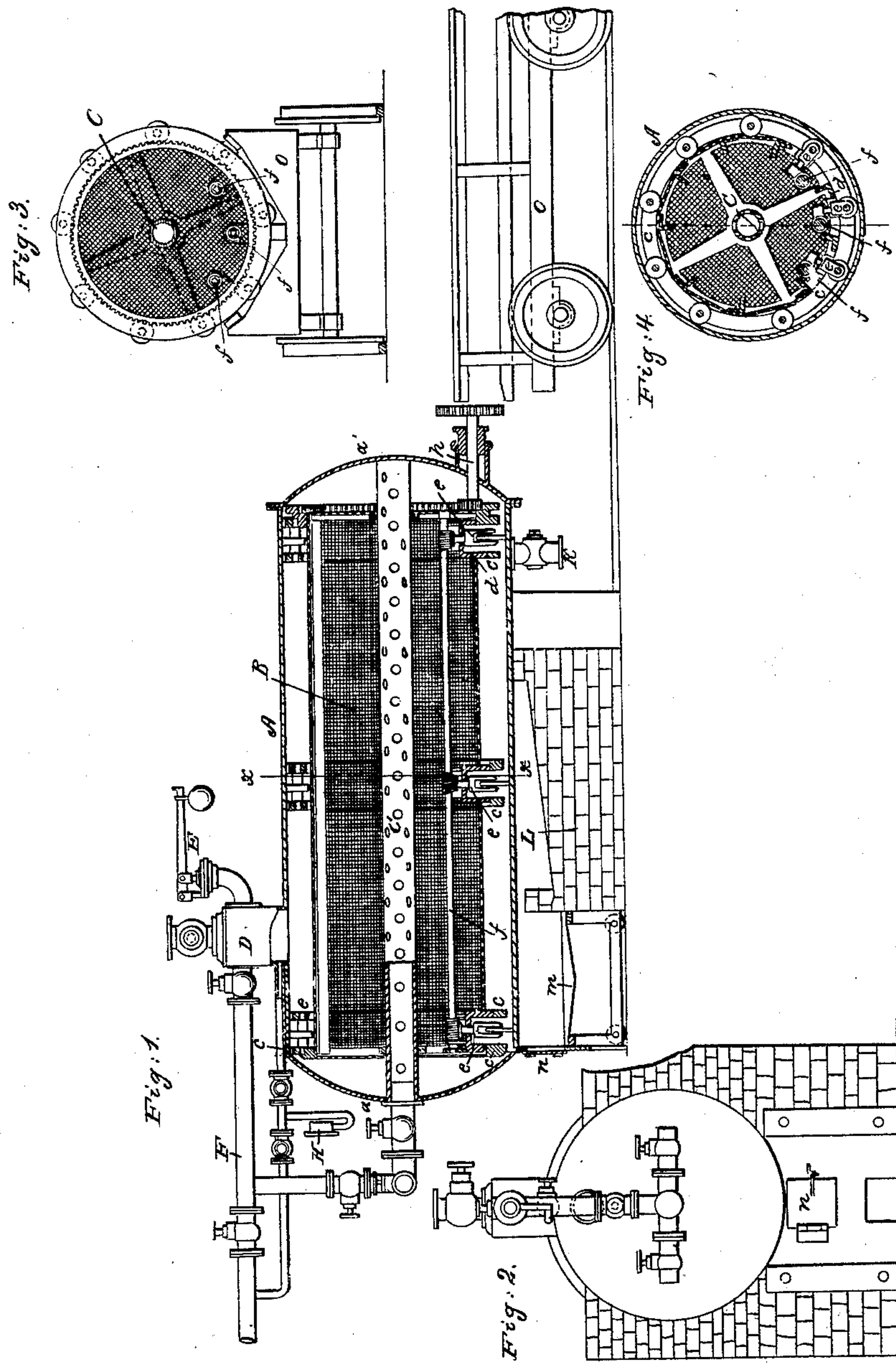


H. WOOD.

Apparatus for Treating Vegetable, Mineral, and Animal Matter with Steam.

No. 67,693.

Patented Aug. 13, 1867.



Witnesses:  
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# United States Patent Office.

HENRY WOOD, OF MONTREAL, CANADA EAST, ASSIGNOR TO GEORGE W. NORRIS.

Letters Patent No. 67,693, dated August 13, 1867.

## IMPROVED APPARATUS FOR TREATING VEGETABLE, MINERAL, AND ANIMAL MATTERS WITH STEAM.

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, HENRY WOOD, of Montreal, Canada East, have invented a new and improved Apparatus for the Treatment of Vegetable Matter, Ores, &c.; 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 a new and improved method of treating vegetable matter, for the purpose of disintegrating the same, desulphurizing and amalgamating ores and minerals of all kinds, and also to bleaching purposes, all of which may be done either under pressure or *in vacuo*. And the invention consists in providing a stationary boiler with a removable head at one end, and a removable grate or fire-place, and also in a retainer or vessel of novel construction, for the reception of the material treated, and in the manner in which it is inserted into and removed from the boiler; and also in a car to be used in connection therewith, with the various attachments connected with the apparatus, as will be hereinafter more fully described.

Figure 1 represents a vertical longitudinal section of the apparatus, showing the retainer within the boiler, with the necessary attachment, and also the furnace.

Figure 2 is a view of the front end of the boiler.

Figure 3 is an end view of the retainer on its car.

Figure 4 is a cross-section of fig. 1, through the line *x x*.

Similar letters of reference indicate like parts.

A represents the boiler; it is a plain shell, which is constructed and fixed in an arch in the ordinary manner. The heads of the boiler *a a'* are convex in form, as seen. The back head *a'* is removable, or it may be attached with a hinge for the introduction or removal of the retainer; when closed, it is designed to be steam and water-tight. B is the retainer; it is cylindrical in shape, and of sufficient diameter to nearly fill the boiler. The frame of this retainer is composed of a spider-head at each end, and, as seen in fig. 4, a succession of rings, which are connected together by longitudinal bars. The rings (marked *c*, and colored red in the drawing) are placed in pairs, as seen, between which are placed rolls, upon which the retainer is supported when it is revolved, and also when it is moved longitudinally. A portion of these rolls are fixed on short shafts, which have their bearings in the rings. These rolls having their bearings in the rings *c*, occupy something more than half the circumference of the retainer, and are placed so that they revolve only when the retainer is revolved. Another kind of rollers occupies the balance of the circumference of the retainer, being placed, like the others, at suitable distances apart. These rolls resemble furniture casters, and revolve in stands *e*, which pass through plates *d*, arranged for the purpose, and in which the stands revolve. On the inner ends of the roll-stands there are small worm-wheels, by which the stands are revolved. These worm-wheels are revolved by perpetual screws, on rods which pass longitudinally through the retainer, as seen marked *f*. When the retainer is to be revolved, these rods are turned by a key on one end, which is made square for the purpose. The act of revolving the rods turns the worm-wheels, and consequently the roll-stands are thus brought into a position corresponding with the other rolls, or so that they will operate when the retainer is revolved. In withdrawing the retainer from the boiler, it is turned so that these caster-rolls will be on the under side after the rolls have been turned by the rods *f* into position. The arrangement of these rolls is plainly seen in figs. 1 and 4. The retainer is revolved within the boiler by gearing, which is applied to an internal gear-wheel on the end, as seen in the drawing. *g* is a pinion, which is attached to a shaft which passes through the convex head of the boiler, as seen. *h* is the shaft, which is supported by a suitable box attached to the head. Upon the end of this shaft there is a gear-wheel, J, which is operated by power from any convenient source. The retainer is covered by wire cloth or perforated metallic sheets, as seen in the drawing. C is a perforated tube, which passes entirely through the retainer. D is a dome on the boiler, provided with a safety-valve, E. F is a pipe, through which steam, chemicals, or liquids of any kind are introduced within the boiler, either directly into the retainer by the pipe C, or into the boiler through the dome. G, on the top of the dome, is the connection for the vacuum-pump. H is a pressure-gauge, which is connected with the dome, and also with the pipe F. K is a valve-cock,



for the purpose of cleaning the boiler. *L* represents the arch by which the apparatus is supported. *m* is the fire-grate, which is supported on wheels, and which is arranged in such a manner that the fire can be readily removed from under the boiler, when desired. *n* is the fire-place door.

The vegetable matter to be disintegrated, and the ores or minerals and other substances to be operated upon, are introduced into the retainer through suitable openings made either in the sides or ends, which openings may be secured by stops or covers fastened in any suitable manner. For the purpose of carrying out my invention, it is necessary that facilities should be provided for handling the retainer in such a manner that it may be readily filled or contents removed, and for this purpose I provide a car or truck, a side view of which is seen at *o*. This truck is supported by flanged wheels, on rails suitably laid for the purpose, the body of the truck being at a height to correspond with the position of the retainer in the boiler. The retainer is withdrawn from the boiler on to the car, as represented in fig. 3, when it can be transported to any desired location, for the removal of its contents, or for filling.

I do not confine myself to any particular materials to be operated upon in the retainer, nor to the manner of their treatment, nor to the purposes to which I may apply the apparatus. I am aware that vessels have been heretofore constructed for similar purposes, that is, for disintegrating vegetable matter, and desulphurizing and amalgamating ores and minerals; but all such apparatus as hitherto used have been attended with so many inconveniences and obstacles, so imperfect in its results, and at the same time so expensive in its operation, that it has proved comparatively worthless. By my improved apparatus, the objections to the old method are removed, while it may be adapted to the various purposes for which it is intended with great facility and with improved results.

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

1. The fixed boiler *A*, with the removable head *a'*, and with the perforated tube *C* passing through the head *a*, and when used for the purposes herein described.
2. I claim the retainer *B*, constructed substantially as described, with its friction-rolls and internal gear-wheel for revolving the same, and with its central perforated tube *C*, as and for the purposes set forth.
3. In combination with the retainer *B*, I claim the truck *o*, as and for the purposes described.
4. I claim the removable grate, when used substantially as and for the purposes herein described.
5. I claim the arrangement and combination of the whole apparatus as substantially described, for the purposes hereinbefore stated, that is to say, for the treatment of ores and minerals by heat, or by chemical action, or for the extraction of the metal by heat or chemical action, for the treatment of vegetable matter for the manufacture of paper or other purposes, or for bleaching purposes, the whole or any part of these processes to be performed either under pressure or *in vacuo*, as may be desired.

HENRY WOOD.

Witnesses:

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