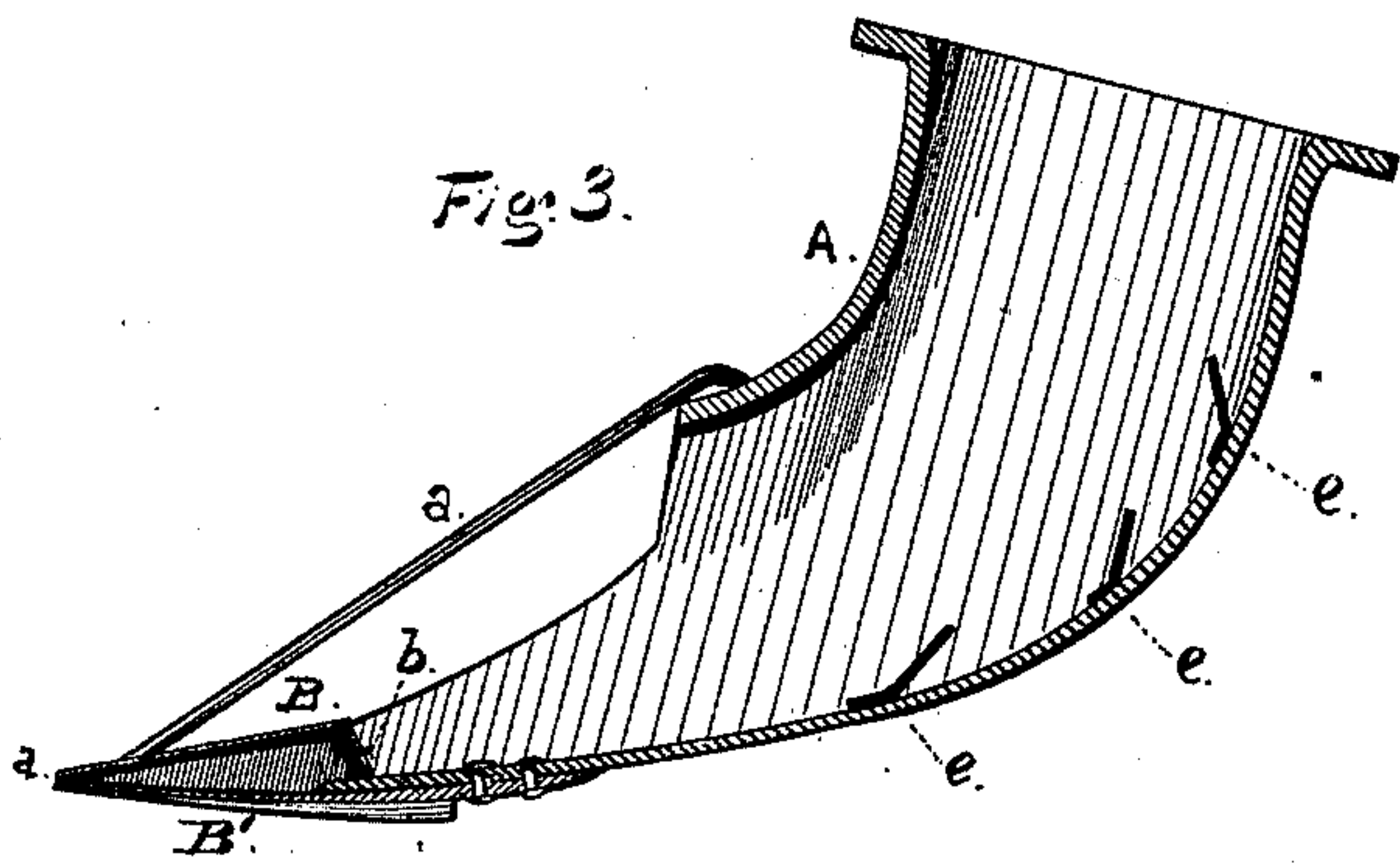
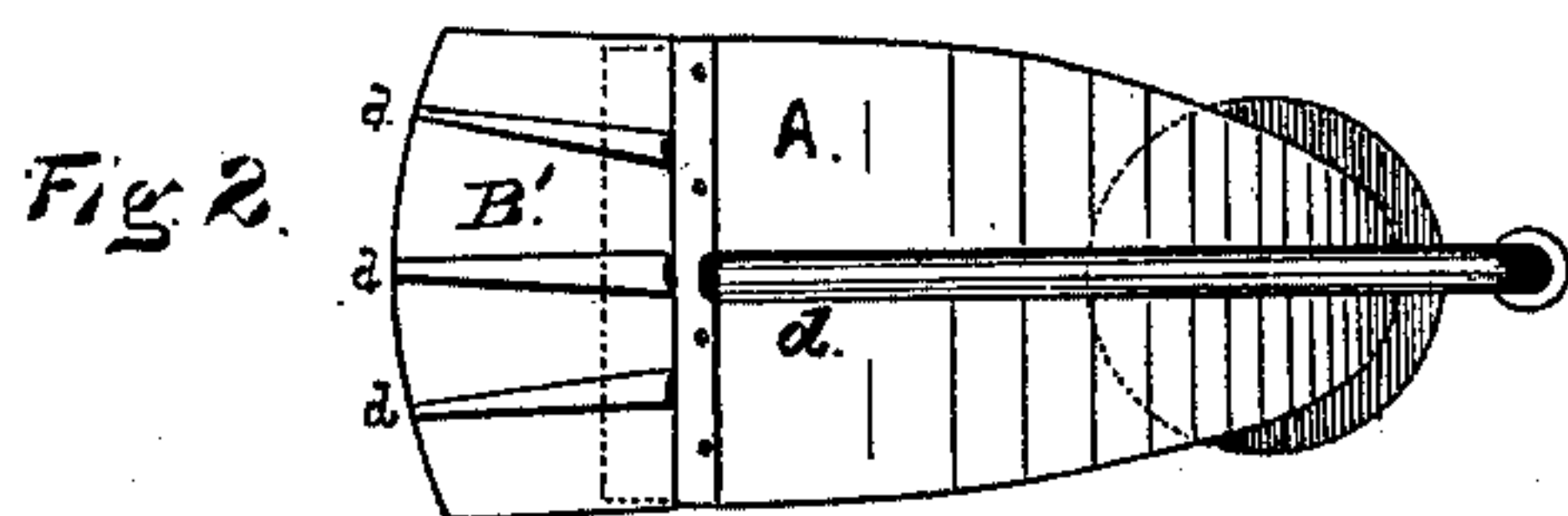
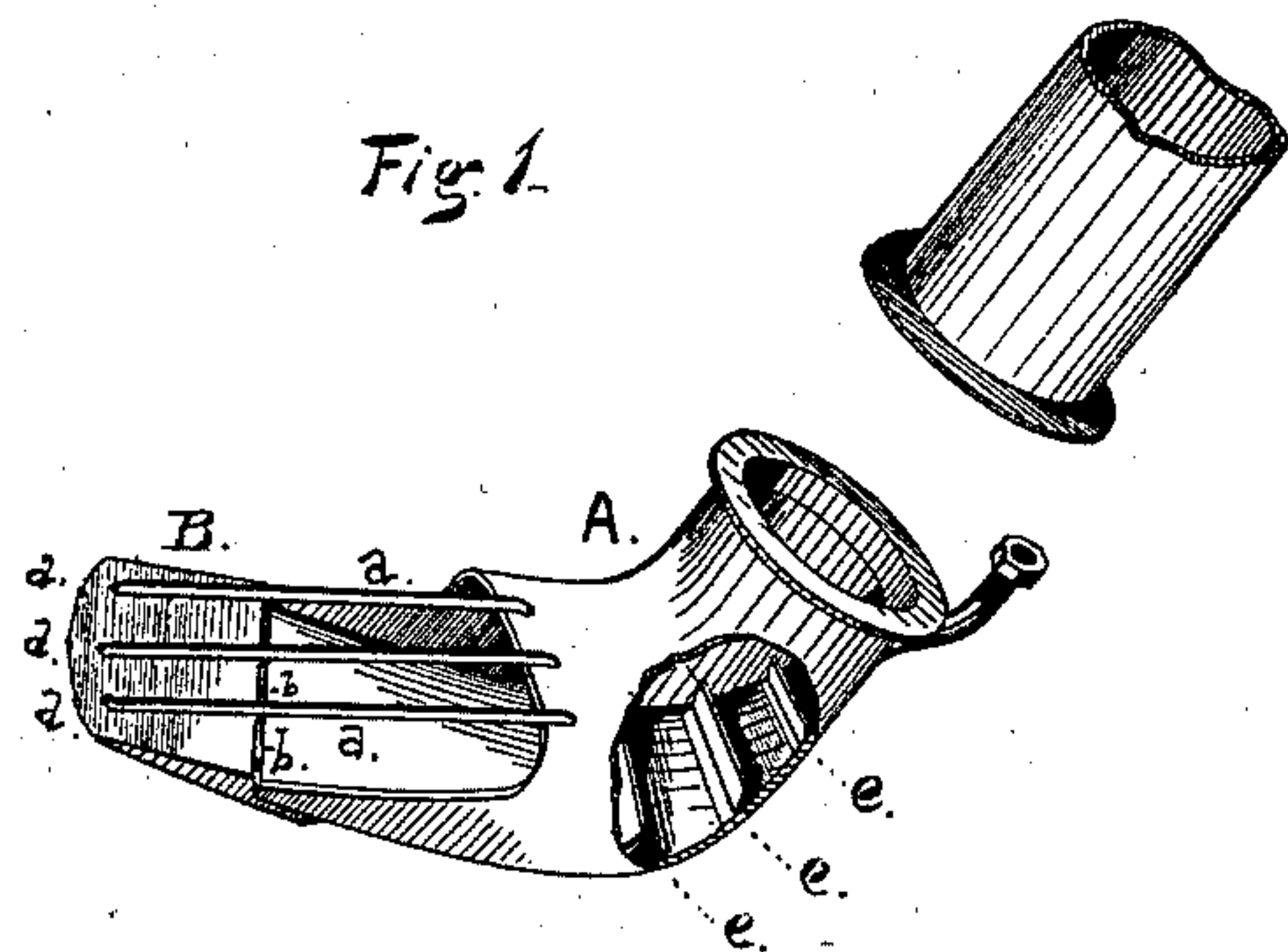


S. W. SHAW.
Dredging-Scoop Nozzle for Mining Purposes.
No. 216,061. Patented June 3, 1879.



Witnesses:

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UNITED STATES PATENT OFFICE.

STEPHEN W. SHAW, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN DREDGING-SCOOP NOZZLES FOR MINING PURPOSES.

Specification forming part of Letters Patent No. **216,061**, dated June 3, 1879; application filed November 2, 1878.

To all whom it may concern:

Be it known that I, STEPHEN W. SHAW, of the city and county of San Francisco, in the State of California, have invented a certain new and useful Improvement or Invention in a Scoop-Nozzle for Suction-Dredges for Mining Purposes; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation of my said invention, reference being had to the accompanying drawing and its figures and letters of reference.

This invention relates to an improvement in the apparatus or machinery used in mining and dredging by means of vacuum or suction pumps, whereby the earth, sand, or gravel is loosened, disintegrated, and raised up through pipes to the required height or distance and then discharged; and its object is to provide an improved kind of scoop and nozzle in one instrument, to be secured to the end of the suction-pipe, and by its action to retain and save such free particles of metal that are otherwise lost, and also to penetrate and work into the body of sand or other substance in a better manner, by having a more thorough disintegrating action as it is thrust forward.

To such end and purpose my invention consists, first, in providing the front end of the scoop with a water-chamber having a number of distributing jets or apertures both at the front and the rear, and also an inlet or connection for a pipe through which water is admitted to the chamber under pressure, and is from thence forced outward through the jets both into the mass or body in front of the scoop and backward against the particles and body of matter caught upon the scoop in its movements; and it consists, second, in the combination, with the curved or sloping bottom of the scoop or nozzle, of a series of pockets, aprons, or riffles, extending across from side to side, for catching and saving the heavier and valuable particles that during the pulsating action of the suction in raising the matter are drawn up into the nozzle and pipe, but from their superior gravity have a tendency to drop back and settle down at the lower end of the nozzle, and so be lost.

Referring to the drawings, Figure 1 is a side view of my improved scoop-nozzle. Fig.

2 is a view showing the under side, and Fig. 3 is a longitudinal vertical section through the center.

These several views show the shape, construction, and arrangement together of the several parts in the manner I consider the best adapted for mining in sand and gravel.

The scoop A, which is secured to the end of the suction-pipe, after the manner of the ordinary suction-nozzles, is made with a curved or inclined sloping bottom, terminating in a broad flattened end, having an open top, but sloping vertical sides. The opening for receiving and admitting the matter to be raised is protected by a grating or a number of separate bars, *a a*, for keeping out rocks, boulders, and larger bodies that would tend to choke the pipe or nozzle and interrupt the operation of the machine.

Across the projecting end of the nozzle is formed or placed a hollow water-chamber, B, consisting, preferably, of a cast-iron shoe with an interior water-tight space and apertures *a b* in the front and rear ends. It is firmly bolted in place upon the front edge of the scoop, and is furnished with a supply-pipe or a connection, *d*, therefor.

This chamber can be composed in part, also, of the end of the scoop itself by extending its bottom forward to form the lower part of the chamber, and placing upon and across it an upper plate with ledges or flanges to fit against the bottom and inclose a water-tight compartment. The proper jet-apertures will then be formed in the end flanges, or at the joints on the front and rear where these two parts meet, as will be readily seen and understood from the drawings, Figs. 2 and 3, by supposing the bottom part, B', of this chamber to be of one piece with the scoop-bottom, and the upper part, B, to be a separate plate secured thereon across the front of the scoop.

Within the upper inclosed part of the scoop and across the curved sloping bottom are placed or formed a series of pockets or riffles, either by securing therein a series of slats or narrow partitions from side to side and to the bottom, and one above the other, as shown at *e e*, or by forming directly upon the bottom a number of ribs, so as to provide a series of pockets or riffles, into which the heavier and

valuable particles are caused to drop as the sand or gravel is drawn up over them, and are thus retained and prevented from falling back and being lost out of the end of the nozzle. During the pulsations of the apparatus the finer ore particles, being of superior gravity, will settle downward through the body or loosened particles of sand or gravel being elevated, and will thus collect in the lower part of the nozzle and be dropped from the end, because they are outside of the influence of the vacuum or suction apparatus. These riffles or ridges *e*, therefore, serve to catch these valuable particles as the scoop is operated, and to hold them until they can be removed.

In the operation of my invention as thus constructed, it is secured to the end of the suction-pipe, and is worked into the mass of sand or other substance to be removed with a backward and forward movement in the arc of a circle. The water supplied to the chamber on the end of the scoop is forced out under pressure in a number of jets from the front of the scoop, with the effect to more thoroughly disintegrate the body into which the front of the scoop is thrust, and at the same time the jets forced backward from the distributing-chamber toward the mouth of the nozzle are caused to act upon the particles caught upon the bottom of the scoop and wash them upward into the action of the ascending current of sand or gravel and over the riffles or partitions.

Having thus fully described my invention, what I claim as new is—

1. A suction dredging scoop or nozzle for mining purposes, constructed with an inclined sloping bottom, terminating in a broadened

flattened end, an inclosed circular upper portion to receive or be secured to the end of the suction-pipe, an open-top receiving end protected by a grating or like covering, and a water-distributing chamber or compartment on the front end of the scoop, with jets or apertures at the front and rear thereof and a supply-pipe or a connection therefor, all substantially as herein described.

2. The herein-described water-chamber B, in combination with and arranged upon the edge of a dredging-scoop, substantially as herein described, for the purposes set forth.

3. In combination with the curved sloping bottom of a dredging-scoop for mining and like purposes, the series of ribs or riffles extending across the bottom from side to side, and within the inclosed space at the upper end of the scoop, substantially as herein described, for the purpose set forth.

4. In combination with a dredging-scoop for mining and like purposes, having an inclined or sloping bottom and a series of ribs or riffles therein, a means for throwing one or more jets of water backward and upward toward and over the said ribs or riffles, consisting of the water-supplying chamber B, with its rear jets or apertures *e*, constructed and arranged to operate substantially as herein described, for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 15th day of October, 1878.

STEPHEN W. SHAW. [L. S.]

Witnesses:

C. W. M. SMITH,
WM. S. CAMPBELL.