June 19, 1923.

1,459,130

W. R. YOUNG

ROCK CRUSHER

Filed April 7, 1922

2 Sheets-Sheet 1

Fig. 1.

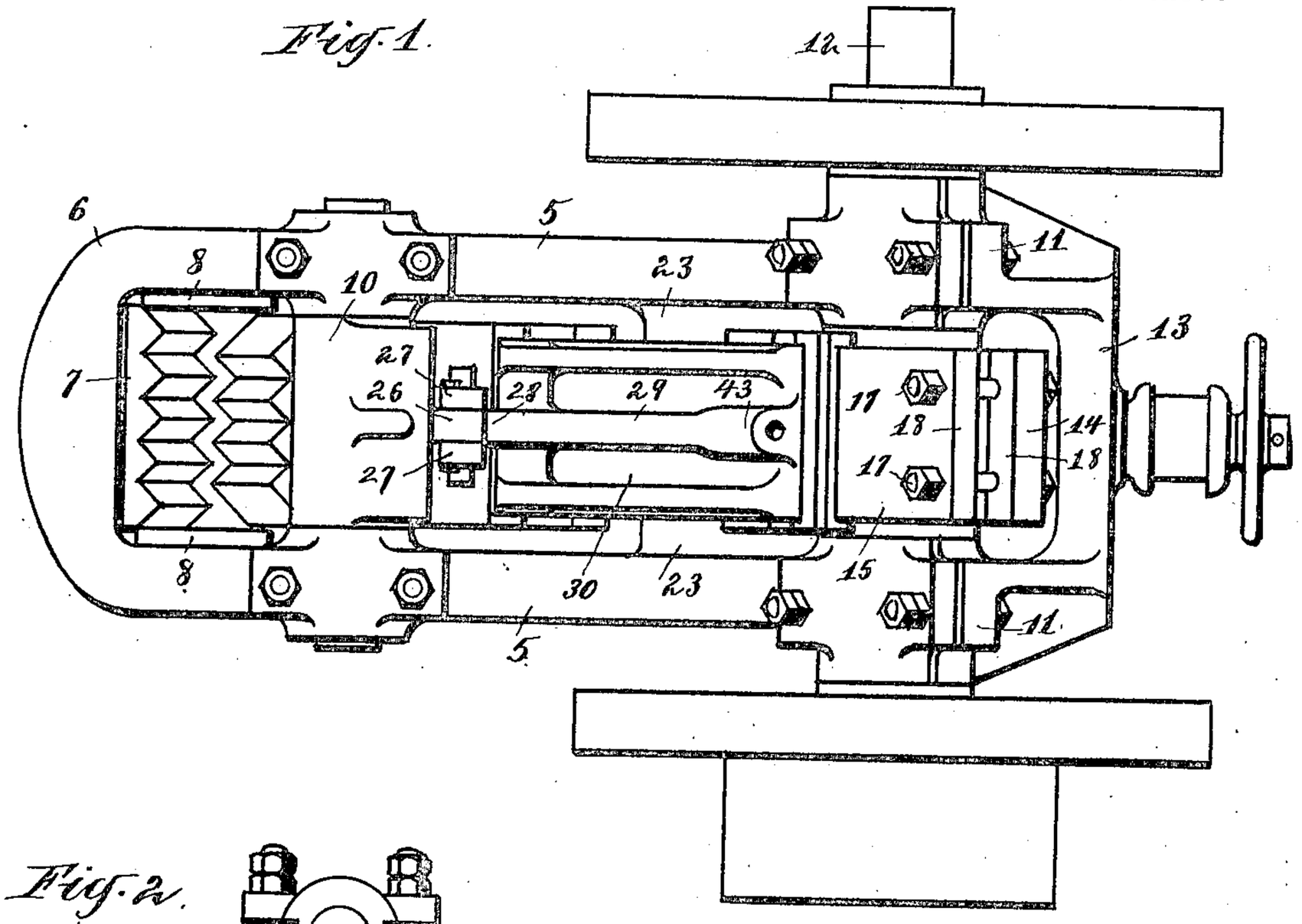
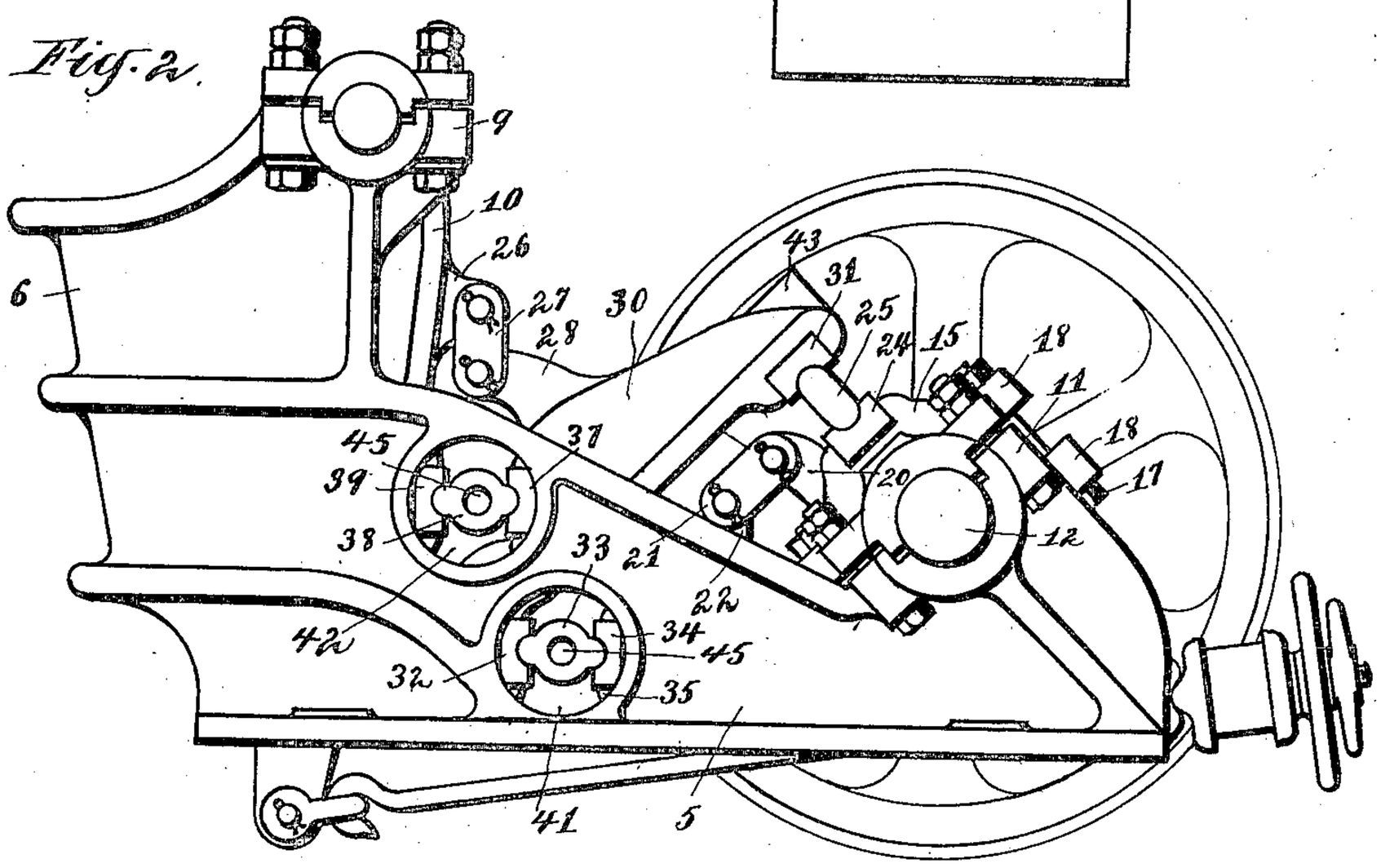


Fig. 2.



INVENTOR

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BY Charles R. Searle

ATTORNEY

June 19, 1923.

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2 Sheets-Sheet 2

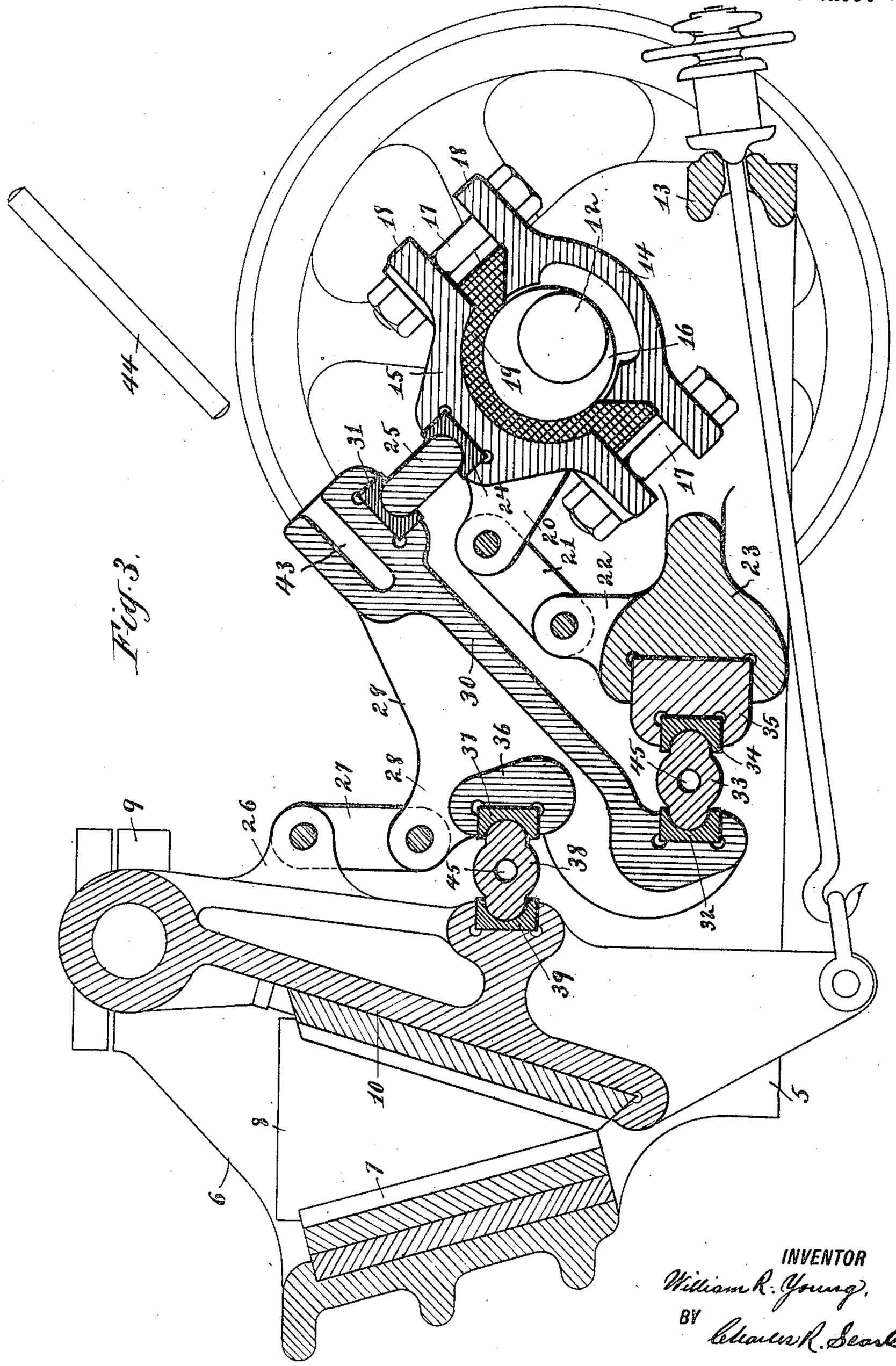

Fig. 3.

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Patented June 19, 1923. 1,459,130

UNITED STATES PATENT OFFICE.

WILLIAM R. YOUNG, OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF AND STANLEY K. GREENE, OF BROOKLYN, NEW YORK.

ROCK CRUSHER.

Application filed April 7, 1922. Serial No. 550,346.

To all whom it may concern:

Be it known that I, WILLIAM R. YOUNG, a citizen of the United States, residing in the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Rock Crushers, of which the following is a specification.

The invention relates to crushers of the swing jaw type, and the object of the invention is to provide a crusher of this character in which the strains are so distributed and transferred to the frame as to permit the latter, and other parts, to be light without lessening the strength or efficiency.

Another important object is to provide simple, inexpensively constructed means for transmitting motion from the eccentric shaft to the swing jaw, so disposed as to be easily assembled, and the wearing parts readily removed and replaced when required.

The invention consists in certain novel features and details of construction and arrangement by which the above objects are attained, to be hereinafter described and claimed.

The accompanying drawings form a part of this specification and show an approved form of the invention.

Figure 1 is a plan view of the improved crusher.

Figure 2 is a corresponding side elevation.

Figure 3 is a central vertical longitudinal section, on a larger scale than the preceding figures, showing the working parts, and partly in elevation.

Similar reference numerals indicate the same parts in all the figures.

The body of the frame is marked 5, having its front extended upwardly at 6 to receive the fixed jaw plate 7 and cheeks 8 and provide bearings 9 for the swing jaw 10. At the rear the frame is low and is provided with angularly disposed bearings 11 for the eccentric shaft 12, and carries a spring bar 13. The sides of the frame are joined at about the midlength by a strong transverse connection or abutment 23.

The eccentric 16 is inclosed in a motion block comprising a base portion 15 and cap 14 joined by bolts 17 extending through flanges 18 on each, and holds in place a removable bushing or lining piece 19 mounted between the portions 14 and 15 and lying against the eccentric 16 to receive the strains therefrom. The motion block is thus loosely mounted on the eccentric and carries a lug 20 projecting from the base 15 forwardly which is pivotally connected to links 21 pivoted at their lower ends on a lug 22 projecting upwardly from the transverse abutment 23 of the frame. The links maintain the block in position and hold it against rotation on the eccentric while permitting the slight upward and forward movement produced by the revolutions of the shaft 12.

In a groove along the upper portion or base 15 is mounted a thrust-plate bearing 24 receiving the rear edge of a thrust-plate 25 through which the thrust of the eccentric is transmitted, through means now to be described, to the swing jaw 10.

On the rear face of the swing jaw is a lug 26 to which a pair of depending links 27 are pivoted, connected pivotally at their lower ends to an arm 28 formed on a central strengthening rib 29 of an angular lever 30 which is thus freely suspended from the swing jaw and extends between the latter and the motion block. On its under face at the upper end is mounted a thrust-plate bearing 31 receiving the forward edge of the angularly arranged thrust plate 25, and on the rear face at its lower end is a bearing seat 32 receiving the forward edge of a horizontally disposed fulcrum plate 33 the rear edge of which is received in a seat bearing 34 mounted in a fulcrum block 35 seated in the abutment 23 referred to above.

Across the lever 30 and connecting its ribs, extends a bar 36 carrying a thrust-plate seat 37 receiving the rear edge of a horizontally arranged thrust-plate 38, the forward edge of which lies in a thrust-plate seat 39 on the rear face of the swing jaw 10 and which transfers the motion from the lever to the swing jaw.

The throw of the eccentric 16 moves the block 14, 15 toward the upper end of the lever and through the thrust-plate 25 rocks the lever on its fulcrum plate 33 and through the thrust-plate 38 the motion of the eccentric, reduced proportionately to the difference in length of the lever arm represented by the distance between 37 and 31 and that between 37 and 34, is transferred to the swing jaw with a corresponding increase in power.

It will be observed that the thrust-plate 25

lies in and practically parallel with the plane of its movement, and that the same is true of the fulcrum-plate 33 and thrust-plate 38, so that the rolling motion of these plates in their seats is reduced to a minimum with a corresponding lessening of wear.

The construction permits the rear portion of the frame to be low while maintaining the required strength thus reducing the weight of the crusher and affording access to the moving parts.

The closing movement of the swing jaw lowers the seat 39 slightly and the upward movement of the lever at the same time, aided by the swing of the links 27, correspondingly lowers the seat 37 so that the rolling motion of the plate 38 is very slight, and the effect of the links 21 induces a like condition in relation to the thrust-plate 25 and its seats. All the thrust-plates are narrow, due to the above described action, and therefore easily handled in removing and replacing; the plate 25 is above the frame and therefore readily accessible, and the openings 41 and 42 in the frame permit easy access to the plates 33 and 38 respectively.

At the reinforced upper end of the lever is a socket 43 adapted to receive a rod or bar, indicated at 44, to aid in handling the lever, and each thrust-plate is provided with an axial recess 45 at each end, adapted to receive a bar for like purposes.

The motion block 14, 15 is easily separated for the removal of a worn lining-piece 19 and the substitution of a new one when required.

All the parts not specifically described may be understood to be of the usual or any approved construction performing their functions in the usual manner.

I claim:—

1. A swing jaw lever-actuating means, and an interposed lever freely suspended intermediate its ends and supported independently of and actuated through said lever-actuating means to oscillate the jaw.

2. A swing jaw lever-actuating means, an interposed lever freely suspended intermediate its ends and supported independently of and actuated through said lever-actuating means to oscillate the jaw, a fixed abutment for the lower end of said lever, and means supported by said abutment for holding the lever-actuating means against rotation.

3. A swing jaw lever-actuating means, an interposed lever freely suspended intermediate its ends and supported independently of and actuated through said lever-actuating means to oscillate the jaw, a fixed abutment for the lower end of said lever, and pivotal means supported by said abutment for holding the lever-actuating means against rotation.

4. A swing jaw, a lever freely suspended intermediate its ends and arranged to oscillate said jaw, a shaft, an eccentric on said shaft, a motion block loosely mounted on and moved by said eccentric and arranged to move said lever, and pivotal means for holding said block against rotation.

5. A swing jaw, a lever freely suspended intermediate its ends and arranged to oscillate said jaw, a fixed abutment for one end of said lever, a shaft, an eccentric on said shaft, a motion block loosely mounted on and moved by said eccentric and arranged to move said lever, and pivotal means from said abutment to said block for holding the latter against rotation.

6. A swing jaw, a lever arranged to oscillate said jaw, a link suspending said lever intermediate its ends, an abutment for one end of said lever, a shaft, an eccentric on said shaft, and a motion block mounted on said eccentric and arranged to move the other end of said lever.

7. A swing jaw, a lever arranged to oscillate said jaw, a link suspending said lever intermediate its ends from said jaw, an abutment for one end of said lever, a shaft, an eccentric on said shaft, and a motion block mounted on said eccentric and arranged to move the other end of said lever.

8. A swing jaw, a lever arranged to oscillate said jaw, a link suspending said lever intermediate its ends, an abutment for one end of said lever, and means for moving the other end of said lever.

9. A swing jaw, a lever arranged to oscillate said jaw, a link suspending said lever from said jaw, an abutment for one end of said lever, a shaft, an eccentric on said shaft, a motion block loosely mounted on and moved by said eccentric, and a link from said abutment to said block for holding the latter against rotation.

10. A frame, a fixed jaw and a swing jaw therein, a lever suspended by links and arranged to oscillate said swing jaw, an eccentric, a motion block loosely mounted on and actuated by said eccentric and arranged to move said lever, and links connected to said block for holding said block against rotation.

11. A swing jaw, a lever suspended intermediate its ends on said jaw and arranged to oscillate the latter, an eccentric, and means actuated by said eccentric for moving said lever.

12. A frame, a fixed jaw and a swing jaw therein, a suspended lever oscillatorily mounted intermediate its ends, a thrust-plate between said swing jaw and lever, an abutment on said frame, a thrust-plate between said lever and abutment, and means for moving said lever, said frame having openings for the introduction and removal of said thrust-plates.

13. A frame, a fixed jaw and a swing jaw therein, a suspended lever, an eccentric, a motion block actuated by said eccentric, a thrust-plate between said motion block and lever and arranged to lie in the plane of the direction of motion from said motion block to said lever, and a thrust-plate between said lever and swing jaw and arranged to lie in the plane of the direction of motion from said lever to said swing jaw.

14. A frame, a fixed jaw and a swing jaw therein, a suspended lever, an eccentric, a motion block actuated by said eccentric, a thrust plate between said motion block and lever and arranged to lie in the plane of the direction of motion from said motion block to said lever, a thrust-plate between said lever and swing jaw and arranged to lie in the plane of the direction of motion from said lever to said swing jaw, an abutment on said frame, and an abutment plate between said lever and abutment and arranged to lie in the plane of the direction of motion from said lever to said abutment.

In testimony that I claim the invention above set forth I affix my signature.

WILLIAM R. YOUNG.