(No Model.)

H. C. LOWRIE.

STRAIGHT EDGE FOR LAYING DRAIN PIPES.

No. 317,158. Patented May 5, 1885.

Fig. 1.

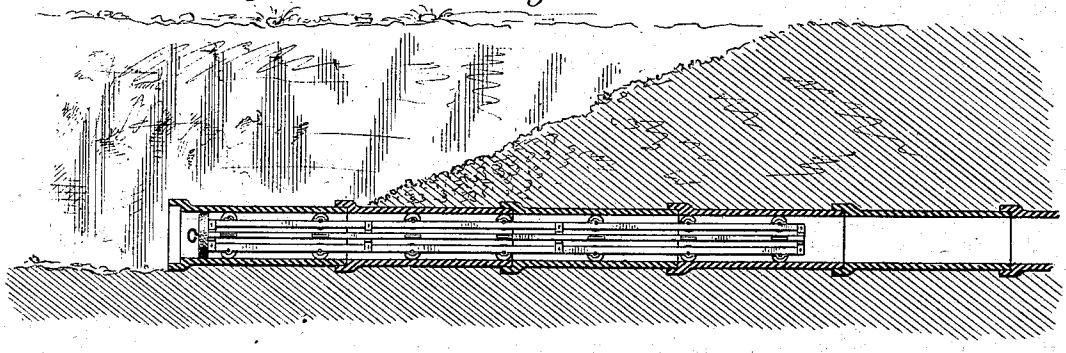


Fig. 2.

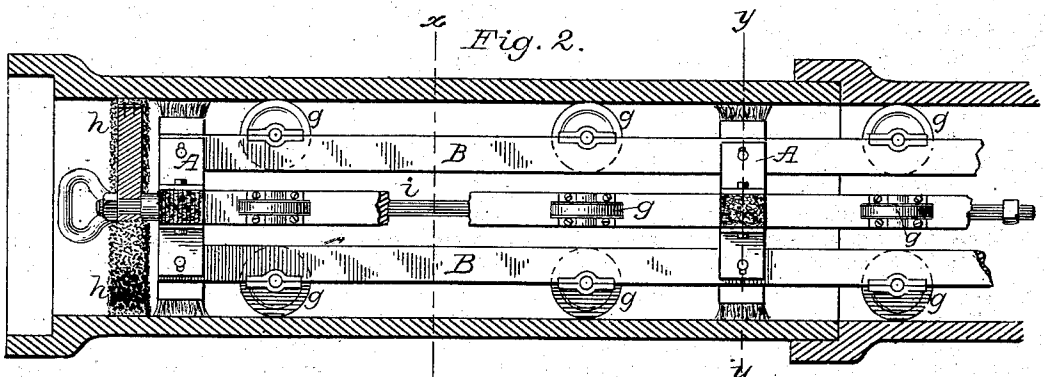


Fig. 3.

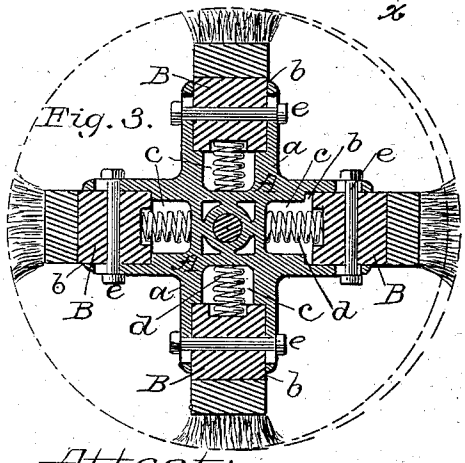
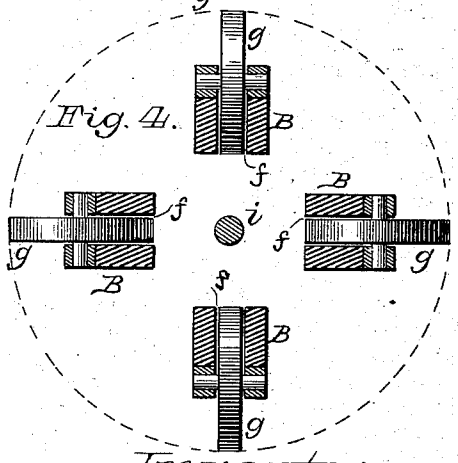


Fig. 4.



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UNITED STATES PATENT OFFICE.

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STRAIGHT-EDGE FOR LAYING DRAIN-PIPES.

SPECIFICATION forming part of Letters Patent No. 317,158, dated May 5, 1885.

Application filed September 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, HARVEY C. LOWRIE, of Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Straight-Edges for Laying Drain-Pipes; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of the several features of my invention.

The importance of laying or setting sections of drain-pipe to proper grade and in straight lines wherever practicable is well known; and it is also well known that "straight-edges" under various names have heretofore been devised with a view to facilitating said operation.

So far as my knowledge extends I am the first to devise means whereby average internal lines can be maintained, it being well known that sections of drain-pipe intentionally of the same form and internal dimensions vary more or less, and I accomplish the end stated by the employment in my straight-edge of a series of roller-contacts or guide-wheels mounted upon three or more circularly-arranged longitudinal parallel rods or bars longer than several sections of pipes, so that by placing said straight-edge within several already-laid sections of pipe additional sections may be accurately located, the joints properly cemented, and the filling in properly accomplished without liability of deviation from the exact direction and grade desired.

In their best form my roller-contacts are capable of yielding; or, in other words, they are capable of slight inward and outward movement radially, thus enabling them to be self-adjusting to the variable interior contour of a pipe, and thereby enabling each section to be laid in average coincidence with the section preceding it. I have also provided my straight-edge with a clearer or brush, whereby all extraneous solid matter is surely removed from the pipe as the work progresses, and also wiping from the joints all excess of cement or mortar, which it is well known is liable to be forced from the joints toward the interior, and which, if not removed, causes obstructive lodgment of matter when the drain is used.

To more particularly describe my invention, I will refer to the accompanying drawings, in which Figure 1 is a longitudinal section of an excavation and a drain composed of a series of drain-pipes with my improved straight-edge therein as if in use. Fig. 2 is an enlarged side view of said straight-edge. Fig. 3 is a vertical cross-section of the same on lines Y. Fig. 4 is a vertical cross-section of same on line X.

My improved internal straight-edge should be light but strong, and therefore it is skeletonized by me as far as is practicable, and heavy materials are avoided whenever possible.

The main portions of my device consist of a series of interior supporting-heads, A, and parallel bars B. In their best form the supporting-heads A are composed of cast-brass skeletonized as fully as will be consistent with the strength required. Each head has radial arms *a*, never less than three in number, and more than four, as shown, would be superfluous. Each radial arm at its outer end is slotted, as at *b*, parallel with the axis of the head, and chambered, as at *c*, at the bottom of each slot, to receive and afford a seat for an expansive spiral spring, *d*. Each arm near its outer end is laterally bored or slotted for the loose reception of a bolt, *e*. The longitudinal bars B are preferably composed of wood, selected and shaped with due reference to avoidance of springing tendencies, and of these either three or four may be employed with good results, if distributed with relation to each other, substantially as shown. Each bar B is mounted edgewise in its proper slots *b* of the several heads A, and so as to be free to move radially therein, and they are secured against actual displacement by the several bolts *e*, which are or may be well seated in lateral holes in said bars, and at their inner edges adjacent to said bolts each bar has a seat for the spiral spring *d*.

At various points throughout the length of each bar it is longitudinally and centrally slotted, as at *f*, for the reception at each slot of a roller or guide-wheel, *g*, provided with suitable bearings. Each group of wheels is preferably located in a peripheral line, so that when within a drain-pipe any two opposite wheels will bear evenly against diametrically-opposite points in the pipe.

For securing lightness, as well as the avoidance of shock in moving the straight-edge longitudinally, I prefer that these wheels be composed of hard wood, or gutta-percha, or other tough, light material, although metal wheels can be used if care be exercised in working with the straight-edge. The distances between any group of rollers or wheels *g* should as a rule be never greater than the average length of a drain-pipe, and preferably about two-thirds of said length. The springs *d* should be of such strength as will be sufficient to enable the straight-edge at its front end to support a section of drain-pipe without material deflection of any of the bars.

As thus far described, my straight-edge can be used with good results, and even if the yielding capacity of the bars due to the springs be not provided for, although these latter are of great practical value.

For effectually removing solid matter liable to become lodged in the drain-pipe during the laying operation, I provide the straight-edge with one or more brushes or swabs, *h*, which are annular in form and may be attached to the bars or to the heads, it being understood that they are so constructed of flexible material, or so mounted upon the bars or the heads, as not to interfere with the desired radial freedom of said bars.

Bands of coarse woolen cloth or soft rope loosely wound around the straight-edge and wrapped and secured with twine to the bars may be used, or rigid segments of brush-wood, filled with bristles, may be attached firmly to each bar.

The brush *h h* at the front end of the straight-edge, as here shown, has a wooden disk-shaped body, and is mounted upon a sliding rod, *i*, having a handle at its outer end and a nut at its inner end, and is fitted to slide in a central hole in the initial head A. The rod *i* should, for convenience, be a little longer than a drain-pipe section.

With the straight-edge constructed substantially as shown, it may be successfully used as follows: Referring to Fig. 1, it will be assumed that an additional section of drain-pipe is to be laid. The flange of the section last laid is freely loaded with cement, and the spigot end of a pipe-section inserted therein and blocked up with sand from beneath, whereupon the sliding rod and its brush are drawn forward, thus wiping the cement joint, followed by drawing the straight-edge forward until its first two groups of wheels are within the section, thereby correcting all temporary inaccuracies and placing the new section in a position where the earth can be safely rammed about it, and so on, the succeeding brush or brushes further smoothing the cement joint, if need be. Another method of use will involve as an initial step the withdrawal of the straight-edge nearly to the length of a pipe-section, applying the cement to the flange, and then slipping the loose pipe-section over the straight-edge to its seat in the flange of the preceding section, and then filling and ramming earth for confining it in position, in which case the inner brushes or swabs are wholly relied upon for wiping the cement joints and removing solid matter. It will be seen that with drain-pipes as thus laid the cement in the lower portions of the flanges will not be unduly displaced by the weight of one end of any section, and I therefore am enabled to secure comparatively tight joints, and it is obvious that said joints will be well finished internally and that no radical or objectionable deviations in direction or grade will be possible.

I am well aware that the guide-wheels may be mounted in the radial arms of the heads or sliding blocks, backed up by the springs, in which case the longitudinal bars may be located between the arms of said heads, and be rigidly secured to the heads, but the particular construction shown will be found to be in every way desirable.

While I prefer to employ all of the features of my invention, substantially as shown, in one drain-pipe straight-edge, it is obvious that some of them may be successfully employed in other organizations, differing more or less from that illustrated by me, but capable of substantially similar uses.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a drain-pipe straight-edge, the combination of a series of supporting-heads, a series of longitudinal bars peripherally mounted on said heads and secured thereto, and a series of guide-wheels, located at various longitudinal points, substantially as described.

2. In a drain-pipe straight-edge, the combination of a series of supporting-heads, a series of radially-movable yielding longitudinal bars provided with guide-wheels and mounted peripherally on said heads, substantially as described.

3. The combination, with a drain-pipe straight-edge, of one or more annular swabs or brushes, substantially as described.

4. The combination, with a drain-pipe straight-edge, of a central longitudinally-sliding rod and handle and an annular swab or brush mounted on said rod, substantially as described.

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Witnesses:
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J. S. LITTELL.