

J. L. HILLER.
CRUSHING AND PULVERIZING MACHINE.
APPLICATION FILED JAN. 13, 1912.

1,020,501.

Patented Mar. 19, 1912.

2 SHEETS—SHEET 1.

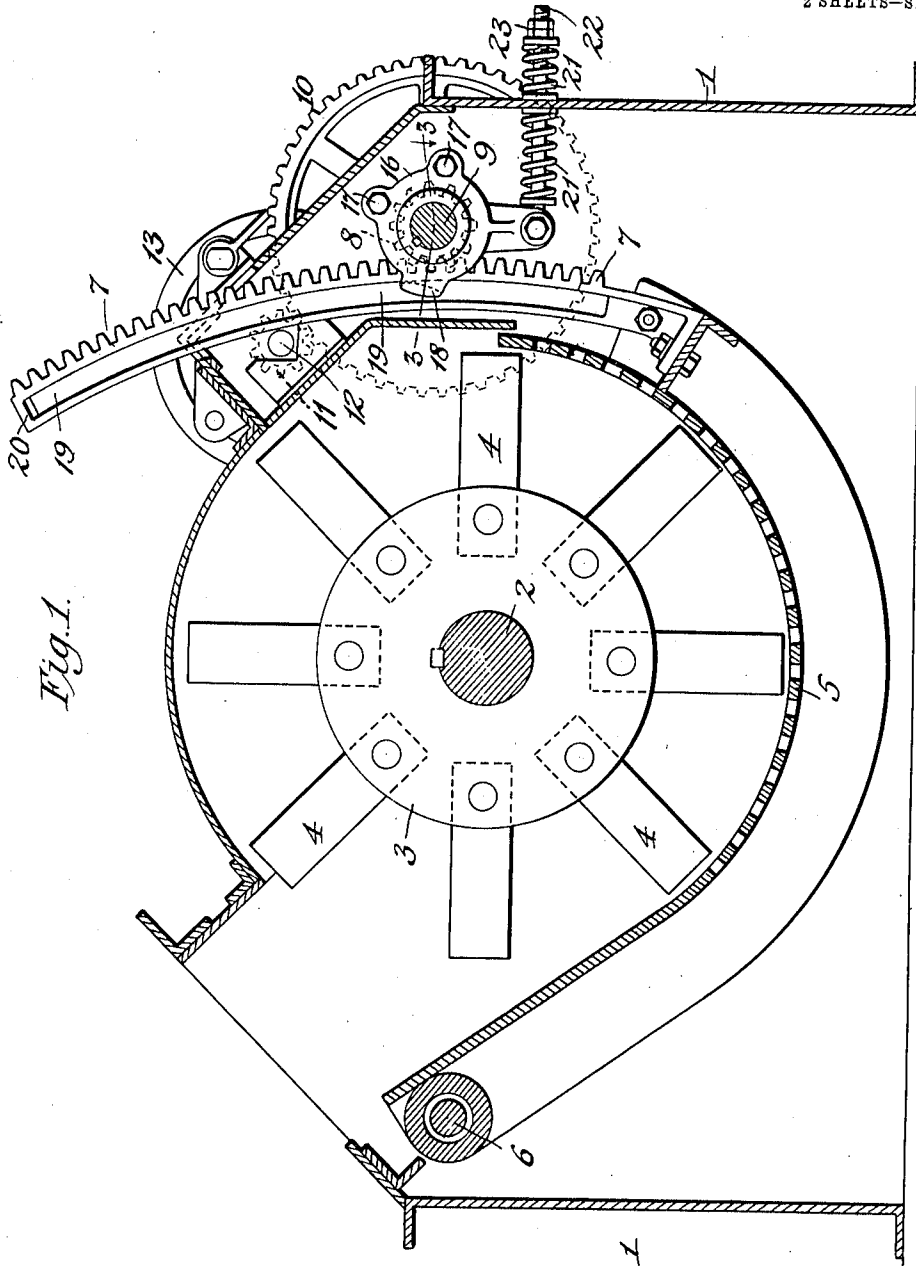


Fig. 1.

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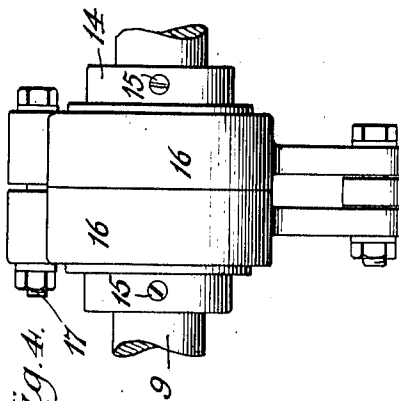
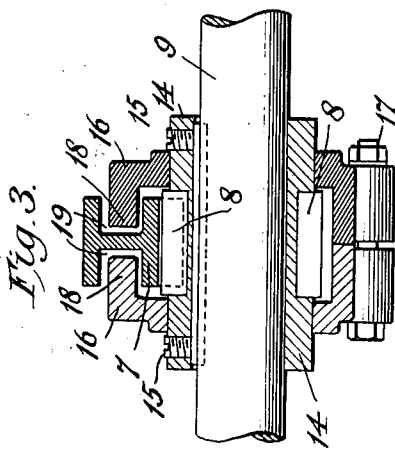
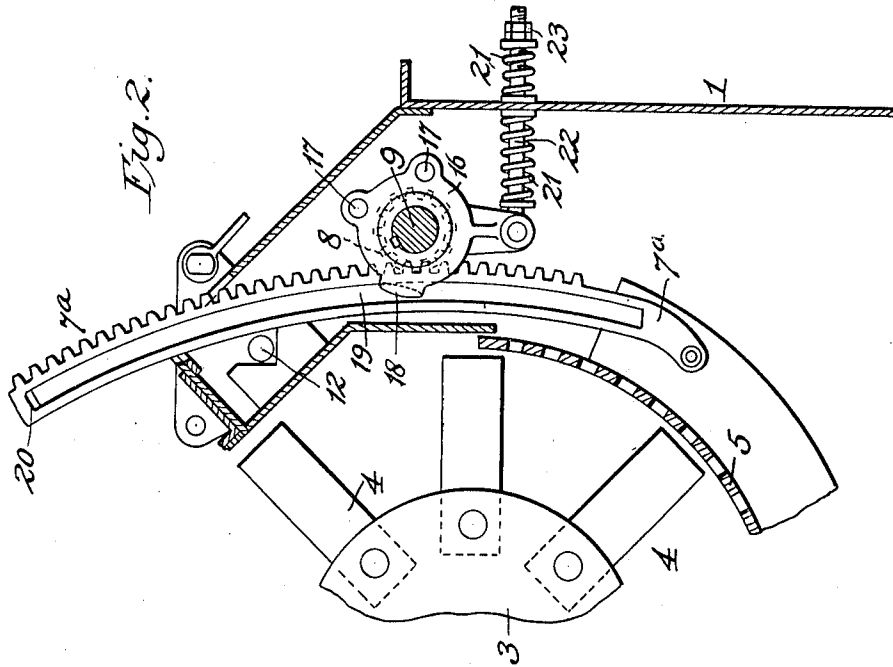
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UNITED STATES PATENT OFFICE.

JOSEPH L. HILLER, OF MATTAPOISETT, MASSACHUSETTS.

CRUSHING AND PULVERIZING MACHINE.

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Specification of Letters Patent.

Patented Mar. 19, 1912.

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To all whom it may concern:

Be it known that I, JOSEPH L. HILLER, a citizen of the United States, residing at Mattapoisett, in the county of Plymouth and State of Massachusetts, have invented new and useful Improvements in Crushing and Pulverizing Machines, of which the following is a specification.

This invention relates to improvements in crushing and pulverizing machines designed, chiefly, though not exclusively, for the crushing of coal, and in the accompanying drawing a machine suitable for that use is illustrated by way of example.

The invention has for its object to provide means for positively adjusting the pivoted grinding cage of the machine with relation to the hammers, to compensate for wear, and for other purposes.

The invention consists in a crushing machine provided with the cage adjusting mechanism hereinafter set forth and illustrated in the accompanying drawing, in which—

Figure 1 is a vertical sectional view, Fig. 2 a partial, vertical, sectional view of a modified arrangement, Fig. 3 a sectional view on the line 3—3 of Fig. 1, and Fig. 4 a detail elevation of the shock-absorber.

In the said drawings, the reference numeral 1 designates, generally, the casing of the machine, which may be of any desired construction and form, and in which is arranged the rotary hammer carrying shaft 2 to which is secured the hammer-carrying disks 3, to which the hammers 4 are pivotally connected as is usual and known in the art.

5 designates what is known in the art as the grinding-cage, pivotally mounted in the casing at one end 6, so that it may be adjusted to and from the hammers to compensate for wear, and for other purposes.

The free end of this cage 5 carries a vertically disposed segmental rack 7, the teeth of which are struck upon an arc that will permit the cage to be raised and lowered throughout any desired, contemplated or designed range of movement. The teeth of this segmental rack mesh with a rack wheel 8 carried by a shaft 9 suitably mounted in the casing, and it also carries a gear 10 of relatively large diameter and number of teeth which meshes with a gear 11 carried by the shaft 12, which is provided with a hand wheel 13 for manipulation of the

mechanism. In Fig. 1, the segmental rack 7 is shown carried by and rigidly connected to the free end of the grinding cage, and in Fig. 2 the corresponding rack 7^a which preferably, though not necessarily, is carried by and pivotally connected to the free end of said cage. As shown in Fig. 3, the rack wheel 8 has a hub 14 keyed to the shaft 9, and held thereto by means of set screws 15.

Surrounding the shaft 9 or the hub 14, in the illustrated example of the invention, and loosely mounted thereon, is a shock-receiver composed of two sections 16, held together by means of bolts and nuts 17, as will clearly appear upon inspection of Figs. 1, 3 and 4. This shock-receiver is provided with fingers 18 which enter longitudinal grooves 19 formed in the sides of the rack 7, and serve the dual function of a guide for the rack to hold the rack in mesh with rack-wheel 8 (this function being chiefly valuable when the rack is a pivoted one as in Fig. 2 of the drawing) and to limit the degree of adjustability of the cage by coming into contact with the closed ends 20 of the grooves 19, which serve as abutments.

While, as hereinbefore stated, in the practical use of such machines, wedging of coal between the edges of the cage and the casing of the machine prevents adjustment of the cage, except by some positive action of the cage-manipulating mechanism, yet when dislodgment of the impediment has been effected by the positive action, the weight of the cage is such that when free it responds to gravity with considerable force, and it is to avoid the shock which would otherwise occur that the shock-receiver is loosely mounted on the shaft 9, and to cushion the fall a suitable shock-absorber is combined with said shock-receiver, in the example of the invention shown this consisting of suitable shock-absorbing springs 21 arranged upon an arm 22 connected to the shock-receiver. The tension of the shock-absorbing springs may be regulated by means of the adjusting nuts 23.

In operation, when it is desired to raise or lower the cage, the hand wheel is manipulated and, through the medium of the speed gear 10, the cage may be moved positively in either direction, so that should coal or other refuse have become lodged between the edges of the cage and the casing of the machine the cage may, nevertheless, be manipulated. If, after such dislodgment of

any impediment to the movement of the cage, the latter should fall, under the influence of gravity, the shock which would otherwise be incident to the action, is relieved in the manner described, that is to say, by the partial rotation of the shock-receiver, cushioned by the shock-absorbing springs, when its fingers meet abutments 20 at the ends of the grooves 19.

10 Having thus described my invention, what I claim is:—

1. In a crushing and pulverizing machine, the combination with a casing, hammers arranged for operation therein, a pivoted grinding-cage, a vertically disposed rack 15 connected to the free end thereof, a rack-wheel in mesh with said rack, means for operating the rack-wheel to positively move the rack for adjustment of the cage, and 20 yielding means arranged in the path of movement of said rack for limiting the movement thereof.

2. In a crushing and pulverizing machine, the combination with a casing, hammers arranged for operation therein, a pivoted 25 grinding-cage a rack pivotally carried by the free end thereof, a rack-wheel in mesh with said rack, and means for holding said rack in mesh with said rack-wheel.

3. In a crushing and pulverizing machine, 30 the combination with a casing, hammers arranged for operation therein, of a pivoted grinding-cage, a rack connected to the free end of said cage and provided with abutments, a rack-wheel meshing with said rack, 35 and a shock-receiver and shock-absorber having parts to engage said abutments.

4. In a crushing and pulverizing machine, the combination with a casing, hammers arranged for operation therein, of a pivoted 40 grinding cage, a rack connected to the free end of said cage and provided with longitudinal grooves, the ends of which constitute abutments for limiting the degree of adjustment of said cage, a shaft carrying a 45 rack-wheel in mesh with said rack, a shock-receiver loosely mounted on said shaft and having fingers engaging the longitudinal grooves of the rack, and a shock absorber combined with said shock-receiver. 50

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH L. HILLER.

Witnesses:

JOHN PARKER,
HAROLD R. HANSON.