

C. G. BUCHANAN.
CRUSHING MACHINE.
APPLICATION FILED DEC. 27, 1907.

1,024,497.

Patented Apr. 30, 1912.

2 SHEETS—SHEET 1.

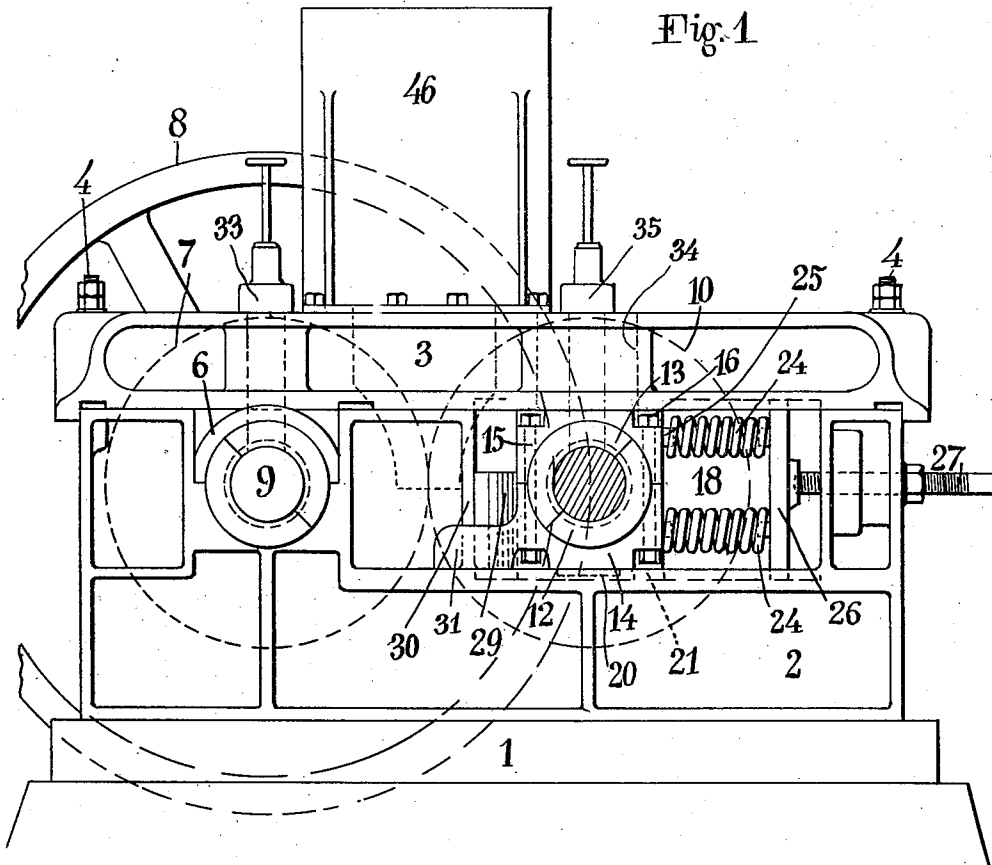
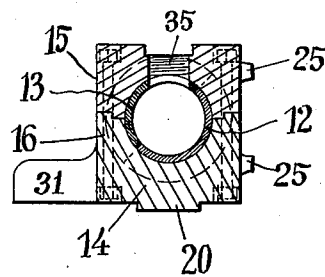


Fig. 5



Witnesses
Edmund O. Dubocq.
Geo. W. Kerr.

Inventor
Charles G. Buchanan,
By his Attorneys
Edwards, Sager & Wooster.

C. G. BUCHANAN.
CRUSHING MACHINE.
APPLICATION FILED DEC. 27, 1907.

1,024,497.

Patented Apr. 30, 1912.

2 SHEETS—SHEET 2.

Fig. 2

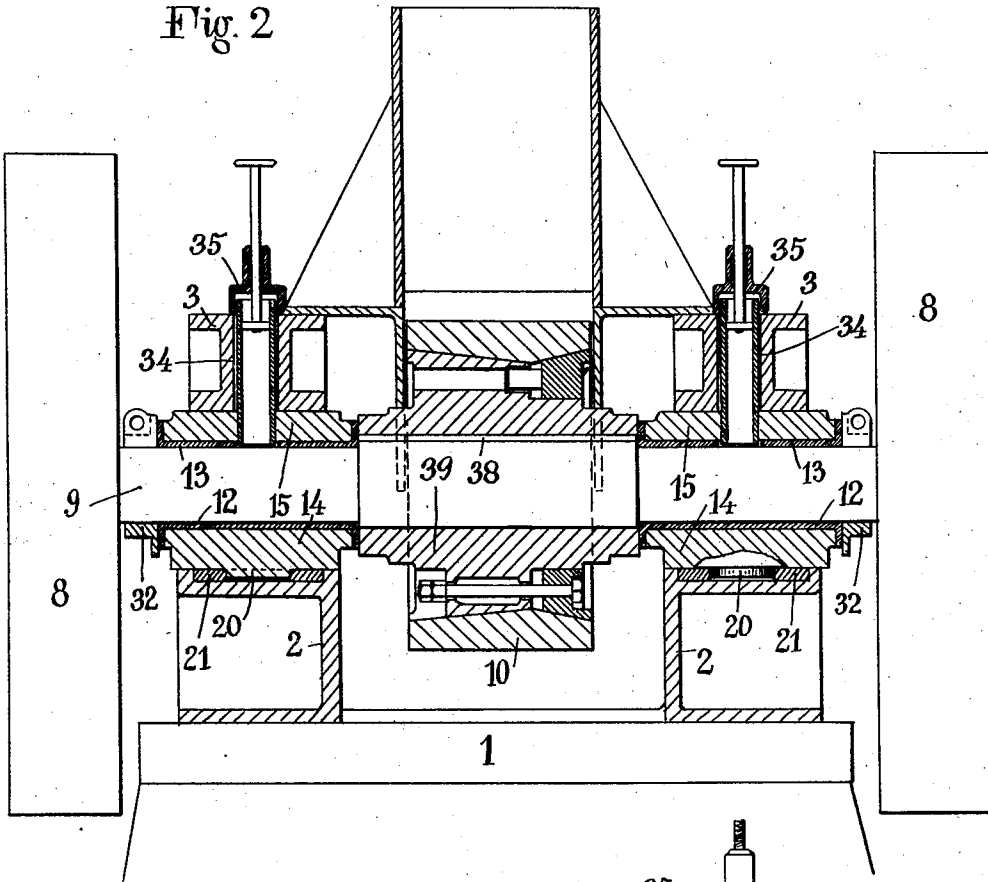
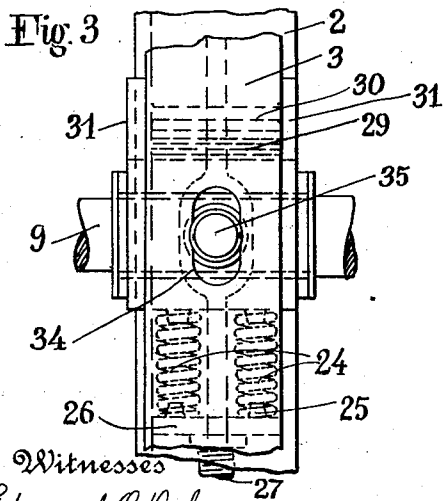
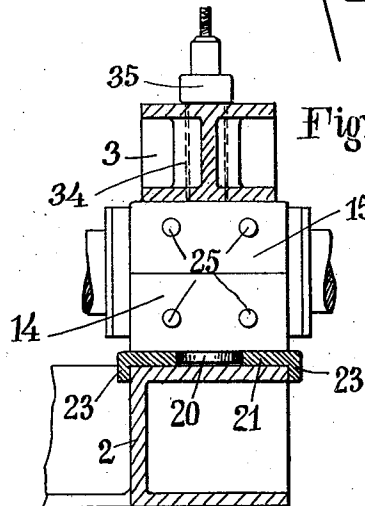


Fig. 3



Witnesses
Edmund O. Duborg.
Geo. W. Kerr.

Fig. 4



Inventor
Charles G. Buchanan
By his Attorneys
Edwards, Lager & Wooster.

UNITED STATES PATENT OFFICE.

CHARLES G. BUCHANAN, OF BROOKLYN, NEW YORK.

CRUSHING-MACHINE.

1,024,497.

Specification of Letters Patent.

Patented Apr. 30, 1912.

Application filed December 27, 1907. Serial No. 408,246.

To all whom it may concern:

Be it known that I, CHARLES G. BUCHANAN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Crushing-Machines, of which the following is a full, clear, and exact specification.

This invention relates to crushing machines, and more particularly is concerned with an end bearing for the rollers whereby one or both of the rolls can yield or move backward in case some refractory piece of material should get between the rolls.

The invention also comprises features of improvement in the combinations of the various parts, all of which will be more fully described hereinafter in connection with the accompanying drawings wherein—

Figure 1 is a side elevation of a crushing machine embodying the invention; Fig. 2 is a vertical transverse section of the machine on the axis of the movable roll; Fig. 3 is a detail plan view showing one of the end boxes for the movable roll; Fig. 4 is a detail partly in longitudinal section showing an elevation of one of the movable roll bearing boxes; and Fig. 5 is an end elevation of one of the roll bearing boxes.

Referring to the drawings, 1 represents a base having mounted thereon side frames 2—2 preferably made of cast steel, and having flanges thereon to combine lightness with strength.

3 represents a top frame bolted to the side frames 2 by bolts 4—4.

The side frames 2 are each provided with notches for the reception of the stationary bearings 6 of the roll 7, which is driven by a pulley 8 mounted on the roll shaft 9. The stationary bearings 6 are secured in suitable boxes mounted on the frame. The bearing boxes for the movable roll each comprises a bearing bushing 12—13 which is secured in the divided box having the parts 14—15 secured together by the bolts 16.

The side frames 2 are provided at one side with a somewhat rectangular slot 18 between which and the top frame 3 the boxes of the movable roll 10 slide, in order to permit one roll to yield in case a drill point or other piece of material not intended to be crushed should fall into the machine.

Referring to Fig. 2, it will be seen that

the part 15 is simply held down by the top frame 3 and is free to slide relatively to the top frame. The bottom box 14 is provided with a pivot or trunnion 20 which engages with a plate 21 sliding on the frame 2 in a groove formed between shoulders of the side frames 2 as in Fig. 1, or the sliding plate 21 is itself provided with shoulders as 23 in Fig. 4, to overlap the sides of the frames 2, so that the plate 21 is free to slide longitudinally on the side frames 2. It will be understood that each end of the movable roll is similarly mounted and that the pivot or trunnion 20, in combination with the sliding plate 21, prevents movement of the roll in an axial direction, but permits either end of the roll to swing about the other end as an axis in order to permit a hard substance to pass through without damaging the rolls. It will therefore be seen that each of the boxes of the roll 10 is pivotally mounted by means of the trunnion 20, and that at the same time longitudinally movable in a direction parallel with the frame by means of the reciprocating or sliding plate 21 which carries the trunnion. 24 are springs bearing on lugs 25 carried by the parts of the box 14 and 15, and the tension of the springs is adjusted by a plate 26 which is moved by set screws 27 mounted at one end of the frame. In order to fix the minimum distance between the rolls, shims or liners 29 composed in part of metal, and in part of absorbent material, such as wood, are interposed between the bearings of the two rolls 10 and 7, or as therein shown, between the bearings of the roll 10 and an abutment 30 formed on the side frames 2, the shims themselves fitting loosely between the ends 31 of the movable boxes. It will be seen that by this construction of movable bearing box, the strains due to crushing are transferred from the boxes through the springs directly to the end of the frame, and at the same time the boxes are permitted a pivotal and longitudinal movement.

The constructions which have been before devised to permit pivotal and bodily movement of the end boxes have been open to the objection that the crushing strains come directly upon a universal connection, with the result of very quickly deteriorating them, such, for instance, as ball and socket joints somewhat similar to swiveled shaft hangers.

Axial thrust collars 32 are provided and are, of course, spaced from the bearing bushings a sufficient distance to permit the necessary axial movement when the roller
5 swings at one end on the trunnion at the other end.

The top frames 3 are provided with holes through which pass grease cups 33 for the fixed roll and slots as at 34, through which
10 pass the grease cups 35, are provided for the movable roll. Fig. 5 shows a threaded hole 36 in the top block 15 and a hole in the bushing 13 for the grease cups.

So far as the invention of this application is concerned, the rolls may be of any usual or suitable construction and are fixed on their respective shafts. This may be accomplished by forcing the roll hub on to the shaft by hydraulic pressure and it may also
20 be held by a key 38. No claim is made herein to the construction of the roll, such subject matter being claimed in a divisional application, filed March 15, 1912, #683,917.

46 is a feed hopper which is fastened to the side frames 3.

From the foregoing description, it is thought that the objects and advantages of the invention of the present application will be fully understood and also the operation
30 of the machine.

Inasmuch as the invention claimed herein is capable of various modifications and changes, it is not to be restricted to the exact construction which has been shown and
35 described.

Having thus described my invention, I declare that what I claim as new and desire to secure by Letters Patent is:

1. The combination with a frame, of a

crushing roll mounted therein, a slide 40 mounted to reciprocate in said frame, a bearing member having formed upon it a bearing surface for the shaft of said roll, the parts of said member being fixed with relation to each other, means for securing said
45 member but permitting turning thereof with relation to said slide, and a resilient abutment between said member and said frame, said abutment bearing against said member independently of any bearing in which said
50 member turns with relation to said slide.

2. In a crushing machine the combination with side frames, of a pair of crushing rolls supported thereby, boxes for said crushing rolls, the boxes of one of said rolls being pivotally and bodily movable with relation to
55 said frames, a top frame securing the said boxes and forming, with the side frames, slots within which the boxes of the movable roll are adapted to slide, a slide upon one
60 side only of each of the slots and adapted to slide along the same, and resilient abutments between the movable boxes and the frames, each of the movable boxes being pivoted at
65 one side to one of said slides and upon the other side having a bearing contact with the portion of the frame forming the opposite side of the slot, the sides of the slots with which the movable boxes come in contact forming bearing surfaces for said boxes upon which said boxes may turn with relation to said frames.

In testimony whereof I affix my signature, in presence of two witnesses.

CHARLES G. BUCHANAN.

Witnesses:

JULIAN S. WOOSTER,
GEO. A. HOFFMAN.