A. WATSON.

Mole Plow.

No. 27,324. Patented Feb. 28, 1860.

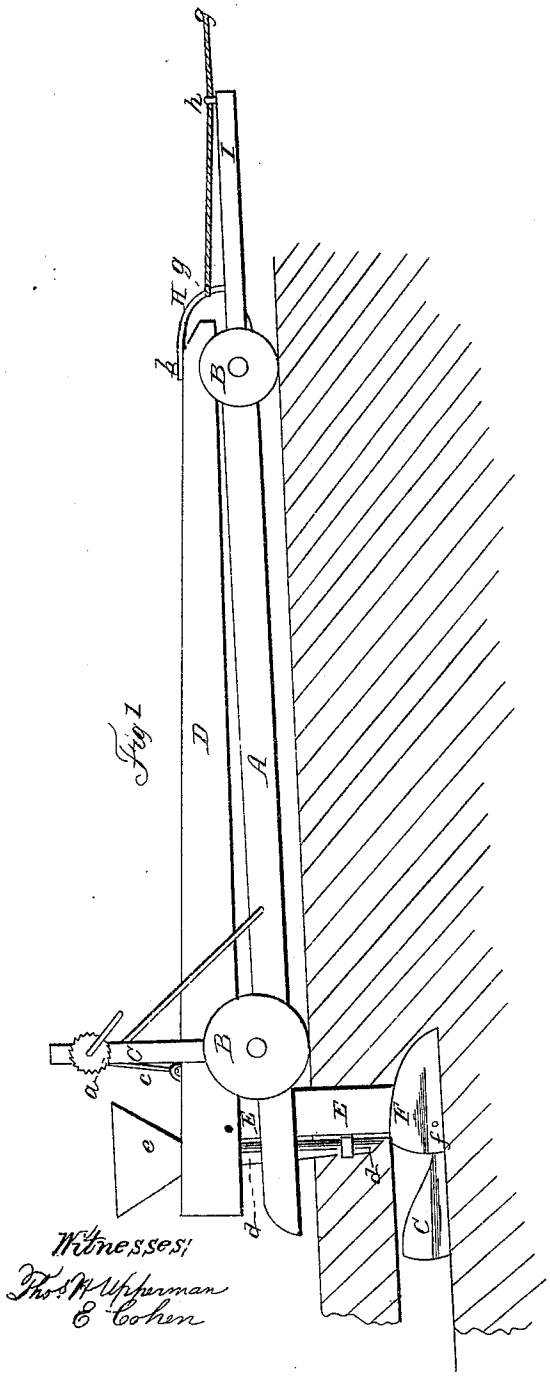

Fig. 1

Witnesses:
Thos. H. Upperman
E. Cohen

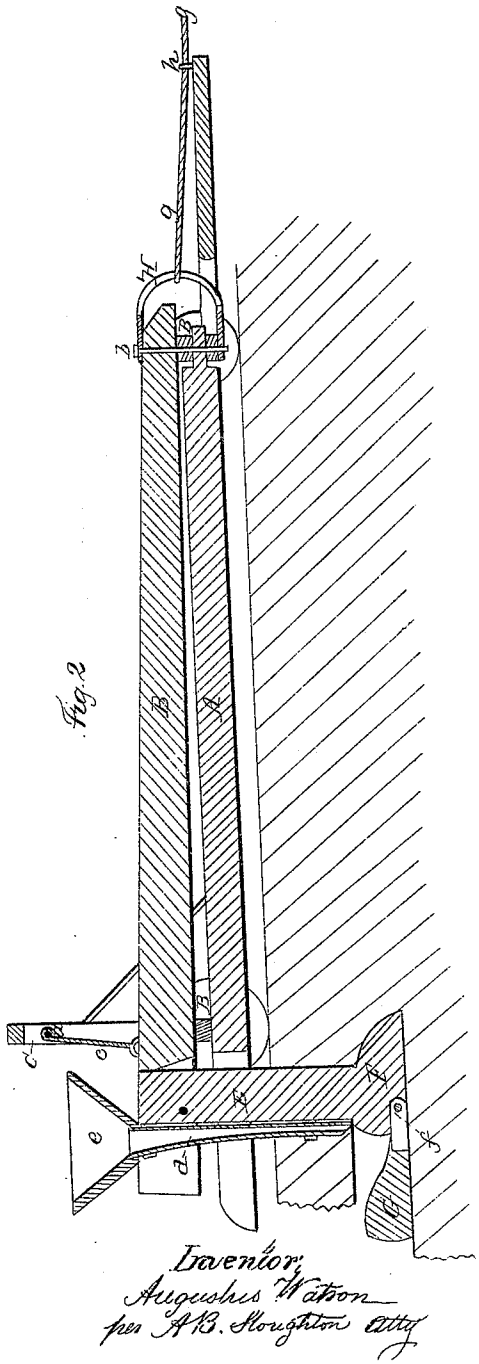

Fig. 2

Inventor:
Augustus Watson
per A. B. Houghton Atty

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

AUGUSTUS WATSON, OF LONDON, OHIO.

IMPROVEMENT IN LINING UNDERGROUND DRAINS WITH CEMENT.

Specification forming part of Letters Patent No. 27,324, dated February 28, 1860.

To all whom it may concern:

Be it known that I, AUGUSTUS WATSON, of London, in the county of Madison and State of Ohio, have invented certain new and useful Improvements in Lining Underground Drains with Cement; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a side view of a mole-plow with the cement-conductor attached, and Fig. 2 is a longitudinal vertical section through the same.

Similar letters of reference denote like parts in both the figures.

My invention consists in plastering or cementing the arch or crown and the sides, or either, of underground drains while they are in process of being made, the object being to cause the drain to maintain its form and not fall in, while the bottom portion is left uncovered to allow the water to enter the drain.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A frame, A, is supported on wheels B, or in any other of the usual ways, and upon this frame, truck, or carriage is raised an upright frame, C, upon which may be mounted a windlass, *a*. A long plow-beam, D, is pivoted to the front axle at *b*, and, extending rearward, passes between the posts of the upright frame C, and is suspended to the windlass *a* by a rope or chain, *c*, so as to be raised or lowered and held at any fixed position. To this beam D is attached the colter E, which passes through a slot or mortise in the rear of the frame-piece A. The lower end of the colter carries the mole F, that forms the drain, and to this mole F is hinged or pivoted at *f* a second mole, G, which I term the "troweling" or "plastering" mole. It has vertical motion on the forward mole, but little or no lateral play.

In rear of the colter E there is a tube, *d*, which may have a box or hopper, *e*, over its top to hold and carry the cement to be used, and the bottom of the tube is near the rear of the forming-mole F, which may be slightly grooved out to direct the cement onto the troweling-mole G, which plasters it onto the sides and top of the drain, or so much thereof as may be desired. The lower portion of the mole G fills snugly the lower portion of the drain formed by the mole F, so as to prevent any of the cement from running down onto said portion of the drain; but the top of the troweling-mole is of different form from the top of the forming-mole, so that there may always be a supply of the plastering material lying on or near the plastering-mole, which supply is kept up from the hopper or box *e* to take the place of that plastered upon the walls and crown of the drain.

Instead of the tube *d*, the colter itself may be tubular, so as to form a passage for the cement. I propose to use hydraulic cement; but any other may be introduced and plastered onto the drain in the same way. By plastering with cement such portions of the underground drain as are liable to wash in or give way, I can make the drain as permanent as a pipe-drain, and with but slight cost over that of a common drain, as the cementing is done as rapidly as and at the same time that the drain is made.

H is a clevis, by which the plow may be drawn. The chain *g* may pass through a ring or staple, *h*, in the tongue I, and thus guide the plow.

The moles are raised and lowered at pleasure to gage the depth of the drain or to give it the grade.

Having thus fully described the nature and object of my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

In combination with a mole for forming an underground drain, a tube for conveying cement or other plastic lining material down to the drain in such manner that it may be spread by a troweling-mole upon such parts of the drain as may be desired, substantially as described.

AUGUSTUS WATSON.

Witnesses:

J. C. BRIDGMAN,

B. F. CLARK.