E. GOMEZ.

Tamping Plug.

No. 102,250. Patented April 26, 1870.

Fig. 1.

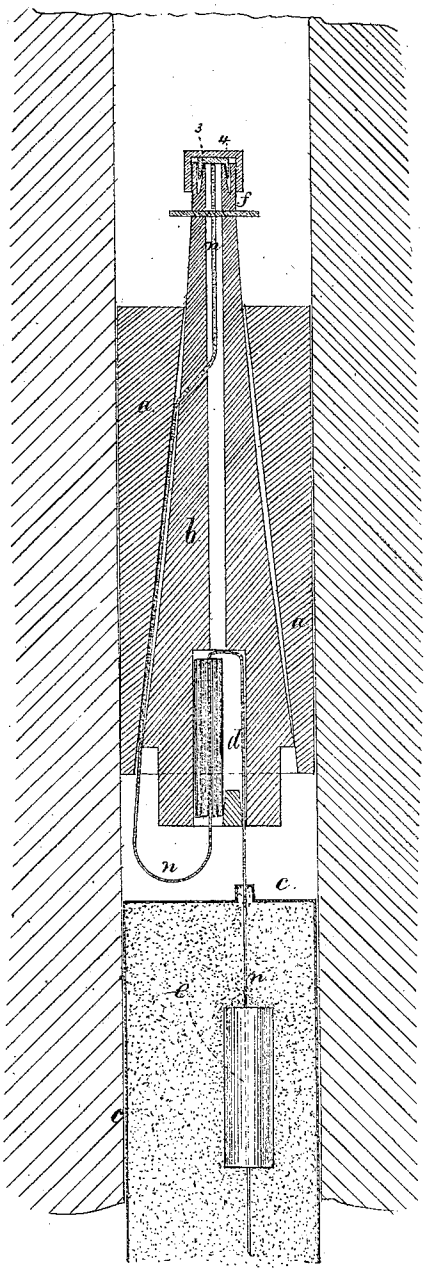


Fig. 2.

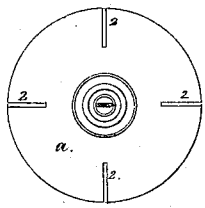
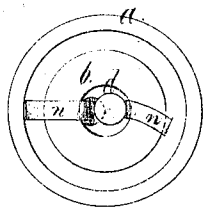


Fig. 3.



Witnesses

Chas. H. Smith

Geo. H. Graves.

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United States Patent Office.

EDWIN GOMEZ, OF NEW YORK, N. Y.

Letters Patent No. 102,250, *dated April* 26, 1870.

IMPROVEMENT IN TAMPING-PLUGS FOR BLASTING.

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, EDWIN GOMEZ, of the city and State of New York, have invented and made a new and useful Improvement in Tamping-Plugs for Blasting, &c.; and the following is hereby declared to be a correct description of the same.

Extended experiments have heretofore been made for ascertaining the ultimate force of gunpowder, but with varying and unsatisfactory results, because the chamber in which the explosive material has been confined has generally been enlarged by the portion of the powder first exploding, and the remainder of the powder either does not all burn or else does not augment the first instantaneous pressure, but the gases expand into the enlarging chamber.

The object of my present invention is to effectually retain the force of exploding gunpowder so that none of it is lost, but it is simply effective in rupturing the walls of the chamber in which the explosive material is confined.

In the drawing—

Figure 1 is a longitudinal section of my improved tamping-plug;

Figure 2 is a view of the upper end of said plug; and

Figure 3 shows the lower end of the plug and secondary chamber.

I make use of a two-part tamping-plug, the outer portion, *a*, being of a size to fit inside the oil-well, salt-well, artesian-well, cannon, or other chamber within which the explosion is to take place.

This plug *a* has within it a tapering opening, into which is placed a tapering expander, *b*, having its larger end toward the chamber *c*, in which the explosion is to take place.

At the larger end of the expander *b* is a secondary chamber, *d*, containing a charge of explosive material that is to be fired before the main charge, *e*, and drive the expander *b* into the plug *a*, so as to spread the said plug *a* and hold it firmly within the walls of the chamber, and, when the main charge is exploded, it acts to tighten the plug by driving the expander still further into the plug.

In order to facilitate the expansion of the plug *a*, there may be longitudinal incisions, as at 2 2, so that the said plug may split open in sections when the expander is forced endwise by the explosion of the charge in *d*, and sand may be run in upon the plug *a* to give additional frictional adhesion when the plug is expanded.

I have shown a nipple, *f*, containing one end of a fuse, *n*, which I call the fighting-fuse or train, and which is described in Letters Patent No. 18,199. This fuse *n* passes through the expander *b* to the charge in the secondary chamber *d*. Said fuse may go through a small hole direct to *d* or pass out of the side, as shown; and from the charge in *d* the fuse leads to the charge *e*.

The nipple *f* may receive a percussion cap, 3, and a protecting-cap, 4, the cap 3 being exploded by a weight dropped upon it, or the charge in *d* may be fired in any other desired manner.

The charges in the chamber *c* are shown as a coil cartridge, such as set forth in Letters Patent No. 21,253, and I remark that the same, and also the charge in the chamber *d*, may be of any desired size or kind; and, by igniting the charge in the chamber *d* at the inner end, the effect on the expander will be more powerful than it would be if ignited at the outer end.

I have shown the coil cartridge *e* as connected with the fuse *n* and occupying the chamber *c*, and two or more may be connected together, so as to have the explosion of the second charge to augment and follow up the effect of the first charge.

By this improvement the danger of blasting is almost entirely removed, because the frequent accidents resulting from ramming the tamping are avoided, and by my plan the force of powder is directed upon the rock instead of expending itself, as now frequent, in blowing out the tamping.

In warfare, this tamping-plug and fuse can be applied to batteries or separate guns, and the guns destroyed in mass at the last moment, when it is impossible to hold them longer, this taking the place of spiking. Where several guns are to be thus burst, the said fuse will have to be led from one tamping-plug to the next cannon and plug throughout the entire number.

In wells or holes in rocks where an explosion is desired at any one point, the tamping-plug can be applied below the charge as well as above the same, and the plug itself may be made of separate parts, held together by tongues and grooves or dowels.

Where the tamping-plugs are of wood, the chamber *d* may be a metallic tube inserted, and the fuse *n*, passing from one plug to the other, (where two are used,) may go through a metal tube from one to the other, and then pass to the charge *e*.

A rubber jacket may surround the plug *a* to aid in rendering the parts gas-tight.

I prefer to use the tamping-plug separately, but it might be attached to the cartridge or torpedo itself.

The fuse *n* and coil cartridge *e* are shown in the drawing as within a case containing powder. The object of this is to obtain the ultimate force of gunpowder by an instantaneous explosion of the whole mass. By using the coil cartridge *e* and fuse *n* I find that a great volume of flame in perfect combustion is instantly forced to all parts of the powder-chamber, causing the ignition of the gunpowder in a much more

perfect manner than heretofore, and effecting greater results with given weights of gunpowder because none escapes unconsumed.

The length of fuse between the charge *e* and that in *d* is to be such as to allow the plugs to be driven before the main explosion, or the quick-firing fuse may be divided and a slow match or other fuse used to unite the ends.

This means for confining the charge is of great advantage, especially as it prevents upward discharges through the hole, and lessens the risk of injury to contiguous buildings in cities, and, by confining the gases, the explosion of gunpowder is rendered as effective as the dangerous nitro-glycerine and other compounds, and, the gases being confined and the combustion rendered perfect, there is but little smoke in confined places to interfere with the workmen, and there is little or no noise from the firing of a charge in rocks, as the force appears to be expended in splitting the rock below the tamping-plug. This plug might be used at the rear end of a breech-loading or other gun in which the bore runs all through, said plug acting to close the same effectually against the explosion.

I claim as my invention—

1. A conical expander, passing into the conical hole of the cylindrical plug and expanding the same when the charge is exploded, as and for the purposes specified.

2. The tamping-plug *a*, in combination with the expander *b* and chamber *d*, substantially as set forth.

3. The plug *a*, expander *b*, and chamber *d*, in combination with the fuse *n* and nipple 3, substantially as specified.

Signed this 26th day of October, A. D. 1869.

EDWIN GOMEZ.

Witnesses:

GEO. D. WALKER,

GEO. T. PINCKNEY.