(No Model.) 2 Sheets—Sheet 1.

S. B. PRICE, Jr., C. E. MARTIN & B. PURSER.

ORE AND COAL CRUSHER AND SEPARATOR.

No. 479,018. Patented July 19, 1892.

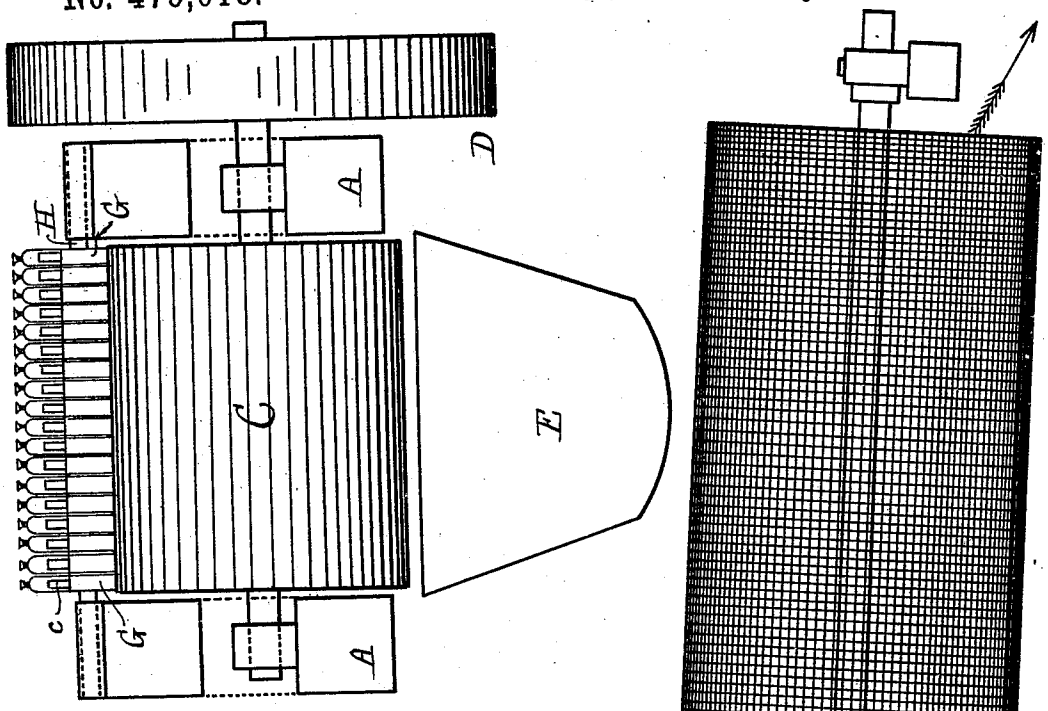


Fig. 3.

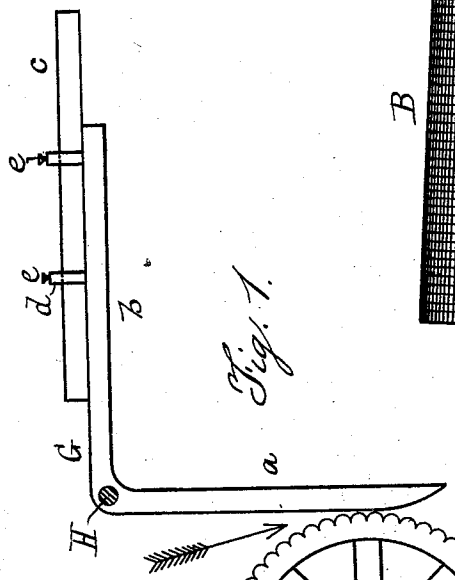
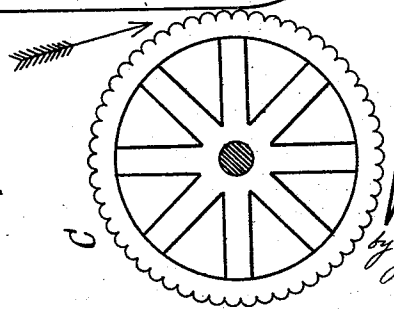


Fig. 1.



WITNESSES:

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Carleton E. Snell.

INVENTORS.

Samuel Barber Price Jr.,
Charles Edward Martin and
Benjamin Purser
by J. H. Soule and Co.,
their ATTORNEYS.

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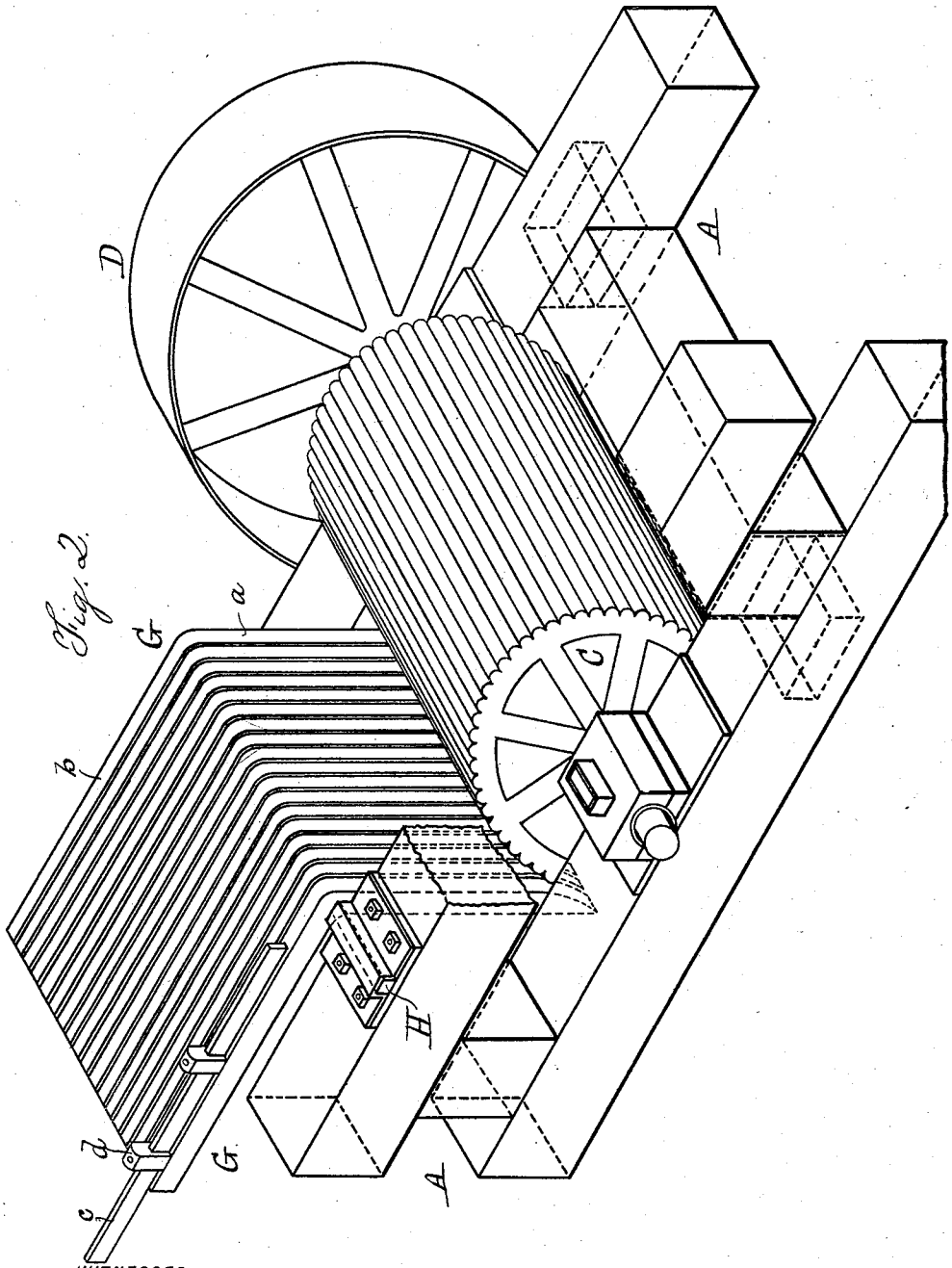

Fig. 2.

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UNITED STATES PATENT OFFICE.

SAMUEL BARBER PRICE, JR., CHARLES EDWARD MARTIN, AND BENJAMIN PURSER, OF BROOKWOOD, ALABAMA.

ORE AND COAL CRUSHER AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 479,018, dated July 19, 1892.

Application filed March 20, 1891. Serial No. 385,791. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL BARBER PRICE, Jr., CHARLES EDWARD MARTIN, and BENJAMIN PURSER, of Brookwood, in the county of Tuscaloosa and State of Alabama, have invented certain new and useful Improvements in Ore and Coal Crushers and Separators, of which the following is a specification.

The present invention relates more particularly to machinery for crushing bituminous or soft coal and for separating the slate therefrom, but is not limited thereto, since the machinery may be employed for crushing any heterogeneous soft ores and separating hard foreign matters therefrom.

The invention consists in the improved construction of a crusher for crushing the coal or ore, with which is employed a separator which separates out the foreign matters.

The principal feature of the crusher is that it only crushes and reduces the soft constituents and leaves uncrushed the hard constituents of the material passed therethrough—that is, if soft coal is being operated upon only the coal will be crushed, while the slate intermingled with the coal passes through the crusher without being crushed. This result is effected by the construction of the crusher.

The crusher consists of a rotating crushing-roller and a yielding bed of special construction co-operating therewith. This yielding bed is composed of a plurality of independently pivoted and weighted iron bars. These bars normally hang vertically and tangentially to the crushing-roller and nearly if not quite in contact therewith. These bars are so weighted that the soft materials in the heterogeneous mass under treatment are crushed by the conjoint action of the bars and the crushing-roller. If, however, hard materials pass between the roller and the yielding bed, they will not be crushed. As many of the pivoted bars as are encountered by the hard material swing back from the crushing-roller and allow the hard material to pass by the roller uncrushed. In case bituminous coal is being treated the coal will be crushed; but any slate in the coal, being much harder than the coal, will pass through between the crushing-roller and the yielding bed without being crushed. The bed composed of independently pivoted and swinging crushing-bars is of primary importance. Its great advantage is that, while permitting slate or other hard materials to pass through without being crushed, it will not at the same time permit the coal or other soft material to fall through uncrushed. Only those bars swing back which are encountered by the slate or other hard materials, the other bars retaining their operative crushing position relatively to the crushing-roller. The weight of the crushing-bars is adjustable, so that they may be regulated in accordance with the character of work to be done. The crushed soft materials and the uncrushed hard materials fall onto a chute, which conveys them into the interior of a rotary inclined screen. The mesh of this screen is of sufficient size to permit the passage of the crushed coal or other soft material, while the uncrushed hard foreign materials pass out through the tail end of the screen.

The construction of the improved crusher and separator is illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of the same. Fig. 2 is an isometric perspective of the crusher. Fig. 3 is a plan view of the crusher.

Referring to the drawings, A is the framework; B, the inclined rotary screen; C, the horizontal rotating crushing-roller, preferably corrugated, as shown; D, the drive-wheel thereof; E, the chute leading from the crusher to the interior of the screen, and G G the independently-swinging narrow crushing-bars co-operating with the crushing-roller C.

Each crushing-bar G is in effect an elbow-lever pivotally hung at its bend upon fixed shaft H. The vertical crushing-arm *a* of each bar hangs tangentially to the crushing-roller and nearly if not quite in contact therewith. The other arm *b* of each crushing-bar extends horizontally and serves to weight the bar G and to hold and maintain its crushing-arm toward the roller. The weight of each weighting-arm *b* is rendered adjustable by a longitudinally-sliding adjusting-bar *c*, which slides in guides *d d* on the arm *b* and is secured in any desired position thereon by set-screws *e*. For convenience of illustration, only one of the crushing-bars G is shown provided with

an adjusting-weight bar *c*. It will be understood, however, that each bar G is similarly equipped.

The width of the crushing-faces of the bars G should bear a proper relation to the character of material operated upon and the extent of reduction demanded. In crushing soft coal we have found that the crushing-faces of the bars should be about one and one-half inches in width. This insures the proper reduction of the coal and effects an almost perfect separation of the coal and slate, very little coal adhering to the slate which passes through.

This apparatus is particularly useful in crushing bituminous coal and freeing it from slate. No water at all is used, which is of very great advantage in preparing coal for coking purposes, since it prevents the ovens from chilling, and the coal can be crushed and screened as fine as may be desired.

We claim as our invention—

1. A coal and ore crusher consisting of a horizontal crushing-roller, in combination with a plurality of independently-movable narrow crushing-bars co-operating therewith and proportioned to the desired size of the crushed particles, as set forth, each crushing-bar consisting of an elbow-lever pivotally hung at its bend, one arm of which lever hangs vertically and tangentially to said roller and constitutes a crushing-arm and the other arm of which extends horizontally and at an angle to said crushing-arm and constituting a weighting-arm, and an adjusting weighting-bar adjustable longitudinally on said weighting-arm, substantially as set forth.

2. A coal and ore crusher consisting of a horizontal crushing-roller, in combination with a plurality of independently-movable narrow crushing-bars co-operating therewith and proportioned to the desired size of the crushed particles, as set forth, each crushing-bar consisting of an elbow-lever pivotally hung at its bend, one arm of which lever hangs vertically and tangentially to said roller and constitutes a crushing-arm and the other arm of which extends horizontally and at an angle to said crushing-arm and constitutes a weighting-arm, substantially as set forth.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

SAMUEL BARBER PRICE, JR.
CHARLES EDWARD MARTIN.
BENJAMIN PURSER.

Witnesses:
R. GEDALLETT,
W. L. DOVE.