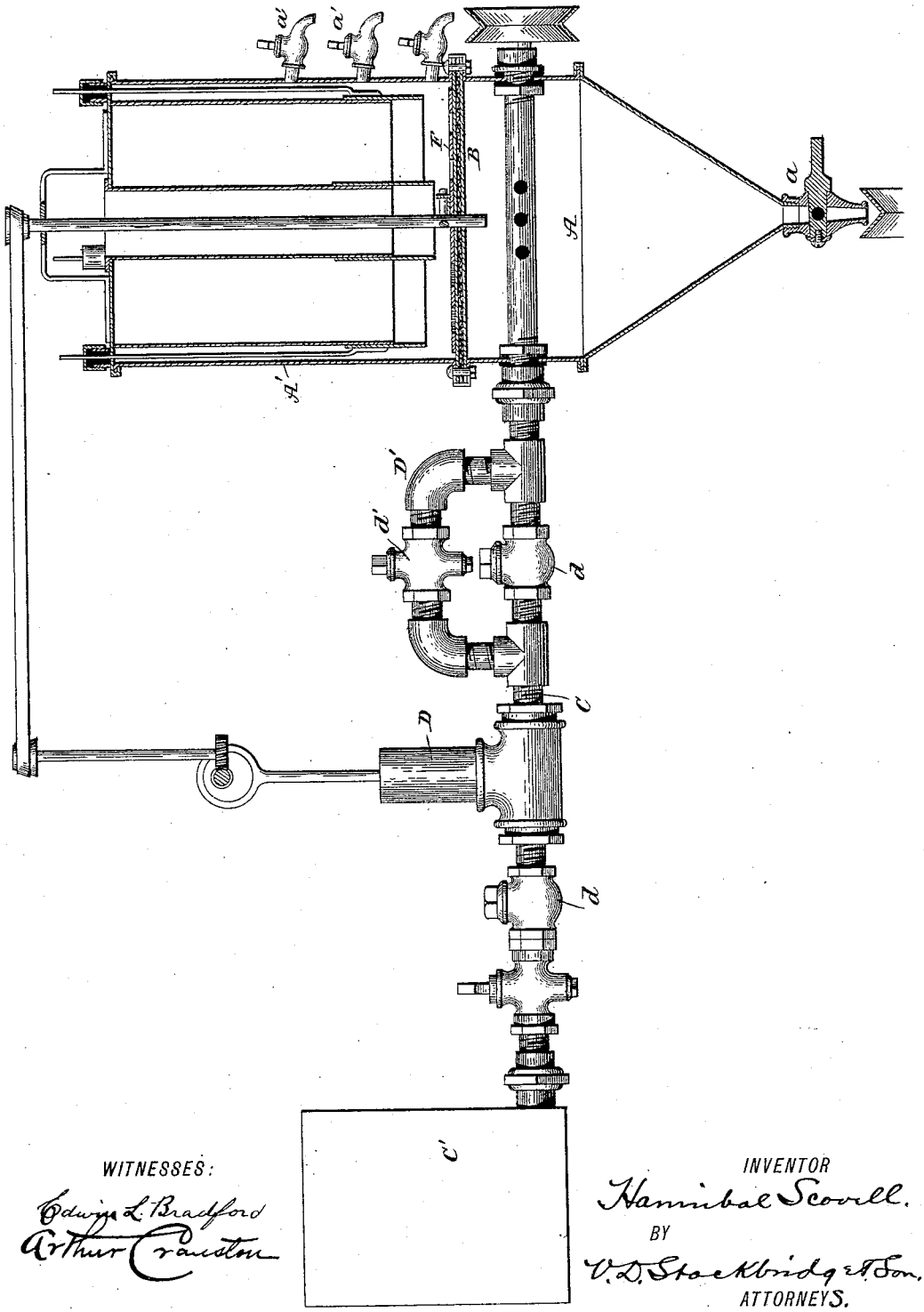
(No Model.)

H. SCOVELL.

PROCESS OF GRADING AND CONCENTRATING ORES.

No. 454,071. Patented June 16, 1891.



WITNESSES:

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HANNIBAL SCOVELL, OF PORTLAND, COLORADO.

PROCESS OF GRADING AND CONCENTRATING ORES.

SPECIFICATION forming part of Letters Patent No. 454,071, dated June 16, 1891.

Application filed October 29, 1890. Serial No. 369,736. (No model.)

To all whom it may concern:

Be it known that I, HANNIBAL SCOVELL, a citizen of the United States, residing in Portland, in the county of Ouray and State of Colorado, have invented certain new and useful Improvements in the Process of Grading and Concentrating Ores; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to practice the same.

My invention relates to an improved process of grading and concentrating ores and minerals.

The object of the invention is economy and efficiency in the separation of minerals and ores from worthless or refuse matter; and to this end my invention consists, essentially, in subjecting mineral or ore to the action of an intermittent, upwardly-progressive, reciprocating, or undulatory current or volume of fluid, as air or water.

The invention also consists in subjecting the mineral to be treated to the above-described action of fluid under pressure.

In carrying out my process many combinations and arrangements of mechanism may be adopted, one of which, especially adapted for using water or other like fluid, I will proceed to describe, reference being had to the accompanying drawing, forming a part of this specification, in which the figure represents a side elevation, partly in section, of an apparatus suitable for conducting my new process.

A is a vessel, having a discharge-cock *a* and an upper part or dome A′. The upper part has a well or passage through it and an annular partition outside the walls of the well, and between this partition and the well a closed chamber is formed. This upper part is also provided with cocks *a′ a′*, through which the tailings or waste material is discharged.

B is a foraminated horizontal diaphragm or screen.

C is a fluid-conduit leading from source of supply, as a tank C′, to the lower part A of the vessel below the diaphragm. Connected with this conduit is a reciprocating pump D, having check-valves *d d*, and also connected with the same is a loop or switch D′, extending around the valve between the pump and the vessel. In this loop or switch is a cock *d′* for regulating the size of passage through it. The pump is driven in any suitable manner, an eccentric and shaft being shown adapted for that purpose. The pump being started and the lower part A of the vessel being filled with fluid and pulp being fed through the well or passage over the screen, the cock *d′* in the switch is partially opened, at which time the forward stroke of the pump will force a volume of fluid equal to its capacity into the vessel, and its backward or return stroke will draw its supply partly from the main source or tank C′ and partly backward from the vessel. By this means an intermittent upwardly-progressive reciprocating current or volume of fluid is produced in the vessel, and the ore or mineral is kept in suspension until separation takes place, when the heavy values settle upon and are drawn through the screen by the backward impulse, and the lighter portions are carried onward by reason of the forward impulse, and pass off as tailings through one or another of the discharge-cocks *a′ a′*. The backward impulse is assisted and augmented and an undulatory movement of the mass is produced by compressed air within the dome or closed chamber above the surface of the liquid. The compressed air operates as a piston to force the mass downward and backward, supplementing the force of gravity and causing the volume to move more promptly than would otherwise be the case.

A rotary spreader F for mechanically distributing the pulp over the screen, and gearing for operating the same, is shown in the drawing; but as it forms no part of the invention herein claimed it will not be further described.

I do not herein claim the apparatus for carrying out my new process, the same being made the subject of application, Serial No. 368,591, filed by me on the 18th day of October, 1890.

Having now described my invention, what I claim is—

1. The improved process of concentrating herein described, which consists in subject-

ing ores and minerals to the action of an intermittent upwardly-progressive reciprocating current or volume of fluid, substantially as described.

2. The process described, which consists in subjecting ores and minerals to the action of an intermittent, upwardly-progressive, reciprocating, or undulatory current of fluid under elastic or yielding pressure, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

HANNIBAL SCOVELL.

Witnesses:
A. J. STILES,
WM. M. STOCKBRIDGE.