Nov. 4, 1924. 1,514,062

R. M. McLAIN

MEANS FOR INCASING WELLS

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Fig. 1.

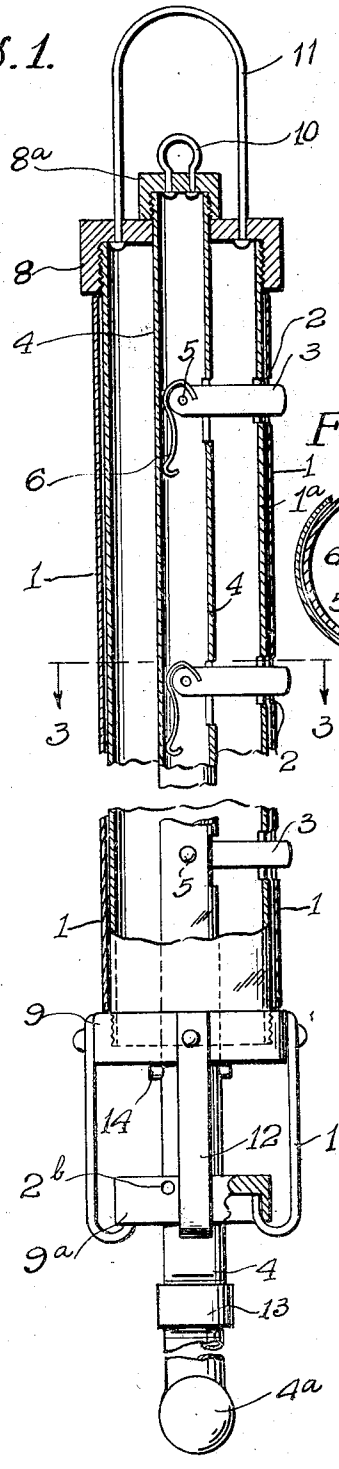


Fig. 3.

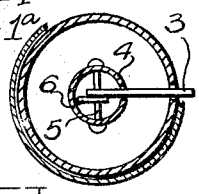
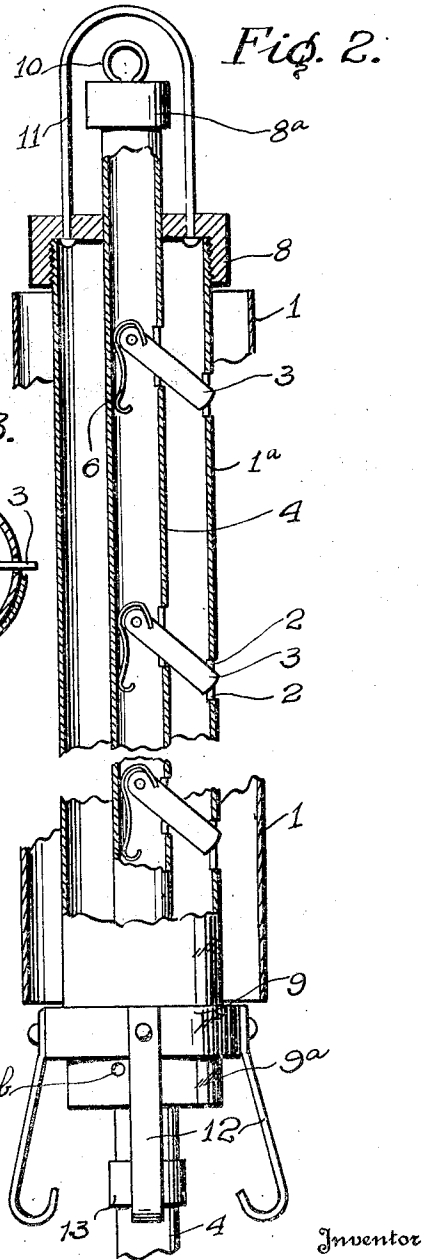


Fig. 2.



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Fig. 4.

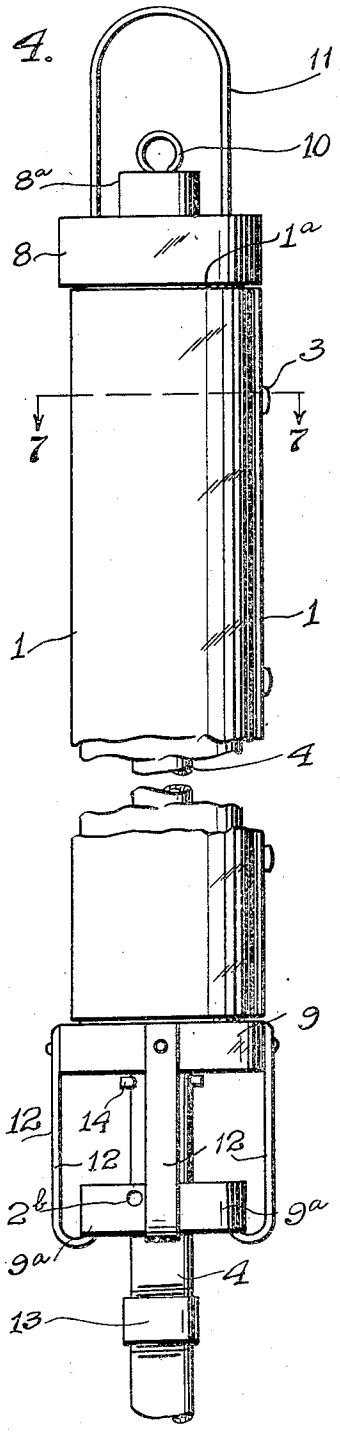
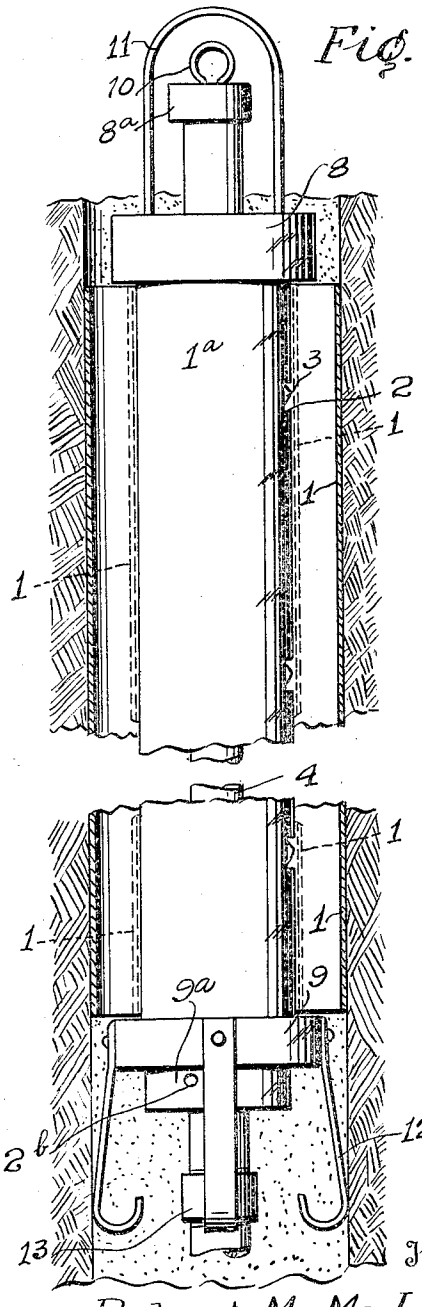


Fig. 5.



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Fig. 6.

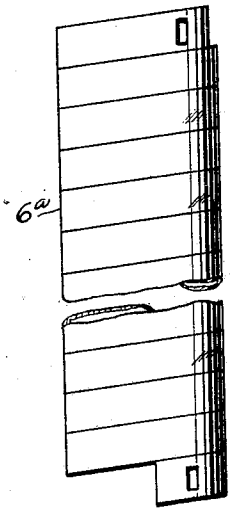


Fig. 7.

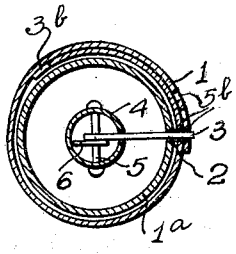


Fig. 8.



Fig. 5a

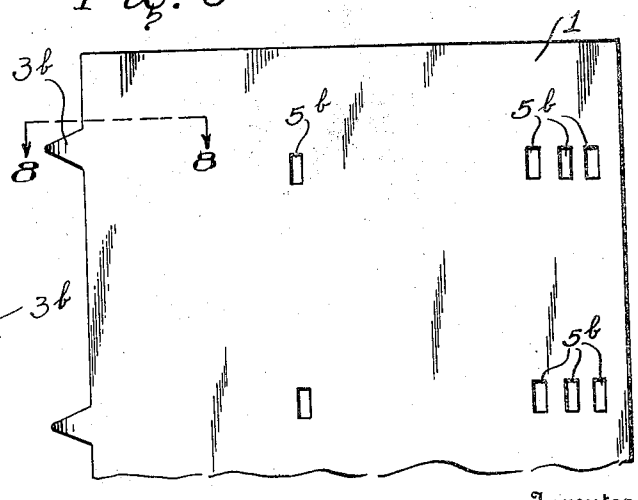
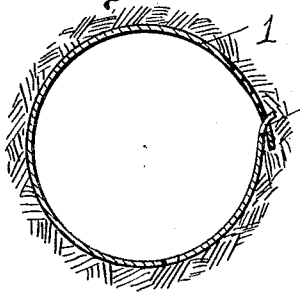


Fig. 9.



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Patented Nov. 4, 1924. 1,514,062

UNITED STATES PATENT OFFICE.

ROBERT M. McLAIN, OF FORT WORTH, TEXAS, ASSIGNOR OF ONE-HALF TO EUGENE A. REILLY, OF FORT WORTH, TEXAS.

MEANS FOR INCASING WELLS.

Application filed May 9, 1922. Serial No. 559,527.

To all whom it may concern:

Be it known that I, ROBERT M. McLAIN, a citizen of the United States, residing at Forth Worth, in the county of Tarrant and State of Texas, have invented certain new and useful Improvements in Means for Incasing Wells, of which the following is a specification.

This invention relates to improvements in means for incasing or lining wells, particularly oil wells.

The invention has for its object, primarily, to guard against or prevent the caving or breaking of the wall of the well, which resultant broken pieces of the well-wall would otherwise drop into or accumulate in the bottom of the well, all of which are obviated by the use of my invention.

A further object of the invention is to provide for carrying out the aforesaid purpose in an extremely simple, inexpensive and effective manner.

Other objects of the invention, together with the foregoing, will be fully apparent from the following description and accompanying illustrations or drawings.

The invention consists, therefore, of certain instrumentalities and features of construction substantially as hereinafter more fully disclosed and pointed out in the claims.

The drawings disclose the preferred embodiment or one form of my invention wherein it will be understood that various changes and modifications as relate to the detailed construction and arrangement of parts may be made without departing from the spirit or scope of my invention as covered by the appended claims, and in which drawings:

Figure 1 is a mutilated side elevation and vertical sectional view of my invention, the casing being in its initial or unexpanded position.

Fig. 2 is a similar view of the invention, the casing being in its expanded position as in positioning it for forming the lining.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1.

Figs. 4 and 5 are a mutilated side elevation and a sectional elevation, respectively of the device.

Fig. 5ª is a fragmentary view of a casing blank of modified form of securing the lateral or meeting edges or portions thereof together.

Fig. 6 is a view of the well-casing shown in the form of a helix.

Fig. 7 is a section on line 7—7 of Fig. 4.

Fig. 8 is a section on line 8—8 of Fig. 5ª.

Fig. 9 shows more particularly the well casing in its expanded condition, within the well.

In carrying out my invention, I take a sheet of preferably spring-steel, designated generally as 1, and roll or coil the same upon a suitable mandrel, to impart to said steel sheet a tubular or cylindric form, which is to constitute a casing or lining for insertion into a well, especially for oil. Such lining or casing is adapted, by reason of its inherent or characteristic lightness and resiliency, when wound or coiled, as indicated, in the well, to provide for effectively and practically automatically retaining the casing or lining in position therein. In disclosing more fully one way for practicing my invention, I provide the spring-steel plate with a plurality of perforations 2, a plurality of dogs or lugs 3 being pivoted to the tubular tool 4, adapted to be received centrally within the wound or coiled member 1, and whereby, upon such conjunction or engagement of said dogs or lugs with the perforations 2, the thus wound, coiled, or compressed casing or lining will preliminarily be retained in such compressed position or condition and allow said casing or lining to be brought within the limits of the interior of, and to be inserted into the well, as would be the case when the parts assume the position as indicated in Fig. 1, more fully made apparent later.

The pivot-connection between the lugs or dogs 3 and the tool 4 is effected by means of pivot-forming pins 5, as clearly seen in Fig. 3, suitably headed and inserted through the lugs or dogs and the tool member. The lugs or dogs 2 are retained and sprung into the retracted position, as disclosed by Fig. 2, by springs 6 adapted to engage the inner ends of said dogs and the tool 4, as disclosed by Figs. 1 and 2, when the casing is in the position as indicated in Fig. 2, i. e., when the mandrel or member 1ª is to be withdrawn, in which event the casing or lining 1 is in encased-position against the wall of the well, and the lugs or dogs 3 are released from the perforations 2 at their free ends. The mandrel 1ª, it will be seen, is adapted to extend when in the position as indicated in Fig. 1, as also when in the

position of Fig. 2, a suitable distance above the upper end of the casing or lining 1 for its ready engagement or actuation, it being provided with a loop or bail 11 to which is attached, in practice, a line or cable (not shown) for the convenient removal or lowering of the mandrel. The tool 4 is adapted to be passed through a suitably apertured screw-threaded cap 8, applied to the upper end of the mandrel 1^a, and a collar 9 applied to the lower end of the mandrel, respectively, the tool 4 being provided with a similar cap 8^a, and the cap 8^a with a loop or bail 10, the cap 8 also being provided with a bail 11 for the attachment thereto, of a line or cable, for the like purpose as indicated in connection with the loop 10, the latter line or cable also not being in evidence. Suitable hook-like members 12 are secured at their upper ends to the collar 9, with their lower inwardly curved or hooked terminals adapted to have an outwardly springing action under the tripping or downwardly thrusting or depressing action of the tool 4. The lower or hooked terminals of the members 12 are adapted to engage or hook under the lower edge of the member 9^a, carried by the lower portion of the tool 4, as seen in Fig. 1, the latter then being in its depressed position or resting upon the bottom of the well and the hooked members 12 being held in engagement with the members 9^a. A wooden pin 14 is preferably inserted transversely through the tool 4 to hold the parts in position. The tool 4 has a lower spherical or stubbed terminal, as 4^a, to prevent it catching into the wall of the well. The device, with the hooked members thus positioned, is lowered into the well, and as the lower end of the tool strikes the well-bottom, it is forced upwardly, the pin 14 is sheared off and the lugs or dogs 3 are disengaged or released from the casing or lining, allowing the dogs or lugs to be withdrawn into the casing or lining and the spring hooks 12 are disengaged from the member 9^a and allowed to spring outwardly. Simultaneously with the release of the lugs or dogs, the released resilient or spring-steel casing or lining will, under recoil action thereof, be thrust with great force against the wall of the well and be there firmly retained by its expansive action. The mandrel is then capable of being drawn from the well by pulling on the tool manipulating line, and in so drawing the tool and mandrel from the well, the spring members 12 are forced outwardly against the casing or lining and force it into more effective engagement with the walls of the well. The casing may be adapted to be positioned at any depth in the well by accordingly lengthening the required piping or pluralizing the pipe-sections. As for instance, when it is desired to sink the casing, say twenty feet from the bottom of the well, twenty feet of what is termed anchor-pipe may be used, and when this strikes the bottom, it would trip the tool twenty feet up the well and provide for positioning the casing at that point. Or should it not be desirable to use the anchor, a line may be attached to the loop 10, Figs. 1 and 2, and the tool be tripped by pulling upon the line at any point along the well.

In the modification as disclosed by Fig. 5^a are shown the ends of the casing bent or deflected to spring into engagement laterally with the wall of the well, as at 3^b.

Fig. 5^a is a fragmentary view of a blank of the casing or lining with means for effecting connection between one longitudial edge thereof and the opposite portion of the blank, comprising interlocking tabs 3^b and perforations 5^b

Fig. 6 shows a modified form of the well casing member, in which the casing is wound after the fashion of a helix, as 6^a. It will be understood that various changes may be made than those disclosed herein in perfecting the details of the invention without departing from my invention and the spirit or scope of the claims as above set forth.

I claim and desire to secure by Letters Patent:—

1. In a well-incasing or lining device, the combination of a tubular or cylindric instrumentality adapted to form the well-casing or lining, and comprising a resilient springy-metal-member, a mandrel about which said springy-metal-member is adapted to be wound and means carried by said mandrel for connection between the overlapping coiled portions of said tubular instrumentality, and means for releasing said coiled portions, whereby said instrumnetality will be adapted to expand and be applied to the wall of the well.

2. In a well-incasing or lining device, the combination of a tubular or cylindric instrumentality comprising a resilient springy-metal-member adapted to form the well-casing or lining, a tubular tool for arrangement within said instrumentality or casing, lugs pivotally connected to said tool and adapted to project through apertures in said instrumentality or casing, and means for retaining the lugs in operative position but movable for retracting said lugs into said instrumentality or casing to release the expansive action of the latter and forcibly thrust said casing into contact with the wall of the well.

3. In a well-incasing or lining device, the combination of a cylindric instrumentality comprising a resilient springy-metal-member adapted to form the well-casing or lining, a mandrel about which said casing is adapted to be wound, a tool having spring pressed lugs effecting connection between

said mandrel and said well-casing or lining and adapted to project beyond said well casing to retain said casing against temporary recoil action, said tool having longitudinal movement to provide for effecting the projecting of said lugs, also the retracting of said lugs into said casing in releasing the expansive action of said casing for forcibly thrusting the casing against the wall of the well as the tool is moved upwardly in releasing its action upon said lugs.

4. In a well-incasing or lining device, the combination of a cylindric instrumentality adapted to form the well-casing or lining comprising a resilient springy metal-member, a mandrel about which the springy-metal-member is adapted to be wound, a tool having spring-pressed lugs effecting connection between said mandrel and the well-casing and adapted to be projected through and beyond said well-casing and to be retracted into said well-casing by the vertical movement of said tool and resilient members carried by said mandrel under tension and adapted to be released and sprung outwardly to press the casing into more effective engagement with the walls of the well.

5. A well casing or lining formed of a tubular or cylindrical springy metal member and means applied thereto for effecting frictional contact therebetween and the wall of the well.

6. A well-casing or lining of tubular springy metal, means adapted to effect frictional contact with the wall of the well and of hooked and annular formation and arranged to be applied to the lower or anchoring terminal of said casing.

7. In a well casing or lining device, the combination with a tubular lining, of a device adapted to support said lining, resilient members carried by said device in their compressed position, and means whereby when the lining or casing is released from said device, the spring members will be released and allowed to spring outwardly to press the lining or casing against the side of the well.

8. In a well casing or lining device, a tubular casing, means to lower the casing into the well, and resilient means carried by said lowering means and adapted during withdrawal of said lowering means, to press the tubular casing into more effective engagement with the sides of the well.

In testimony whereof he affixes his signature.

ROBERT M. McLAIN.