

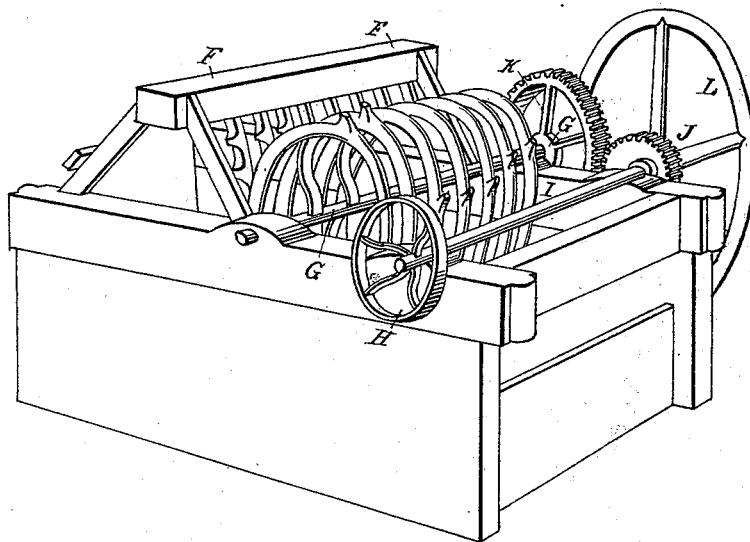
W. RICHARDSON.

Coal Breaker.

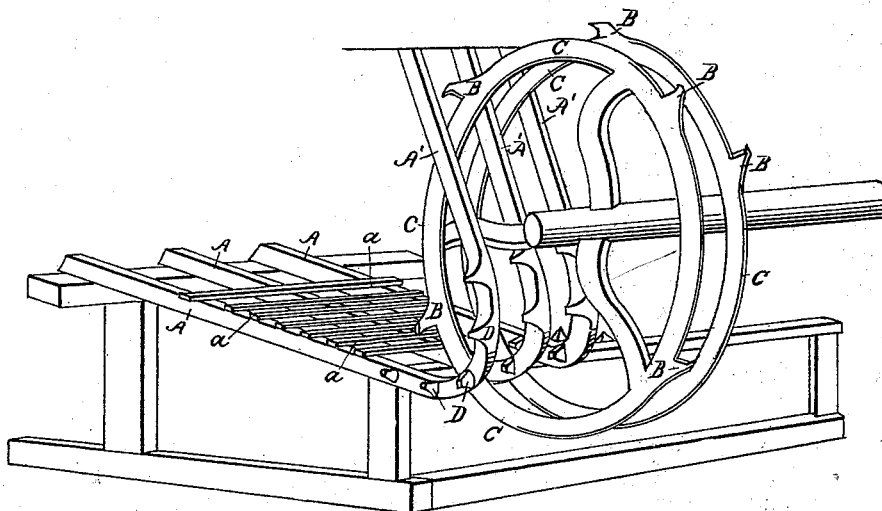
No. 4,172.

Patented Sept. 2, 1845.

*Fig. 1.*



*Fig. 2.*



# UNITED STATES PATENT OFFICE.

WILLIAM RICHARDSON, OF PHILADELPHIA, PENNSYLVANIA.

## COAL-BREAKER.

Specification of Letters Patent No. 4,172, dated September 2, 1845.

*To all whom it may concern:*

Be it known that I, WILLIAM RICHARDSON, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and Improved Machine for Breaking Coal; and I do hereby declare that the following is a full and exact description thereof.

In my machine I use a series of wheels of cast-iron, which are made fast to the same shaft, at a suitable distance from each other. From the peripheries of these wheels project a number of teeth, or cutters which in the revolutions of the wheels are brought into contact with the coal to be broken. The peripheries and cutters of these wheels pass in between bars of iron which constitute a part of the bed on which the coal to be broken is deposited, and which may be denominated the hopper. From the sides of these bars project stationary teeth or cutters which coöperate with the revolving cutters in breaking the coal.

In the accompanying drawing, Figure 1 is a perspective view of the machine, the manner of constructing and the operation of which are most distinctly shown in Fig. 2, in which two only of the wheels (one without its spokes) are represented and three of the bars, constituting a part of the hopper.

A, A, A, are the bars of the hopper *a, a, a*, being small cross bars to aid in sustaining the large lumps of coal. The lower parts of the bars A, have an inclination toward the breaking wheels, whence they turn up as shown at A', and have their upper ends made fast to the frame work of the machine, as to F F Fig. 1.

B, B, are the revolving cutters, projecting from the rims of the wheels C, C; and D, D, are stationary cutters projecting laterally from the bars A, A.

G, G, is the shaft which carries the wheels C, C. H is a whirl on the shaft I, by which power may be communicated to the machine. J is a cog wheel on the opposite end of said shaft, gearing into a cog wheel K, on the shaft G.

L, is a fly-wheel by which the motion of the machine may be regulated.

The wheels C, C, may if preferred, be made in a continuous disk without arms or spokes.

Having thus fully described the nature of my machine for breaking coal and shown the manner in which the same operates, what I claim therein as new and desire to secure by Letters Patent is—

1. The manner herein made known in which I form and combine the bars A, A, and the wheels C, C, working between them; the bars A, A, having the cutters D, D, projecting out laterally from them, and the wheels C, C, carrying the cutters B, B, on their peripheries.

2. I do not make any claim to the manner of gearing this apparatus; nor do I intend to limit myself to the particular mode of so doing herein described; but to vary this as well as the form of other parts as I may deem proper, while I attain the same end by means substantially the same.

WM. RICHARDSON.

Witnesses:

W. W. OVERMAN,  
WM. R. GREBLE.