

# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN PROCESSES FOR TESTING PIPES.

Specification forming part of Letters Patent No. **201,841**, dated March 26, 1878; application filed January 7, 1878.

*To all whom it may concern:*

Be it known that I, EDWARD P. SMITH, of Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Processes for Testing Pipes; and I do hereby declare that the following is a full and exact description of the same.

I have found, in the manufacture of pumps, pipes, and tubes, that the method heretofore employed of testing the integrity of the same by hydraulic pressure has not been sufficiently accurate, as it often happens that minute holes, too small for casual observation, which will not allow the passage through them of water under the pressure conveniently employed, will allow air to be drawn in through them, and thereby seriously impair and destroy the efficiency of the pump, pipe, or tube. It often happens that cracks or splits upon the interior do not show to casual observation upon the outside, which, after use of the pump, pipe, or tube, wear or develop into cracks or splits, which render the pump, &c., nearly or quite useless.

I have found that such defects are not remedied by painting or coating the pumps, pipes, or tubes, because, such painting or coating being upon the outside and the pressure being constantly from within, the water soon forces its way out.

I have also found that the use of hydraulic pressure for testing was expensive, requiring a large force and much mechanism to test several hundred pumps a day, which I have been in the habit of manufacturing.

The object of my invention, therefore, is to produce a cheap, certain, and rapid mode of testing pumps, pipes, tubing, &c.; and the novelty therein consists in applying a steam-pressure directly to the interior of the pump, pipe, or tubing.

While I do not wish to restrict myself to any particular form of apparatus in which my mode of testing may be applied, I will proceed to describe one apparatus which may be used conveniently in testing pumps, &c.

A suitable pipe may lead from a steam-boiler through a head like that of a lathe, terminating in a suitable tapering nozzle. Said pipe should also be provided with a suitable cut-off valve near the head, and furnished with a

hand wheel or lever. Another lathe-head, adapted to be moved back and forth conveniently, should have also a suitable projecting solid nozzle. Two men, taking the pump, or pump pipe or stock or tubing, which has been bored, and one of them entering his end of the bore upon the tapering nozzle which has the steam-pipe, the other enters his bore upon the solid nozzle of the other head, moving the same toward the other, so that both nozzles are firmly and tightly pressed into the bores at their several ends of the wood. The operator at the steam end then lets on steam by means of the hand wheel or lever before named, and the steam instantly fills the bore under pressure. Wherever there is a hole, even the most minute, and even if the same is filled with gum or pitch, the steam will find its way out and display itself in a vaporous form; and wherever there is a crack or split not developed upon the outside, the steam will soften the wood or force the contiguous parts aside, so that it will escape and be seen in a vaporous form. One of the operators, or, more conveniently, a third one, instantly marks the places where the steam escapes with chalk.

The pump, or pump pipe or stock or tube, is then removed from the nozzles, and the work of testing is complete.

In use, that three men, with one such mechanism, can test six hundred pumps, or pump stocks or pipes, in one day.

The advantages of this system are too obvious to need further enumeration.

The result is that pumps, pipes, and tubes are tested so accurately that each pump, pipe, and tube is absolutely sound and perfectly air-tight.

I do not wish to confine myself to any particular apparatus which I may employ, as it is obvious that such apparatus may be varied to suit convenience, or in accordance with the ingenuity of inventors; nor do I wish to confine myself to the pressure of steam in testing pipes of wood, as it is evident that the same method may be used with pipes of metal or any other material which will resist steam.

I am aware that cans, barrels, and like articles have before been tested by means of an

apparatus which creates an air-pressure in the same; and is connected with a gage to ascertain the degree of pressure, and hereby disclaim the same as making any part of my invention.

What I claim as new and my own invention, for which I desire Letters Patent, is—

The mode or method, substantially as described, of testing pumps, pipes, and tubes by

introducing into the same a steam-pressure, as explained.

This specification signed and witnessed this 5th day of January, 1878.

EDWARD P. SMITH.

Witnesses:

L. W. SEELY,  
R. N. DYER.