(No Model.)

J. FARRELL.

MANUFACTURE OF LEAD PIPE.

No. 269,651. Patented Dec. 26, 1882.

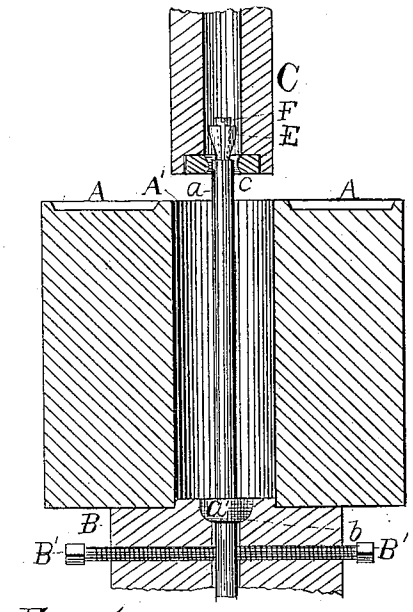

Fig. 1.

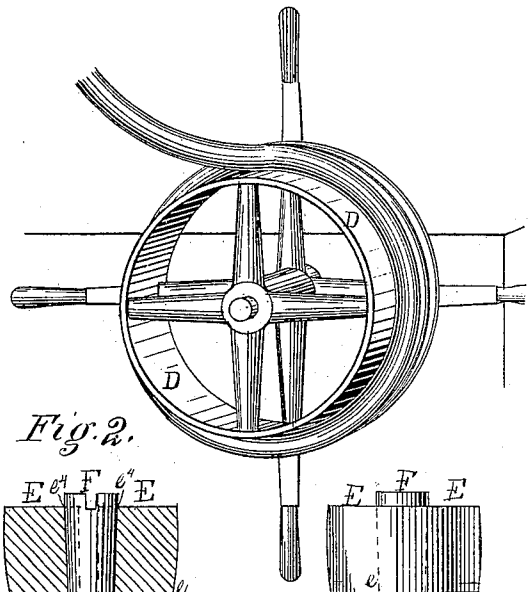

Fig. 2.

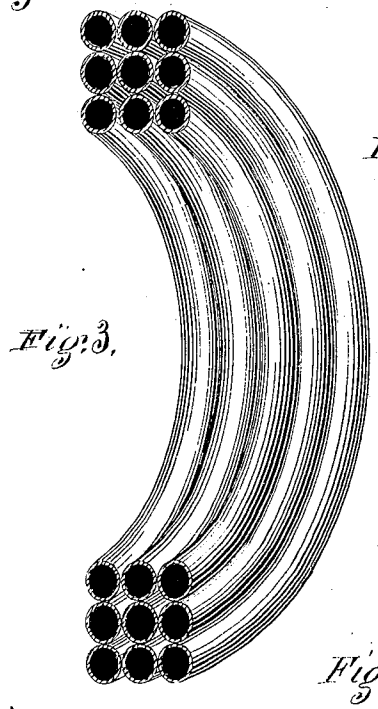

Fig. 3.

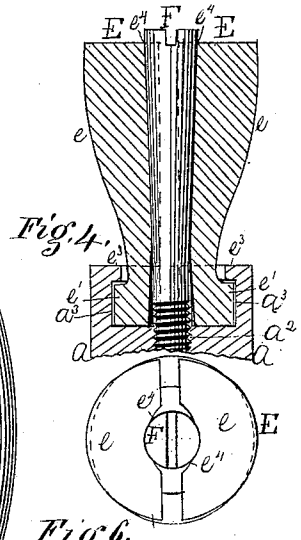

Fig. 4.

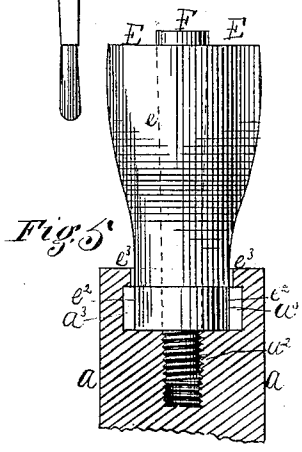

Fig. 5.

Fig. 6.

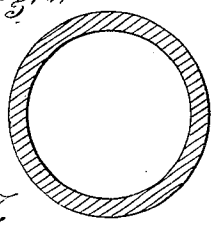

Fig. 7.

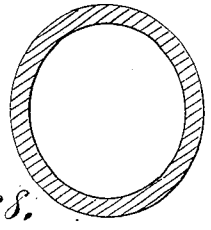

Fig. 8.

Witnesses,
C. L. Parker
H. P. Potter

Inventor John Farrell
By Attorney George H. Christy

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN FARRELL, OF PITTSBURG, PENNSYLVANIA.

MANUFACTURE OF LEAD PIPE.

SPECIFICATION forming part of Letters Patent No. 269,651, dated December 26, 1882.

Application filed August 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN FARRELL, a citizen of the United States, residing at Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in the Manufacture of Lead Pipe; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a vertical sectional view of parts of a pipe-press illustrative of my invention. Fig. 2 is a perspective view of a pipe-coiling drum, illustrative of the operation of coiling the pipe. Fig. 3 is a sectional perspective view of a pipe coil. Figs. 4, 5, and 6 are detached views to an enlarged scale, showing in different positions an adjustable shaping device attached to the core of the press for giving the desired form in cross-section to the pipe as it is delivered from the press. Figs. 7 and 8 are sectional views of pipe, illustrative of the forms given it in carrying out my invention.

In the manufacture of lead pipe it is customary to wind it on a cylindrical drum or reel into bundles or coils in order to put it into convenient form for subsequent handling; but as heretofore practiced such winding or coiling involves permanent injury to the pipe, in that the pipe is flattened or distorted somewhat, or is reduced from a round to an oval or elliptical form in cross-section; also, the operation of unwinding the pipe for use, instead of removing such distortion, actually increases it, and gives the pipe a still more flattened form. Consequently such a pipe which has been coiled or reeled and straightened for use has its area of passage or conducting capacity materially reduced from what it would have been if it were round. This distortion is especially noticeable on and injurious to the larger and lighter grades of lead pipe, and it involves a waste of money and materials which it is desirable for economical reasons to avoid; and it also causes more or less trouble in plumbing operations.

My present invention relates to certain improvements in the manufacture and coiling of lead pipe by which such injurious distortion of the pipe by coiling is wholly or practically prevented; and, in general terms, it consists in giving the pipe an oval or flattened form as it leaves the press, by means presently described, and then winding or coiling such flattened pipe in the plane of its greatest diameter, whereby the distorting action involved in coiling tends to reduce the flattened or oval form previously given; and, also, when such coil is unwound for use, the action on the pipe incident to such straightening will wholly or practically restore the pipe to a full round form, or much nearer a round form than could be secured by methods of handling or coiling heretofore practiced.

In carrying out my invention a pipe-press of any suitable form and construction may be employed—such, for example, as are now in common use in the art.

In Fig. 1 I have illustrated parts of one form of press suitable for the purposes of my invention, in which A represents a press-cylinder having a cylindrical lead-chamber A′ therein. This cylinder rests upon a supporting-block, B, which latter also serves as a support for the core *a*, a concave socket, *b*, being formed in the upper extremity of the passage *b′*, and a rounded shoulder, *a′*, in the stem of the core is seated in such socket. Adjusting-screws B′ B′ are provided for adjusting the core laterally, so as to set it in the axial line of the chamber A′ and in the center of die *c*, which is seated in a socket in the end of plunger C, and secured in the usual or any suitable way. Either the block B or plunger C may be connected in the usual way with the ram of a hydraulic or other press, whereby the requisite power and motion may be secured for forcing the plunger through the chamber A′, and thereby causing the lead to exude through the die-opening around the core, and forming it into pipe in the usual way. I have illustrated the die-opening and the core circular in form, adapted to make round pipe, as in Fig. 7, this being the form usually given in manufacture. As before stated, my invention contemplates changing this form from round to oval, flattened, or elliptical, and I prefer to do this by pressure applied within the pipe as it leaves the core in its passage from the machine. This I do by means of a plug or shaping device, E, secured to the end of the core, such plug or device presenting, by preference, an exterior outline in

cross-section over the whole or a part of its circumference of the oval or flattened form which it is desired to give to the pipe. This plug may be solid or expansible. I prefer, however, to make it expansible, in order that it may be adjusted for different grades and sizes of pipes without trouble from removing and replacing. I have shown such an expansible device constructed of two half-rounded pieces, *e e*, tapering somewhat longitudinally, and having external flanges or collars e' on the convex or rounded sides, which collars are reduced at the edges e^2 of the pieces *e* sufficiently to permit of the insertion of the collared end of each piece into a chambered socket, a^3, made in the outer end of the core. Grooves e^4 are also made in the inner flat faces of these pieces *e e*, and a taper-headed screw, F, is passed through such grooves and screwed into a threaded hole, a^2, made in the end of the core. The screw thus serves the double purpose of securing the device to the core by pushing the collars e' outward under the rim e^3, which projects partially over the socket a^3, and also of spreading the parts *e* as it is screwed in. The pressure of the surrounding pipe, which passes over this plug as it is delivered from the machine, presses the pieces *e e* firmly upon the head of the bolt. By turning the screw backward or out the pieces *e e* will be pressed toward each other and the plug be reduced in size. In this way the pieces may be spread more or less, so as to adapt the device for use in pipes differing somewhat in size and weight. To this end I make the transverse width of the inner faces of the pieces *e e* at their largest part equal to or a little less than the smallest diameter which it is desired to give the flattened pipe. This may be done, since the device will give the desired form by pressing upon two opposite sides of the pipes. Such pressure is secured by setting the rounded side of the pieces outside of the line of the core-surface sufficiently to give the desired flat or oval form by enlarging the diameter in one direction and reducing it at right angles to the enlargement, as represented in Fig. 8. As such flattened pipe is delivered from the machine it is wound in the plane of its greatest diameter upon any suitable drum or reel, D. Such winding or coiling reduces the greater and enlarges the smaller diameter and brings the pipe more nearly to a round form, as represented in Fig. 3; but by preference the flattening in the press is somewhat more than will be removed by once coiling, so that the pipe, when coiled, will still be out of round and its greatest diameter will still be in the plane of coiling. When this coil is unwound for use the binding of the pipe in the plane of its greatest diameter will reduce that diameter still more, and will correspondingly increase the smaller diameter, thereby bringing the pipe to or approximately to a round form.

By adjusting the shaping-plug E properly with reference to the size and weight of pipe being made, such a degree of flattening or such difference in diameters may be secured that after coiling and straightening, as above described, the pipe shall have practically a round form and possess the full carrying capacity of a round pipe. This adjustment can readily be determined by the skilled workmen, and it will vary somewhat with different conditions of manufacture; but for inch-and-a-quarter pipe, extra light, the difference in diameter given to the pipe before coiling should be in ordinary cases about one-eighth of an inch; for the same size pipe, strong, about one-sixteenth of an inch, and for two-inch pipe about double the differences above named. A pipe so formed will after coiling and straightening in the plane of its greatest diameter be practically round, and in substantially the condition in which it would be if made round in the first instance and never coiled or bent. It is therefore much superior to pipe made and coiled in the usual way, in which a permanent distortion is imparted to the pipe both in coiling and uncoiling. Such distortion not only impairs the carrying capacity of a pipe, and thereby detracts from its utility and value, but also is very difficult to remove by methods convenient to plumbers and users; and where a round form is particularly desired it is a common expedient with them to resort to a mallet and block and pound it approximately to the desired shape. By my improvement all this difficulty is effectually removed, for as the plumber or user unwinds the coil made in accordance with my invention the pipe is delivered for use free from such distortions. A coil thus formed of oval, flattened, or elliptical pipe and coiled or wound in the plane of its greatest diameter is readily distinguishable by the exterior or interior shape of the pipe, and is a desirable, useful, and highly advantageous article of manufacture, use, and sale in the art or trade. In forming such a coil in accordance with my invention various means may be employed other than those described for giving the pipe the desired oval, flattened, or elliptical form preliminary to coiling. For example, an oval, flattened, or elliptical core and die opening may be employed, whereby the pipe is made in such form in the first instance; or outside pressure may be applied to the pipe on opposite sides by rolls, dies, or other means, whereby the pipe is reduced from a round form; or other equivalent expedients may be resorted to, which, in so far as they impart the desired oval, flattened, or elliptical form to the pipe before and preparatory to coiling, I consider as coming within my invention. I prefer, however, the adjustable shaping device herein described, which imparts the desired shape by inside pressure upon the pipe. With outside pressure there is danger of compression or of reducing the size of the pipe, especially as the pipe is delivered hot and comparatively soft, and with an oval-shaped die and core there is increased difficulty in keeping them centered

or in proper working relation to produce uniform thickness in the pipe-walls. For these and similar reasons I prefer the construction described and shown. Also, instead of making the plug E separate from the core, it may be made with and practically a part of it, and either expansible or solid; but such construction would be inconvenient in use, and for that reason undesirable. This improved mechanism, however, with its various modifications, as above described, by means of which the pipe is flattened preparatory to coiling or reeling, is not claimed herein, but will form the subject-matter of a separate application for patent.

I claim herein as my invention—

1. A coil of lead pipe, such pipe being of oval, flattened, or elliptical form in cross-section and wound or coiled in the plane of its greatest diameter, substantially as set forth.

2. The improvement herein described in the art of preparing lead pipe, consisting in giving the pipe an oval, flattened, or elliptical form and coiling or reeling it by bending in the plane of its greatest diameter, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand.

JOHN FARRELL.

Witnesses:

S. HARVEY THOMPSON,

C. L. PARKER.