

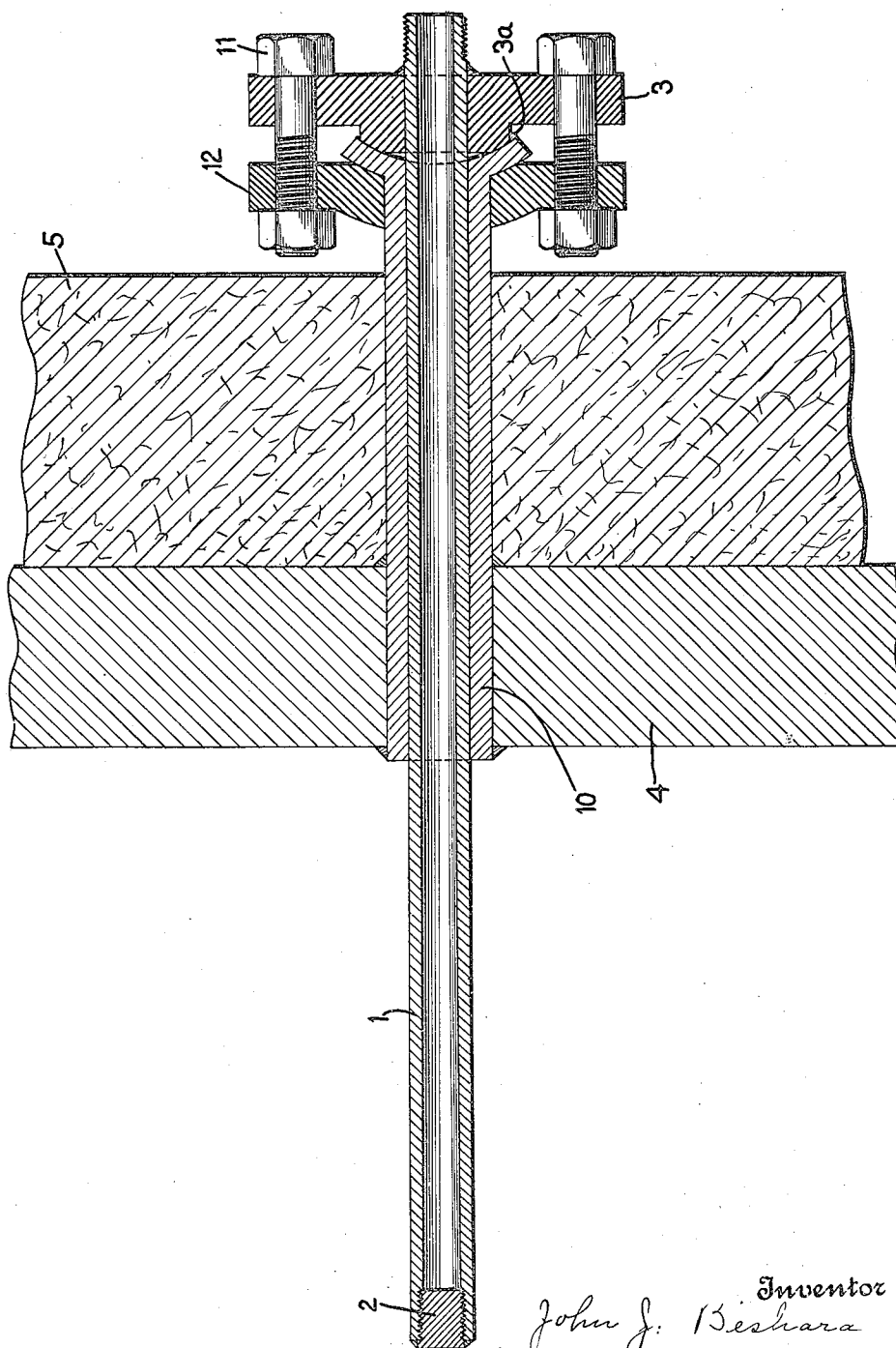
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THERMOCOUPLE WELL

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UNITED STATES PATENT OFFICE

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THERMOCOUPLE WELL

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This invention relates to wells for holding thermometers or thermocouples in substances of various kinds undergoing treatment or temperature change and relates more specifically to an improved corrosion resisting well, which is also resistant to the adherence of cokey deposits, for use where substances containing various corrosive compounds and coke forming constituents are undergoing heat treatment, for example, hydrocarbon oils undergoing cracking.

In the cracking of hydrocarbon oils where corrosive compounds are present, which in the most prevalent forms are particularly destructive to relatively pure iron or steel of which the bulk of the apparatus in this sort of equipment is composed, it is necessary to protect the walls of the vessels and pipes from these compounds.

Various linings have been used with more or less success in protecting the walls of such vessels and pipes in apparatus of this nature but no positive success has been had in the attempt to provide thermometer and thermocouple wells for the instruments used for observing or recording the temperature of substances undergoing treatment containing highly corrosive compounds.

In addition to the comparatively short life, due to corrosion, of the average thermometer wells in the presence of corrosive compounds another objection presents itself in that cokey or carbon-like constituents in the substance tend to adhere to ordinary thermometer wells made of iron or steel and thereby form a coating or a mass of the carbon-like material upon it which, since it is a poor conductor of heat, renders the thermometer much less sensitive to temperature changes of the substance under observation. The most effective alloy known for use in corrosive atmospheres, as considered here, is that alloy consisting of a preponderance of chromium, nickel and iron, which is also repulsive to the adherence of cokey particles.

Thus the foremost object of this invention is to provide a suitably constructed well of durable material which will not only be resistant to corrosion but will also repulse ad-

herence of cokey or carbon-like constituents thereto.

This together with other objects of the invention will be better understood from the following detailed description taken in connection with the accompanying drawing which illustrates in sectional elevation a preferred form of thermometer well made in accordance with the invention.

A relatively thin walled elongated tubular member 1, having one end open and threaded exteriorly is provided with a flange member 3 near the exteriorly threaded end and with a suitable closure plug 2 in its opposite end which plug is preferably screwed and welded therein thus forming a socket or well. It will be understood that the plug is not essential as the tube end itself may be formed so as to effect a closure. The flange 3 is preferably bored to fit snugly over the well member 1 and when it is advanced a certain distance over the well from the threaded end it is preferably welded to the wall of the well to suitably secure it thereto.

A shorter tubular member or sleeve 10 having one end flared to cooperate with a hub or boss like protrusion 3a on the flange 3, has a loosely surrounding flange 12 which cooperates with the flared end of the member 10. The other end of the tubular member 10, which may be either plain or threaded exteriorly, is adapted to be inserted through the wall of a vessel or pipe 4, inclosing a treating zone whose temperature is under observation, and may be secured thereto either by welds or threads or both, the wall 4 being preferably provided with appropriate heat insulating material 5.

In assembling the thermometer well the plug end of the well member 1 is inserted in the flared end of the tubular member 10, after the latter is secured in the wall of the vessel or pipe 4, and advanced until the boss 3a of the flange 3 is in contact with the flared end of the tube 10 when it is drawn up tightly by bolts 11 and the cooperating flanges 3 and 12 to form a leak-proof joint between the boss 3a and the flare on the pipe 10.

Obviously many modifications and variations of the invention, as hereinbefore set

forth, may be made without departing from the spirit and scope thereof, and therefore, only such limitations should be imposed as are indicated in the appended claims.

5 I claim:

1. A thermocouple well comprising a tubular member having a closed end adapted to protrude into a treating zone and an open end adapted to protrude outside thereof containing a thermocouple, a flange attached to the
10 tubular member near its open end, a sleeve partially inclosing the tubular member having one end adapted to be secured into means inclosing the treating zone and the other end
15 flared and protruding outwardly, a slip flange on the sleeve adapted to cooperate with its flared end and the flange on the tubular member and bolts for drawing the two flanges together thereby securing the
20 thermocouple well rigidly in the sleeve and thereby into the treating zone.

2. A thermocouple well of corrosion resisting alloy metal composed chiefly of iron, chromium and nickel which resists the ad-
25 herence of carbon deposits thereto comprising a tubular member having a closed end adapted to protrude into a treating zone and an open end adapted to protrude outside thereof for containing a thermocouple, a
30 flange attached to the tubular member near its open end, a sleeve partially inclosing the tubular member having one end adapted to be secured into means inclosing the treating zone and the other end flared and protruding
35 outwardly, a slip flange on the sleeve adapted to cooperate with its flared end and the flange on the tubular member and bolts for drawing the two flanges together thereby securing the thermocouple well rigidly in the
40 sleeve and thereby into the treating zone.

In witness whereof I have hereunto set my hand this 23 day of December, 1929.

JOHN J. BESHARA.

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