

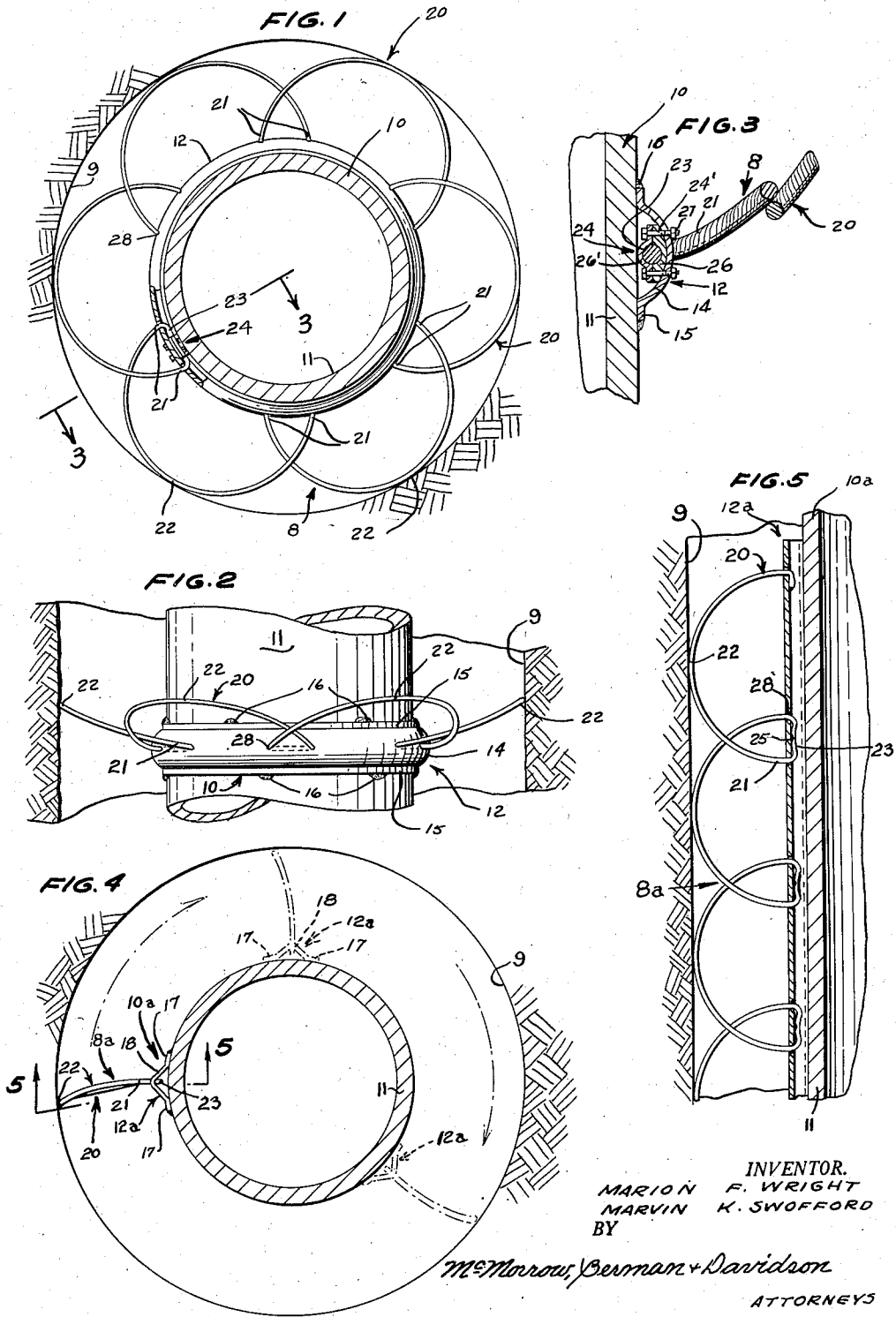
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BORE WALL CLEANER

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BORE WALL CLEANER

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This invention relates to a device for cleaning the walls of a bore.

An object of the invention is to provide a more efficient and practical device for cleaning the interior walls of pipe, casings, or holes drilled into the ground or other medium, such as oil wells, water wells, or gas wells, of plant growths, rust scale, mud cake, embedded cuttings, or other foreign matter as paraffin.

Another object of the invention is to provide a device of the character indicated above, which is effective in operation and avoid use of projecting fingers, bristles, or tines likely to cause excessive abrading, gouging, or scratching of the bore wall.

Other objects and advantages of the invention will appear from the following description considered in conjunction with the attached drawings, in which:

Figure 1 is a top view, partially in section, of the preferred embodiment of the cleaner of the present invention.

Figure 2 is a side elevational view of the assembly of Figure 1.

Figure 3 is a view taken along the line 3—3 of Figure 1.

Figure 4 is a top plan view, partially in section, of an alternative embodiment of the cleaner of the present invention, the solid lines indicating the cleaner of such embodiment and the dotted arrows and dotted lines indicating respectively the rotational movement of such cleaner in a bore and positions of such cleaner during the rotational movement.

Figure 5 is a view taken along the line 5—5 of Figure 4. Referring now to the drawings in more detail, the reference numeral 9 designates a bore formed in the ground or some other medium and the numeral 10 designates the embodiment of Figures 1 to 3 inserted into the bore 9.

The embodiment 10 comprises a pipe or casing 11 and attached thereto, is a supporting member 12. In the embodiment of the invention shown in Figures 1, 2 and 3, the member 12 consists of a hollow collar circumsposed about and attached to the pipe 11. The collar 12 has a central portion 14 of arcuate section and edge portions 15 which are flat. The edge portions 15 of the collar are secured to the exterior of the pipe 11 by welding, as shown at 16, or by other appropriate means, and the portion 14 is spaced outwardly from the exterior of the pipe 11.

In the form of the invention shown in Figures 4 and 5, a bore wall cleaner 10a is shown in which a supporting member 12a comprises a strip of metal positioned longitudinally of and attached exteriorly to the pipe 11. The strip 12a has flat edge portions 17, secured to the exterior of the pipe 11 by welding or other suitable means, and a bowed portion 18 intermediate the edge portions 17 and spaced outwardly from the exterior of the pipe 11. The strip 12a has longitudinally spaced apart pairs of openings or apertures 28 provided therein, as shown in Fig. 5, and a wire or cable 8a is connected to extend continuously from an anchorage at the upper end of the strip, through the apertures 28 in the manner shown, to be anchored at the lower end of the strip. As thus installed

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the cable 8a provides loops 20 having inner portions 21 adjacent the apertures 28, and having intermediate portions 22 spaced outwardly from the member 12a. The loops 20 have inner portions 23 which extend within the supporting member 12a, as shown in Fig. 5.

Exteriorly of and extending along the supporting member 12 in Figures 1 to 3 is a flexible member 8 comprising a plurality of loops 20 formed of resilient material, the loops 20 having inner portions 21 adjacent to and secured to the member 12 and having intermediate portions 22 spaced outwardly from the member 12. The loops 20 are formed of the continuous length of wire or cable 8 which is threaded through spaced pairs of apertures or openings 28 provided in the member 12 to form the loops 20 with their inner portions overlapping, as shown in Figures 1 and 5. The loop-forming wire or cable 8 has portions 23 which extend interiorly of the member 12.

As shown in Figs. 1 and 3, the ends of the wire or cable 8 may be joined to make it continuous by means of a cable end locking clamp 24. Such clamp 24 comprises an outer clamp section 26 to fit outwardly within the central portion 14 of the supporting member 12, and an inner clamp section 26', the clamp sections complementally providing a slot of circular cross-section to receive the ends of the cable 8 therein to be clamped therein when in an abutting position whereby the cable 8 may be described as extending continuously as set forth hereinabove. To this end clamping is effected by bolts 24' which extend through suitable holes in the clamp sections 26, 26', and in the arcuate portion 14 of the supporting member 12, the outer ends of the bolts having nuts 27 threaded thereon to effect clamping.

In the event that frictional contact between the loops and the aperture surfaces is insufficient to anchor the loops against longitudinal displacement, such clamping arrangements could be provided to hold the interior portions 23 against longitudinal displacement. As shown in Fig. 5 such anchorage of the loops 20 to the supporting member 12a can be effected as shown by welding at 25.

The manner in which the bore wall cleaner of the present invention is used will suggest itself from the foregoing description. Cleaners of different sizes are, of course, required for attachment to different sizes of casing or pipe and for use in different sizes of bores. For cleaning a particular bore wall, the cleaner selected should be of such size that when attached to a pipe and inserted in the bore, the intermediate portions 22 of the loops 20 will make firm resilient contact with the wall of the bore. If the form of the cleaner being used is that shown in Figures 1, 2 and 3, loops 20 will be bent slightly upwardly, as shown in Figure 2, when the cleaner is inserted into the bore 9. To use this form of the cleaner to clean the bore 9, the device 10a is moved upwardly and downwardly in a reciprocating motion, causing the intermediate portions 22 of the loops 20 to wipe the adjacent portions of the wall of the bore 9 so as to remove the dirt or foreign matter present thereon. If the form of the invention shown in Figures 4 and 5 is used, the device 10a is inserted into the bore 9 and then rotated, as indicated in Figure 4, to bring the intermediate portions 22 of the loops 20 into wiping contact with the wall of the bore 9 to remove dirt and foreign matter therefrom. It will be obvious that in both forms of the invention, the wiping of the bore wall is accomplished by the rounded intermediate portions 22 of the loops 20 and there are no sharp projecting fingers, bristles, or tines which are likely to scar the bore wall. Moreover, the resiliency of the loops 20 protects the bore wall against excessive abrasion and also adapts the cleaner to be used with bores of different diameters within a limited range. The bore wall cleaner will be manufactured to fit all sizes of pipe and well casing,

What is claimed is:

1. In a well bore wall cleaner for cleaning a well bore having irregularities on the wall surface thereof, the combination of a hollow supporting member adapted to be positioned on the exterior of a pipe in said well bore and provided with spaced pairs of openings therein, lying in a common plane, an elongated flexible member mounted on said supporting member, said flexible member extending through said openings to provide outer loop members projecting exteriorly from said support member and to provide inner portions in contact with the inner wall surface of the supporting member, adjacent loop members overlapping and contacting each other, and means securing said inner portions to said support, said elongated member being of sufficient rigidity to wipe the well bore and being of sufficient yieldability to flex in so doing.
2. A well bore wall cleaner as claimed in claim 1 wherein said support member comprises an annular collar adapted to encircle the pipe in the well bore and adapted to be secured thereto.
3. A well bore wall cleaner as claimed in claim 1 wherein said support member comprises a hollow strip of metal adapted to be attached to the pipe in the well bore.
4. In a well bore wall cleaner for cleaning a well bore having irregularities on the wall surface thereof, the combination of a hollow supporting member adapted to be positioned on the exterior of a pipe in a said well bore and provided with spaced pairs of openings therein, lying in a common plane, an elongated flexible member extending through said openings, one end of said flexible member being secured in one opening of a predetermined pair of openings, said flexible member extending from said one opening to and through the remoter opening of the next adjacent pair of openings, and thereafter through the nearer opening of said next adjacent pair of openings, and serially until the flexible member has passed through all of said openings, the free end of said flexible member being secured to the interior of said supporting member through the second opening of said predetermined pair of openings, said flexible member being in the form of loops projecting outwardly from the exterior of said supporting member and being positioned to lie against and in contact with the inner surface of said supporting member, said elongated member being of sufficient rigidity to wipe the well bore and being of sufficient yieldability to flex in so doing.
5. In a well bore wall cleaner for cleaning a well bore

having irregularities on the wall surface thereof, the combination of a hollow supporting member adapted to be positioned on the exterior of a pipe in said well bore and provided with spaced pairs of openings therein, lying in a common plane, an elongated flexible member mounted on said supporting member, said flexible member extending through said openings to provide outer loop members projecting exteriorly from said support member and to provide inner portions in contact with the inner wall surface of the supporting member, adjacent loop members overlapping and contacting each other, said elongated flexible member being adapted to be held by contact with said supporting member against longitudinal displacement and being of sufficient rigidity to wipe the well bore and being of sufficient yieldability to flex in so doing.

6. In a well bore wall cleaner for cleaning a well bore having irregularities on the wall surface thereof, the combination of a hollow supporting member adapted to be secured on the exterior of a pipe in said well bore, an elongated substantially inextensible flexible member mounted on said supporting member, said flexible member forming a plurality of outer loop members projecting exteriorly from said support member and a plurality of inner portions in contact with the supporting member, adjacent loop members overlapping each other, and means securing said inner portions against movement relative to said support, said elongated member being of sufficient rigidity to wipe the well bore and being of sufficient yieldability to flex in so doing.
7. The invention as set forth in claim 6 wherein an individual securing means is provided for each of said inner portions.

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