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H. H. POLZIN

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JAW CRUSHER

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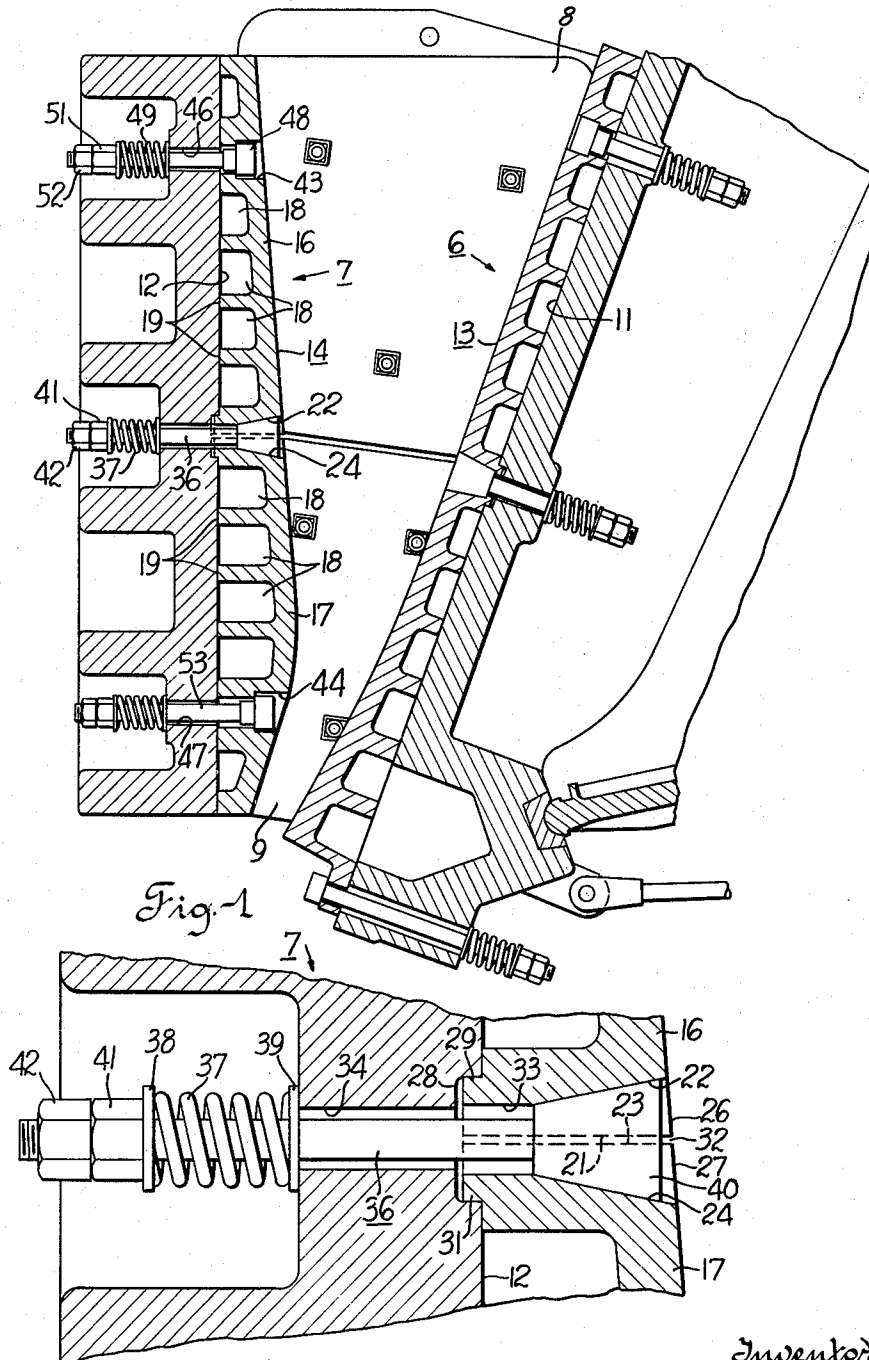


Fig. 1

Fig. 2

Inventor
 Henry H. Polzin
 By John P. Hines
 Attorney

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JAW CRUSHER

Henry H. Polzin, Brookfield, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

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This invention pertains in general to a jaw crushing machine and more particularly to the crushing plates and the means of attaching same to the crusher jaws.

Extremely large forces are developed between the crushing surfaces of the jaw crusher and the material being worked upon. Because of these large forces the crushing surfaces wear and require replacement from time to time. To this end the crushing surfaces or wear plates are releasably attached to the jaws of the crusher so they can be easily removed and replaced.

It has been found through experience that manganese steel is one of the better substances out of which to manufacture the wear plates because of its ability to withstand the large forces developed. Manganese steel is, however, quite expensive and has a tendency to flow under the large forces to which it is exposed in jaw crusher use. If the wear plates are not permitted to flow, they will buckle and prematurely rupture, thereby considerably shortening the useful life of the plates. It is, therefore, necessary to connect the wear plates to the crusher jaws in a manner to permit this flowing of the manganese steel; however, it also is necessary to rigidly connect the wear plates in a manner so that they do not shift bodily.

In view of the above requirements, it is a general object of this invention to provide a jaw crusher with wear plates wherein the plates are made in two sections and are rigidly connected to the crusher jaws so as to prohibit bodily shifting of either section, however, at the same time to permit a flow of each individual plate section.

A further object of the subject invention is to provide a jaw crusher of the hereinbefore described type with two wear plate sections wherein the adjacent end of each section is forced into rigid engagement with a flange on the jaw mounting face and wherein opposite ends of each section are connected to the jaw mounting face in a manner to permit flow of each plate section.

These and other objects of the subject invention will become more fully apparent as the following description is read in light of the attached drawing, wherein:

FIG. 1 is a cross section of a portion of a jaw crusher showing the wear plates attached to the crusher jaws; and

FIG. 2 is an enlarged partial cross section of the novel attaching means.

Referring to the drawing, it is the usual practice to provide one movable jaw generally designated 6 and one stationary jaw generally designated 7. Stationary end covers 8 and 9 may be provided at the transverse ends of the jaws to confine the material being worked upon between the crushing surfaces.

Each jaw 6 and 7 is provided with a mounting face 11 and 12, respectively, herein shown for purposes of illustration as being plane faces. Wear plates 13 and 14 are connected to the mounting faces 11 and 12, respectively. Since each wear plate is connected to each mounting face in a similar manner, only the wear plate 14 connected to the stationary jaw 7 will be described. Furthermore, although the configurations of the wear plates 13 and 14 are different, these configurations do not form a part of the invention and are herein shown concave and convex merely for purposes of illustration of one particular type which may be utilized.

Wear plate 14 is constructed of two independent upper and lower sections 16 and 17, respectively. Each plate section may be cast with voids 18 to reduce the cost of the plates. Here again it should be understood that these

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voids 18 do not form a part of this invention and are merely shown as a particular type of plate construction. The end surfaces of the ribs 19 which define the voids 18 are machined to conform to the configuration of the mounting face 12.

The end surface 21 of plate section 16 has a number of spaced beveled grooves 22 therein and the adjacent end surface 23 of plate section 17 has an equal number of complementary oppositely beveled grooves 24 therein. When assembled in position as shown particularly in FIG. 2, these complementary beveled grooves 22 and 24 form a series of wedge shaped openings divided by walls 26 and 27 of plate sections 16 and 17, respectively.

In accordance with the invention, a flange which may be in the form of a channel 28 is provided in the mounting face 12 substantially at the central portion thereof. Each wear plate section 16 and 17 is provided with a cooperating flange means which in this embodiment are in the form of depending transversely extending lips 29 and 31, respectively. These lips may extend the full transverse width of each wear plate section or may consist of a series of spaced lips.

When the wear plate sections are positioned in place on the mounting face 12, the lips 29 and 31 fit into the channel 28 and the adjacent end surfaces of the wear plate sections are spaced a slight distance from one another as for instance the space indicated 32. Furthermore, each wear plate section is provided with a series of spaced half bores which are alignable, when the plate sections are positioned for mounting to the face 12, to define bores 33 concentric with the wedge openings defined by the beveled grooves 22 and 24. These bores 33 are also in alignment with through bores 34 in the jaw 7.

A wedge bolt generally designated 36 is passed through the bore 33 defined by the half bores in each wear plate section and through the jaw 7. A relatively heavy coil spring 37 may be provided between a pair of spaced washers 38 and 39 encircling the portion of the bolt 36 on the side of the jaw opposite from the wear plate. The washer 39 bears against the under surface of the jaw and two nuts 41 and 42 may be threaded onto the end of the bolt to pull the bolt into resilient holding engagement with the wear plate sections. The head of the bolt is constructed in the form of a wedge 40 which is complementary to the wedge shaped opening so that as the bolt is pulled through the bores 33 and 34 by a tightening of the nut 41, a spreading force is exerted on each wear plate section forcing the lips 29 and 31 into engagement with the side walls of the channel 28. Such a connection provides a very solid attachment of each wear plate section to the mounting face so as not to permit any bodily shifting of either wear plate section. Furthermore, this type of connection permits easy removal of either wear plate section when it is necessary for replacement.

An additional series of bores 43 and 44 are provided adjacent the remote ends of each wear plate section. These bores are alignable with bores 46 and 47, respectively, in the crusher jaw 7. A mounting bolt 48 is passed through the bores 43 and 46 and is provided with a spring 49 and nuts 51 and 52 similar to the arrangement provided for the wedge bolts 36. A bolt 53 is also utilized in the same type of connection in the remote end of wear plate section 17. It should be noted that the bores 43, 46 and 44, 47 have a larger diameter than the diameter of the shank portions of the bolts 48 and 53, respectively. This permits each wear plate section to flow outwardly from the rigid connection between the lips 29 and 31 and the channel 28.

It can be seen from the above description that a very solid connection has been provided between the wear plate sections and the mounting face of the crusher jaws, however, one which permits easy removal of the wear

plates. Furthermore, by providing two individual wear plate sections, it is possible to replace only that section which needs replacement due to an excessive amount of wear.

Although only one embodiment of the subject invention has been herein shown and described, it will be apparent to those skilled in the art after reading this description, that other modifications are possible without departing from the spirit of the invention and it is intended that all such modifications as come within a reasonable interpretation of the appended claims be covered.

Having now particularly described and ascertained the nature of my said invention and the manner in which it is to be performed, I declare that what I claim is:

1. In a jaw structure for a crushing machine a support member having a mounting face thereon; a pair of wear plate sections positioned on said mounting face and having spaced oppositely beveled grooves in the adjacent end surfaces thereof, said beveled grooves being in facing alignment to form wedge shaped openings; first flange means on said mounting face defining a line substantially parallel to said end surfaces of said wear plates; cooperating flange means on each of said wear plate sections; and tapered locking means connected to said support member and engaging said beveled grooves to hold said plate sections to said support and force said cooperating flange means into engagement with said first flange means.

2. In a jaw structure for a crushing machine a support member having a mounting face thereon; a pair of wear plate sections positioned on said mounting face and having spaced oppositely beveled grooves in the adjacent end surfaces thereof, said beveled grooves being in facing alignment to form wedge shaped openings; first flange means on said mounting face defining a line substantially parallel to said end surfaces of said wear plates; cooperating flange means on each of said wear plate sections; tapered locking means connected to said support member and engaging said beveled grooves to hold the adjacent ends of said plate sections to said support and force said cooperating flange means into engagement with said first flange means; and holding means connecting the remote ends of said plate sections to said support in a manner to permit limited flow of said wear plate sections on said mounting face.

3. The jaw structure of claim 2 wherein said locking

means and said holding means are spring biased to resiliently connect said wear plate sections to said support.

4. In a jaw structure for a crushing machine a support member having a mounting face thereon; a first wear plate section having spaced beveled grooves in one end surface thereof; a second wear plate section having spaced beveled grooves in one end surface thereof, said wear plate sections being positioned on said mounting face with said beveled grooves in facing alignment to form spaced wedge shaped openings; groove means in said mounting face defining a line substantially parallel to said end surfaces of said wear plate sections; depending lip portions on the underside of each of said wear plate section extending into said groove means; and tapered locking means connected to said support member and engaging said beveled grooves to hold said plate sections to said support and force said lip means into engagement with said groove means.

5. In a jaw structure for a crushing machine a support member having a mounting face thereon; a first wear plate section having spaced beveled grooves in one end surface thereof; a second wear plate section having spaced beveled grooves in one end surface thereof, said wear plate sections being positioned on said mounting face with said beveled grooves in facing alignment to form spaced wedge shaped openings; groove means in said mounting face defining a line substantially parallel to said end surfaces of said wear plate sections; depending lip portions on the underside of each of said wear plate sections extending into said groove means; tapered locking means connected to said support member and engaging said beveled grooves to hold said plates to said support and force said lip means into engagement with said groove means; and holding means connecting the remote ends of said plate sections to said support in a manner to permit limited flow of said wear plate sections on said mounting face.

6. The jaw structure of claim 5 wherein said locking means and said holding means are spring biased to resiliently connect said wear plate sections to said support.

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