in the construction and arrangement of parts herein-after described and particularly pointed out in the appended claims.

In the accompanying drawing:

Figure 1 is a fragmentary side view of a pipe coating apparatus showing my improved traveling mechanism associated therewith. Figure 2 is a cross section taken on line 2—2, Figure 1. Figure 3 is an enlarged fragmentary side view of the troweling mechanism, showing it in its projected operative position by full lines and in its retracted inoperative position by dotted lines. Figure 4 is a front view of a modified form of the invention in its operative troweling position. Figure 5 is an enlarged horizontal section taken on line 5—5, Figure 4.

Similar characters of reference indicate corresponding parts throughout the several views.

By way of example, I have shown my improved troweling mechanism in connection with a pipe coating apparatus, indicated generally by the numeral 10, which is adapted to travel through a steel pipe line 11 for applying a protective coating, such as concrete mortar or the like, to the inner wall thereof and thereafter smoothing down the applied coating by troweling. The material is applied to the pipe wall by centrifugal force through the medium of a revolving dispensing head 12 and the troweling mechanism is revoluble about a similar axis to the rear of and substantially alongside the dispensing head.

In the embodiment of my invention shown in Figures 1-3, inclusive, the troweling mechanism comprises a rotatable head 13 mounted on a shaft 14 driven in any suitable manner and having a stem 15 projecting axially from the rear

face thereof. Guided on this stem for axial movement toward and from the head 13 is a guide member 16, a spring 17 being applied to the stem and disposed between said head and guide member for normally urging the latter in a direction away from the former. Operatively associated with the head 13 and guide member 16 is a centrifugally controlled, trowel-carrying means preferably including two sets of levers 18, 19 which are disposed radially at diametrically opposite sides of the head and guide member to fold and unfold in accordance with the speed of rotation of the head. The inner ends of each pair of levers 18, 19 are pivoted at 20, 21, respectively, to the head 13 and guide member 16, while their outer ends intersect and are joined to each other by a common pivot 22. The lever 18 extends somewhat outwardly beyond the companion end of the lever 19 and applied thereto is a weight 23 which acts, during rotation of the head 13, by centrifugal force to contract or fold the levers 18, 19 toward each other against the resistance of the spring 17 and displace the pivot 22 outwardly. As the speed of the head 13 is reduced and the rotation of the head eventually stopped, the spring acts to expand or unfold the levers from the full line to the dotted line position shown in Figure 3 and thereby displace the pivot inwardly. Applied to the weight 23 associated with each pair of levers is a circumferentially-extending resilient arm 24 to the free end of which is connected a trowel 25. If desired, an auxiliary trowel 26 may also be applied directly to the weight 23 whereby a dual troweling action may be effected on the coating material applied to the pipe wall.

For the purpose of adjustably limiting the axial movement of the guide member 16 in one direction or the other to in turn govern the expanding and contracting movements of the trowel-carrying levers 18, 19, I provide the stem 15 with jam-nuts 27. By adjusting the inner nut the outward throw of the levers may be regulated to control the degree of pressure of the trowels on the coating material.

In the modified form of the invention shown in Figures 4 and 5, the trowel mechanism comprises parallel rods 28 applied to opposite sides of a revolving head 29 and having companion sleeves 30 guided for longitudinal movement on the outer portions thereof. Each pair of sleeves is joined as an integral unit with a tie plate or trowel-carrier 31 for substantially radial movement toward and from the pipe wall, a spring 32 normally urging each tie plate and its companion

sleeves 30 in a direction toward the pipe axis or away from the pipe wall. Joined at one end to each tie plate is an arm 33, of spring steel or the like, to the free end of which a trowel 34 is connected. For the purpose of limiting the inward and outward movements of the trowel-carrying plates, I provide stop pins 35 projecting from the rods 28 and engaging companion longitudinal slots 36 in the tubes 30. When the head is rotated, centrifugal force acts to shift the trowel-carriers 31 outwardly against the resistance of the companion springs 32 to bring the trowels in operative engagement with the coating material applied to the pipe wall. Adjusting screws 37 may be applied to the plates 31 for bearing engagement with the companion trowel-arms 33 to control their inward displacement and regulate the degree of pressure of the trowels on the coating material. To prevent the trowel-arms springing outwardly beyond a predetermined point after a troweling operation is completed and the trowels are contracted inwardly from the pipe wall, I provide retaining loops or guides 38 on the carrier-plates 31 through which the trowel arms extend and relative to which they are permitted a predetermined range of movement. In the contracted position of the trowel mechanism, these loops guard against the trowels accidentally springing outward against the pipe wall.

I claim as my invention:

1. A troweling mechanism for pipe coating apparatus, comprising a revolving head, flexible means applied to said head for movement by centrifugal force to a projected position, means correlated with said flexible means for positively guiding the same in a radial path to and from a troweling position, means operatively associated with said flexible means for normally urging the latter to a retracted position, and a trowel applied to the outer end of said flexible means.

2. A troweling mechanism for pipe coating apparatus, comprising a revolving head, substantially radially displaceable trowel-bearing means operatively connected to said head to rotate therewith and having a weighted element at the outer end thereof for urging such means by centrifugal force to an outwardly displaced position, means correlated with said trowel-bearing means for guiding the same radially relatively to said head to and from a troweling position, and a spring connected to said trowel-bearing means for resisting its movement to an outwardly-displaced position.

3. A troweling mechanism for pipe coating apparatus, comprising a revolving head, a normally retracted, centrifugally-responsive means applied to said head for rotation therewith and adapted for movement to a projected operative position by centrifugal force and as determined by the rotative speed of the head, a trowel applied to the outer end of said centrifugally-responsive means, means correlated with the latter for radially guiding the same during its centrifugally-initiated movements, and means operatively associated with said centrifugally-responsive means for limiting their retracting and projecting movements.

4. A trowelling mechanism for pipe coating

apparatus, comprising a revolving head having a trowel-carrying member thereon for displacement toward and from operative relation with the pipe wall, means for guiding said trowel-carrying member radially relative to said head during such movements, a spring acting on such member for constantly urging it to a retracted position, a weight element applied to the outer end of said trowel-carrying member and tending to project it by centrifugal force toward the pipe wall, and a trowel resiliently mounted on said weight element.

5. A troweling mechanism for pipe coating apparatus, comprising a revolving head having a stem extending axially therefrom, a guide member applied to said stem for movement axially thereof toward and from the head, centrifugally-controlled, trowel-carrying lever means pivotally connected to each other and to said head and said guide member, and a spring interposed between the head and the guide member for normally urging the latter in a direction to displace said lever means radially inward.

6. A troweling mechanism for pipe coating apparatus, comprising a revolving head having a stem extending axially therefrom, a guide member applied to said stem for movement axially thereof toward and from the head, centrifugally-actuated lever means pivotally connected at their inner ends to said head and said guide member, respectively, and connected at their outer ends to a common pivot, and a trowel applied to the outer end of said lever means for displacement toward and from the pipe wall in accordance with the rotative speed of the head.

7. A troweling mechanism for pipe coating apparatus, comprising a revolving head having a stem extending axially therefrom, a guide member applied to said stem for movement axially thereof toward and from the head, lever means pivotally connected at their inner ends to said head and said guide member, respectively, and connected at their outer ends to each other by a common pivot, a spring interposed between said head and said guide member for normally urging the latter in a direction away from the former to displace the lever means radially inward and permit its outward displacement by centrifugal force as determined by the rotative speed of the head, and a trowel applied to the outer end of said lever means.

8. A troweling mechanism for pipe coating apparatus, comprising a revolving head having a stem extending axially therefrom, a guide member applied to said stem for movement axially thereof toward and from the head, lever means pivotally connected at their inner ends to said head and said guide member, respectively, and connected at their outer ends to each other by a common pivot, a weight applied to the outer end of said lever means, a spring applied to the head-stem between the head and said guide member for normally urging the latter in a direction away from the former to displace the lever means radially inward and permit its outward displacement by centrifugal force as determined by the rotative speed of the head, and a trowel connected by a resilient arm to said weight.

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