June 9, 1931. H. D. WILSON, JR 1,808,913

HOLDING RING FOR MANUFACTURING WELL SCREENS

Filed Nov. 25, 1929

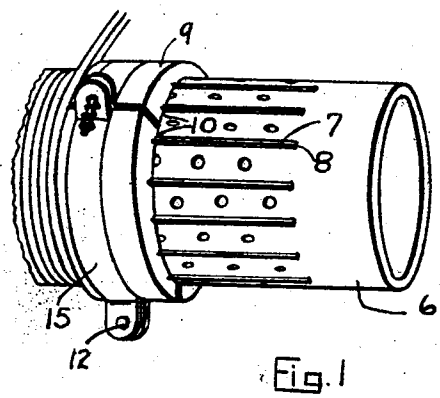


Fig. 1

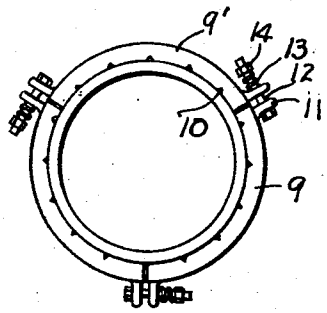


Fig. 2

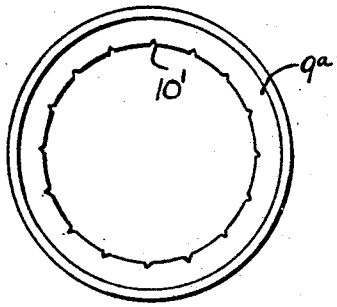


Fig. 3

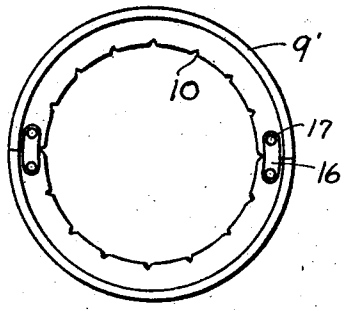


Fig. 4

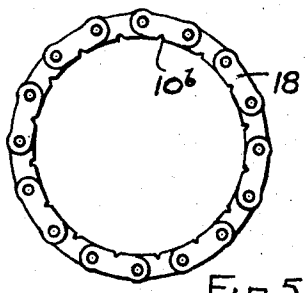


Fig. 5

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Patented June 9, 1931 1,808,913

UNITED STATES PATENT OFFICE

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HOLDING RING FOR MANUFACTURING WELL SCREENS

Application filed November 25, 1929. Serial No. 409,733.

My invention relates to the manufacture of well screens for use in deep wells for oil, gas, water and the like and pertains particularly to the so-called wire-wrapped pipe in which the straining openings are obtained between the windings of wire about the perforated pipe.

In the construction of certain forms of well strainer, it is common to perforate the pipe to be used as a strainer and to wrap wire spirally about the pipe, the winding being spaced apart sufficiently to provide between adjacent windings a slotted opening acting as a strainer for the fluid entering the pipe. The windings of wire may be spaced slightly from the pipe by means of longitudinal ribs upon the pipe sections which are thus wrapped.

My device is adapted particularly for use with perforated pipe in which the ribs longitudinally thereof are formed by wires of the proper size secured at one end to the pipe and drawn taut along the pipe in spaced parallel relation from one end to the other and secured at the other end to the pipe by means of welding or otherwise. In this manner there are a suitable number of ribs comprising these wires held rigidly to the pipe at both ends and held against the pipe by the resiliency of the wire. Difficulty is commonly experienced in wrapping the straining wire spirally about the ribbed pipe due to the fact that the straining wire is wrapped under high tension upon the pipe and in doing so the ribs are moved laterally out of their parallel position longitudinally of the pipe and are thus not uniformly spaced.

It is an object of my invention to provide means to hold the wire ribs upon the pipes in evenly spaced position parallel with each other while the screen wire is being wrapped thereon. I desire to provide a holding means which may be moved slidably along the pipe in advance of the wrapping of the screen wire so that it will not be possible to force the wires out of alignment while the screen wire is being wrapped upon the pipe.

I also desire to provide a holding means which will hold the wire ribs rigidly in position and which is also capable of slight expansion to accommodate the holding ring to inequalities in the outer surface of the pipe upon which it is being wrapped.

Referring to the drawings herewith, Fig. 1 is a perspective view in elevation showing one end of a pipe to be employed as a well screen with one embodiment of my holding ring thereon.

Fig. 2 is an end elevation of the pipe and holding ring shown in Fig. 1.

Figs. 3, 4 and 5 each shows a separate embodiment of the holding ring indicating how the invention may be carried out with slightly different constructions of the holding ring.

In Fig. 1 the screen pipe is indicated at 6. It is understood that this pipe is to be perforated longitudinally to allow the entrance thereto of fluid from the well. This is the usual construction of well screen. To space the screen wire away from the surface of the pipe upon which it is wrapped I provide longitudinal ribs indicated at 7. These ribs are preferably made up of wire, which is secured to the pipe at 8 by any preferred means. The pipe may be perforated and the wire inserted through the opening and clinched in position or the end may be welded in place or any preferred means may be employed. The wire is then stretched tightly from one end of the pipe section to the other and is secured at its loose end to the pipe in a similar manner so that when the wires are all placed in position and secured rigidly to the pipe at both ends they will lie in spaced relation parallel with each other as indicated in Fig. 1.

It will be understood that although the ends are secured firmly to the pipe the wire itself is not secured to the pipe between its ends so that it is capable of some lateral displacement under a force applied thereto and it is a common difficulty that the process of winding screen wire over the ribs will serve to displace them so that they do not form an even support as is desired. To hold them evenly spaced I provide a holding ring, one embodiment of which is shown at 9 in Figs. 1 and 2. This ring is of approximately the same internal diameter as is the outer diameter of the pipe. This will cause the ring

to fit closely against the pipe but will allow it to be moved slidably from one end of the pipe to the other.

The interior face of the ring is formed with notches 10 evenly spaced so as to fit over the ribs 7 provided by the wires and as the wires are thus held spaced apart they will not be capable of lateral movement under strain. In this particular form of ring I contemplate forming the same in a plurality of sections. I have shown three such sections although any preferred number may be employed. At the meeting ends of the sections I have provided radially extending lugs 11 which are formed with openings therethrough to receive a clamping bolt 12. On this bolt I prefer to provide an extension to form a seat for a compression spring 13, which bears at one end against an adjustable nut 14 and at the other against the adjacent lug 11. When the ring is assembled upon the pipe the nuts 14 may be tightened so as to hold the ring firmly against the outer surface of the pipe. The resiliency provided by the springs 13 will, however, allow the holding ring to expand slightly when inequalities are encountered in the pipe. It is sometimes found that the pipe is not of entirely uniform diameter and furthermore it may be slightly distorted or bent while it is being handled so that a flexibility in the ring thus provided will allow the same to pass the inequalities in the pipe without difficulty and still serve to hold the ribs spaced evenly apart.

While I have shown the ring as made up of three sections I wish it understood that it may be made in a single section or in any other desired number of sections as previously noted. In the Fig. 1 embodiment the clamping device may also be made separate from the ring itself. This may be done by countersinking in the outer periphery of the ring a strap 15 of metal, the meeting ends of sections of the strap being bent outwardly to form the lugs 11 previously noted.

In Fig. 3, I have shown a single unitary ring 9*a*. It is to be understood that this ring may be employed in the same manner as is the ring 9 previously described. It will, however, not have the flexibility of the previous form but where the pipe is approximately uniform in diameter it will serve the same purpose. The interior face of the ring is notched at 10′ to engage with the ribs to hold them properly spaced. In Fig. 4 the ring, like that shown in Fig. 1, is cut into sections, said sections being hinged together by links 16, which overlap the ends of the sections and are secured to such sections by pins 17, which may be removable.

In Fig. 5, I have shown the ring made up of short sections 18 similar to the links on a chain. Each link is provided on its inner face with a notch 10*b* adapted to engage over the ribs upon the pipe and serve to space the ribs uniformly apart as in the previous embodiments.

While I have shown and described several different forms which my invention may take I wish it understood that I am not confined to any particular form of holding ring but contemplate the use of a holding device of this character having means to engage the ribs and hold them uniformly spaced while the screen wire is being wrapped about the pipe. Ordinarily the holding ring will be made of metal but the material employed is also adapted to be varied and I wish it understood that any desired material may be employed.

By the use of my device the wire may be wrapped about the ribs of the screen without difficulty and it is desired that the holding ring be moved slightly ahead of the winding apparatus thus assuring that the wires comprising the ribs be uniformly spaced at all times. The advantage of this construction will be apparent to those skilled in the art.

What I claim as new and desire to protect by Letters Patent is:

1. A holding ring of the character described comprising a band of material shaped to encompass a screen pipe, said band having notches on its inner face to receive and space apart the wire ribs longitudinally of said pipe, said band being slidably axially along said pipe.

2. A holding ring of the character described comprising a band of material shaped to encompass a screen pipe, and means on said band to engage and space apart the wire ribs longitudinally of said pipe, said band being slidable axially along said pipe.

3. A holding ring of the character described comprising a band of material shaped to encompass a screen pipe, said band having notches on its inner face to receive and space apart the wire ribs longitudinally of said pipe, said band being held resiliently against said pipe and slidable axially along said pipe.

4. In a device of the character described adapted for use with a screen pipe having longitudinal wire ribs secured at their ends to said pipe, a holding ring slidable on the outer surface of said pipe and provided with notches on its inner surface to receive said wires, and means to allow said ring to expand to provide for inequalities in the pipe.

5. In a device of the character described adapted for use with a screen pipe having longitudinal wire ribs secured at their ends to said pipe, a holding ring made up of a plurality of sections slidable on the outer surface of said pipe and provided with notches on its inner surface to receive said wires, and means to allow said ring to expand to provide for inequalities in the pipe.

6. In a device of the character described adapted for use with a screen pipe having

longitudinal wire ribs secured at their ends to said pipe, a holding ring made up of a plurality of sections slidable on the outer surface of said pipe and provided with notches on its inner surface to receive said wires.

In testimony whereof I hereunto affix my signature this 21st day of November, A. D. 1929.

HILLSMAN D. WILSON, JR.