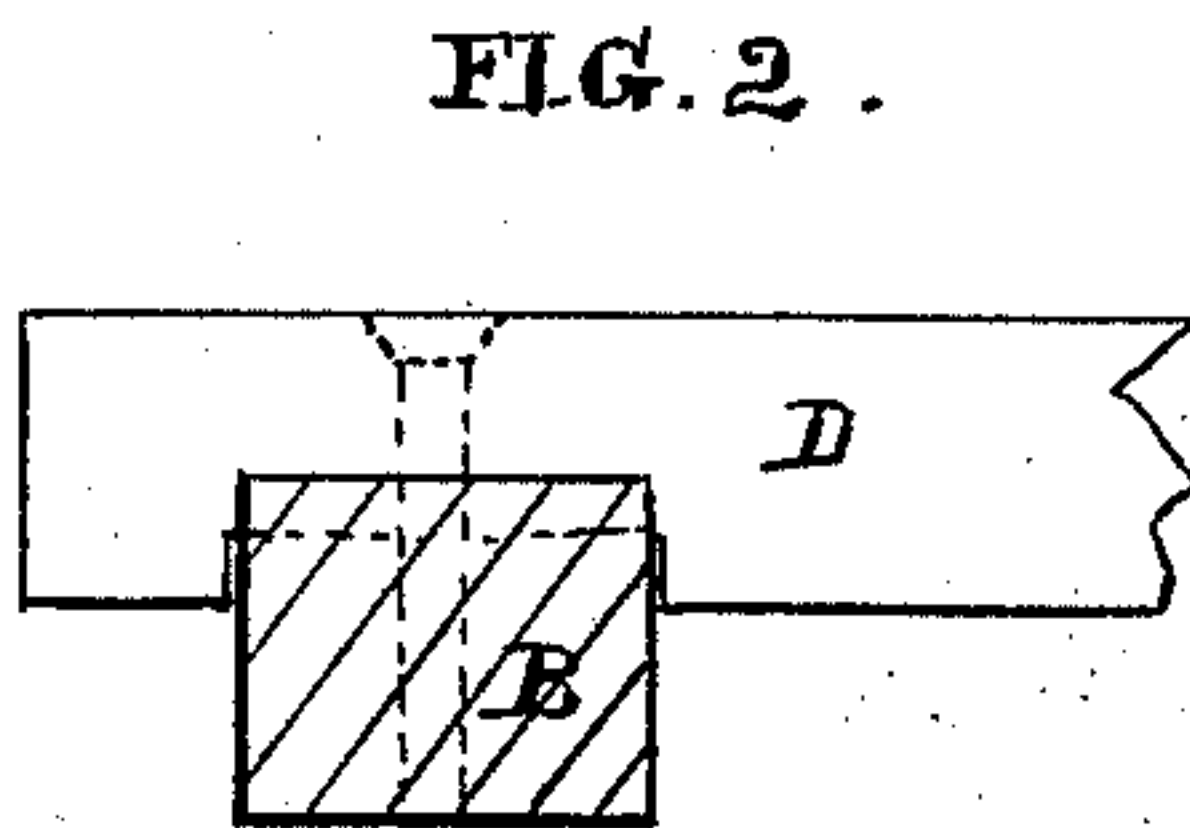
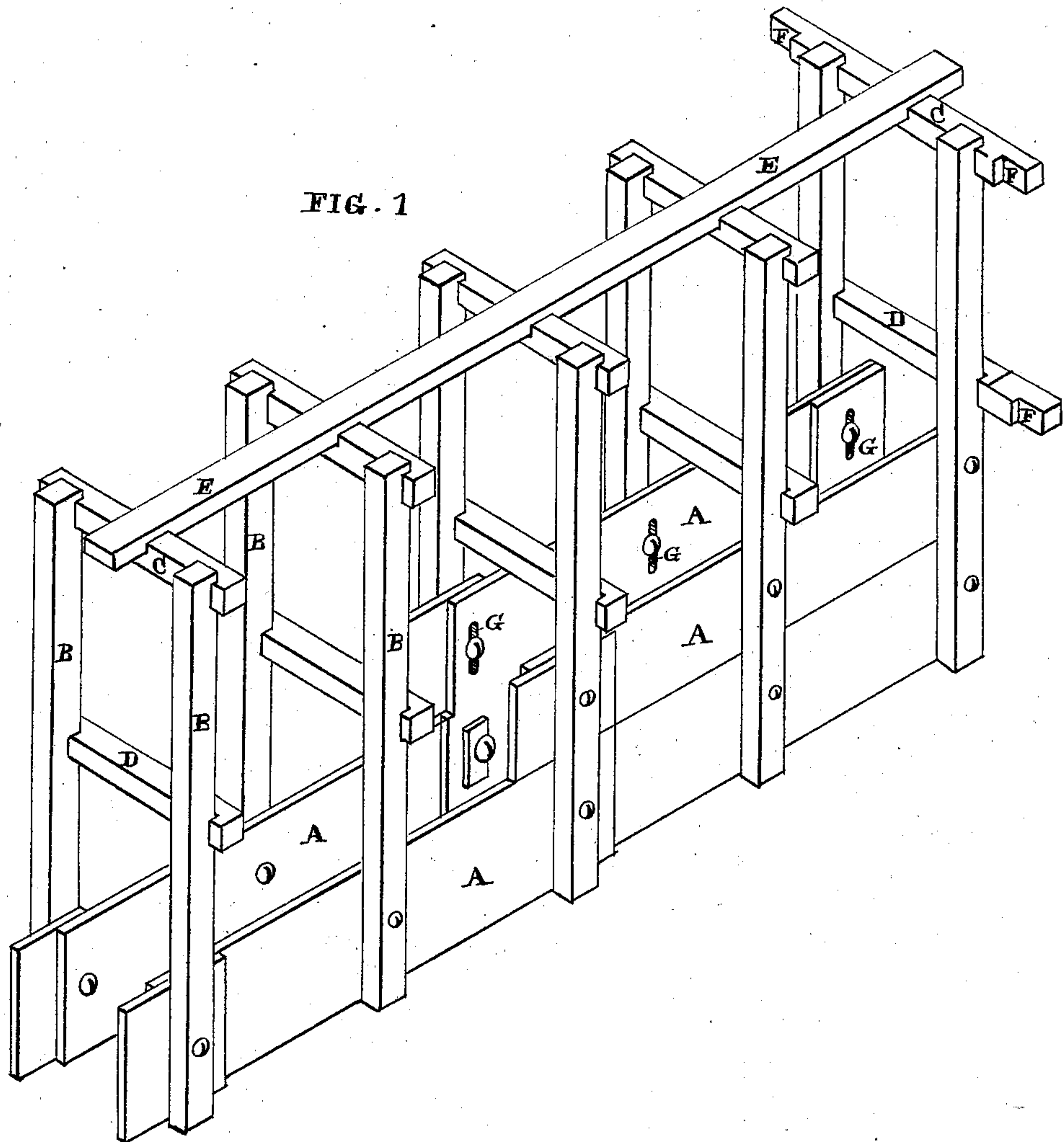


J. HOWE & N. WAITE.  
Portable Mining-Flume.

No. 216,325.

Patented June 10, 1879.



Witnesses

*Geo. H. Strong.*  
*Frank A. Brooks*

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*Nelson Waite*  
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# UNITED STATES PATENT OFFICE.

JAMES HOWE AND NELSON WAITE, OF SHASTA, CALIFORNIA.

## IMPROVEMENT IN PORTABLE MINING-FLUMES.

Specification forming part of Letters Patent No. **216,325**, dated June 10, 1879; application filed April 17, 1879.

*To all whom it may concern:*

Be it known that we, JAMES HOWE and NELSON WAITE, of Shasta, county of Shasta, and State of California, have invented an Improved Portable Mining-Flume; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

Our invention relates to an improved method of constructing portable mining-flumes, either for the purpose of working new ground or to carry off tailings; and it consists in the employment of a frame-work which is so constructed as to support the side-boards of a flume without the necessity of any bottom or the use of the bracing usually employed upon flumes. This enables us to build our flume by simply setting it upon the ground, and when working new ground it will gradually settle down, the earth caving into it, and being washed down until the flume has reached the bed-rock, side-boards being added as fast as may be necessary.

The flume may be built of any width, and without the necessity and expense of first excavating to the bed-rock, as is now the case.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a view of our flume. Fig. 2 is an enlarged section of the post and brace-joint.

Our flume, which is intended for working new ground or for transporting tailings, consists of the sides A, which are made of boards or planks, in suitable lengths, secured to the inner side of vertical frame-timbers B, as shown. These timbers have cross-timbers C and D secured to them at suitable distances above the bottom of the upright timbers, and they serve as braces to secure the upright timbers and prevent them from either closing in or spreading out at the bottom. These frame-timbers we place at the ends and about midway of the flume-sections, which are usually about twelve feet long, and a board, E, is placed upon the upper timbers, C, to serve as a walk. The timbers C and D are made long enough so that any width of flume can be used by simply securing the vertical timbers B in the more widely-separated notches F.

The present form of constructing flumes for

new ground or for tailings is to lay bottom timbers, to which the uprights are secured, and a complete floor and sides are then laid. In addition to this, the floor must be paved with blocks set on end, to prevent the flume from being worn out by the rocks and coarse material moving through it. The uprights must also be braced, and when the flume is made twelve or sixteen feet wide, as is often the case, the expense for bottom boards and timbers is very great. In addition to this, it is necessary, in working new ground, to first excavate to the bed-rock, so as to set the flume in place, and this is often done at an expense of from ten to one hundred thousand dollars per mile.

Our flume is built as described, and set upon the surface, a little dirt, brush, or rocks being thrown against the sides A. The water being turned, it will begin to excavate at the lower end of the flume, gradually working back toward the head, and as the flume settles, it will only be necessary to add new side-boards at a comparatively small expense. As the work proceeds the banks formed by the settling of the flume will cave, or may be thrown in, and the work will thus proceed from the very commencement, instead of waiting, as in the former plan, until the flume has been set. Not having any bottom, it may be sunk to any point, and the expense of this portion will be saved, and the whole cost of our flume will be inside of one thousand dollars per mile, even up to the maximum width.

When employed to carry tailings it is built in the same manner, upon the surface of the ground, at any suitable grade. The tailings will run out at the end and build an embankment of the same grade as the flume, and when it has been extended sufficiently, another length may be added to the flume. In this manner the tailings may be carried to any required distance and at any grade. If desired, they may be employed to fill up low places; or, by carrying the flume along in a line, a levee or embankment may be built of any desired length.

Only one screw-bolt to each frame-timber is required to secure each plank, as the timbers B are held upright by the board E, and the two uniting cross-timbers C D keep them in



place, so that no other braces are required. The use of one bolt also allows the flume to give and settle gradually at any point, and prevents that rigidity which would usually strain the flume in settling if nailed together. The upper boards are slotted at G, where the bolts enter, and this also allows settling of the flume in section, or as the necessities of the case call for. The whole flume is portable, and may be easily transported from one place to another by taking out the lagging screw or bolt which we use to unite the parts.

The expense is very little increased in making a wide flume over a narrow one, which is one of the most important advantages of our construction.

As the grade decreases, the flume may be narrowed and its depth increased, so that the current will be increased and the dirt carried on the decreased grade as well as on the steeper one.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The improvement in constructing flumes, consisting of the vertical posts B, with the extension cross-bars C and D arranged therewith at the top, and intermediately between the top and bottom thereof, as shown, and so constructed as to receive the side-boards at their lower ends without bottom boards or bracing, substantially as herein described.

2. The vertical posts B, with the cross-bars C and D, so constructed that the width of the flume may be adjusted, in combination with the side-boards, slotted at G, with the single bolt or screw, and the top board, the whole forming a bottomless flume, substantially as shown, and for the purpose herein described.

In witness whereof we have hereunto set our hands.

JAMES HOWE.  
NELSON WAITE.

Witnesses:

GEO. H. STRONG,  
FRANK A. BROOKS.