July 15, 1958 M. L. REEVES 2,843,331

JAWS FOR HINGED ROCK CRUSHERS

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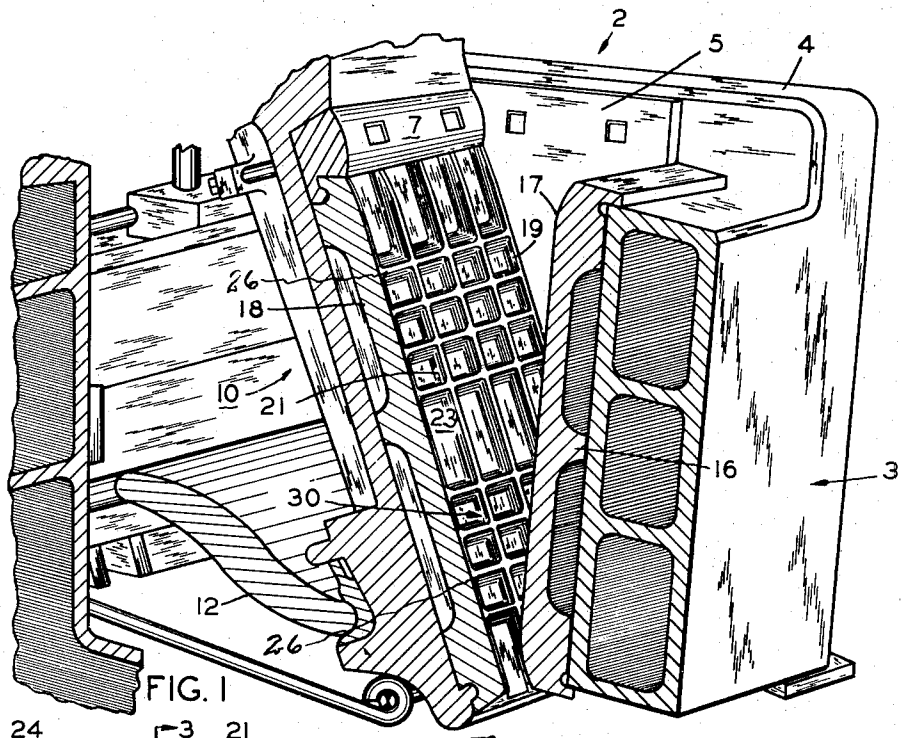

FIG. 1

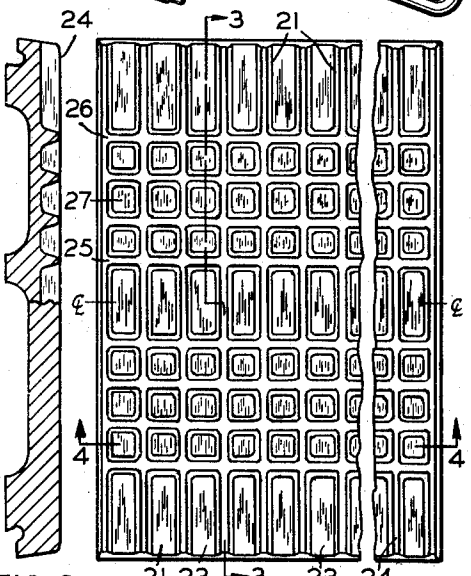

FIG. 3

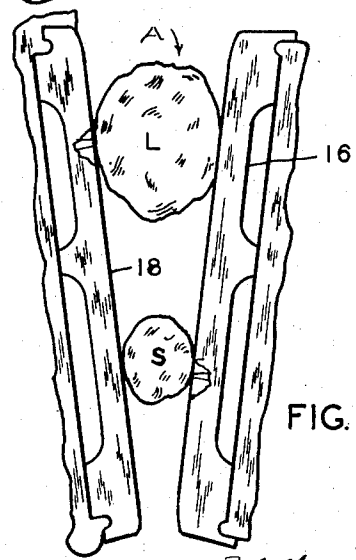

FIG. 5

FIG. 2

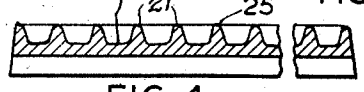

FIG. 4

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JAWS FOR HINGED ROCK CRUSHERS

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1 Claim. (Cl. 241—291)

This invention concerns replaceable jaws for hinged rock crushers.

This invention concerns particularly rock crusher jaws that are replaceably attached to the jaws of crushers which define a V-shape opening into which rock to be crushed is fed.

Heretofore the wear faces of crusher jaws of this type have been made with vertically extending corrugations. These corrugations were adapted to aid in feeding the rock through the crusher, to prevent lateral slipping motion of rocks caught between the jaws, and to keep the jaws free from the accumulating of fines. Where soft ores and brittle, irregular shaped minerals were to be crushed, as heretofore has been the principal use of such jaw crushers, plain jaw faces or vertically corrugated faces have been adequate.

With the advent of the use of crushed rock aggregates for various types of concrete mixtures the crushing of river run gravel has become important. In this industry the fines are first screened out through a grizzly and then the larger river run rocks and boulders are crushed and classified. Crushers used are preferably of the type herein concerned and are known as hinged jaw crushers. It has been found that the river run boulders are much harder than any of the common types of ores which were previously crushed by such types of crushers. In addition to this the boulders are water worn and comparatively smooth and are either of a generally round or generally oval shape. Boulders of this type tend to hang up in jaw crushers. Because of their smooth and rounded surfaces the boulders will lodge between the faces of the jaws and merely move up and down or "dance" with the motion of the crusher jaws. This "dancing" motion causes the jaws to wear excessively and forms shallow pits and depressions in their surfaces. The wear is so excessive that crusher jaws handling river run round boulders will last only a fraction of the time that they ordinarily last when used with broken rock from mines or the like. In order to provide crusher jaw liners with faces which will efficiently handle, crack and crush river run round boulders, or similar hard rounded substances, I have designed improved jaw liners which have for their objects—

Jaw faces having vertical corrugations to prevent lateral slippage of rocks to be crushed and having horizontal webs between the corrugations to prevent vertical slippage of rocks to be crushed between the faces of the crusher jaws;

Another object of the invention is to provide replaceable crusher jaws having both vertical and horizontal corrugations;

Still another object is to provide crusher jaw liners having faces with primary vertical grooves and ridges crossed by secondary horizontal grooves and ridges; said horizontal ridges being disposed throughout portions of the jaw where, due to "dancing" of uncrushed rocks, wear is most likely to occur;

Still another object is to provide replaceable liners for crusher jaws of the hinged type, having vertical grooves and ridges and horizontal ridges arranged in rows in areas

adjacent the throat of the crusher; said horizontal ridges being arranged so that the liners may be turned end for end in order to provide double wear areas on each jaw; the liners being formed to permit the adjustment and turning above mentioned.

I attain the foregoing objects by means of the construction, shape and formation and combinations of parts shown in the accompanying drawings, wherein—

Figure 1 is a perspective view of a jaw crusher including my improved type of jaw liner; said jaws being sectioned off to show interior construction;

Figure 2 is a plan view of a crusher jaw liner incorporating my improvements;

Figure 3 is a section thereof taken substantially on line 3—3 of Figure 2;

Figure 4 is an end elevation of said crusher jaw liner; and

Figure 5 is a semi-diagrammatic view showing the action of the jaws on rocks to be crushed.

Similar numerals refer to similar parts in the several views.

The jaw crusher **2** is provided with a stationary jaw **3** set into the frame **4** by usual methods including the lateral check plate **5**. Positioned oppositely to this jaw is a movable hinged jaw **10** which is supported on the toggle **12** at the bottom and attached to an eccentric pitman (not shown) at the top.

The stationary jaw **3** is provided with a liner **16** which incorporates a jaw face **17** formed according to my improvements, and the movable jaw **10** is provided with a liner **18** which also has a face **19** including the improvements, which are the subject matter of my invention.

Each jaw liner is substantially the same and they are therefore interchangeable. The jaw liners are locked into the backing portions of the jaws by means of bolt held wedges **7** and check plates **5**, above mentioned, which are positioned so that neither they nor the holding bolts are subjected to excessive wear due to the crushing action.

The liners each have vertical corrugations **21** on their faces **17** and **19**, respectively. These are composed of grooves **23** and ridges **24** having their meeting edges smoothly rounded as indicated by numeral **25**. Within the top and bottom end portions of each of the liners and symmetrically positioned relative to the center of each liner there are a series of horizontal ridges **26** separated by depressions **27** formed on each liner face. As shown in the drawing there are four rows of these horizontal ridges and grooves in each end portion of each liner above and below the center of each liner face as indicated by CL.

In the assembled crusher the lower horizontal cross ridged portions are disposed adjacent to each other within the throat **30** of the crusher where the principal amount of crushing takes place. Therefore, this is the area within which there is the greatest amount of wear. It is to be understood that when the faces of the liners are worn in this area the liners may be removed and turned end for end so that the worn horizontal ridged and grooved portion is repositioned in the upper portion of the crushing space and above throat **30**. In this way each set of jaw liners may be made to provide double service, since there is much less wear above the throat area.

In practice, boulders marked "A" are caught between the jaw faces and, instead of slipping up and down between the opening and closing jaws, as is the case with jaws with only vertical corrugations, the boulders are caught by the horizontal corrugations and held long enough so that they are cracked into irregular fragments. When once cracked the crushing proceeds the same as with ordinary irregular and angularly shaped rocks. The upper rows of horizontal corrugations (ridges and de-

pressions) are adapted to receive and hold large rounded rocks, such as "L," Figure 5, while the lower row of horizontal corrugations holds smaller rounded rocks "S." It has been found that, particularly with river run gravels and even with large rocks classified by grizzlies, the wear on this type of jaw is less than a smooth face jaw or a jaw with vertical corrugation only. When aggregates fed into the crusher include sharp faced irregularly shaped rocks as well as the rounded rocks that cause the excessive wear in the plain type liners, no difficulty is experienced in using this type of liners. On the other hand where the aggregates include a large proportion of rounded smooth rocks this type of jaw is far more effective both in providing quick cracking and quick crushing, and also in preventing wear on the face of the liners themselves.

Although I have shown the horizontal ridges **26** with edges in the same plane as the vertical ridges it is to be understood that they may be built out somewhat, as desired. This gives additional horizontal wear surface when needed on particularly tough rocks. When these built out extended parts are worn down level with the vertical ridges the metal of the horizontal ridges is work hardened and capable of resisting abrasion equally with the vertical ridges. Aggregates to be crushed which contain a large proportion of rounded water worn rocks are efficiently crushed by this type of construction.

All types of gravels, however, crush more quickly and with less wear on the jaw liner faces. The up and down motion called "dancing" is substantially eliminated by this type of jaw face.

I claim:

In a rock crusher of the type having a substantially vertical stationary jaw and a movable jaw mounted for swinging movement toward said stationary jaw, invertable jaw liners detachably secured to said jaws, said jaws and said jaw liners being formed substantially straight and said jaw liners each having a wear face formed by a plurality of upstanding equi-spaced parallel ridges, said spaced ridges forming vertically extending corrugations on said wear face to prevent lateral slippage of rocks introduced for crushing between said jaw liners, said wear faces each having a plurality of spaced apart parallel transversely extending horizontal ridges, said transverse ridges extending perpendicularly to said vertical ridges, said spaced transverse ridges forming horizontally extending corrugations on said wear face to prevent vertical slippage of rocks introduced for crushing between said jaw liners, said vertical ridges and said horizontal ridges having the edges thereof disposed toward the opposite jaw liner lying in a single flat plane, said vertical ridges and said horizontal ridges delineating a pair of upper and lower zones of generally square pockets, a central zone of vertically elongated rectangular pockets positioned therebetween and a zone of vertically elongated generally rectangular pockets at the upper and lower ends of said jaw liners with said last named pockets opening upwardly and downwardly respectively.

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