H. BALL.

Tamping Plug.

No. 85,888. Patented Jan'y 12, 1869.

Fig. 1.

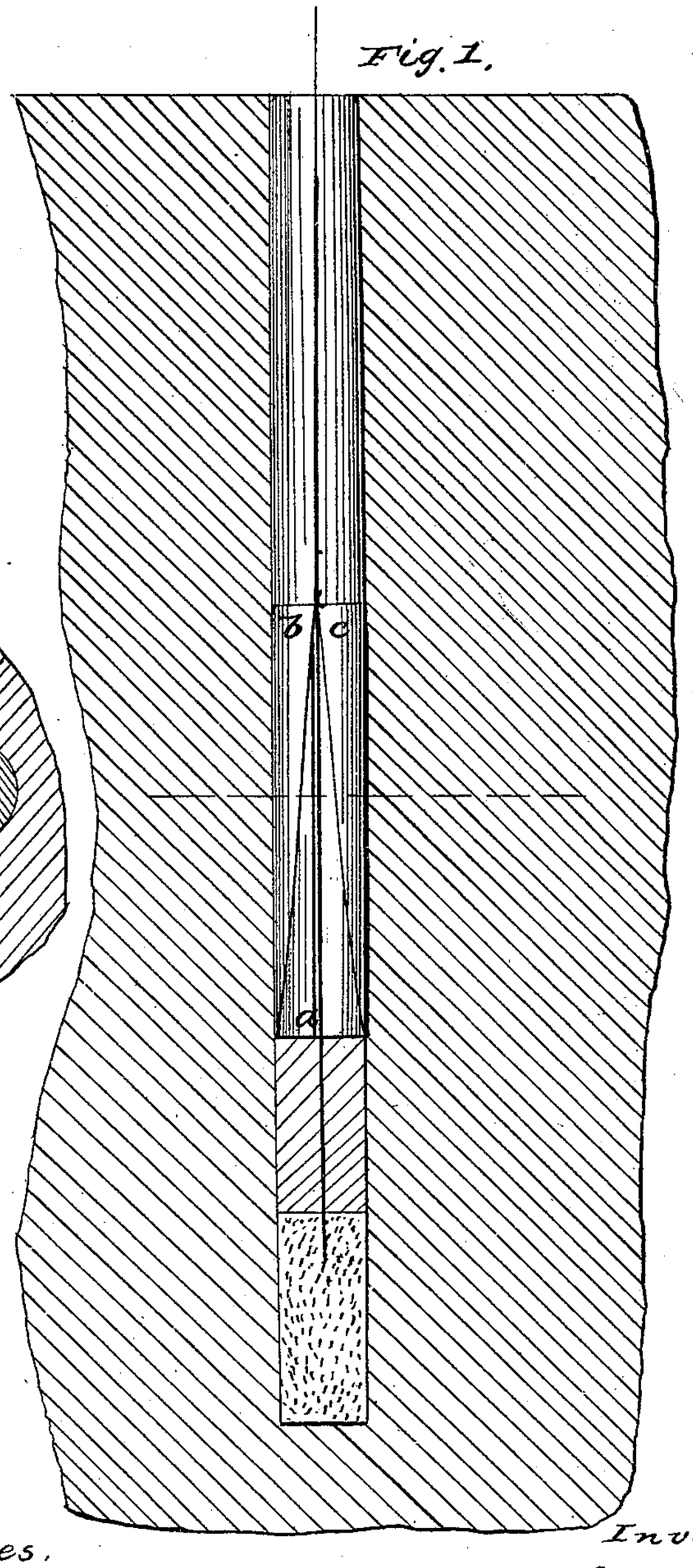
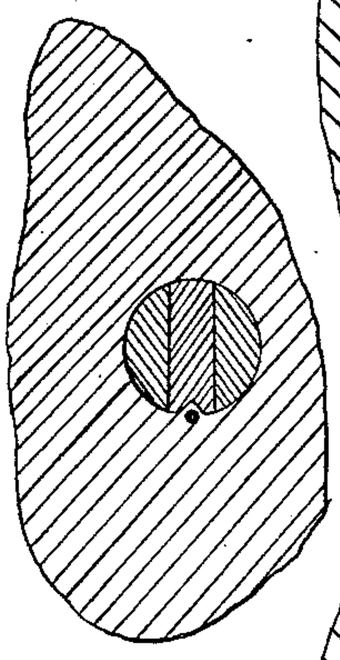


Fig. 2.



Witnesses.
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United States Patent Office.

HOSEA BALL, OF NEW YORK, N. Y.

Letters Patent No. 85,888, *dated January* 12, 1869.

IMPROVEMENT IN TAMPING-PLUGS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HOSEA BALL, of New York, in the county of New York, and State of New York, have invented a new and improved Tamping-Plug; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to improvements in the method of blasting rock and other substances, the object of which is to cause the force of the explosion to be applied more effectually than under the present method.

It consists in packing the bore, in which the charge is placed, with wedges, preferably made of steel, so arranged that that portion of the force of the charge received against the packing will act on the head of a wedge, and be expended in the direction to separate the substance to be broken.

Figure 1 represents a sectional elevation of a bored rock, prepared with a charge, and my improved packing, and

Figure 2 represents a transverse section of the same.

Similar letters of reference indicate like parts.

Instead of packing the bore with sand, earth, or other matter, as commonly practised, I propose to use wedges, to be arranged as represented in the drawings, or in any suitable manner, so that the force of the charge will be received against the head of a wedge, *a*, to be driven outwardly between other wedges, *b c*, the outer sides of which latter bear against the wall of the bore, and are prevented from being driven out by the friction thereon, the frictional contact of the sides bearing against the wedge being much less than that against the wall, thereby admitting the movement of the wedge *a* between the wedges *b* and *c*.

The said wedges may be of the form represented in the drawings, or of any other suitable form; as, for instance, the faces of the wedges *b* and *c* may be grooved, and the wedge *a* may be conical if the said grooves be curved, or angular if the grooves are angular, or there may be three or any other number of outside wedges.

The wedges may be dropped into the bore and adjusted to the right position by a string passing through them laterally, and packed by driving the upper ones down against the lower one.

Other means for adjusting and introducing the wedges may be adopted; as, for instance, a wooden pin may be passed through the lateral holes, when they may be dropped in, and the pin broken by driving them down, or a small rod may be hooked to them in a manner to be readily unhooked after being let down by it.

By this arrangement, that portion of the force of the blast which is usually expended upon the packing, and is resisted by the friction of the same along the wall of the bore, and in the direction of the same, is turned to account in a lateral direction, and assists to effect the separation of the substance to be broken.

I have found, in practice with this improved packing, that the powder is more sure to be burned, for the reason that the packing is not thrown out of the bore as soon as the substance begins to part, as in the case of the ordinary packing, but it continues to resist the action of the charge until the parts have so far separated that the wedges will cease to act, and during the time of this separation the wedge *a* is being moved upward, and making room for the charge to expand and ignite.

And another important feature is, that owing to the more perfect confinement of the charge, the breaking is confined to that portion of the substance being blasted which is around the bottom of the hole, and the pieces are thereby much less liable to be thrown to any considerable distance into the air, as they are projected more directly in a horizontal plane, and their upward flight obstructed by the upper and less-broken portion of the rock or other substance.

I propose to interpose a small quantity of sand between the charge and the wedge, as represented at *d*, for the purpose of closing any passages that may exist by the side of the wedges, owing to the irregularity of the holes.

I am aware that wedges have been before used as tamping-plugs for blasting-purposes.

This, therefore, I do not claim, but, under my invention, the wedges are arranged and so applied as to act upon the sides of the chamber, above the blasting-charge, when driven by the force of the powder, and to exert a power upon the surrounding rock or other substance, at right angles with the direction of the chamber or drilled hole in which the charge is placed, thus tending, by their united force, to separate the sides of the chamber, adding greatly to the effect of the explosive agency employed.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

The tamping-plug, constructed and operating substantially as described, and consisting of the external wedges *b* and *c*, and the middle wedge *a*, whose base is presented downwards to receive the force of the charge, and whose sides are driven against the oblique faces of the said wedges *b* and *c*, which are thereby pressed forcibly against the sides of the chamber or bore, acting as splitting and separating-instruments.

To the above specification of my invention I have signed my hand, this 31st day of August, 1868.

HOSEA BALL.

Witnesses:

EDWARD H. KNIGHT,

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