

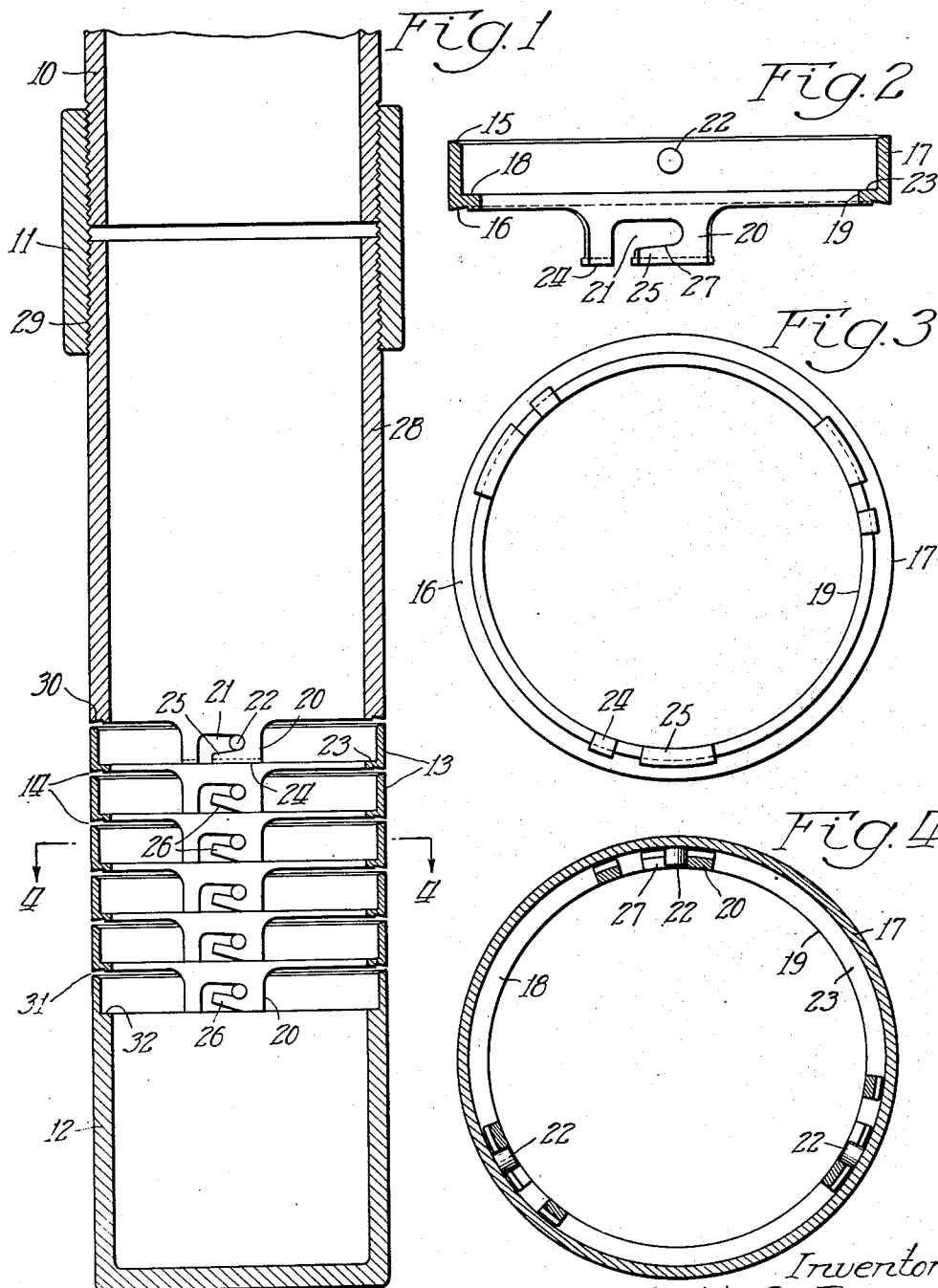
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WELL STRAINER

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WELL STRAINER

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This invention relates to well strainers and the like, and among other objects aims to provide an improved strainer which may be easily adapted to a variety of conditions.

5 The nature of the invention may be readily understood by reference to one illustrative construction embodying the invention and shown in the accompanying drawing.

In said drawing:

10 Fig. 1 is a longitudinal section of a strainer connected to the extremity of a well pipe;

Fig. 2 is a similar section through an individual strainer unit;

Fig. 3 is a plan view, taken from the plane 3—3 of Fig. 2, of one face of a strainer unit; and

Fig. 4 is a cross-section taken on the plane 4—4 of Fig. 1.

The invention is here shown embodied in a strainer adapted to be applied at the lower end 20 of a well pipe 10. In this instance the strainer is connected to the pipe by threaded external sleeve 11. Its lower end is provided with an appropriate terminal fitting which may be of a variety of shapes, depending upon the method of 25 inserting the well pipe. As here shown, the terminal fitting is a blunt-end cap 12. If the pipe be driven, the terminal fitting is preferably pointed.

The operative portion of the strainer comprises a plurality of connected units 13, each providing a circumferential strainer slot 14 in conjunction with the adjacent unit. The capacity of the strainer may be adjusted to the conditions under which it is intended to function by 35 assembling such a number of strainer units 13 as will provide the proper strainer capacity. As here shown, the strainer units are provided with spacing means which rigidly separate the circumferential edges of adjacent units by distances which provide the strainer slots 14. The width of the strainer slots may be adjusted to suit conditions by appropriately adjusting the effective relative height of the spacing means.

The slots 14 are advantageously outwardly tapered to make them self-cleaning. This is effected in this instance by outwardly beveling the upper and lower edges 15 and 16 of each unit (see Figs. 1 and 2) so that when assembled the edges of adjacent units provide an outwardly 50 tapering slot. The amount of bevel may of course be varied to suit conditions but a generally satisfactory bevel is 5°, thus making a 10° taper for the slot.

The strainer units are shown in the form of 55 rings 17 each having a narrow flange 18 which in this instance projects inwardly. The opening 19 through the ring is therefore not materially reduced. The means for connecting the various units together and for spacing them as aforesaid are here shown embodied in projections 20 ex-

tending from the flanged edge of the unit, which have a bayonet joint connection with the ring of the next unit. In this instance the projections are each provided with a bayonet slot 21, and the rings with inwardly projecting pins 22 5 which are adapted to enter the bayonet slots of the adjacent unit. As here shown (see Figs. 2 and 3), the projections 20 are spaced inwardly of the outer periphery of the units so as to nest or enter the ring portion of the next unit and seat upon the inner surface 23 of the flange 18. The width of the latter preferably need not be substantially greater than the thickness of the projections so as not to restrict the opening 15 through the unit more than necessary yet wide enough to provide an adequate seat for the projections. Preferably the projections are arranged so as to fit tightly inside the ring of the adjacent section to avoid any lateral play and to facilitate the rigid connection between the units presently 20 described. Each of the strainer units is in this instance provided with three symmetrically arranged spacing projections 20.

The width of the slots between adjacent units is thus determined by the difference in height 25 between the projections 20 and the ring 17 of each unit. The slots 14 may be narrowed by grinding or machining down the end 24 of the projections so as to decrease their height. In this connection it should be understood that initially the pins 22 have a loose fit in the bayonet slots and will therefore allow the sections to be brought closer together if the ends of the projections be machined or ground down. More- 35 over the pins will bend slightly if there be insufficient play. The slots may be widened by grinding or machining down the edges 15 of each of the units. If in use the slots become excessively widened through the abrasive action of sand or otherwise, or their taper reduced, the slots may be narrowed and properly tapered by withdrawing the strainer and tapering the edges 15 and 16 and grinding down the edges 24 of the projec- 40 tions to adjust the slot width.

A strainer is easily assembled by interlocking 45 the bayonet joints of successive units and thereafter bending down the overhanging portion 25 of the bayonet slot projection to the position indicated at 26, so as to prevent withdrawal of the pins 22 and thereby locking the units to- 50 gether. The bending of the bayonet slot projections as aforesaid removes any looseness which may have existed between the sections and is preferably performed successively as successive units are assembled. Preferably the edges 27 of the bayonet slots are inclined away from the adjacent section so as to wedge the sections tightly together on relatively rotating the inter- 55 locked units. This tight wedging is maintained by bending the slot projection as aforesaid to 60

prevent movement of the pins in the slots. It has been found that the three bayonet slot projections provide ample bearing on the adjacent unit so that when locked together as aforesaid the units are so rigidly and firmly connected as to be able to resist damage even if the well pipe be driven down.

Preferably the strainer is provided with a connecting section 28 screw threaded at its upper end 29 or otherwise appropriately prepared for connection with the well pipe and provided at its lower end with the aforesaid bayonet slot projections. Also preferably the lower edge 30 of the connecting section is beveled as aforesaid so as to give the upper slot the desired outward taper. Likewise, the upper edge 31 of the cap or terminal unit 12 is beveled as aforesaid to give the lowest slot the proper taper. The terminal unit is preferably provided with an internal shoulder 32 appropriately spaced from its edge 31 to provide a seat for the bayonet slot projection of the bottom strainer unit.

If it becomes necessary to disassemble the units of the strainer, this may be effected by inserting a tool through the connecting section 28 of the strainer and bending back the bayonet slot projections so as to release the section 28. Thereafter successive bayonet slot projections are bent back to release the units.

The strainer units may be made of any desired material, corrosive resisting or otherwise, and a supply may advantageously be kept in the field so that strainers may be assembled without delay as and when desired.

Obviously the invention is not limited to the details of the illustrative construction since these may be variously modified. Moreover, it is not indispensable that all features of the invention be used conjointly since various features may be used to advantage in different combinations and subcombinations.

Having described my invention, I claim:

1. A strainer of the character described comprising in combination a plurality of rings each having an inwardly projecting flange, a plurality of projections extending from said flange and adapted to enter an adjacent ring and to seat on the flange thereof, said projections being deep enough to space the adjacent edge of the latter ring from the first named ring to provide a slot, said rings and projections connected by bayonet joints, a connecting fitting for one end of said strainer, a terminal fitting for closing the other end of said strainer, said fittings and the end rings of said strainer being provided with projections with bayonet joint connections for connecting the fittings to the strainer.

2. A unit for a well strainer formed from a plurality of connected units comprising in combination, an imperforate cylindrical ring having an inwardly projecting flange, a plurality of projections extending from said flange a distance greater than the depth of said ring and adapted to enter a similar adjacent ring and to seat on the flange thereof to space the adjacent edge of the latter ring from the first named ring to provide a slot, said projections being variable in height to vary the width of said slot, said ring and projections respectively provided with connecting means whereby a succession of rings may be connected together.

3. A unit for a strainer of the character described comprising in combination, a ring having an imperforate cylindrical surface and having a flange extending laterally therefrom, a projection

extending from said flange a distance greater than the depth of said ring and adapted to seat on the flange of an adjacent ring and to space the edge of the latter from the first named ring to provide a slot between the rings, said projection being variable in height to vary the width of said slot, and means associated with said projection for connecting the latter to an adjacent ring.

4. A unit for a strainer of the character described comprising in combination, a ring having an imperforate cylindrical surface and having an inwardly projecting flange, a plurality of projections extending from said flange a distance greater than the depth of said ring and adapted to enter an adjacent similar ring and to seat on the flange thereof to space the adjacent edge of the latter ring from the first named ring to provide a slot, said projections having bayonet slots therein and said ring having pins projecting therefrom and adapted to enter the bayonet slots of an adjacent ring to connect the same together, the metal adjacent said slots being bendable to lock two rings together after the pins have been seated in the slot.

5. A unit for a strainer of the character described comprising in combination, a cylindrical ring having an inwardly projecting flange, a plurality of projections extending from said flange a distance greater than the depth of said ring and adapted to enter an adjacent similar ring and to seat on the flange thereof to space the adjacent edge of the latter ring from the first named ring to provide a slot, the edges of said ring being beveled to give the slot an outwardly tapered contour, said projections having bayonet slots therein and said ring having pins projecting therefrom and adapted to enter the bayonet slots of an adjacent ring to connect the same together.

6. A strainer of the character described comprising in combination a plurality of imperforate cylindrical rings each having an inwardly projecting flange and a plurality of projections extending from said flange a distance greater than the depth of said ring, said projections being seated against the flange of the adjacent ring and being of sufficient depth to space the rings to provide a strainer slot, said projections and rings having bayonet joints therein to connect the same together to provide a strainer.

7. A strainer of the character described comprising in combination a plurality of superposed cylindrical imperforate rings each having an inwardly projecting flange, a plurality of projections extending axially from said flange a distance slightly greater than the depth of said ring and seated against the flange of the adjacent ring to space the adjacent edge of the latter ring from the adjacent edge of first named ring to provide a narrow strainer slot, said rings and projections respectively provided with means for connecting the units together to provide a strainer having a slotted cylindrical surface.

8. A strainer of the character described comprising in combination a plurality of superposed rings, each ring having extension means entering the adjacent ring, said extension means and said adjacent ring being provided with interlocking means for connecting said rings firmly together independently of other rings and for spacing and for holding them apart slightly to provide a narrow strainer slot between said rings, and means for closing the end ring.

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