

April 22, 1924.

A. H. STEBBINS

1,491,431

CRUSHER

Filed June 15 1922

3 Sheets-Sheet 1

Fig. 1

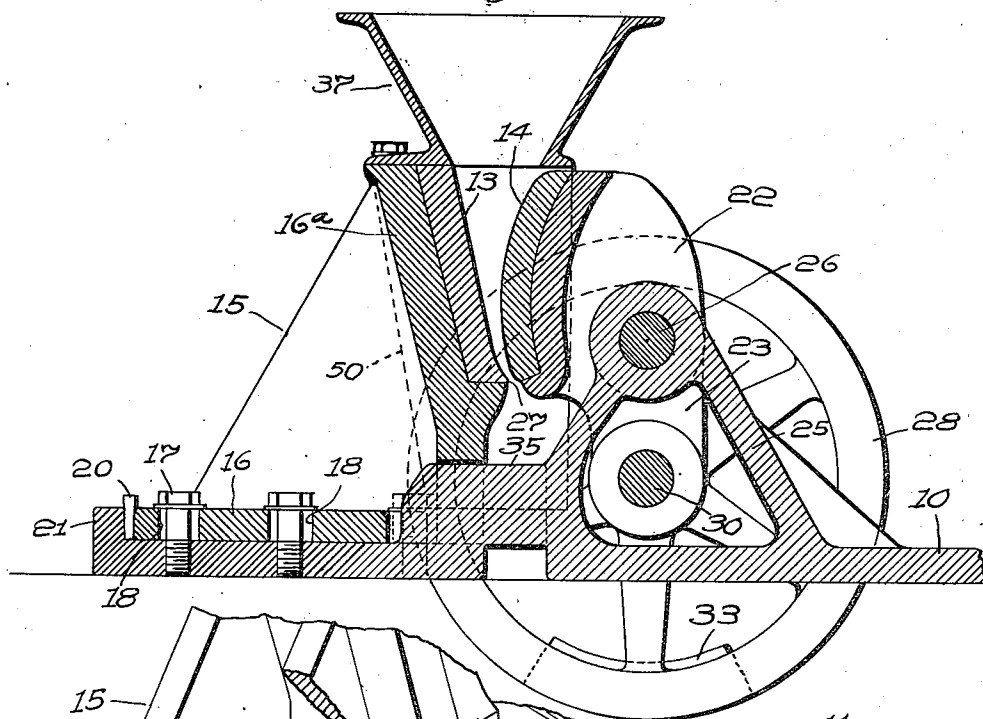
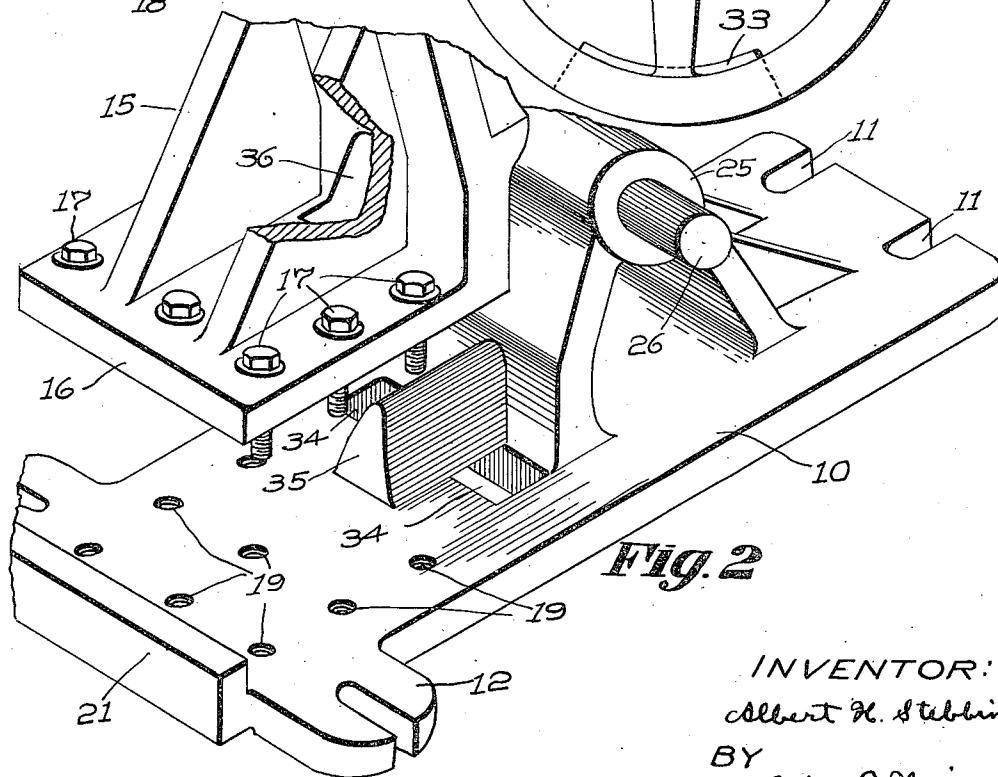


Fig. 2

INVENTOR:
Albert H. Stebbins
BY
Robt. P. Hains
ATTORNEY

April 22, 1924.

A. H. STEBBINS

1,491,431

CRUSHER

Filed June 15, 1922

3 Sheets-Sheet 2

Fig. 3

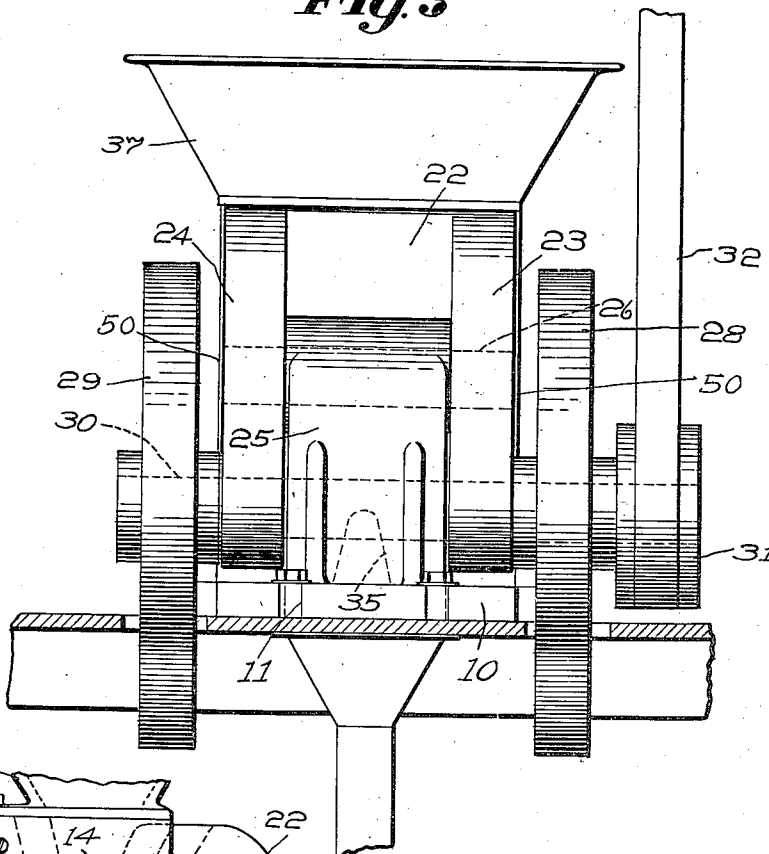
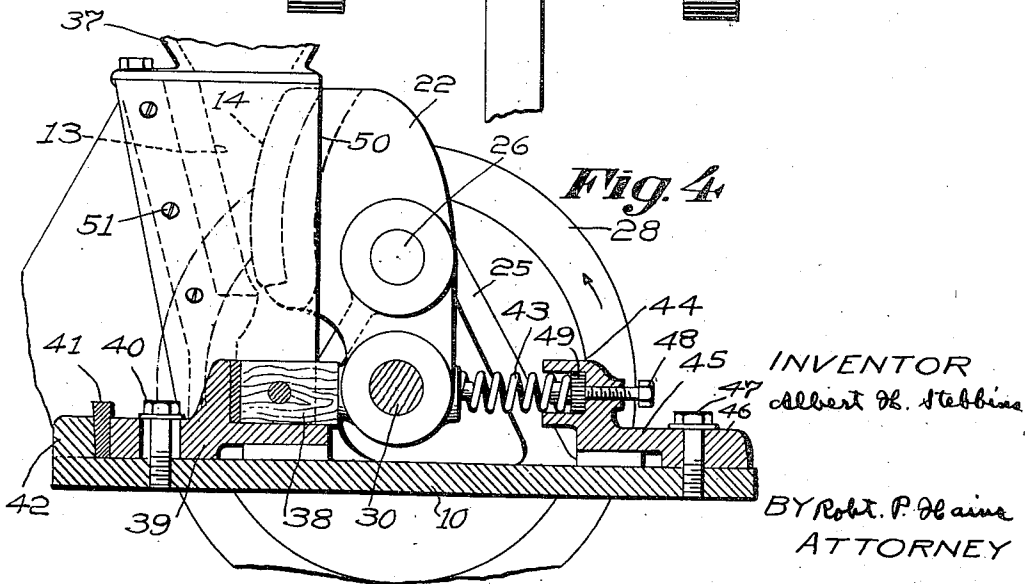


Fig. 4



INVENTOR
Albert H. Stebbins

BY Robert P. Haine
ATTORNEY

April 22, 1924.

A. H. STEBBINS

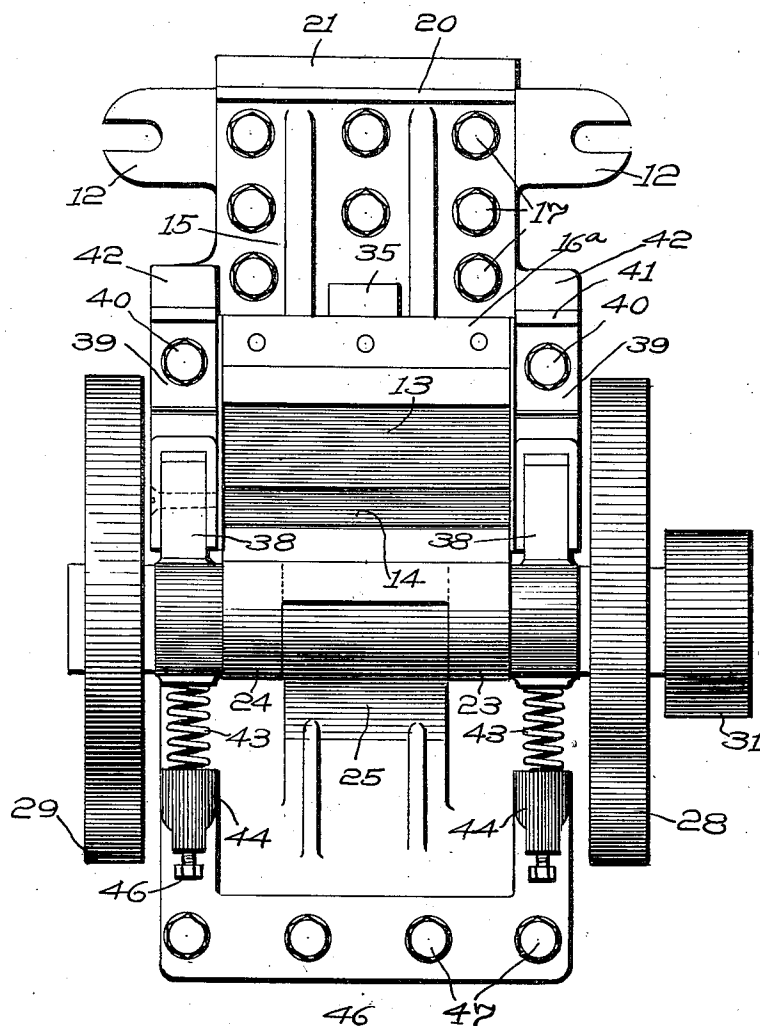
1,491,431

CRUSHER

Filed June 15, 1922

3 Sheets-Sheet 3

Fig. 5



INVENTOR:
Albert H. Stebbins

BY Robt. P. Haine
ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT H. STEBBINS, OF LOS ANGELES, CALIFORNIA.

CRUSHER.

Application filed June 15, 1922. Serial No. 568,383.

To all whom it may concern:

Be it known that I, ALBERT H. STEBBINS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented an Improvement in Crushers, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The invention to be hereinafter described relates to crushing machines.

One feature of the present invention resides in a crusher having a normally fixed jaw and a cooperating swinging jaw mounted for rocking movement about its pivotal mounting toward the fixed jaw with a movement lengthwise of the fixed jaw to produce a combined crushing and rubbing effect upon the materials being crushed.

Another feature of the invention resides in a crusher having a normally fixed jaw, and a cooperating swinging jaw, and having an unbalanced wheel connected to the swinging jaw to impart rocking movement thereto. The unbalanced wheel serves to operate the jaw without danger of breaking the crusher upon the introduction of an exceptionally hard piece of material between the jaws, since the unbalanced wheel is free to vary its path of movement under excess pressure.

Other features of the invention and novel combination of parts in addition to the above will be hereinafter described in connection with the accompanying drawings which illustrate one good practical form thereof.

In the drawings:

Fig. 1 is a vertical sectional view through a crusher constructed in accordance with the present invention;

Fig. 2 is a perspective view of parts of the crusher shown in Fig. 1;

Fig. 3 is an end view of the crusher shown in Fig. 1, looking to the left;

Fig. 4 is a vertical sectional view, showing a modification of the crusher of Fig. 1; and

Fig. 5 is a top plan view of the crusher of Fig. 4.

In the drawings the crusher is shown as having a base plate 10 provided at one end with bolt receiving notches 11 and adjacent the other end thereof are provided

lateral ears 12 having bolt receiving notches, so that the base plate may be firmly secured to any suitable support. The present crusher is provided with a normally fixed jaw 13 and with a swinging jaw 14. In the present case the crushing jaw 13 is supported by an angle plate or bracket 15 which is preferably secured to the base plate 10 for a limited amount of adjustment. The angle plate 15 consists of a horizontally extending portion 16 and an upwardly extending portion 16^a to which the jaw 13 is secured, and the angle plate may be adjustably secured to the base plate by bolts 17 which extend through relatively large holes 18 in the angle plate and have threaded engagement with the holes 19 of the base plate, the arrangement being such that the angle plate 15 may be adjusted to a limited extent lengthwise of the base plate 10, and a strip or wedge 20 preferably is inserted between the rear edge of the angle plate and the upwardly extending portion 21 of the baseplate, so that accidental sliding movement of the angle plate upon the base plate will be prevented.

The swinging jaw 14 is mounted upon a lever 22 which is pivotally supported for swinging movement towards and from the jaw 13, and in the present case the lever 22 consists of spaced downwardly extending arms 23 and 24 connected by a transversely extending portion to which the jaw 14 is secured, and the lever 22 is pivotally secured to a bracket 25 extending upwardly from the base plate 10. The arms 23 and 24 preferably straddle the upstanding bracket 25 and are pivotally secured thereto by a transversely extending shaft 26.

It is desirable that the swinging jaw 14 be supported so that it will move in a direction lengthwise of the jaw 13 as it moves toward this jaw so that the jaw 14 will exert a combined crushing and rubbing pressure upon the materials between the jaws. To this end the shaft 26 about which the movable jaw 14 swings is disposed substantially opposite the fixed jaw 13, as clearly shown in Fig. 1, and as a result of this construction the jaw 14 which is disposed between the jaw 13 and the shaft 26 will swing downwardly as it advances toward the jaw 13. It is also desirable that the swinging jaw 14 be provided with a convex crushing face, as shown in Fig.

1. to promote the combined crushing and rubbing effect above mentioned. The normally fixed jaw 13 preferably is provided with an outwardly extending lip 27 at its lower end which serves to increase the rubbing effect just mentioned and also to reduce the lumps being crushed to a predetermined size before they escape from the crushing jaws.

Various means may be provided for imparting rocking movement to the jaw supporting lever 22 and in the present case the spaced arms 23 and 24 of this lever extend downwardly below the lever supporting shaft 26, and unbalanced wheels 28 and 29 are carried by the lower portions of these arms. The unbalanced wheels preferably are rigidly secured to a transversely extending shaft 30 which is rotatably supported by the arms 23 and 24 and this shaft preferably extends through the bracket 25 so that it is free to move within the space between the upstanding legs of this bracket. A pulley 31 may be driven by a belt 32 to rotate the unbalanced wheels and the driving belt preferably extends in substantially a vertical direction from the pulley so that it will not appreciably interfere with the swinging movement of the lever 23. Weights 33 secured to the rim of the wheels, as shown in Fig. 1, may serve to unbalance the wheels.

The materials which have been crushed between the jaws 13 and 14 may be discharged from the crusher through an opening 34 formed in the base plate 10 and to prevent the base plate from being unduly weakened by the formation of this discharge opening, a reinforcing bar 35 may be provided which extends across the opening 34 and upwardly therefrom in the form of a wedge, so that the materials that fall upon the same will pass to either side thereof. The angle plate 15 is slotted as at 36 to clear this reinforcing bar. A hopper 37 secured to the upper portion of the angle plate 15 serves to deliver the materials to be crushed to the crushing jaws.

Rotation of the unbalanced wheels 28 and 29 will serve to move the jaw 14 towards and from the normally fixed jaw 13 with the desired crushing effect, but these unbalanced wheels will not exert sufficient force upon the jaw 14 to break the crusher should an exceptionally hard piece of material be introduced between the jaws. It will therefore be seen that the present means for operating the movable jaw prevents injury to the crusher.

In some cases it may be desirable to provide a stop for limiting the movement of the jaw 14 away from the jaw 13 and to this end in the modification shown in Figs. 4 and 5, adjustable stops 38 are provided which cooperate with the lower portion of

the spaced arms 23 and 24. These stops, which preferably are formed of wood, may be supported for a limited amount of adjustment by brackets 39 adjustably secured to the base plate 10 by the bolts 40, and wedges or strips 41 preferably are inserted between the rear ends of the brackets 39 and the upstanding portion 42 upon the base plate. It may be desirable to provide means for normally holding the jaws open, and to this end springs 43 are provided which act upon the downwardly extending arms 23 and 24 opposite the stops 38 and which serve normally to force the lower end of these arms against the stops. The outer end of these springs may be seated in sockets 44 formed in the brackets 45 provided upon the transversely extending bar 46. This bar may be secured to the base plate 10 by bolts 47 and the tension of the springs 43 may be varied by adjustment of the bolts 48 the inner ends of which operate against disks 49 contacting with the outer end of the coiled springs.

The crusher shown in Figs. 4 and 5 may be similar in construction and operation to that shown in Figs. 1, 2 and 3, except that the modification of Figs. 4 and 5 is provided with the additional means just described for limiting the outward movement of the jaw 14 and the springs for normally holding this jaw in its open position.

The materials being crushed may be prevented from escaping laterally between the jaws by securing side plates 50 to one of the jaws by screws 51 (see Fig. 4) so that these side plates will overlap the other jaw.

As a result of the construction herein disclosed a strong durable crusher is provided which consists of but few parts, and the unbalanced means described for operating the swinging jaw will operate the jaw without at any time subjecting it to a crushing force sufficient to damage the crusher.

What is claimed is:

1. A crusher comprising in combination, a normally fixed jaw, a swinging jaw mounted for rocking movement toward and from the fixed jaw, and an unbalanced wheel mounted to impart its vibratory movement to the swinging jaw to move the swinging jaw toward and from the fixed jaw.

2. A crusher comprising in combination, a normally fixed jaw, a jaw supporting lever pivotally mounted between its ends for swinging movement toward and from the fixed jaw, and an unbalanced wheel mounted upon a portion of the lever remote to the fixed jaw and operable to rock the lever relative to the fixed jaw by the unbalanced rotation of the wheel.

3. A crusher comprising in combination, a normally fixed jaw, a jaw supporting lever pivotally mounted between its ends for swinging movement toward and from the

fixed jaw and having a jaw supporting arm extending from said pivot toward the fixed jaw and a second arm extending from the pivot away from the fixed jaw, and a shaft rotatably supported by said second arm and provided with unbalanced means operable upon rotation of the shaft to rock the lever toward and from the fixed jaw with crushing effect.

4. A crusher comprising in combination, a normally fixed jaw, a jaw supporting lever pivoted between its ends and having an arm extending downwardly from the pivot, and an unbalanced wheel mounted upon said downwardly extending arm and operable to rock the lever about its pivot toward and from the fixed jaw with crushing effect.

5. A crusher comprising in combination, a normally fixed jaw, a jaw supporting lever pivotally mounted for rocking movement toward and from the fixed jaw, a shaft rotatably supported by said lever and provided with unbalanced means adapted to vibrate the lever upon rotation of the shaft to move the swinging jaw toward and from the fixed jaw with crushing effect.

6. A crusher comprising in combination, a base plate, an angle plate having a horizontally extending portion adjustably secured to the base plate and an upstanding portion for supporting a crushing jaw in its adjusted position, an upstanding bracket positioned in spaced relation to said jaw, a lever provided with spaced downwardly extending arms that straddle the bracket, a shaft for pivotally securing the arms to the bracket, a jaw upon said lever and movable thereby toward and from the first-mentioned jaw

with crushing effect, and means for imparting rocking movement to the lever.

7. A crusher comprising in combination, a normally fixed jaw, a swinging jaw pivotally mounted for swinging movement and having spaced arms extending downwardly from the pivot to actuate the jaw, and an unbalanced wheel rotatably supported by said arms to rock the jaw back and forth by the unbalanced rotation of the wheel.

8. A crusher comprising in combination, a normally fixed jaw, a swinging jaw pivotally mounted for swinging movement toward and from the fixed jaw, an unbalanced wheel connected to the swinging jaw to rock it by the unbalanced rotation of the wheel, and an adjustable stop for limiting the rocking movement of the swinging jaw.

9. A crusher comprising in combination, a normally fixed jaw, a swinging jaw pivotally mounted for swinging movement toward and from the fixed jaw, an unbalanced wheel connected to the swinging jaw to rock it by the unbalanced rotation of the wheel, and an adjustable stop for limiting the rocking movement of the swinging jaw away from the fixed jaw.

10. A crusher comprising in combination, a normally fixed jaw, a swinging jaw pivotally mounted for swinging movement toward and from the fixed jaw, an unbalanced wheel connected to the swinging jaw to rock it by the unbalanced rotation of the wheel, and a spring for normally holding the movable jaw in the open position.

In testimony whereof, I have signed my name to this specification.

ALBERT H. STEBBINS.