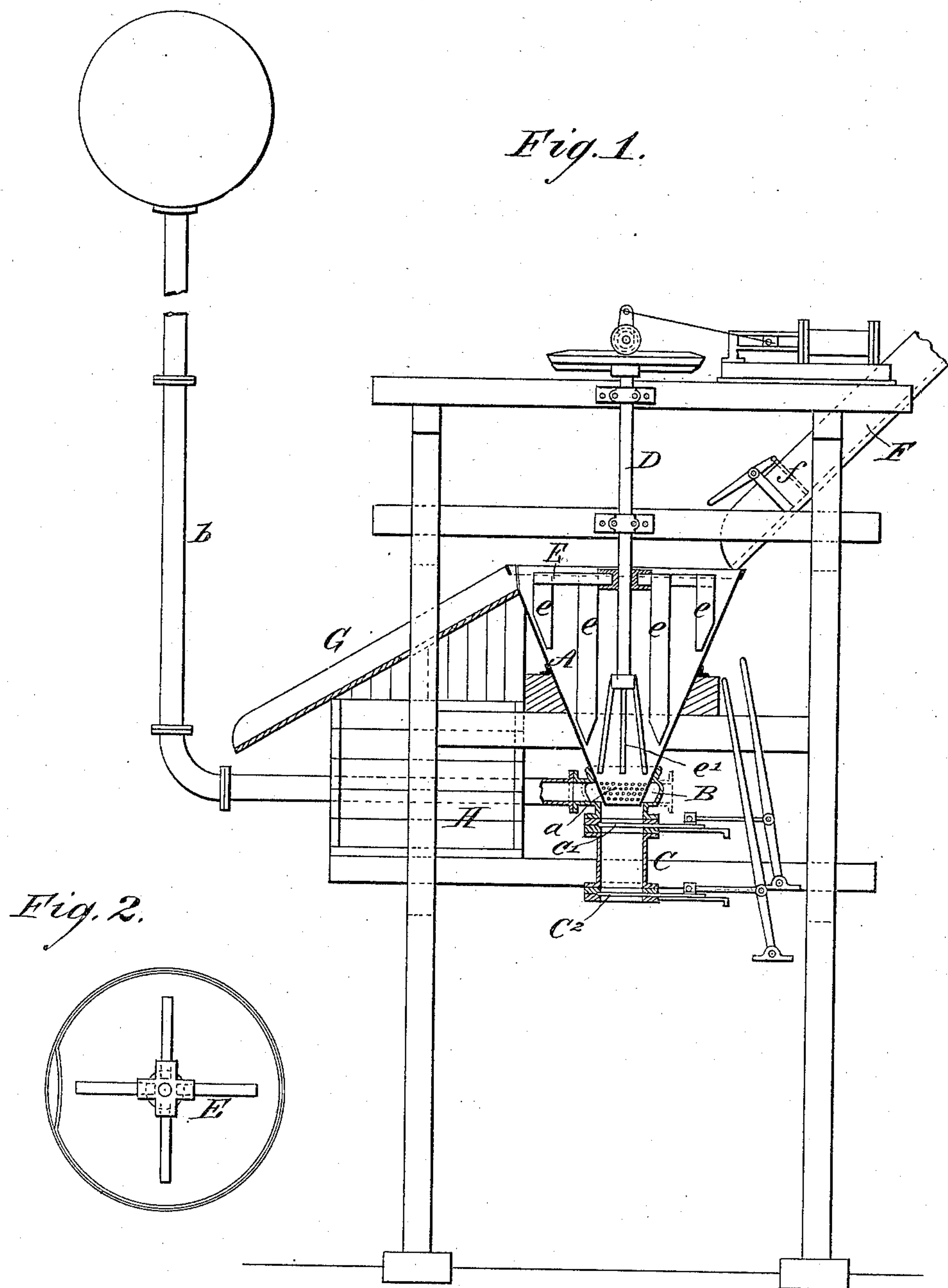


(No Model.)

R. ROBINSON.  
MACHINE FOR WASHING COAL, &c.

No. 344,545.

Patented June 29, 1886.



WITNESSES:

Donn Twitchell.  
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# UNITED STATES PATENT OFFICE.

ROBERT ROBINSON, OF HOWLISH HALL, NEAR BISHOP-AUCKLAND,  
COUNTY OF DURHAM, ENGLAND.

## MACHINE FOR WASHING COAL, &c.

SPECIFICATION forming part of Letters Patent No. 344,545, dated June 29, 1886.

Application filed January 20, 1886. Serial No. 189,234. (No model.) Patented in England April 25, 1884, No. 6,789; in France January 6, 1886, No. 173,363, and in Belgium January 7, 1886, No. 71,529.

*To all whom it may concern:*

Be it known that I, ROBERT ROBINSON, of Howlish Hall, near Bishop-Auckland, in the county of Durham, England, mining engineer, have invented a new and useful Machine for Washing Coal or other Minerals, of which the following is a full, clear, and exact description.

This invention relates to a machine for effecting the separation of stone, dirt, and other impurities from coal or other minerals by the difference of their specific gravities, the operation being performed by the immersion of the coal or other mineral in water in a conical hopper-like vessel, through which a constant upward flow of water is maintained, the coal being floated or carried off and the impurities left behind, the vessel being provided with an agitator to facilitate the separation and precipitation of the impurities, and also provided with inlets for the water at the lower part, and with means of discharging the impurities without interrupting the operation of the washing-machine, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, wherein Figure 1 is an elevation, partly in section, of the complete machine; and Fig. 2 is a plan of the washing-vessel, showing the stirrer.

A is the washing-vessel in the form of an inverted frustum of a cone. It is constructed of iron plate, and its sides are perforated all round at the lower part with numerous rows of small holes *a*, the perforated portion being inclosed by an annular casing or hollow ring, B, forming an annular water-space in communication with the interior of the vessel A by the holes *a*. This water-ring B is in connection by one or more pipes, *b*, (according to the size of the machine,) with a cistern, pump, or other source of water-supply, and the water supplied therefrom to the water-ring B passes through the orifices *a* into the vessel A and overflows at the top, a constant ascending current being maintained.

The lower mouth of vessel A is in connection with a lock-chamber, C, closed at top and bottom, respectively, by slides or doors *c'* *c''*, operated by levers or other suitable means, so

that on drawing out the upper slide, *c'*, the impurities which have settled down upon it fall into the lock-chamber C, whence they are discharged into wagons beneath by first closing or pushing in the upper slide, *c'*, and then opening the lower slide, *c''*, the refuse being thus discharged without interrupting the working of the washer.

D is a vertical shaft, mounted in suitable bearings and turning in the vessel A, at its lower part, on which shaft are mounted radial arms E, to which are fixed iron blades *e*, which dip down to the sides of the washer, and by their revolution with the shaft agitate the water and the minerals being washed and facilitate the separation of the impurities, which settle down at the bottom of the vessel A. A second set of arms, *e'*, are fixed to the bottom end of the shaft and project down nearly to the bottom of the vessel for same purpose.

Shaft D may be driven directly by a small engine on the frame, or by belt or other gear from any suitable motor.

The coals or other minerals to be washed are fed in at the top of the washer through a chute, F, provided with a regulating-slide, *f*. An overflow-chute, G, at the opposite side of the washer, receives the washed coal, &c., which is floated over the top edge of the vessel A by the overflowing water, the former being discharged by the chute into wagons and the latter being received in a cistern, H, placed immediately beneath a part of the chute G, which is constructed of wire-work, and over which the coal passes on its descent, while the water runs through it into the cistern for use again.

Having now particularly described and pointed out the nature of the said invention and in what manner the same is to be operated, I declare that what I claim is—

1. A machine for separating impurities from coal and other minerals by the difference of their specific gravities, and by an ascending current of water, consisting of a conical hopper-shaped vessel, A, furnished with inlets for water near the bottom, a water-ring, B, surrounding and inclosing said inlets, a lock-chamber, C, slides *c'* *c''* beneath the vessel A, for withdrawing the impurities without interrupting the action of the machine, and a stir-

rer, D, rotating within the vessel A, for facilitating the separation of the coal, &c., from the impurities, substantially as shown and described.

- 5 2. A machine for separating impurities from coal and other minerals by the difference of their specific gravities, and by an ascending current of water, consisting of the conical hopper-like vessel A, having inlet-orifices *a* near  
10 the bottom, the water-ring B, the lock-chamber C, the slides *c'* *c''* in the upper and lower

part of said chamber, the stirrer D E *e'*, the supply-chute F, and the perforated discharge-chute G, substantially as herein shown and described.

ROBERT ROBINSON.

Witnesses:

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