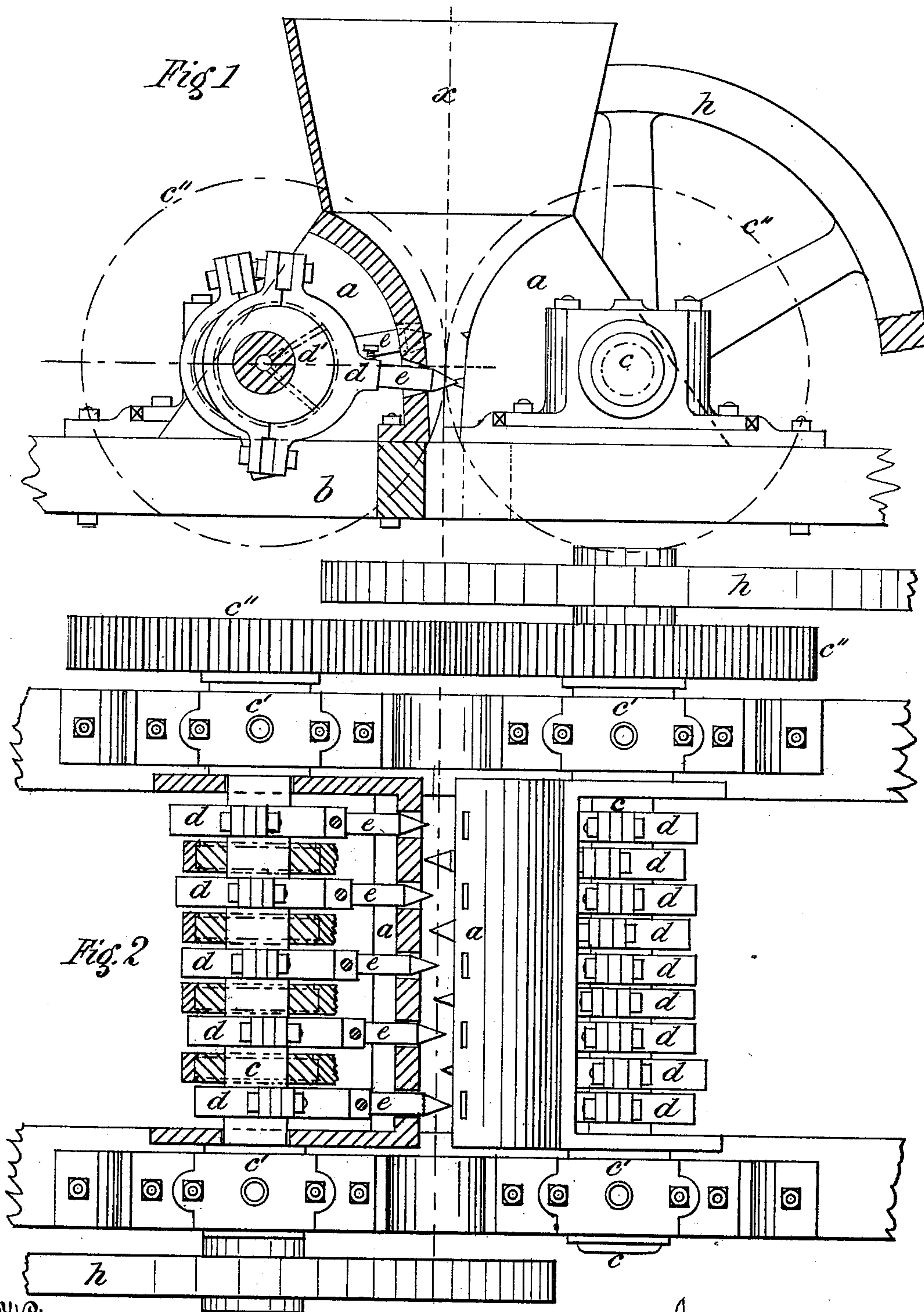


P. H. SHARP.  
Coal-Breaker.

No. 219,773.

Patented Sept. 16, 1879.



Witnesses;  
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# UNITED STATES PATENT OFFICE.

PHILIP HENRY SHARP, OF WILKESBARRE, PENNSYLVANIA.

## IMPROVEMENT IN COAL-BREAKERS.

Specification forming part of Letters Patent No. **219,773**, dated September 16, 1879; application filed June 5, 1876.

*To all whom it may concern:*

Be it known that I, PHILIP H. SHARP, of Wilkesbarre, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Breaking Coal and other Minerals, of which improvements the following is a specification.

As ordinarily constructed coal-breaking machines are composed, substantially, of two parallel rollers, the peripheries of which are studded with teeth, which break up the lumps of coal fed to and passing between the rollers. Such construction is objectionable in the regard that the crushing action of the rollers pulverizes the coal to a considerable extent and entails a corresponding amount of waste, and, with a view to the avoidance of such result, the rollers have in some cases been dispensed with and the coal broken by means of vibrating plates, each carrying a series of picks or breakers operating within a stationary hopper. An example of such mechanism will be found in the patent of Jacob Fox, No. 47,409, dated April 25, 1865.

It is the object of my invention to provide a coal-breaker which will be free from the wasteful crushing action of the roller-machine, and in which the splitting action of a series of reciprocating picks may be applied by simple, compact, and efficient mechanism.

To these ends my improvements consist in the combination of two stationary curved or inclined plates, each having one or more rows or series of apertures throughout its length, and two revolving shafts, each adjacent to and parallel with one of said stationary plates and carrying a series of eccentrics, each of which has a pick or breaker secured to its strap, the picks or breakers of each shaft projecting through the apertures of the adjacent stationary plate and being guided in their traverse thereby, so as to enable a direct application of power to be made within small compass and with a material reduction of parts. The improvements claimed are hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a side view, partly in section, of a coal-breaker embodying my improvements, and Fig. 2 a plan or top view, partly in section, of the same.

To carry out my invention, I provide a sub-

stantial frame, *b*, upon which I secure transversely two plates, *a a*, curved or inclined toward each other from their upper ends, to which a feed-hopper, *x*, is attached to their lower ends, between which there is a free opening or passage. One or more series of openings or apertures is formed in line horizontally in each of the plates, the apertures of each series of one of the plates being in the same horizontal plane as those of the corresponding series of the opposite plate; but the apertures of the two plates, respectively, are in different vertical planes, so that each aperture of one plate is opposite an imperforate portion of the other plate.

Two shafts, *c c*, are mounted in bearings *c'* on the frame *b* parallel with the plates *a a*, each shaft having firmly secured upon it a series of eccentrics, *d'*, provided with straps *d* of the ordinary form. A pick or breaker, *e*, is fitted to each of the eccentric-straps *d*, and secured therein by a key or set-screw, the picks *e* projecting through the apertures of the plates *a a* into the space between said plates, so as to be guided by the said apertures in the reciprocating motion which is imparted to them by their respective eccentrics, and in their traverse to act upon the coal which is supplied to the space between the plates through the feed-hopper *x*.

The several eccentrics which operate the picks in each series are fixed upon their shafts in different positions, respectively, so that when the pick at one end of the series is at the outer extremity of its traverse that at the other end shall be at the inner extremity, and vice versa, and that the remaining picks shall occupy corresponding intermediate positions. The eccentrics of the opposite shaft are similarly arranged, but in opposite direction, the object being that a substantially-equal distance shall be maintained between the points of the picks in each series in one side of the machine, and those of the corresponding series upon the opposite side, during their entire traverse.

A fly-wheel, *h*, is secured upon each of the shafts *c c*, which are geared together by spur-wheels *c'' c''*, and driven by the application of power from a suitable prime mover to either of them by a pulley, gear-wheel, or crank.

If desired, the graduated arrangement of teeth may be dispensed with in the several rows, and the teeth of each row be arranged to ad-



vance simultaneously, the advance of the bottom series (where only two rows from each plate are used) alternating with the upper series; also, if deemed desirable, the teeth of one series may be arranged to advance directly opposite those of the opposite side in the same horizontal plane instead of meshing with each other, as shown in the drawings.

In order to provide automatic lubrication for the eccentrics the shafts *c c* may be made hollow and have a series of radial holes drilled from their peripheries to their central cavities, each of which holes corresponds with a similar hole in the eccentric fitted over it, so that, the cavities of the shafts being filled with oil and their ends properly stopped, the oil will be fed outward by centrifugal force to lubricate the bearings of the straps on their respective eccentrics.

In the operation of the machine, the coal which is fed to the hopper *x* falls into the space between the plates *a a*, where it is subjected to the action of the reciprocating picks *e*, by which it is split into fragments of the desired size without being subjected to any crushing or grinding action and falls through the space between the plates into a suitable receiver be-

neath. In this operation the transmission of the applied power is direct, and corresponding simplicity of construction and economy, both in first cost and in maintenance, are attained by the avoidance of intermediate mechanisms.

I am aware that the use of vibrating or reciprocating picks in a coal-breaker is not new, and do not, therefore, broadly claim such device.

I claim as my invention and desire to secure by Letters Patent—

The combination, in a coal-breaker, of two stationary vertically curved or inclined plates, each of which is provided with one or more series of apertures or openings, two rotating shafts, each parallel to said plates and having a series of eccentrics fixed upon it, and a series of reciprocating picks or breakers secured to the straps of said eccentrics and projecting through the apertures of the plates into the intermediate space, so as to be guided by said plates and reciprocated by said eccentrics, substantially as and for the purpose set forth.

PHILIP HENRY SHARP.

Witnesses:

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