

A. STROH.  
ORE-JIGGERS.

No. 171,189.

Patented Dec. 14, 1875.

Fig. 1.

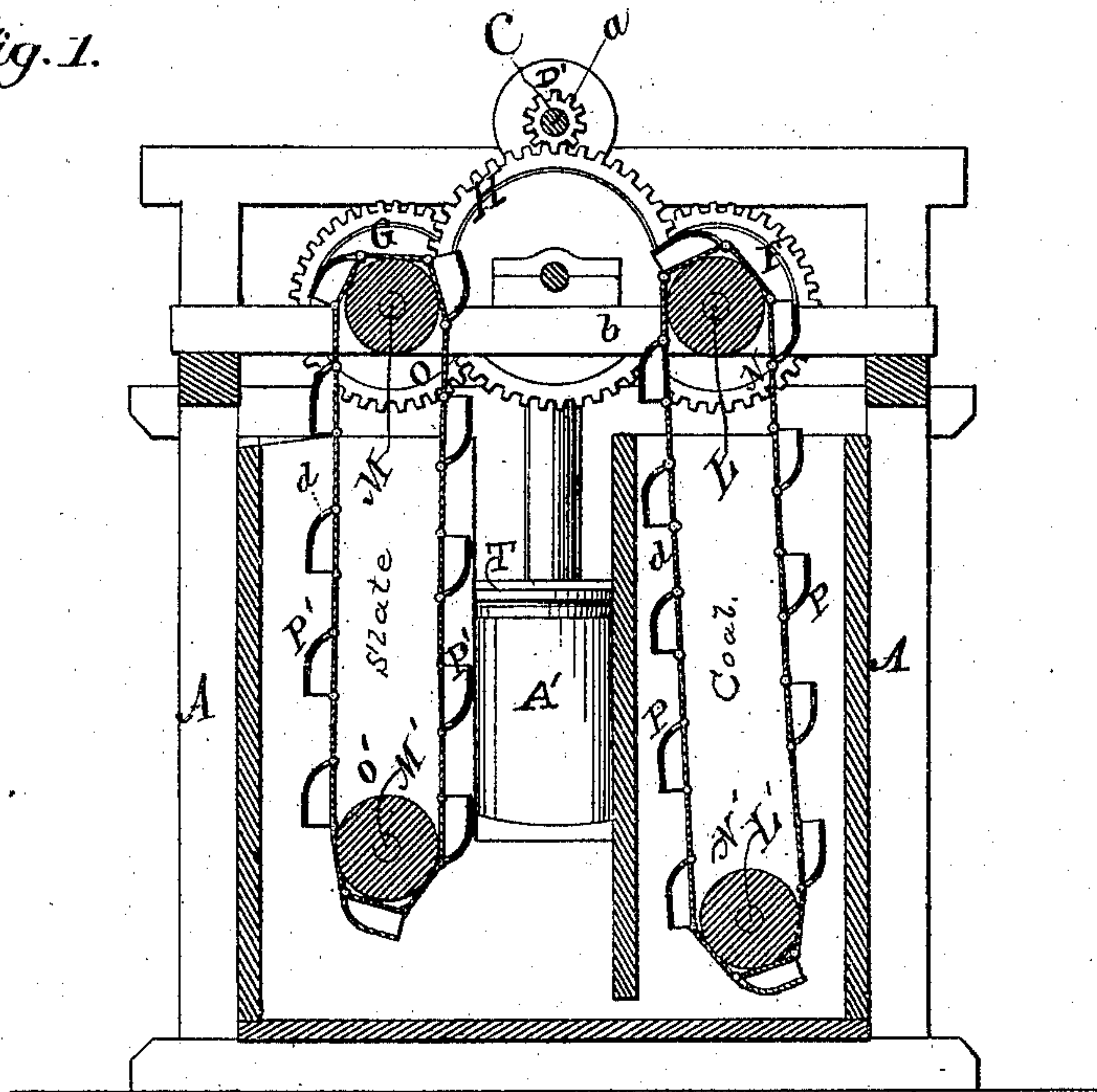
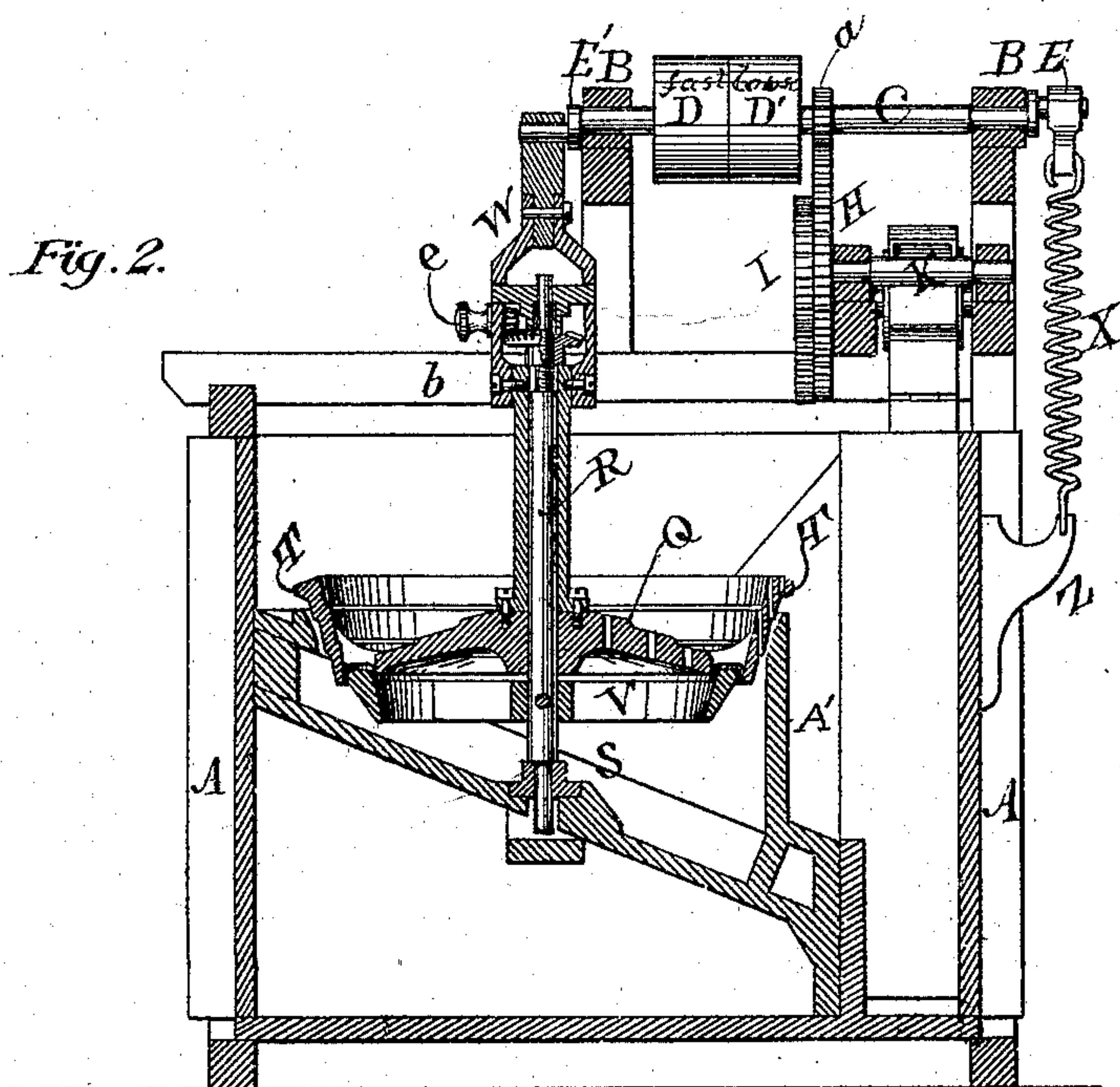


Fig. 2.



Witnesses:  
*J. W. Swank*  
*Chas. A. Hyatt*

Inventor:  
*Abraham Stroh*



# UNITED STATES PATENT OFFICE

ABRAHAM STROH, OF MAUCH CHUNK, PENNSYLVANIA.

## IMPROVEMENT IN ORE-JIGGERS.

Specification forming part of Letters Patent No. **171,189**, dated December 14, 1875; application filed November 20, 1875.

*To all whom it may concern:*

Be it known that I, ABRAHAM STROH, of Mauch Chunk, in the county of Carbon and State of Pennsylvania, have invented certain new and useful Improvements in Jiggers for Separating Ores, of which the following specification is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a transverse side elevation of my improved apparatus, with the end of the outer casing and the outer supporting-braces removed, so as to more clearly exhibit the arrangement of the endless belts carrying the buckets or receptacles for receiving and discharging the separated ores. Fig. 2 is a vertical longitudinal section immediately through the center of the apparatus.

Like letters represent like parts in both views.

The object of my invention is to furnish, for collieries, mines, and analogous purposes, an apparatus for the separation of coal, ore, and other mineral products, by which large quantities thereof can be rapidly and cheaply separated in a complete manner—based on the difference of the specific gravity of the minerals.

The invention consists in constructing the ore-receiving receptacle with a terraced and perforated bottom—the perforations being, preferably, conically-shaped, with the larger openings beneath, or on the under side thereof. Also, in providing the outer shell or cylindrical walls of said receptacle with continuous terraces or steps, and with, preferably, conically-shaped perforations at different points of its circumference. The bottom of this receptacle (which is as much less in circumference than the exterior of the walls of said receptacle, at the point at which it is secured thereto, as may be necessary for the free admission of the slate or heavy minerals to the slate-valve) is rigidly secured to its surrounding casing by furrowed arms slightly curving upward. Also, in locating the entrance to the slate-valve between the cylindrical walls of the casing of the ore-receptacle and the rim of the bottom thereof, and in hanging the adjustable slate-valve, whose outer sur-

face coincides with the inner tapering walls of the casing of the ore-receptacle, and which is provided with arms upon its inner circumference, upon a spindle stepped in the framework of the apparatus beneath the ore-receptacle, and raised and lowered, according to the requirements of the nature of the coal or mineral being operated upon, by means of mechanism hereinafter described. Also, in constructing the elevating-buckets with water-apertures at the point where they are hinged one to another. Also, in the arrangement of the gearing, so that a single shaft will answer for communicating power to the jigger, as well as to the coal-elevator—the whole as more fully explained below.

In the drawings, A represents the tank or frame-work in which the operating mechanism is located. This is generally made of wood, and of any approved construction. B B are beams supporting the shaft C, which carries the pulleys D D', (one of which, D', is loose,) to which the band for communicating power to drive the apparatus is attached. To the opposite ends of the shaft C cranks or eccentrics E E' are secured. The gearing consists of the wheels F, G, H, and I. The shaft K carries the cogs H and I, and the latter (I) meshes into the cogs F and G, which are on the extensions of the shafts L and M, and these latter carry the spiders N and O, over which the endless belt with the buckets P secured thereto passes. The shafts L' M' and pulleys N' O' are located near the bottom of the casing—these being necessary to insure the successful operation of the belt of buckets above mentioned. The pinion a is fixed to the driving-shaft C, and meshes into cog-wheel H, and thus communicates power to the gearing located below it.

The ore-receptacle is composed of a bottom, Q, which is terraced or furrowed, and provided with water-apertures, as shown. These perforations are preferably conically-shaped, with the larger opening at the bottom. This bottom Q is securely bolted, in any well-known manner, to the outer casing surrounding the spindle R, which latter is screw-threaded near its upper end, and passes through the bottom Q, and is stepped in the casting at the point S. The cylindrical side



walls T T of this ore-receptacle are also terraced or formed with steps, and it is also perforated with water-inlets, preferably conically-shaped, at different points of its circumference. The bottom Q and cylindrical side walls T are secured to each other by curved and furrowed arms, and, the circumference of said bottom being much less than that of the side walls at the point at which the arms just mentioned are connected to the same, the consequence is, there is an opening of considerable width provided between these two parts, constituting the ore-receptacle. This opening furnishes the inlet to the slate-valve, and this valve V is secured to the spindle R, and is located just beneath the bottom Q of the ore-receptacle. Its outer circumference coincides with the inner circumference of the walls T of the ore-receptacle, which latter, as will be perceived from the drawings, conically inclines toward the center. The extent of the opening to the slate-valve is regulated by the bevel-gear b, affixed to the hanger W, and the end of the spindle R.

The adjustment of the spindle carrying the valve V, which controls the opening, is effected by operating the nut e, as is obvious.

The size of the opening to the valve is regulated according to the specific gravity of the mineral or coal being operated upon.

The upper end of the hanger W is connected to the extension of the eccentric E', and to the other eccentric is secured, by a suitable fastening, one end of the spring X, the other end of which is fastened to a bracket, Z, projecting from the side of the casing. This spring serves as a governor, and assists in raising the operating parts of the jigger at the end of each stroke of the same.

The operation of the apparatus is as follows: The casing being submerged in water to the desired depth, and power being applied and the apparatus set in motion, the revolution of the shaft C produces, through the cranks E E', a vibratory motion of the ore-receptacle Q T. The number of strokes per minute will vary with the difference of the specific gravity of the coal or mineral acted upon. The coal or ore being filled into the ore-receptacle T Q, either through a hopper or in any other desired manner, the heavier parts thereof are caused, by the quick vibratory motion of the ore-receptacle and its adjuncts, to seek the entrance to the slate-valve, and they are assisted toward this opening by the steps or terraces of the top of the bottom of the ore-receptacle. As the slate, &c., escapes through the valve V it is received into the buckets P' of the elevator. These buckets empty into a chute provided for the purpose of conveying the slate, &c., to its receptacle. While this process is going on those portions of the coal

or ore which are of less specific gravity than the slate, &c., constantly find their way over the rim of that portion of the ore-receptacle which constitutes the side walls thereof, and are conveyed, by their own gravity, along the inclined floor to an opening, where they make their exit into the buckets P of the other elevator, and are thence deposited into the chute provided for that purpose.

This above-described process is not intermittent, but goes on continuously so long as the apparatus is kept in motion. The water constantly passing through the apparatus herein described serves to keep the coal, ore, &c., from clogging during the operation of the apparatus.

The slate is apt to lodge in the steps of the side walls T; but these are kept clear by water passing constantly through the apertures provided therein.

The buckets on the elevators P P' are of cast-iron, and are provided, in the act of casting, with openings d d, for the discharge of the water which finds its way therein with the coal, slate, &c. This arrangement dispenses with the troublesome method of drilling holes in the buckets for the exit of the water.

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

1. In a jigger for separating coal, ore, &c., the ore-receptacle, consisting of the cylindrically-shaped walls T T, terraced and perforated, as explained, and the terraced perforated bottom Q, of a diameter less than that of the interior of said walls T, substantially as and for the purpose specified.

2. The combination, with the ore-receptacle T T Q, having terraced and perforated sides and bottom, of the slate-valve V, located immediately beneath said ore-receptacle, substantially as described, for the purpose explained.

3. The ore-receptacle T T Q, terraced and furrowed, and provided with water-apertures, as herein described, in combination with the slate-valve V and vertically-adjustable spindle R and its operating mechanism, substantially as set forth.

4. The combination of the shaft C, carrying the eccentrics E E', the hanger W, and spindle R, with the ore-receptacle T T Q and slate-valve V, all substantially as specified.

5. The combination of the spring X with the shaft C, eccentrics E E', ore-receptacle T T Q, and intermediate operating mechanism, substantially as specified.

ABRAHAM STROH.

Witnesses:

E. T. BOOTH,  
W. R. WHITE.