(No Model.) 2 Sheets—Sheet 1.

S. STUTZ.

COAL AND ORE JIGGER AND WASHER.

No. 481,438. Patented Aug. 23, 1892.

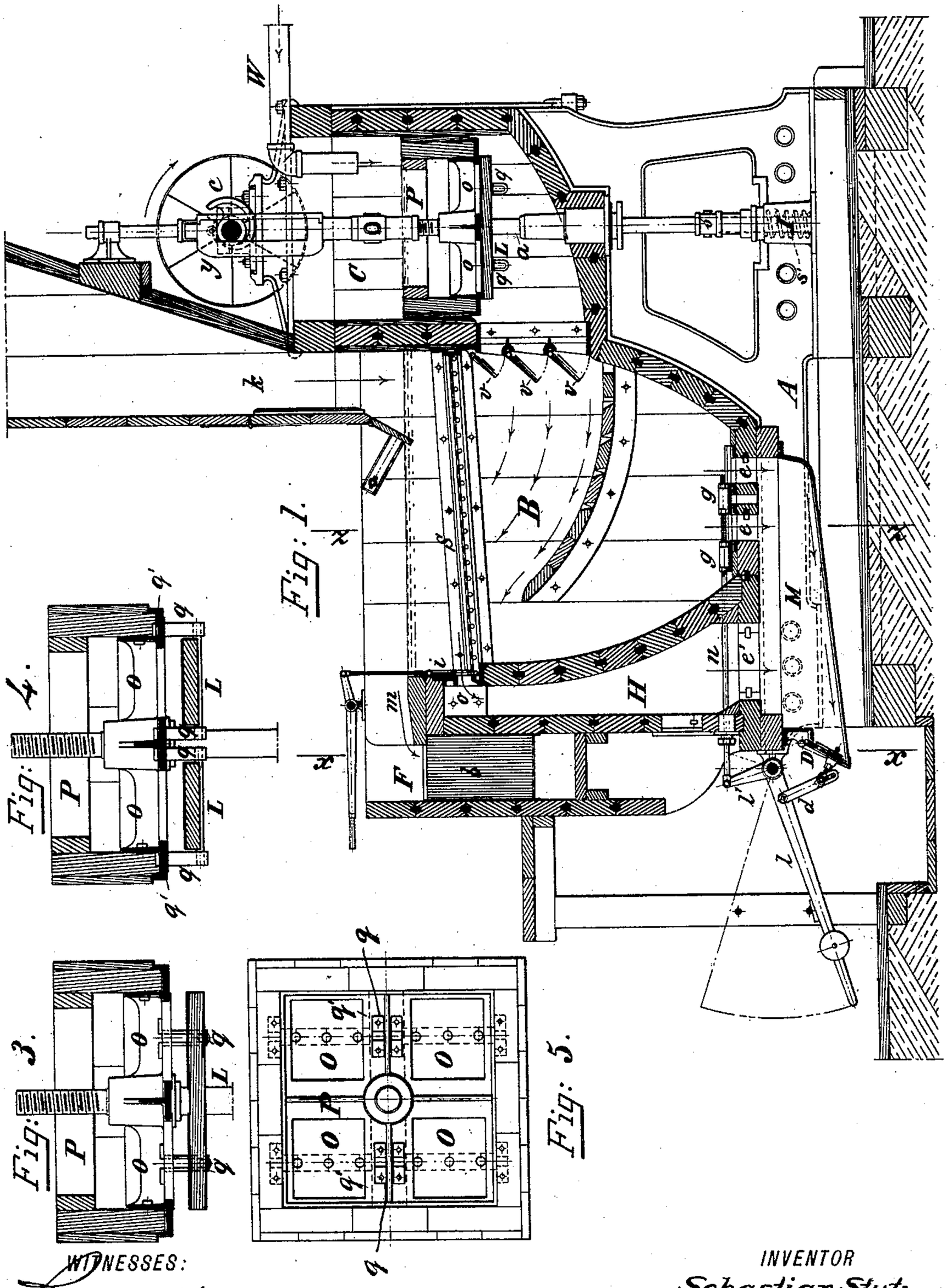

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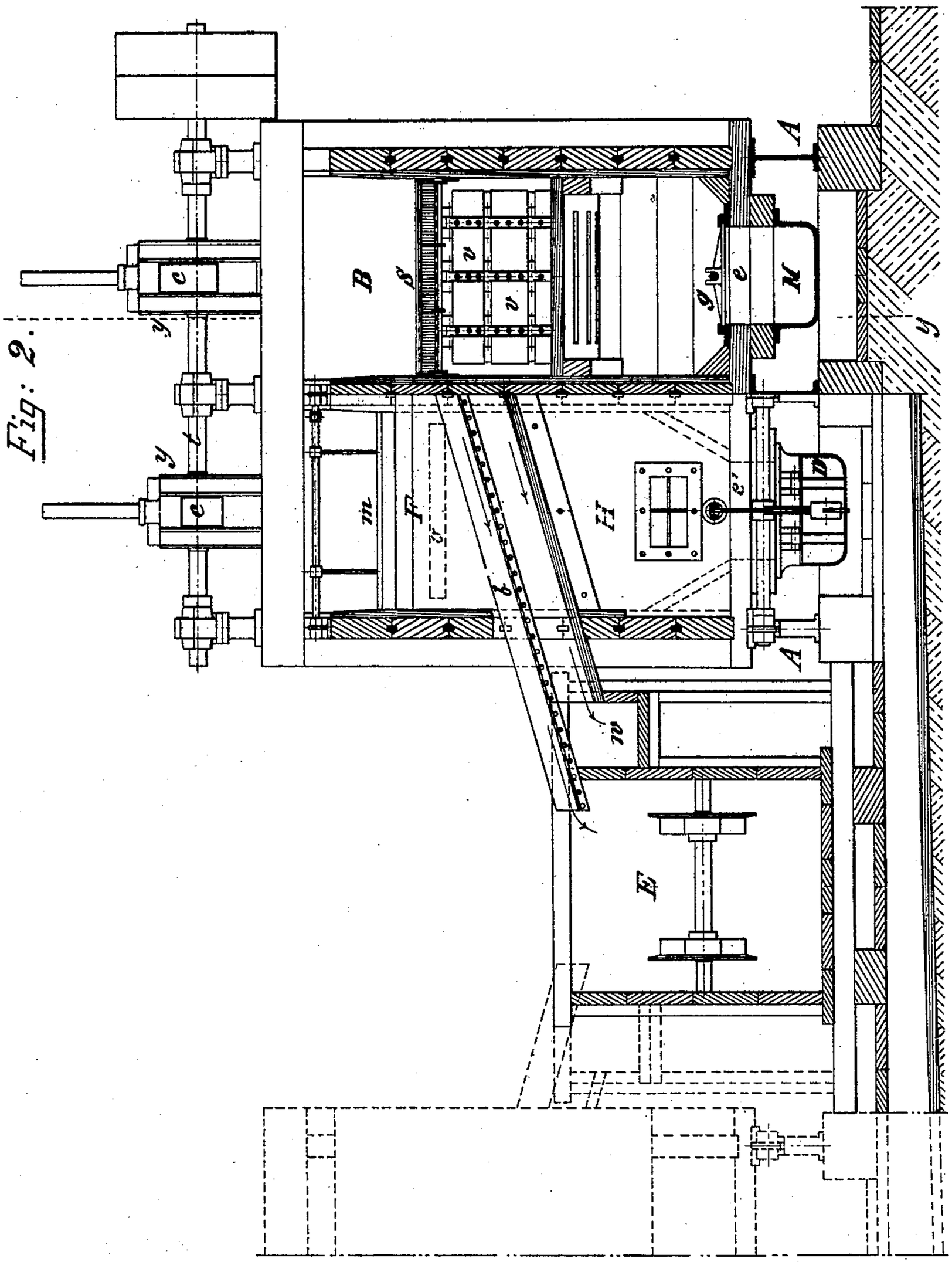
Fig. 2.



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SEBASTIAN STUTZ, OF PITTSBURG, PENNSYLVANIA.

COAL OR ORE JIGGER AND WASHER.

SPECIFICATION forming part of Letters Patent No. 481,438, dated August 23, 1892.

Application filed March 29, 1892. Serial No. 426,911. (No model.)

To all whom it may concern:

Be it known that I, SEBASTIAN STUTZ, a citizen of United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Coal or Ore Jiggers and Washers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to coal or ore jiggers or washers.

The object of the present invention is to produce an ore or coal jigger or washer whereby by a simple construction both coarse and fine impurities may be collected in an auxiliary reservoir below the washer, from which they can be discharged at will.

Furthermore, the object of the invention is to produce a coal or ore jigger or washer in which the plunger or piston for forcing the water through the coal or ore is provided with openings at the bottom, governed by floating valves properly guided, and by which arrangement the place below the piston or plunger is always filled up by the water.

With these objects in view the invention consists in a coal or ore washer or jigger comprising a separating-chamber, a sieve or screen arranged in said chamber, a slate-chamber adjacent to the separating-chamber, a piston or plunger chamber, a piston or plunger reciprocating vertically in said chamber, and an auxiliary receiver arranged below the washer and communicating with both the separating-chamber and the slate-chamber. Furthermore, the invention resides in various novel details of construction, whereby the objects of the invention are attained.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of a coal or ore washing machine, taken on the line *y y* of Fig. 2, constructed in accordance with my invention. Fig. 2 represents a vertical cross-section at the lines *x x* and *z z* of Fig. 1. Figs. 3 and 4 are vertical sections at right angle through the plunger or piston, and Fig. 5 is a plan view of the same.

In the drawings, A represents brackets, preferably of cast-iron, upon which is supported a rectangular box divided into chambers B, C, and H, and constituting two entire machines. Arranged within the chamber B is a screen or sieve S, while the chamber C contains the piston or plunger P, with its mechanism, to reciprocate vertically.

H represents the slate-chamber, which communicates at its upper end with the separating or washing chamber B through an opening *o*, governed by a suitable valve *i*.

F shows a trough or chute provided with a screen *b* and communicating with the separating-chamber B to receive the washed coal as it passes from the latter.

Beneath the slate-chamber H and the separating-chamber B an auxiliary receiver M is arranged, which communicates with both chambers by means of the openings *e'* and *e e*, for the purpose of receiving the coarse and fine impurities. The object of this auxiliary receiver M is to prevent the great waste of water while letting escape the impurities, and thus make the machine do its work continuously, since by previously closing the gates *g g* and *i* the water-level cannot sink below the delivery-bridge *m;* hence the separation is not interrupted. The receiver M is provided with an outlet door or gate D, connected with the levers *l l'* by means of a link *d*. The gates *g g* are also connected with the levers *l l'* by means of a rod *n*. For the purpose of giving the gates *g g* a certain lead or advance while closing and before the movement of the lever *l* is transmitted to the door D, the link *d* is provided with a slot. A single movement of the levers will effect the closing of the gates *g g* and the discharge from the machine of both coarse and small impurities.

The piston or plunger P is provided with openings O O in its bottom. These openings are governed by floating valves L L, supported upon vertical guides *q q*, depending from and secured to cross-pieces *q' q'* of the piston or plunger P. The object of the improved piston or plunger is to allow the necessary volume of water to enter the machine from above the plunger by means of a pipe W, instead of below, as formerly, and thus fill up the entire space when the piston is moving upward. The inflow of water into the machine through the piston or plunger is further controlled by means of a series of

valves *v v*, governing the opening between the plunger-chamber and the separating-chamber, which regulate the depth of water in the plunger-chamber beneath the piston, and consequently the length of time the valves L L are allowed to remain open. Secured on the plunger-rod near the lower end thereof is a collar *s*. This collar is designed to limit the downward movement of the plunger-rod by engagement with a buffer, in which is seated a spring *s'*, encircling the plunger-rod, the purpose of which is to impart a differential movement thereto. The sudden and sharp contact of the collar *s* with the buffer I is prevented by the water in the plunger-chamber, which offers a resistance to the downward stroke of the plunger, and thereby causes it to descend gradually.

Movement is imparted to piston P from the shaft *t* by means of the cam *c*, yoke *y*, and rod *a*.

Coal to be washed is supplied to the screen S through the hopper or feed-channel *k*. The pulsations of the water, caused by the movement of the plunger, raise and spread the material out over the whole surface of the screen, and at the same time permit the heavier parts to take the lower stratum or layer next to the screen while the lighter substances remain above to reach the top. When the space becomes filled up, the lighter substances are discharged over the bridge *m* upon the drying-screen *b* of the trough F, leading to an elevator E or other receiver, while the heavier material (slate and sulphur) pass through the opening *o* into the slate-chamber H, and thence through *e'* into the receiver M and to the outside. During the operation of the machines the gates *g g* are left wide open to allow the sediment of fine sulphur and slate passing through the meshes of the sieve to enter freely into the receiver M, the front door D of which being tightly closed. The slate valve or gate *i*, governing the opening *o* between the slate-chamber and the separating-chamber, may also be partly left open to allow the impurities to pass off continuously; or it may be kept closed and opened only at intervals. Before letting the impurities out of the receiver M the gate *i* must be closed to prevent the water above the screen from escaping; thence the lever *l* is pulled upward, thus closing the openings *e e* and opening the door D of the receiver.

I do not wish to be understood as claiming herein a coal or ore washer or jigger comprising a separating-chamber, a piston or plunger reciprocating vertically therein, a slate-chamber adjacent to the separating-chamber, and an auxiliary receiver arranged below the separating-chamber and communicating with both the separating-chamber and the slate-chamber, as this forms the subject-matter of my pending application, Serial No. 423,581, filed March 3, 1892.

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

1. A coal or ore washer comprising a separating-chamber, a sieve or screen fitted into the chamber, a piston or plunger chamber adjacent to the separating-chamber, a piston or plunger adapted to reciprocate vertically in said chamber, a slate-chamber adjacent to the separating-chamber, and an auxiliary receiver arranged below the bottom of the washer and communicating with both the separating-chamber and the slate-chamber, substantially as described.

2. A coal or ore washer comprising a separating-chamber, a sieve or screen fitted into said chamber, a piston or plunger chamber adjacent to the separating-chamber, a piston or plunger adapted to reciprocate vertically in said chamber, a slate-chamber adjacent to the separating-chamber, an auxiliary receiver arranged below the bottom of the washer and communicating with both the separating-chamber and the slate-chamber, and mechanism for opening and closing the communication between the separating-chamber and the receiver, substantially as described.

3. A coal or ore washer comprising a separating-chamber, a plunger-chamber and a slate-chamber adjacent to and communicating with the separating-chamber, and an auxiliary receiver arranged beneath and communicating with the separating-chamber, substantially as described.

4. A coal or ore washer comprising a separating-chamber, a sieve or screen fitted therein, a piston or plunger chamber adjacent to the separating-chamber, a piston or plunger having a valve-controlled opening therein adapted to reciprocate vertically in said chamber, and an auxiliary receiver arranged beneath the separating-chamber and communicating therewith, substantially as described.

5. A coal or ore washer comprising a separating-chamber, a sieve or screen fitted therein, a piston or plunger chamber adjacent to the separating-chamber, a piston or plunger having a valve-controlled opening therein adapted to reciprocate vertically in said chamber, a slate-chamber adjacent to the separating-chamber and communicating therewith, and an auxiliary receiver arranged beneath the separating-chamber and communicating therewith and with the slate-chamber, substantially as described.

6. A coal or ore washer comprising a separating-chamber, a piston or plunger chamber communicating therewith by means of an opening, valves for controlling said opening, a piston or plunger adapted to reciprocate vertically in the plunger-chamber having openings in the bottom thereof governed by a floating valve or valves, and an inflow-pipe arranged above the piston or plunger, substantially as described.

7. A coal or ore washer comprising a separating-chamber, a piston or plunger chamber

adjacent thereto and communicating therewith by means of an opening, valves for controlling said opening, and an auxiliary receiver arranged beneath the separating-chamber and communicating therewith, substantially as described.

8. A coal or ore washer comprising a separating-chamber, a piston or plunger chamber adjacent thereto, an auxiliary receiver arranged beneath the separating-chamber and communicating therewith by means of openings, valves for controlling said openings, a slate-chamber adjacent to the separating-chamber and communicating therewith through an opening, and a gate for governing said opening, substantially as described.

9. A coal or ore washer comprising a separating-chamber, a piston or plunger chamber adjacent to the separating-chamber, and a piston or plunger adapted to reciprocate vertically in the chamber having openings in the bottom thereof, the floating valve or valves for governing said openings, the vertical guides for supporting said valves, and the inflow-pipe arranged above the piston or plunger, substantially as described.

10. A coal or ore washer, in combination with a piston or plunger having openings in the bottom thereof, the floating valve or valves for governing said openings, the vertical guides for supporting said valves, and the inflow-pipe arranged above the piston or plunger, substantially as described.

11. A coal or ore washer comprising a separating-chamber, a sieve or screen fitted therein, a piston or plunger-chamber adjacent thereto and communicating therewith, a piston or plunger adapted to reciprocate vertically in said chamber, a slate-chamber adjacent to the separating-chamber, an auxiliary receiver arranged beneath the separating-chamber and communicating therewith, and mechanism for governing the communication between the separating-chamber and plunger-chamber, the separating-chamber and auxiliary receiver, and separating-chamber and slate-chamber, substantially as described.

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

SEBASTIAN STUTZ.

Witnesses:
JOS. E. BISSELL,
G. A. HILLEMANN.