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ORE CRUSHER.

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952,046.

Patented Mar. 15, 1910.

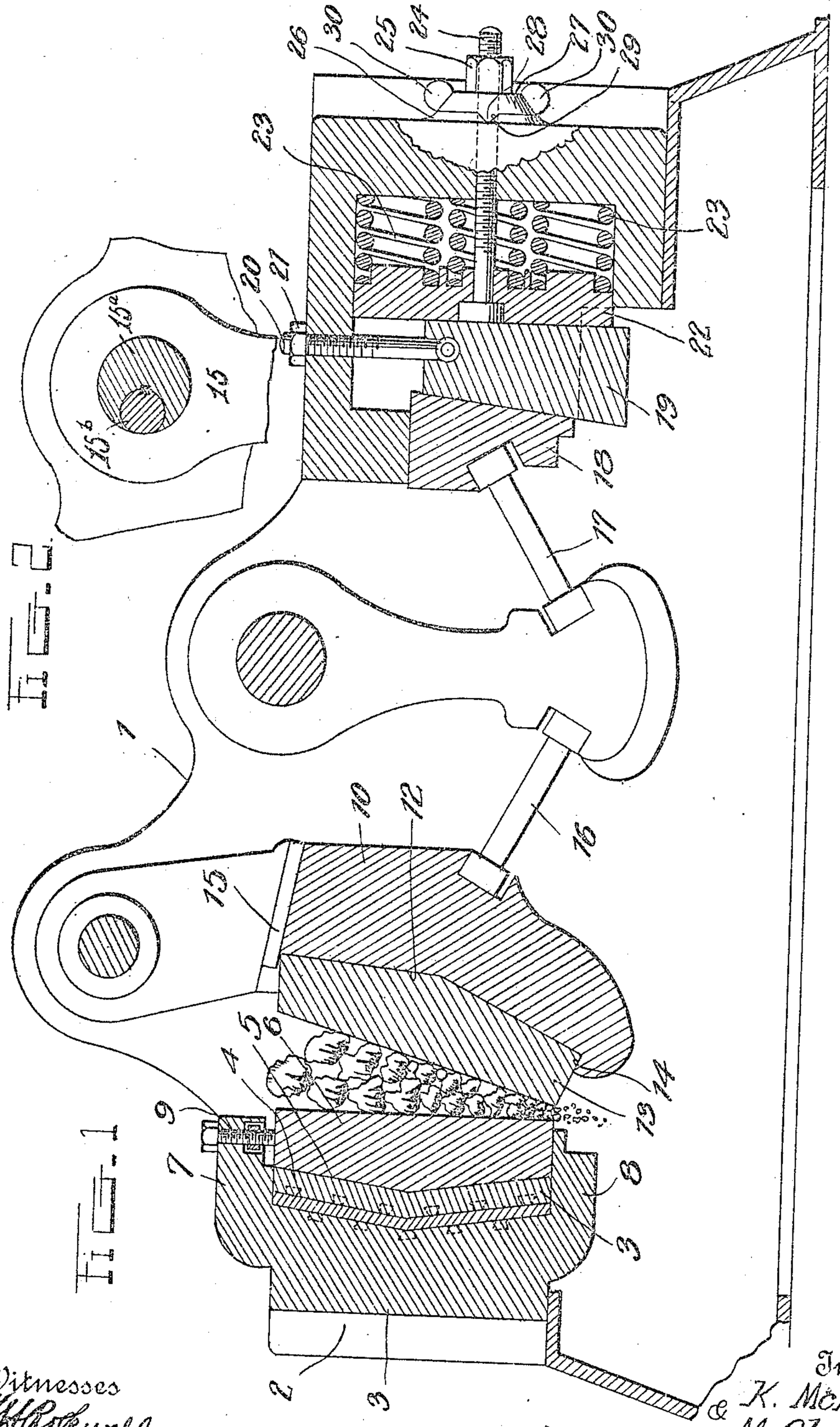

FIG. 2.

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UNITED STATES PATENT OFFICE.

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ORE-CRUSHER.

952,046. Specification of Letters Patent. Patented Mar. 15, 1910.

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To all whom it may concern:

Be it known that we, KENNETH McKENZIE and MERITT CHARLEY, citizens of the United States, residing at Anaconda, in the county of Deerlodge and State of Montana, have invented certain new and useful Improvements in Ore-Crushers; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in ore crushers.

The object of the invention is to provide a crusher having means whereby the shoes or dies in the crushing jaws are rigidly held in operative position and the strain of the shoes or dies removed from their supporting lugs and fastening devices.

A further object is to provide means whereby the jaws of the crusher will be permitted to open and allow any uncrushable material to pass through and thus prevent the breaking of the jaws or operative parts of the machine.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be described and particularly pointed out in the appended claim.

In the accompanying drawing is shown a vertical sectional view of a crusher embodying our improvements.

Referring more particularly to the drawing, 1 denotes the crusher frame, in the front end, 2, of which is formed a stationary jaw seat, 3. In the seat, 3, is babbitted a stationary jaw plate, 4. The seat 3 is in the form of an angular recess and the stationary jaw 4 is of angular construction to fit said recess and provided on its outer side with an angular seat, 5, to receive the angularly formed inner wall of a die or shoe, 6. The die, 6, is supported and held in position by upper and lower pairs of lugs, 7 and 8, in the upper pair, 7, of which are arranged set screws, 9, which are screwed into engagement with the upper edge of the shoe, 6, while the lower edge thereof rests upon the lower pair of lugs, 8. The lugs 7 and 8 are preferably formed by integral extensions on the front end, 2, of the frame. In the frame, 1, adjacent to the stationary jaw, 4, is arranged a hinged jaw, 10, on the inner side of which is formed an angular seat, 12, with which is adapted to be engaged the angular inner side of a movable shoe or die, 13, the lower end of which rests upon a lip, 14, formed on and projecting from the lower portion of the jaw, 10. The upper end of the die or shoe, 13, is fastened by a key, 13′, or other suitable fastening device.

By providing angular seats in the stationary and movable jaws to receive the angular rear or inner sides of the crushing shoe or dies, the latter will be rigidly held in the seats and prevented from moving up or down during the crushing operation, thereby relieving the supporting or fastening lugs of the stationary jaw and the supporting lip and fastening devices of the movable jaw of all strain due to the tendency of the shoes or dies to move up or down in their seats as occurs when the shoes are engaged with straight seats. The crushing of the ore between the dies or shoes will firmly press the same into engagement with their angular seats and thus prevent any vertical shifting movement of the shoes which are held by the angular engagement of their rear sides with the angular seats.

Mounted upon the eccentric 15^a which is keyed to the operating shaft 15^b is a pitman, 15, which may be made of the usual or any suitable construction and which is loosely engaged at its lower end with the inner ends of toggle levers, 16 and 17. The toggle lever 16 is loosely engaged at its outer end with the swinging jaw, 10, while the outer end of the toggle lever 17 is loosely engaged with an adjusting block, 18, having an inclined inner wall adapted to engage a similar wall of a second adjusting block, 19. The blocks 18 and 19 are arranged in the rear portion of the frame 1 and the upper end of the block 19 is connected to an adjusting bolt, 20, which projects upwardly through the frame and is provided with an adjusting nut, 21. The adjusting block 19 bears against a tension plate, 22, arranged in the rear portion of the frame, and between said plate, 22, and the adjacent wall of the end of the frame is disposed a series of coiled pressure springs, 23, the tension of which is exerted to yieldingly hold the blocks 18 and 19 in operative position. The tension of the springs 23 is regulated by an adjusting bolt, 24, arranged in said tension plate 22 and the rear end of the frame, as shown. On the outer end of the bolt, 24, is screwed an adjusting nut 25, between which

and a boss, 26, on the end of the frame is arranged a washer, 27, on the inner surface of which are formed oppositely disposed V-shaped lugs, 28, which are adapted to be turned into and out of engagement with V-shaped recesses 29, formed in the boss, 26. The washer 27 is provided with wings, 30, by means of which the same may be readily turned to engage and disengage the lugs 28 with the recess, 29. When the washer, 27, is turned to disengage the lugs, 28, from the recess 29, the plate 22 will be retracted against the pressure of the springs, 23, which will allow the swinging jaw, 10, and the operating parts connected thereto to give back or retract, thereby opening the jaws and allowing any foreign uncrushable material which may have fallen between the jaws to pass out, thereby preventing any injury to or breaking of the jaws or the operating parts of the machine, which might occur should the jaws be closed upon such substances. The arrangement of the springs, 23, and the tension plate 22 is also such that should the jaws be closed upon any uncrushable material, the parts will be forced back against the pressure of the springs and thereby prevent damage to the machine.

From the foregoing description, taken in connection with the accompanying drawing, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention, as defined in the appended claim.

Having thus described our invention, what we claim as new and desire to secure by Letters-Patent, is:

In an ore crusher, a stationary crushing jaw, a swinging jaw, crushing shoes carried by said jaws, an operating pitman, toggle levers operatively engaged with said pitman to actuate said swinging jaws, adjusting blocks engaged by one of said toggle levers, a tension plate engaged by said adjusting blocks, pressure springs to engage said tension plate, a retracting bolt connected to said tension plate to regulate the pressure of said springs, an adjusting nut on said bolt, a recessed boss on the end of the crusher frame, a washer arranged between said adjusting nut, and recessed boss and V-shaped lugs on said washer adapted to be turned into and out of engagement with the recess in said boss whereby the pressure springs and tension plate are retracted to release the operating mechanism, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

KENNETH McKENZIE.
MERITT CHARLEY

Witnesses:
D. Oswald Cohen,
T. P. Stewart.