(No Model.)

G. R. ROOT.

COAL BREAKER.

No. 342,811. Patented June 1, 1886.

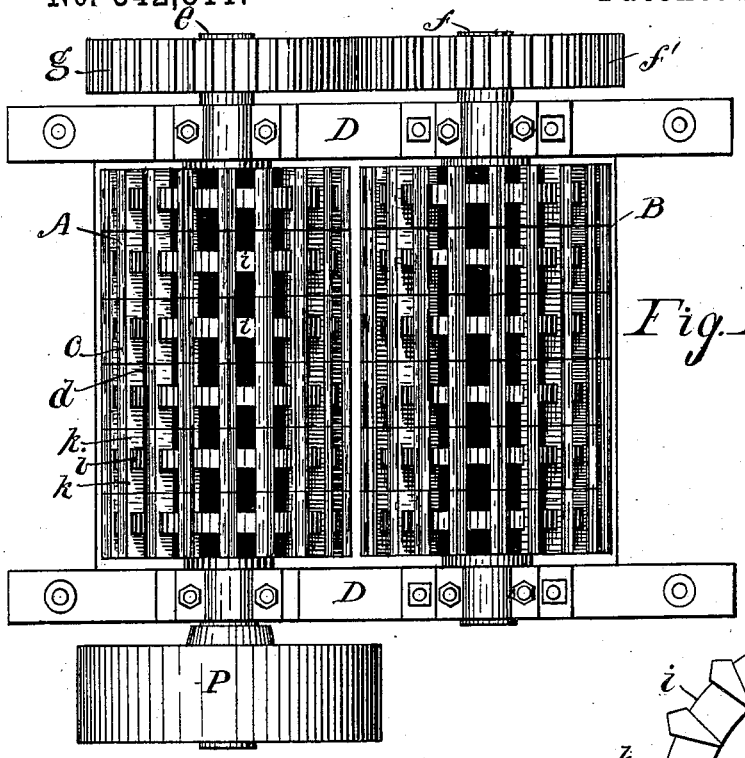

Fig. 1.

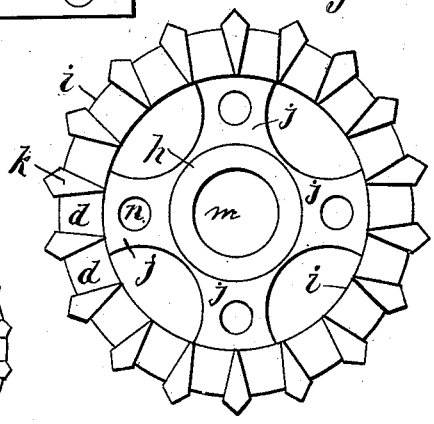

Fig. 3.

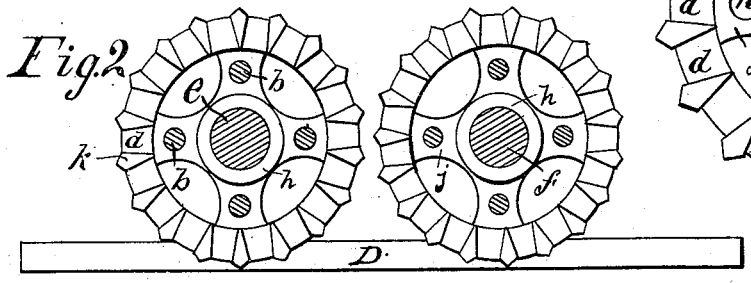

Fig. 2.

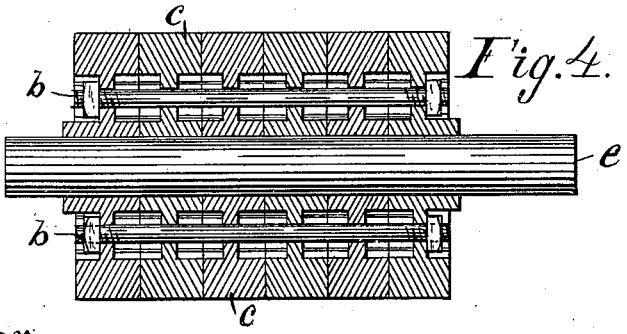

Fig. 4.

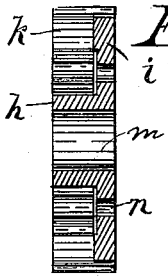

Fig. 5.

Witnesses
T. M. Hood.
C. P. Hood.

Inventor:
George R. Root.
By his Attorney
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UNITED STATES PATENT OFFICE.

GEORGE R. ROOT, OF INDIANAPOLIS, INDIANA.

COAL-BREAKER.

SPECIFICATION forming part of Letters Patent No. 342,811, dated June 1, 1886.

Application filed February 8, 1886. Serial No. 191,153. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. ROOT, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Improvement in Coal-Breakers, of which the following is a specification.

My invention relates to an improvement in a machine for crushing coke, for which Letters Patent No. 179,612 were issued to me July 4, 1876. In the machine above mentioned each of the crushing-rolls between which the coke is broken consists of a pair of circular heads mounted on a shaft, and arranged to support on their peripheries opposite ends of a series of bars, which are tapering in cross-section from the outside inward, and are arranged with open spaces between them, thus forming a hollow skeleton cylinder. A pair of such rolls are mounted in a suitable frame and connected by gear-wheels, so as to revolve simultaneously, and the crushing-bars are relatively so arranged that the bars of one roll force the crushed coke through the intervals between the bars of the other.

The object of my improvement is to adapt hollow rolls to crush anthracite coal and other like hard substances. It is important for this purpose that the crushing-bars be very strong and well supported, and that the bars, when broken, may be easily repaired. I attain these results by the construction illustrated in the accompanying drawings.

Figure 1 represents a plan of my improved coal-breaker. Fig. 2 is a vertical section of the same. Fig. 3 is an enlarged side elevation of one of the roll-sections. Fig. 4 is a longitudinal section of one of the rolls. Fig. 5 is a sectional view of a modified form of the roll-section.

A and B are a pair of hollow rolls having their peripheries formed into alternate projecting longitudinal bars *c* and spaces *d*, which spaces are wider on the inside than on the outside, and communicate with the interior of the rolls. Said rolls are mounted with their peripheries near together, but not touching, on suitable shafts, *e* and *f*, in bearings on a supporting-frame, D. A driving-pulley, P, is secured on shaft *e*, and a pair of intermeshing spur-gears, *f'* and *g*, are secured to the respective shafts, so that they may be revolved simultaneously, the arrangement being such that the bars of one roll will come opposite the spaces in the other, as shown in my before-mentioned Letters Patent. The rolls A and B are each formed of a series of sections like that shown in Fig. 3. Said sections consist of a hub, *h*, a thin annular ring, *i*, arms *j*, connecting the ring and hub, and a series of radial ribs, *k*, projecting laterally from one or both sides of the ring, and projecting radially beyond its periphery, all of said parts being cast in one piece. Said radial ribs taper from the outside inward, and are arranged at regular intervals, so as to form spaces *d*, which are wider on the inside, for the purpose of allowing the broken particles of coal to pass easily into the roll. A central hole, *m*, is formed in each section, and also a hole, *n*, in each arm. To form a roll a shaft, *e*, is passed through the central holes in a series of the above-described sections, the sections being arranged so that the ribs *k* and holes *n* of each are opposite. The sections are then fastened together by bolts *b*, passed through the holes *n* of the several sections. The outside or end sections are then secured to the shaft by keys or in any suitable manner.

In operation the coal to be broken is introduced between the revolving rolls, and is broken into small pieces. As there is opposed to each of the bars *c*, formed of the successive ribs *k*, a space communicating with the interior of the opposite roll, the broken particles of coal escape through said space as soon as reduced to the required size. Clogging of the rolls and excessive waste are thereby avoided. When any portion of the roll becomes broken or worn out, the sections forming that particular part are easily removed and new ones substituted.

I claim as my invention—

1. In a coal-breaker, the above-described improved roll-section, consisting of a thin annular ring, a central hub, a hole in said hub, arms connecting said ring and hub, and a series of tapering radial ribs projecting radially and laterally from the ring, and arranged to form spaces between the ribs, said spaces having their maximum or greater width toward the hub, for the purpose specified.

2. In a coal-breaker, a roll formed of a series of like roll-sections secured together side by side upon a central shaft, each of said sections consisting of a thin annular ring, a central hub, a hole in said hub, and a series of tapering radial ribs projecting radially and laterally from the ring, said sections being arranged so that their radial ribs form continuous longitudinal bars with spaces between them communicating with the interior of the roll, substantially as and for the purpose specified.

GEORGE R. ROOT.

Witnesses:
H. P. HOOD,
V. M. HOOD.