S. STUTZ.

2 Sheets—Sheet 1.

Ore-Crusher.

No. 203,794. Patented May 14, 1878.

Fig: 1.

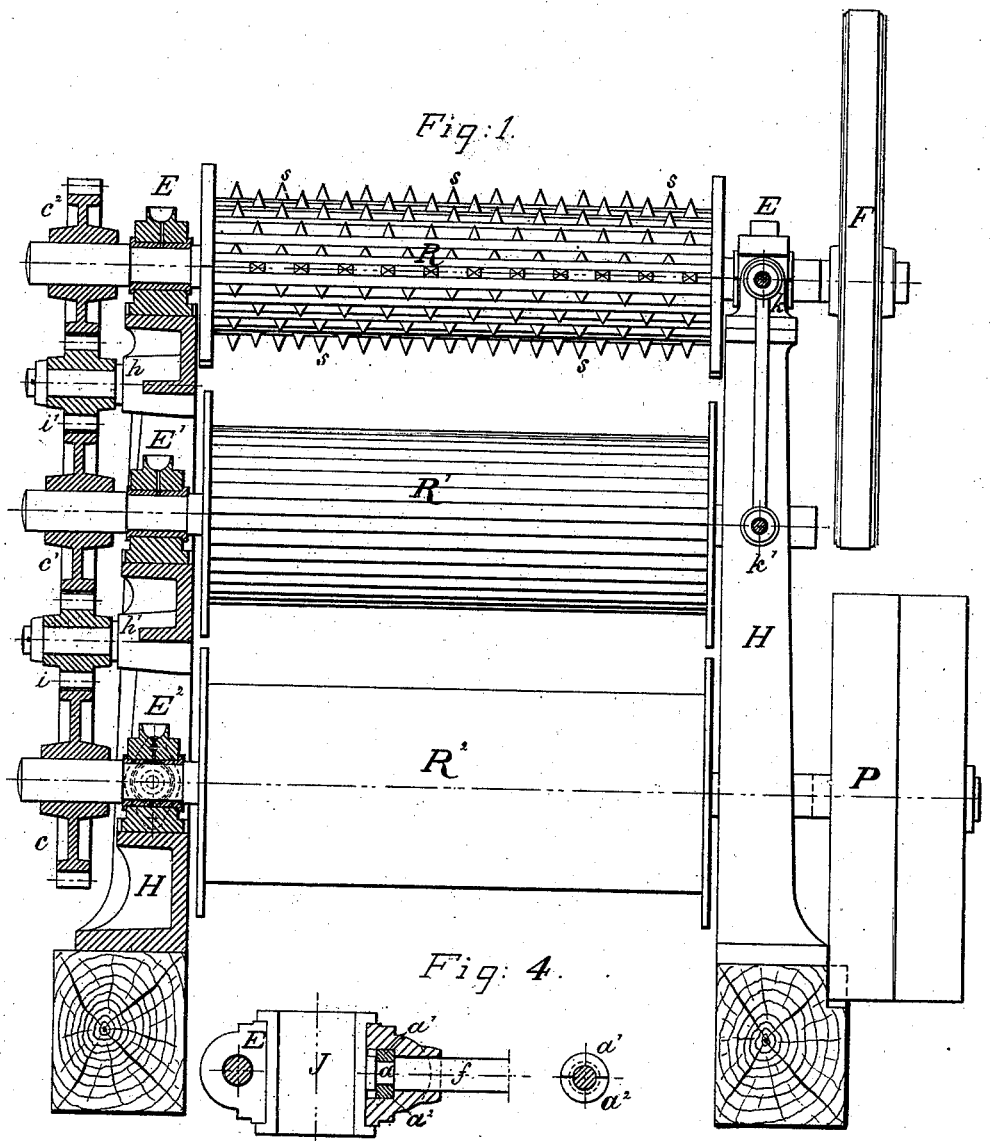
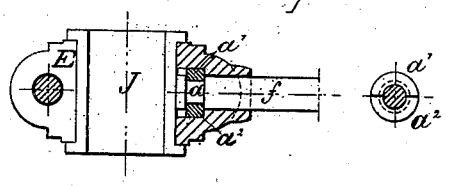


Fig: 4.



WITNESSES:

J. K. Thorne

J. K. Fairfield

INVENTOR.

Sebastian Stutz

S. STUTZ.

Ore-Crusher.

No. 203,794. Patented May 14, 1878.

Fig: 2.

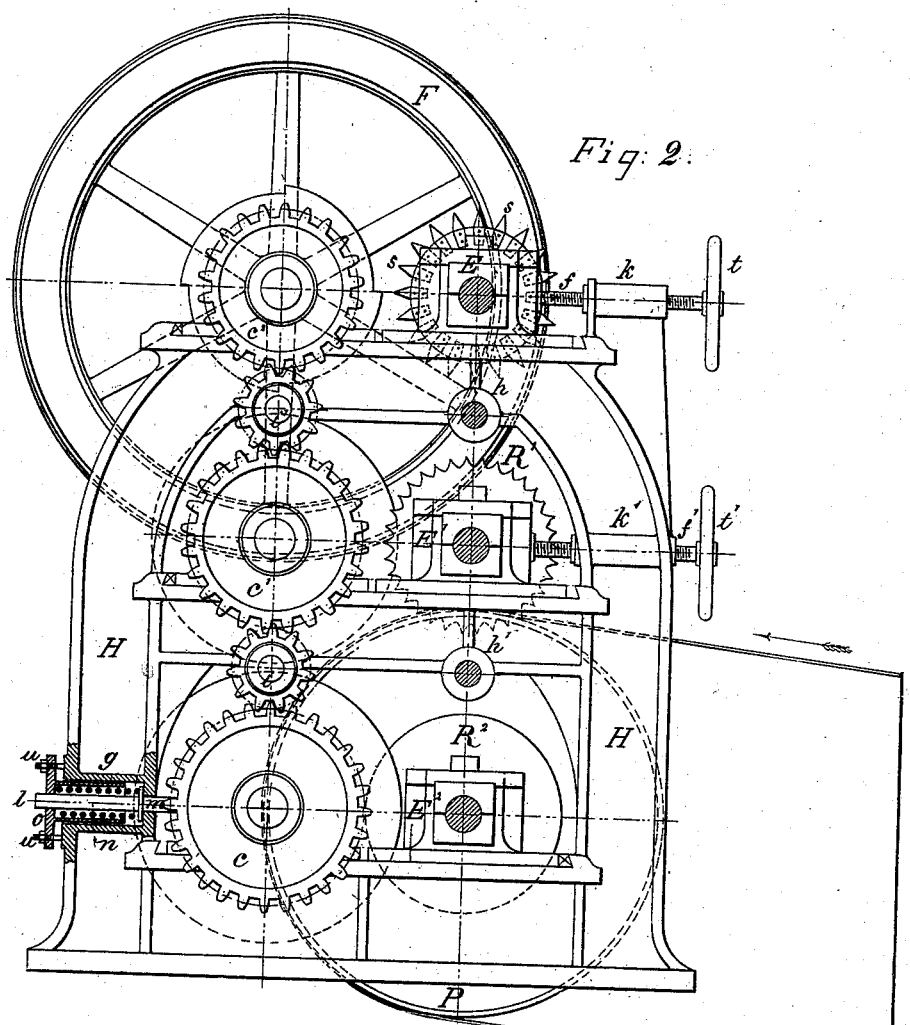
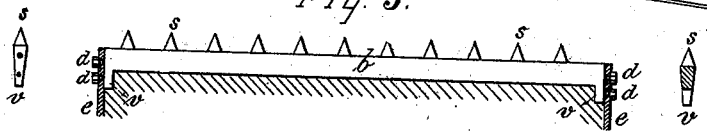


Fig: 3.



WITNESSES:
J. W. Thorne
J. K. Hatfield

INVENTOR:
Sebastian Stutz

UNITED STATES PATENT OFFICE.

SEBASTIAN STUTZ, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN ORE-CRUSHERS.

Specification forming part of Letters Patent No. **203,794**, dated May 14, 1878; application filed September 1, 1877.

To all whom it may concern:

Be it known that I, SEBASTIAN STUTZ, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Coal and Ore Breaking and Crushing Machinery; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a front elevation of the machine, partly in section; Fig. 2, an end view thereof; and Figs. 3 and 4 detached views, representing, respectively, the breaking-bars and the method of attaching the screw-stems to the pillow-blocks.

Similar letters of reference in the accompanying drawings denote the same parts.

This invention relates to improvements in that class of machines for breaking and crushing coal, coke, &c., in which several pairs of rolls are employed to reduce the materials to the requisite fineness; and it consists in the novel construction and arrangement of the various parts, as will be hereinafter specifically described, and pointed out in the claims.

In the accompanying drawings, H H represent the housings, in which are located three pairs of rolls, R R, R^1 R^1, and R^2 R^2. The upper rolls, R R, are designed to break up the large lumps of the material, and are provided with bars *b b b*, carrying numerous steel points or teeth, *s s s s*, so arranged that the teeth of each bar will stand opposite the spaces between the teeth of the adjacent bars. The bars are located in longitudinal grooves cast in the face of the rolls, and are held firmly in place by means of circular plates *e e* and screw-bolts *d d d*. (Shown in Fig. 3.) Should any of the bars become injured or worn out, they can be removed by unscrewing the bolts *d d d* at both ends, and new ones substituted in their places.

The rolls R^1 R^1, forming the second pair, are corrugated, and serve to break the larger pieces which have passed through the rolls R R to smaller ones, while the rolls R^2 R^2, having smooth sufaces, still further reduce the material to the required size.

Motion is communicated to one of the lower rolls R^2 from the pulley P, and is transmitted to the remaining rolls by means of cog-wheels *c c* c^1 c^1 c^2 c^2 and loose wheels or idlers *i i* and *i′ i′*. The object of interposing the idlers between the cog-wheels *c c* c^1 c^1 is to transmit to the upper rolls the same inside movement as that given to the lower pair. A still further advantage results from the use of the idlers in that a greater horizontal movement of the rolls one from the other is obtained, so that the openings between them may be increased or diminished without unmeshing the gears.

The housings are cast or provided with hubs *h h h′ h′*, to prevent the idlers from moving inward out of mesh with the pinions, as shown in Figs. 1 and 2.

The rolls of each pair R R and R^1 R^1 can be adjusted to and from each other, relatively to the quality of the material to be operated upon, by means of screw-stems *f f* and *f′ f′*, working in brass nuts, located in brackets *k k* and *k′ k′*, cast with the housings H, and connecting with pillow-blocks E E and E′ E′. The front ends of the screw-stems are each secured to the pillow-blocks in the following manner: A groove, *a*, is turned into the stems, and into this groove the two halves a^1 a^2 of a ring are placed. The journal-boxes J are then placed in position to receive the journals of the rolls. Hand-wheels *t t′* are provided at the outer ends of the stems for conveniently operating the latter.

g g are boxes located in the same horizontal plane with the smooth rolls R^2 R^2, and also cast with the housings H H. They are provided with rubber or steel springs *n n*, acting at one end upon the shoulder *m* of the stem *l*, and at the other end upon the bottom of a flanged sleeve, *o*, as shown in Fig. 2. The front ends of the stems *l* are fixed into the pillow-blocks E^2 E^2 in the same manner as the stems *f f*, above described, and transmit the pressure of the springs *n n* to the rolls. By screwing or unscrewing the nuts on bolts *u u*, the pressure upon the pillow-blocks E^2 E^2, and consequently upon the rolls R^2 R^2, may be increased or decreased to correspond to the density of the material.

To regulate the movement of the machinery, I provide one of the upper rolls R with a fly-wheel, F.

I claim as my invention—

1. In a coal or ore breaking machine, the combination of the upper set of toothed rollers

R, the intermediate set of corrugated or fluted rollers R^1, and the lower set of smooth rollers R^2, the three sets of rollers being arranged with the spaces between them in the same vertical plane, substantially as described, for the purpose specified.

2. The housings H H, having brackets *k k* and *k' k'*, spring-boxes *g g*, and hubs *h h* and *h' h'*, in combination with the rolls R R, R^1 R^1, and R^2 R^2 and cog-wheels *c c*, c^1 c^1 c^2 c^2, as described, and for the purpose set forth.

3. The combination of the stem *l*, having shoulder *m*, the spring *n*, flanged sleeve *o*, and bolts *u u* with the housings H H and pillow-blocks of the lower rolls R^2, as described, for the purpose set forth.

4. The combination of the screw-stems *f f* and *f' f'*, having grooves *a*, the half-rings a^1 a^2, and hand-wheels *t t'* with the pillow-blocks E E and E^1 E^1, as described, and for the purpose set forth.

5. The breaking-bars *b b b*, having points *s s s* and ears *v v*, the plates *e e*, and bolts *d d*, in combination with the rolls R R, as described, and for the purpose set forth.

6. A machine for breaking and crushing coal, coke, ore, &c., consisting, essentially, of one set of adjustable rolls for breaking the large lumps of material, a second set of adjustable rolls for reducing the material broken by the first set, and a third set of adjustable rolls for reducing the material received from the second set to the required size, substantially as described.

SEBASTIAN STUTZ.

Witnesses:
J. J. McCORMICK,
M. B. CONNOLLY.