DEIHM & SNELL.

Coal Breaker.

No. 18,501. Patented Oct. 27, 1857.

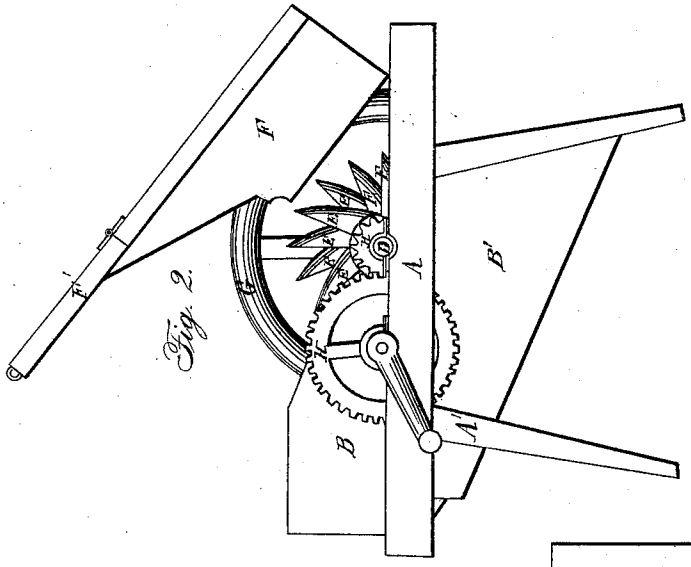

Fig. 2.

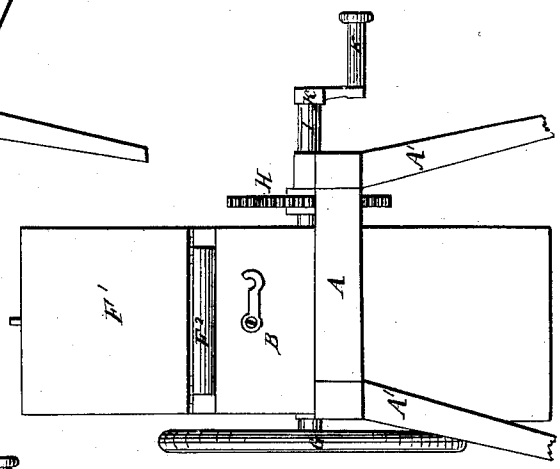

Fig. 3.

Fig. 4.

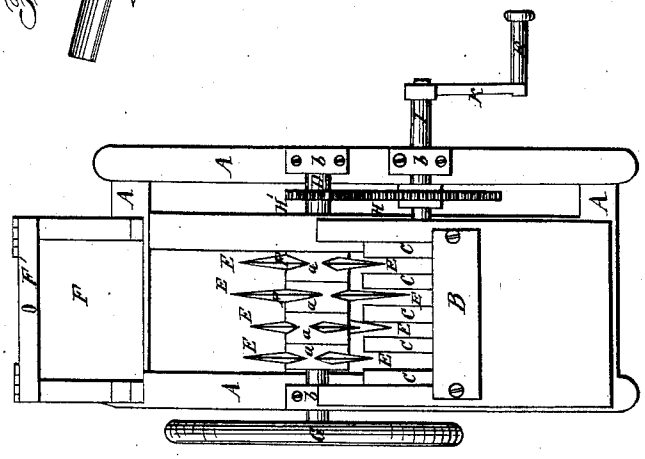

Fig. 1.

# UNITED STATES PATENT OFFICE.

JOHN R. DEIHM AND JASPER SNELL, OF POTTSVILLE, PENNSYLVANIA.

## MACHINE FOR BREAKING COAL.

Specification of Letters Patent No. 18,501, dated October 27, 1857.

*To all whom it may concern:*

Be it known that we, JOHN R. DEIHM and JASPER SNELL, of Pottsville, in the county of Schuylkill and State of Pennsylvania, have invented a new and useful Machine for Breaking Coal; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Figure 1, is a plan view. Fig. 2, is a side elevation. Fig. 3, is an end elevation. Fig. 4, is a view showing grate bars.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

In Fig. 1, A, the frame of the machine; B, the elevation or top end of the grate; C, the grate; D, the shaft on which the knives or dividers are placed; E, the knives or dividers on segments *a;* F, the cover thrown back leaving the machine open; F′, the door for admitting the coal to the knives and grates; G, fly wheel on the end of shaft D; H, gear wheel on crank shaft; I, crank shaft; K, crank, and handle; *b*, *b*, the bearings of the shafts.

In Fig. 2, A′ the legs or upright on which the machine is supported; A, the frame; B, the elevation of the grate; B′, the body of the machine through which the coal passes; F, the cover; F′ door thrown back; G, flywheel; H′, small gear wheel or pinion on shaft D; D, the shaft; E, the knives or dividers.

In Fig. 1, *a*, the segments on which on the knives or dividers are set.

In Fig. 3, A′, the standards or legs; A, the frame; B, the top or elevation of the grate; $F^2$, the open space, the door F′ being thrown open and the cover being fastened down by means of staples and hooks on the sides; G, the fly wheel; H, gear wheel on the crank shaft; I, crank shaft; K, crank and handle. Instead of a crank and handle when "power" is used, we will use a pulley wheel on the shaft, and a belt. We use for the construction of our machine any of the known suitable materials for such purposes; Z, cross section through *x*, *x*, of Fig. 4.

In the operation of our invention, the coal is passed through the space $F^2$, and falls immediately onto the grate bars C, the undersides of which are of a V shape, the spaces between them being equal to the space between their ends and the periphery of segments *a* on shaft D. The object of this equality in the spaces is that the coal can pass down between the shaft and the grate bars, as well as between the bars. The V shape of the spaces between the bars greatly facilitates the discharge of the broken coal. As the coal falls on the grate, the knives or dividers having been put in motion by means of power applied to the crank,) as they revolve, meet it on a line above the shaft, and the knives or dividers, are so arranged that but one of them strikes the coal at the same instant of time, and by means of the sharp sides of the knives striking quickly the coal as it is lying across the spaces between the bars C, it is instantly broken, and falls through, and is not operated upon a second time; and as it falls through onto the screen it is carried off and separated from the dirt. The coal can be divided into the size that may be required by the arrangement of the screen.

It will be seen that the operation of our machine is very different from those constructed with rollers or crushers, as such an operation must necessarily crush and reduce to almost powder a very large portion of the coal. It will also be seen that teeth or cutters on the periphery of a wheel cannot operate on the coal at the same point where we break ours, the grate necessarily being different the coal is longer continued under the action of the cutters thus greatly reducing and wasting the coal.

By the arrangement of our machine we are able to save a very large per cent of the coal over any machine now in use (say five per cent.) as we do not break the coal twice, so soon as broken to the size required it immediately falls out of the way of the dividers and passes out of the machine. It will be seen that as the knives revolve, and come in contact with the coal, they have a tendency to press the coal toward the shaft D, thus readily breaking and discharging the coal with great facility.

Having thus fully described the construction and operation of our invention, what we claim as new and desire to secure by Letters Patent, is—

The inclined curved grate bars C, constructed as described, in combination with knives or dividers E, on segments *a*, placed spirally on shaft D, operating as described and for the purposes set forth.

JOHN R. DEIHM.
JASPER SNELL.

Witnesses:
Y. G. CLAYTON,
P. S. CLAYTON.