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SAND TESTER FOR WELL STRAINERS

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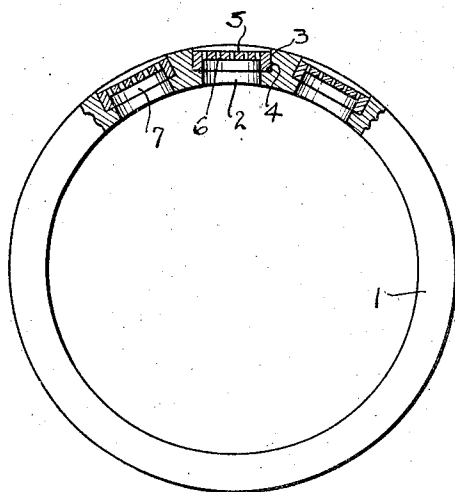


Fig. 1.

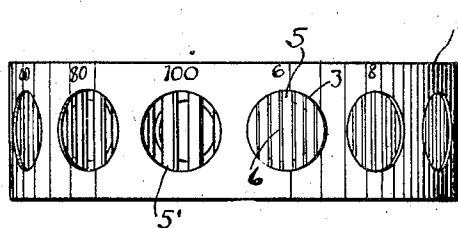


Fig. 2.

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UNITED STATES PATENT OFFICE.

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SAND TESTER FOR WELL STRAINERS.

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My invention relates to a device for testing the size of sand particles contained in the fluid entering the well in deep well operations.

5 In the successful operation of filtering sand and other fine foreign particles from the liquid entering a well, it is necessary to form the strainer with straining openings of the proper size to prevent the entrance into
10 the well of sand grains of the size found in the bulk of the sand in the producing stratum.

In order to ascertain what size of screening opening is necessary, I have provided a device whereby the samples of sand from the
15 well may be tested. The size being determined, the strainer buttons with slots therein of the proper degree of fineness to prevent the entrance of the sand may be readily provided.
20

It is desired that the testing device be small in bulk and thus adapted to be easily carried with the user, either in his pocket or with other small tools, ready for use when
25 necessary.

In the drawing, I have shown in Fig. 1, a plan view of the invention, partly in central horizontal section. Fig. 2 shows a side elevation of the device.

30 My invention is particularly adapted for use with well strainers of the slotted plug type, wherein the straining openings are formed in plugs or buttons adapted to fit fluid openings in the pipe. Such plugs are
35 manufactured with straining slots therein of varying widths so that a button may be formed with slots of the proper gauge to screen out the sand encountered no matter what the size of the sand particles may be.

40 My invention is adapted for use in testing the sand when a sample has been obtained and determining what size of straining openings should be used. I, therefore, provide a plate or strip of metal 1, preferably arranged in annular shape, forming a ring. This type of device may be easily
45 placed in the pocket of the user and carried with him in testing the degree of fineness of the sand in the different formations. The ring is provided at closely spaced points with openings 2 therein, said openings being enlarged by reaming the outer ends of said openings to provided seats 3, having shoulders 4 at its lower side. In each of the seats
50 thus formed in the ring, I place a button or plug 5 formed with slots 6 therein. These

strainer plugs are not materially different from strainer plugs now in ordinary use. I employ, however, only one plug of each size of strainer opening. Thus in Fig. 2 it
60 will be noticed that the plug, indicated at 5, is formed with very fine openings or slots 6 therein and that proceeding to the right from this plug the slots 6 are gradually increased in width, each successive lug having slots
65 slightly wider than slots in the preceding plug, the last plug in the series, indicated at 5', having the widest slots of all.

The interiors of the slotted plugs 5 are cupped, as shown at 7, on their interior faces, the internal diameters being approximately
70 equal to the diameters of the openings 2.

When it becomes necessary to test the sample of sand, it will be noted that the concave inner face of the ring is naturally
75 shaped to receive a small portion of sand. The cup provided by the opening 2 in the pipe and by the interior of the plug forms, in conjunction with the concave interior face of the ring, a small receptacle into which
80 samples of the sand may be received. The user of the device may estimate with his eye about the approximate gauge of strainer opening which is necessary to screen out sand of the degree of fineness shown in the
85 sample. He will then pour the sand into the receptacle, formed on the interior of the plug, which he thinks will prevent the passage of the sand and will then shake or jar
90 the ring to test the sand to see whether it will pass through the straining slots. If he finds that it will not, he then places some of the sand in the strainer plug next adjacent having wider slots to ascertain whether it will pass through this gauge of slot and
95 if it does not he may continue his tests until he finds a plug with slotted openings as large as possible therein which will also prevent passage of the sand. He thus ascertains the average size of the particles
100 of sand in the sample and will be enabled to state with accuracy the size of strainer plug or screen opening that will be required to most efficiently perform the straining function to prevent the entrance of sand into
105 the well. The screen pipe may thus be fitted up with the screen plugs of the proper gauge for the particular formation in which the screen is to be placed.

While I have described the invention as
110 being adapted particularly for use with strainers of the button or plug type, it is

obvious that the device may be used with all types of well strainers, the device serving the purpose of testing the sizes of the sand particles, it being understood that the sizes of the straining slots or other openings will then be regulated to handle the particular grade of sand which is found in the sample.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A sand testing device comprising an annular plate forming a ring, said ring having spaced openings therein, and strainer plugs having cupped ends presented inwardly to register in said openings, said strainer plugs being arranged with straining slots therein of graduated widths,

beginning with one of said plugs and arranged in sequence around said ring from the finest mesh to the coarsest mesh.

2. A sand testing device comprising an annular plate forming a ring, said ring having spaced openings therein, and strainer plugs having cupped ends presented inwardly to register in said openings, said strainer plugs being arranged with an outer wall having straining slots therein of graduated widths, beginning with one of said plugs and arranged in sequence around said ring from the finest mesh to the coarsest mesh, said openings and said plugs forming receptacles for the purpose described.

In testimony whereof I hereunto affix my signature this 4th day of May, A. D. 1926.
JOSEPH HENRY McEVOY, JR.