superior to other lead pipes. At the Baltimore water works also, we understand that they have been adopted, and are preferred.

We have delayed noticing the patents for this pipe in the expectation of receiving the report of the committee of the Franklin Institute thereon, which we are informed is altogether approbatory; this report we shall probably publish hereafter; in the mean time it will be satisfactory to our readers to know something of the nature of the manufacture. The lead, or other soft metal, from which the pipes are to be made, is fused, and poured into a very strong metal cylinder, furnished with a piston, and it is suffered to cool therein sufficiently to become set, or to lose its fluidity. The piston is then forced down by means of a very powerful hydraulic press; by this pressure the metal is made to pass through four openings which surround a mandril, or core, on the outside of the cylinder head, and which is of the size of the intended bore; the four solid bars, or strips of metal, which are formed by these openings, are received within a funnel-formed cavity of steel, which surrounds the core, and by the enormous pressure to which they are subjected they are firmly welded together and made to pass out from a cylindrical opening in the funnel-formed cavity, in the state of a finished tube. The tubes thus made may be cut across into wafer-like pieces, which will exhibit a perfect juncture and continuity of the metal.

We do not attempt to describe the particular construction of the apparatus in its details, as this would require several engraved figures; the specifications of the original patent, and of that for the improvements, have been drawn up with much care and clearness, and the claims appear to be made to a construction and arrangement of the parts which are new, and, as we believe, sustainable in law.

Progress of Practical & Theoretical Mechanics & Chemistry.

Adcock's Patent Spray Pump.

The following extract from a communication by Mr. Adcock, which appeared in the last number of the Mining Journal, fully illustrates the construction and action of his patent Spray Pump, of which we inserted a descriptive notice in a recent number.

"This wood cut is intended to represent and explain a plan put down by me at the 100-yard shaft, at Pemberton, to relieve the bend pipe and lower part of the apparatus from any water that might, from accidental or other cause, be there collected; and as it answers the intended purpose well, I have no doubt that the wood-cut, and its descriptive account, will be gratifying to many of your readers.

"In the wood-cut a b c represent a part of the downcast pipe, or the pipe that conveys the air from the top of the pit, or the galleries and workings of the mine, through the bend pipe into the upcast; b to c the bend pipe, or that which unites at the bottom of the pit the downcast with the upcast; c d e the upcast pipe, or pipe through which the air, and the water commingled with it, is carried to the

* Published at p. 49 of this number. † See Jour. Frank. Inst. vol. ii, 3rd series, p. 380.
surface or top of the pit, that the water may be there again collected in a solid body, and thence be allowed to flow freely away; 5 6 represents five slits, through which the water flows from the sump or well at the bottom of the pit into the upcast pipe, when the apparatus is in action, that it may, by the current of air, be dispersed into drops, like drops of rain, and conveyed to the top. The downcast pipe is twenty-nine and a half inches diameter—the upcast pipe seventeen and a half inches; and when not working, and from causes which it is not necessary to explain, water leaks from the sump into the apparatus, to a height equal to the head of the water there, which is about eight feet from the bottom of the bend, or eight feet seven inches from the bottom of the pipe beneath the bend, consequently, the water rises to the same height in the pipe $g g g g$, which is four inches diameter; $m m$ is a pipe, twenty feet long, that receives a supply of water from a water ring, placed so as to receive the water that oozes through and trickles down the sides of the pit. This pipe also is four inches diameter, but is unnecessarily large; it terminates in a compound cone marked $a$, as shown in the figure. Of the smaller cone the dimensions may be thus stated:—Its greater diameter, $\frac{2}{10}$ of an inch; its smaller diameter, $\frac{5}{10}$ th ditto; and its length $\frac{1}{10}$ ditto. Of the greater cone, the dimensions may be thus stated:—Its smaller diameter, $\frac{6}{10}$ th of an inch; its greater diameter, $\frac{7}{10}$ th ditto; and its length $\frac{9}{10}$ th ditto. A pipe, $\frac{4}{10}$ th of an inch diameter, descends from the junction of the larger cone with the smaller into the four inch pipe $g g g g$, as shown by the wood-cut. This pipe is nine feet long.

"Having thus given the proportions, I have only to describe the rationale of the contrivance:—The water in the pipe $m m$, is maintained by the water ring, or by the water that oozes through and trickles down the sides of the pit to a height or level equal to the height of the pipe itself, or twenty feet. Now, it is well known that the theoretic velocity of water, flowing out of an aperture, is equal to that of a heavy body falling from the height of the head of water, which is found, very nearly, by multiplying the square root of that height in feet by eight, for the number of feet described in a second. Thus, a head of one foot gives eight, a head of nine feet twenty-four, and a head of twenty feet thirty-five and three-fourths feet per second. This is the theoretical velocity; and from what is equally well known respecting the vena contracta, or the contraction which all streams undergo when passing through orifices, we must, in order to obtain the actual velocity, multiply the square
New Motive Power

The idea of turning to account, as a mechanical force, the oscillations of a tree by the wind, has never been proposed, because no one,