March 7, 1944. E. T. PETERSON 2,343,322

CRUSHING MACHINE

Filed Oct. 13, 1941 3 Sheets-Sheet 1

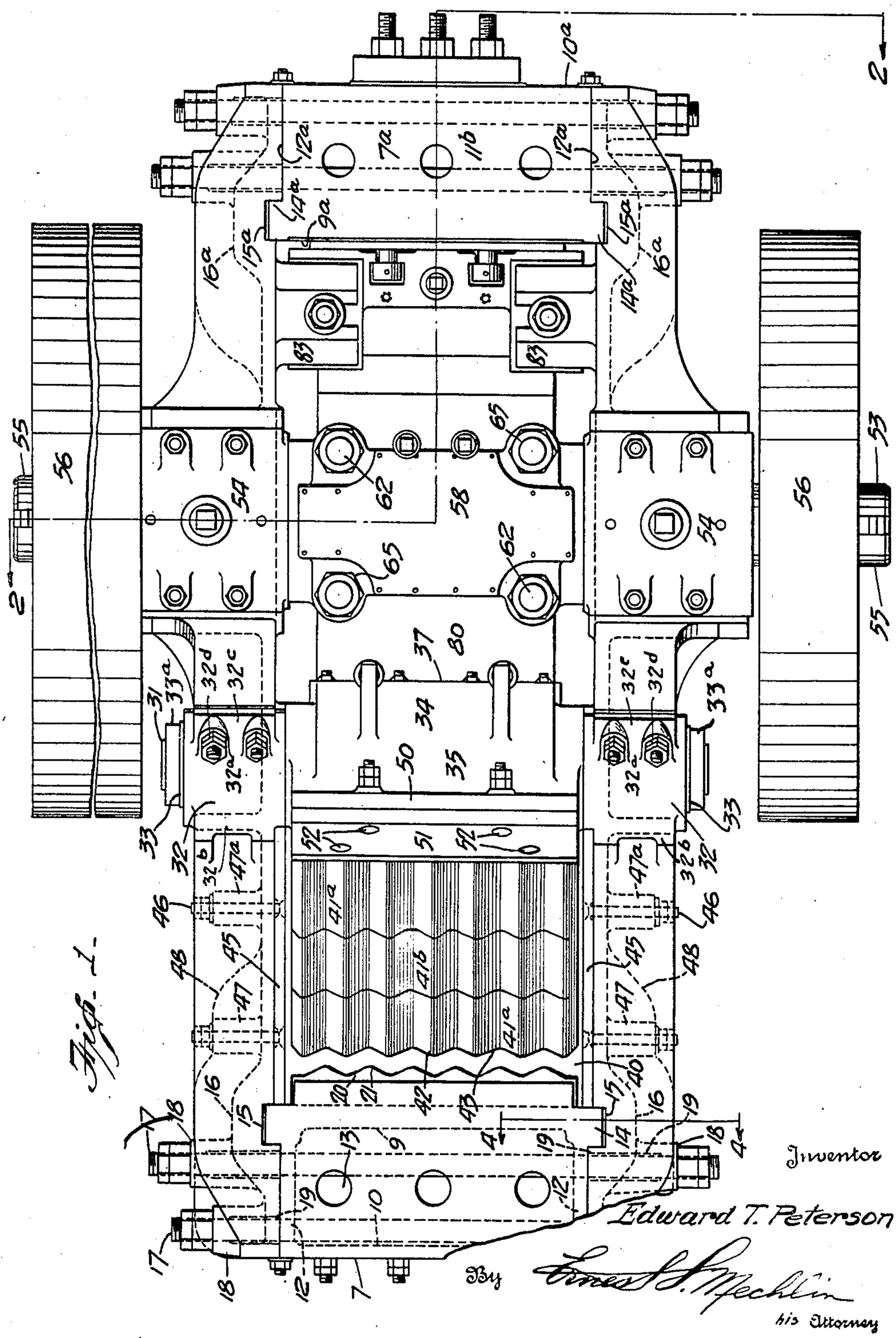

Fig. 1.

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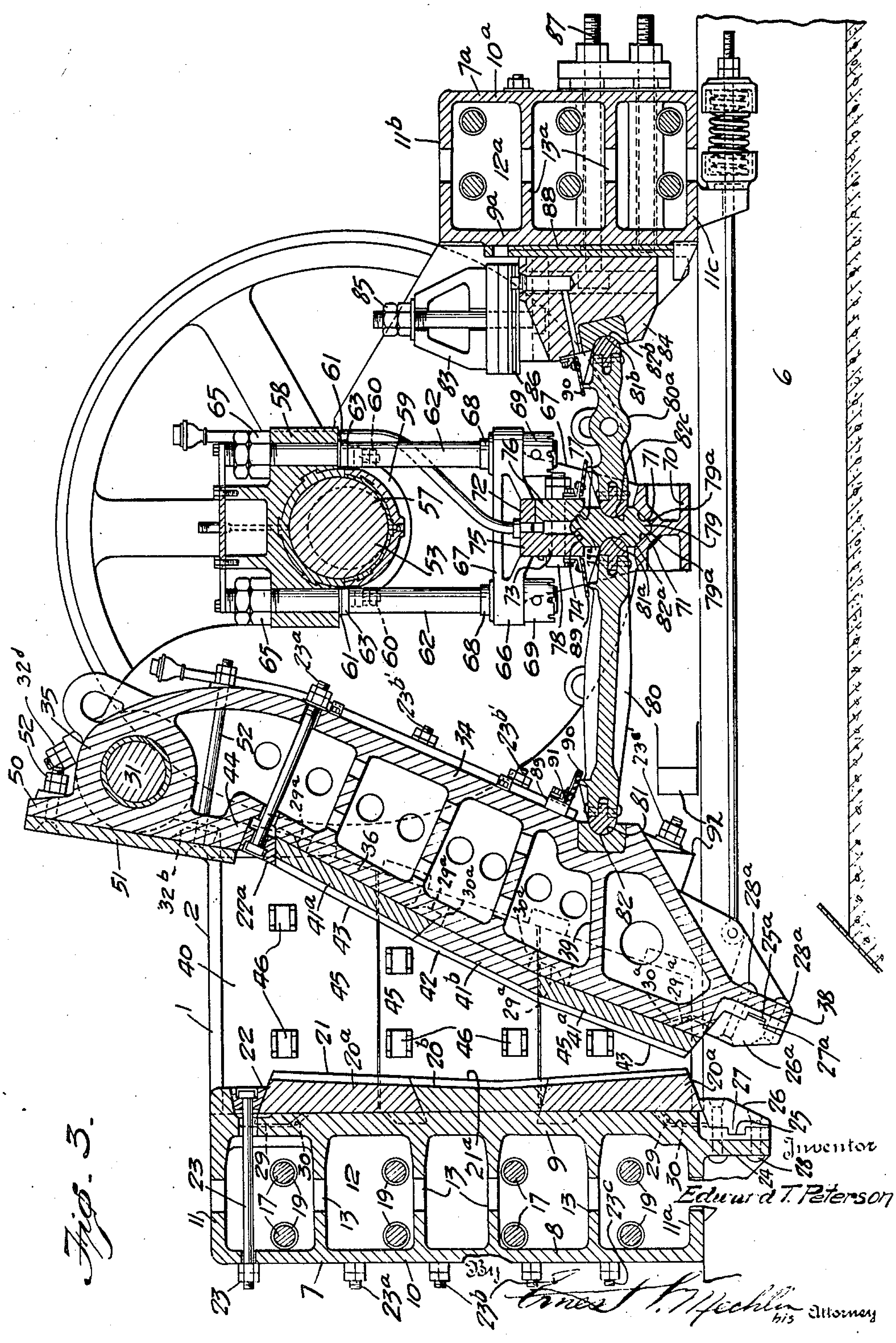

Fig. 3.

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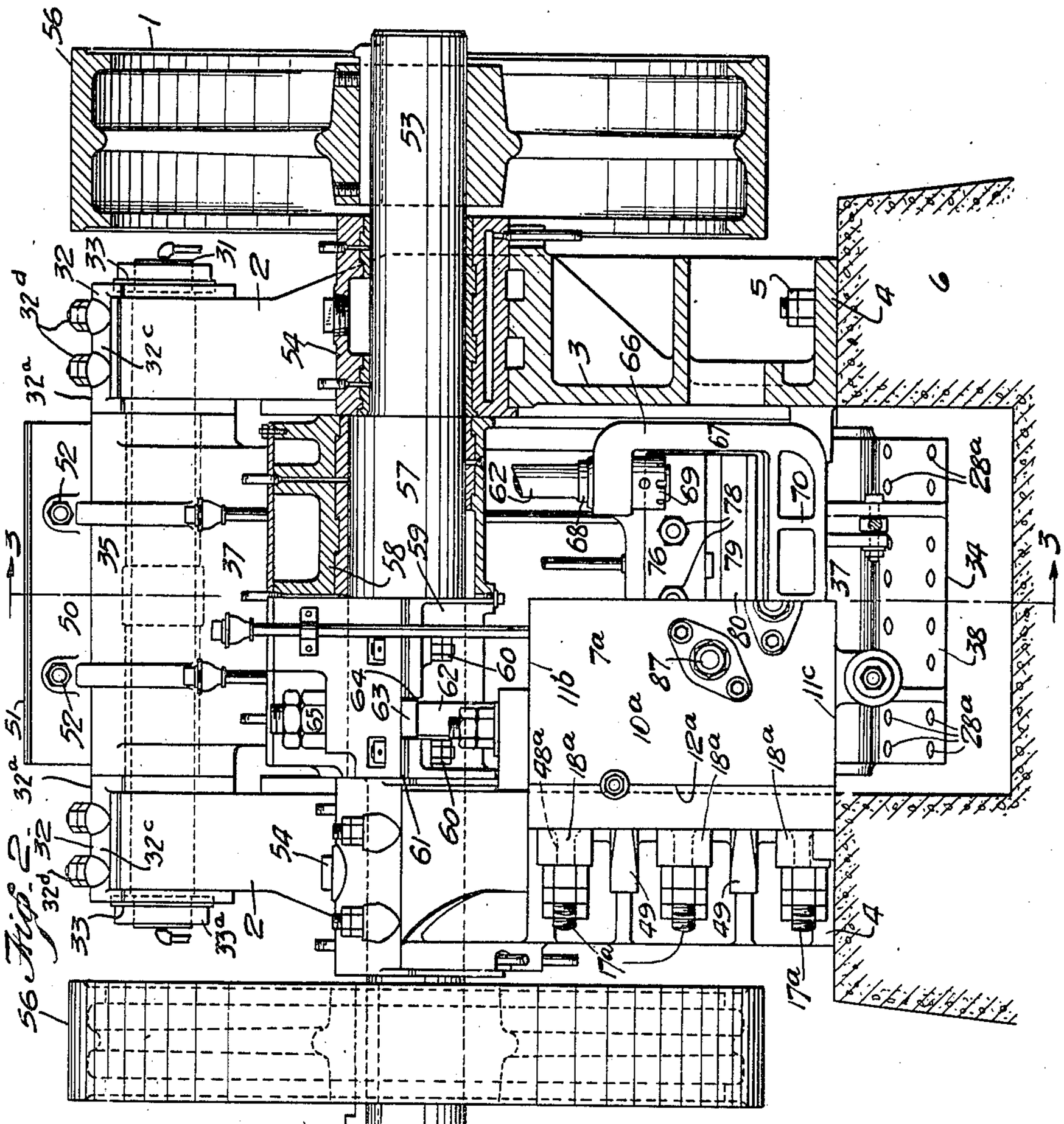

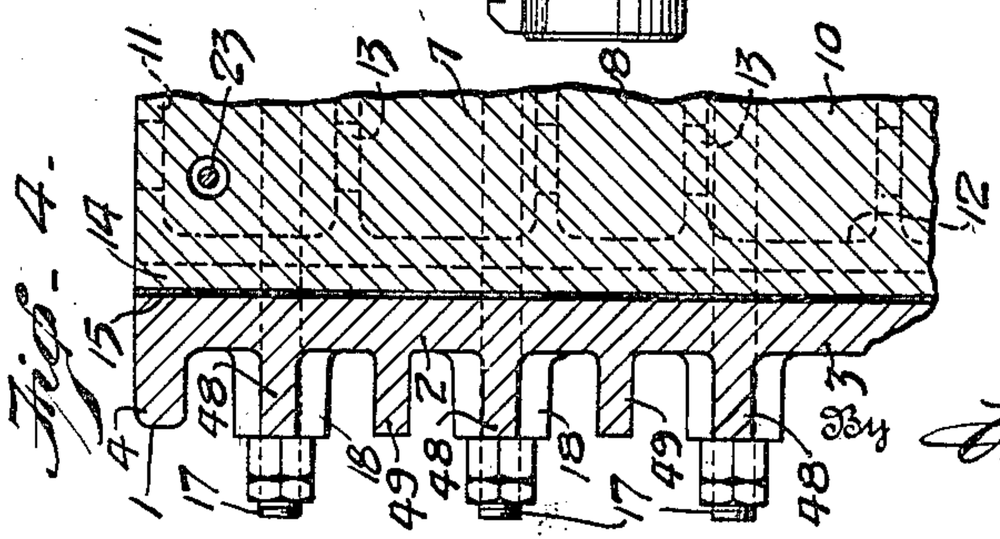

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Patented Mar. 7, 1944

2,343,322

UNITED STATES PATENT OFFICE

2,343,322

CRUSHING MACHINE

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Application October 13, 1941, Serial No. 414,895

6 Claims. (Cl. 83—53)

The invention relates to a machine for crushing material, such as iron ore, stone or the like, and more particularly to a jaw type thereof.

An object of the invention is the provision, in a crushing machine, of a pair of jaws one of which is adapted to move relative to the other so as to break down any material that may be interposed or positioned between the jaws.

Another object of the invention is the provision, in a crushing machine, of a swing or movable jaw actuated through the medium of a plurality of toggle arms by a pitman journaled on an eccentric axle.

A further object of the invention is the provision, in a crushing machine, of a rod type pitman which is vertically movable and adapted to impart a rotary and substantially horizontal movement to a swing jaw.

An added object of the invention is the provision of particularly disposed surfaces on jaws of a crushing machine so as to increase the efficiency of the crusher as well as prolong the service life thereof.

These and other objects of the invention will become apparent from the succeeding description and by referring to the accompanying drawings which disclose an exemplified form of the invention and wherein:

Figure 1 is a plan view of a crushing machine illustrating a form of the invention.

Figure 2 is a partial end elevational view and a partial transverse cross sectional view of the crushing machine taken along the lines 2—2 of Figure 1, looking in the direction of the arrows.

Figure 3 is a longitudinal sectional view of the crushing machine taken along the lines 3—3 of Figure 2, looking in the direction of the arrows.

Figure 4 is a transverse sectional view of a portion of the crushing machine taken along the lines 4—4 of Figure 1, looking in the direction of the arrows.

Referring now in detail to the drawings wherein like reference characters indicate like parts, the numeral 1 is employed to designate, in a general manner, a type of crushing machine embodying the present invention. The crushing machine comprises main or side walls 2 spaced transversely of the machine and extending, parallel to one another throughout the entire length thereof. Each side wall is formed by a vertically disposed web 3 having, extending outwardly therefrom, a peripheral flange 4, the lowermost of which is suitably apertured to accommodate anchor means of any description and characterized in the present construction by bolts 5 which are imbedded in a foundation 6 underlying and supporting each side wall to maintain each side wall in a predetermined fixed position.

What may be considered the front or forward and adjacent extremities of the side walls are joined by a forward beam, bulkhead or bridge 7, preferably forming a portion of a jaw 8 of the crushing machine and desirably the stationary jaw thereof since it remains fixed relative to the side walls of the housing. The forward bulkhead is substantially skeletonized in form, being made up of longitudinally or horizontally spaced front and rear vertical webs 9 and 10, respectively, which are joined adjacent their extremities by spaced top and bottom webs 11 and 11a and end webs 12. The end webs of the front bulkhead lie adjacent to and are in surface bearing relation with the side wall webs. The front and rear bridge webs are further joined by vertically positioned and horizontally disposed reinforcing or connecting intermediate webs 13 which merge with the end webs of the bulkhead.

Since any crushing forces exerted against the stationary jaw will tend to urge it horizontally or longitudinally of the crushing machine away from between the side walls thereof, shear lugs 14 are formed outstanding from the end webs 12 to extend into suitable or accommodating grooves 15 facing inwardly of the housing from the side wall webs. As will be noted, the side wall webs are bulged or extended in thickness, as at 16, adjacent the area of the grooves to compensate for the latter and build up the side walls to their original capacity because of the otherwise weakening effects of the grooves. The front bulkhead is retained in position by means of a plurality of tie rods 17 which extend through bosses 18 formed on and outstanding from the side wall webs and aligned apertures 19 in the bulkhead end webs. The bosses extend to substantially the horizontal limits of the respective side walls to present appreciable bearing areas for the tie rod extremities.

Positioned on the forward bulkhead and desirably in bearing relation with the front web thereof is a plurality of wear plates 20 forming a part of the stationary jaw and comprising interchangeable upper and lower wear plates 20a and an intermediate wear plate 20b. The upper and lower wear plates each have a material engaging surface 21 and the intermediate wear plate has a material engaging surface 21a, all of which face inwardly of the housing and are corrugated or sinuous in horizontal cross section for the purpose to be hereinafter explained. The

surfaces 21 of the upper and lower wear plates are inclined vertically of the crushing machine from a position commencing at the vertical limits of the wear plates to be tapered at a slight angle outwardly toward the bulkhead and terminate adjacent the contiguous edges of the upper and lower wear plates and the intermediate wear plate. The surface 21a of the intermediate wear plate is also tapered and is in alignment with the inner extremities of the upper and lower wear plate surfaces. The vertical disposition of the wear plate surfaces presents upper and lower sections of identical configuration and since, during service, the lower section or wear plate is subjected to the greatest wearing forces, the upper and lower wear plates are thus made reversible or counter-parts of one another so that, after a prolonged use of the wear plates in their illustrated position, the upper and lower wear plates may be turned end for end or reversed so as to locate the relatively worn lower wear plate in the location occupied by the illustrated upper wear plate and the relatively worn upper wear plate at the position occupied by the lower wear plate. The intermediate section may also be inverted if it is found that the lower extremity thereof has been worn to such a degree as to warrant this procedure. By this arrangement and construction, it will be noted that the service life of the crushing machine will be greatly increased or augmented.

Various means may be employed to affix the wear plates to the bulkhead, and as exemplary of one means there is disclosed a top wedge 22 interposed between the bulkhead top web 11 and the upper extremity of the upper wear plate to prevent an inward and upward shifting of this wear plate from a predetermined position. The top wedge is locked in place by means of bolts 23 which extend through the bulkhead. A plurality of aligned bolts 23a spaced below the bolts 23 extend through the upper wear plate and bulkhead to retain the lower extremity of the upper wear plate in place. A plurality of bolts 23b removably secures the intermediate wear plate to the bulkhead. Depending from the lower web of the bulkhead is a reinforcing flange 24 provided with an inwardly opening keyway 25. Bearing against and secured to the flange is a toe lug 26 which locks the lower extremity of the lower wear plate against a downward and inward movement to assist in fixedly securing this wear plate in place. The toe lug is provided with a shoulder or key 27 formed integral therewith which extends into the keyway so as to substantially relieve rivets 28, which secure the toe lug to the flange, of any service stresses. Since the upper and lower wear plates may, due to their being subjected to transverse or lateral thrusts, tend to shift from their illustrated position, there have been provided vertically spaced shear lugs or lips 29 so as to outstand from the side of the wear plates opposed from the sinuous surface carrying side thereof to project into suitable or correspondingly formed recesses or reliefs 30. It will be noted that the wedge 22 and toe lug 26 are set back or spaced away from the material wearing surface of the wear plate material engaging surfaces 21, and accordingly the wear plate may be worn down a considerable extent before the material deposited in the machine is permitted to contact and wear the wedge and toe lug. Bolts 23c also assist in maintaining the lower wear plate in a predetermined position.

Spaced inwardly of the crushing machine from the forward bulkhead or stationary jaw is an auxiliary axle or shaft 31 seated in suitable bearings 32 provided in the side walls adjacent the upper limits and intermediate the extremities thereof. Each bearing 32 has an upper cap portion 32a pivotally connected to the side wall at its one extremity, as at 32b, while the other extremity 32c is provided with cap bolts 32d, and by reason of this construction the cap bolts employed are removed from the area where the material to be crushed enters the machine. The axle is provided, at its extremities, with centering rings slightly receded in the frame so as to position the shaft when rebabbiting in the field and which are employed to position the axle in a predetermined horizontal alignment. Locking nuts 33a are associated with each shaft extremity to bind the side walls together and prevent a horizontal shifting of the axle respectively. Pivotally mounted on the auxiliary axle and adapted to oscillate relative thereto is a swing or movable jaw 34 which desirably comprises a top bearing 35 encircling the auxiliary axle. Depending from opposite sides of the top bearing are spaced front and rear walls 36 and 37, respectively, which merge adjacent the lower extremity of the swing jaw to continue as a flange type shelf 38. The front and rear walls are joined intermediate their height by a plurality of stiffening partitions 39. The jaw walls are desirably inclined away from the vertical plane of the auxiliary axle in a direction toward the stationary jaw so that the two jaws may present a hopper or receiving chamber 40 into which the material to be crushed is to be deposited. Further, since the center of mass of the swing jaw is out of vertical alignment with the axis of the auxiliary axle, the tendency of the swing jaw, assisted by the weight of the material between the jaws, is to move away from the stationary jaw so that no additional means is required for opening the jaws in permitting the material to be crushed to assume a lower position in approaching the delivery or lower extremity of the hopper.

Bearing against the front jaw wall 36 are a plurality of wear plates 41 which afford a jaw facing surface 42 sinuous or corrugated in horizontal cross section and which comprise upper and lower wear plates or sections 41a and an intermediate wear plate or section 41b. The apices of the corrugations of the swing jaw wear plates are staggered with respect to the apices or meshed with the valleys of the corrugations of the stationary jaw wear plates, as clearly illustrated in Figure 1 of the drawings so that material to be crushed may, upon bridging the apices of one set of wear plates, be forced or urged therebeyond or therebetween by the apices of the other set of wear plates to break down the bulk material into small particles. The surfaces 42 of the upper and lower wear plates of the swing jaw are inclined or tapered away from the plane of the surface of the swing jaw intermediate wear plate so that they commence in alignment with the swing jaw intermediate section surface 42 and diverge away therefrom in an inclined manner toward the front wall 36, as indicated by the reference character 43. In this manner and by reason of this arrangement, therefore, it will be noted that the swing jaw wear plate not only assists in defining a hopper of considerable extent or capacity for the reception of material to be crushed, but also the sinuous surface of the lower wear plate 41a is in close proximity to the stationary jaw to transmit substantially hori-

zontal crushing forces to the material interposed between the jaws effectively to break down the material into small particles. Further, the swing jaw upper and lower wear plates may be transposed so that after considerable wear has taken place in the lower wear plate, it may be moved to the location occupied in the illustration by the upper wear plate where it will not be subjected to such severe surface wear forces and the upper wear plate may be moved to occupy the space as illustrated now by the lower wear plate. Since the upper and lower wear plates of the swing jaw are also counter-parts of one another, a transposition of these wear plates will also function materially to increase the service life of the machine.

Like the attaching means for the stationary jaw upper wear plate, the swing jaw upper wear plate has associated therewith a top wedge 22ª interposed between a shoulder 44 formed on the front wall 36 and the uppermost extremity of the associated upper wear plate to assist in locking the latter against an inward and upward movement from its illustrated position. The top wedge is secured to the swing jaw by means of bolts 21ª′ or any other suitable locking device. Securing means such as the illustrated bolts 23ᵇ′ are employed to assist the top wedge 22ª′ in retaining the upper wear plate as well as the intermediate wear plate of the swing jaw in operable position. The flange-like shelf 38 has a keyway 25ª opening toward the hopper to accommodate a key 27ª outstanding from a toe lug 26ª, the latter of which is in wedging engagement with the lowermost extremity of the swing jaw lower wear plate to prevent its downward and inward shifting from the illustrated position. Rivets 28ª are employed to secure the toe lugs 26ª to the flange-like shelf and assisting the toe lug 26ª are a plurality of bolts 23ᶜ′ spaced vertically therefrom and disposed horizontally of the swing jaw to maintain the lower wear plate thereof in a fixed predetermined position. To prevent the upper and lower wear plates of the swing jaw from shifting laterally as well as to relieve the securing means thereof from transverse service thrusts, there is provided on these wear plates vertically spaced shear lugs 29ª which extend into suitably formed or accommodating recesses 30ª. It will be noted that the shelf 38 is angularly inclined to the vertical, being disposed preferably in the same general direction as the front wall 36, and accordingly any forces tending to urge the swing jaw wear plates downwardly will create shear stresses only in the key 27ª, thereby subjecting the rivets 28ª to tensional stresses only with no or very little reliance being made on the rivets 28ª to overcome a shifting action of the overlying or associated wear plate.

So as to relieve the housing side walls of wear, and particularly that portion thereof which defines the transverse limits of the hopper, there have been provided wear plates 45 removably secured to the side walls in the proximity of the hopper by means of bolts 46 or any elected securing means. Bosses 47 and 47ª outstand from the housing side walls to afford greater bearing areas for the bolts 46. The side wall webs, adjacent the area occupied by the stationary jaw, are, during service, subjected to substantially concentrated forces, and in order to strengthen the side walls about this area there have been provided a series of vertically spaced longitudinally or horizontally directed ribs 48 which connect or join the bosses 18 and 47 to extend a trifle beyond the latter, where they merge with the side wall web short of the bosses 47ª. Additional ribs 49 are interposed between the bosses to extend to a position substantially midway of the side walls. Both sets of ribs are desirably thickened where they pass or bridge the opposite side of the web carrying the grooves 15 to additionally reinforce the webs in these areas.

Means has been provided on the swing jaw to protect the top bearing 35 thereof against wear to which it will be otherwise subjected by the material deposited in the hopper, and as exemplary of such a means a forwardly facing lip 50 is formed on the top bearing with which is associated a striking or buffer plate or shield 51. The shield, adapted to direct the material into the hopper, is secured to the swing jaw through the medium of suitable bolts 52.

A driving mechanism is arranged with the housing to oscillate the swing jaw in a material crushing action. This mechanism is illustrated in the drawings by a main or drive axle 53 which is rotatably associated with and supported by suitable bearings 54 formed in and removably secured to the housing forming side walls adjacent their upper extremities and intermediate their ends. The drive axle, spanning the spaced housing forming side walls, has its extremities 55 extending beyond the bearings 54 to present extensions to which are splined power means such as driving or fly wheels or pulleys 56. The drive axle has, intermediate the ends thereof, a portion 57 formed eccentric with the extremities thereof which, in effect, forms a crank arm for the driving mechanism. Associated with the eccentric is a pitman comprising a box including a plurality of, preferably two, segmental or half top and bottom bearings 58 and 59, respectively, which are secured together in circumambient relation with the eccentric by means of locking bolts 60. The segmental bearings are freely movable or rotatable relative to the eccentric and have, interposed therebetween, the usual adjusting shims 61 which compensate for any initial variation between the segmental bearings and eccentric as well as for any wear which might take place therein during service.

Extending downwardly of the pitman box are a plurality of, preferably four, pitman rods 62 each of which is provided with an upper upset portion or shoulder 63 intermediate its ends. The shoulder 63 is preferably in bearing relation with the underneath surface of the top segmental bearing, and for the accommodation of the rods, the bottom segmental bearing is recessed or relieved, as at 64, in the immediate area about the shoulder 63, reference being made particularly to Figure 2 of the drawings. The upper extremities of the pitman rods are provided with suitable locking means, such as nuts 65, so that the rods are securely fastened to only the top segmental bearing. From the above, therefore, it will be noted that adjustments may be made to the segmental bearings by adding to or removing from the illustrated shims without disturbing the pitman. This adjustment may be made by removing the locking bolts 60, which permits a downward removal of the bottom segmental bearing to make the necessary adjustments, and a reversal of the enumerated steps will place the eccentric bearing in assembled relation so that at no time during the adjustment procedure will the pitman connection be disturbed.

Spaced an appreciable or predetermined dis-

tance below the eccentric or pitman box is a pitman head 66 formed in part by transversely spaced bridge members or stanchions 67. The lower ends of the pitman rods which have shoulders or upset portions 68 bearing against the bridge members extend through suitable apertures in the members and are rigidly connected thereto by rotatable locking means, such as the nuts 69. Spanning or joining the lower extremities of the bridge members and desirably formed integral therewith is a Y-shaped lower tie bar 70 having upwardly facing or diverging surfaces 71 inclined or angularly disposed relative to one another to present a V-shaped surface formation in cross section. Spaced a predetermined distance above the tie bar is a top connecting plate 72 also extended between and preferably formed integral with the bridge members. The top connecting plate is inverted L-shaped in cross section and has a vertical leg 73 thereof presenting an inclined face 74 angularly disposed relative to one of the surfaces 71 and parallel relative to the other surface 71. Associated with the top connecting plate and preferably in subjacent relation to a longitudinally directed leg 75 thereof is a removable member or retaining bar 76 having a surface 77 thereof angularly disposed to the surface 74 and forming therewith an inverted V-configuration when viewed in cross section, reference being made particularly to Figure 3 of the drawings. The retaining bar is removably secured to the top connecting plate leg 73 by means of bolts 78. Interposed between the lower tie bar and the top connecting plate and retaining bar is a shoe or wear block 79 having angularly disposed or V-shaped surfaces 79a thereof parallel and in bearing relation with the inclined surfaces 71, 74 and 77 to clamp the shoe in a fixed predetermined position.

Force transmitting means has been provided in the driving mechanism to impart a motion to the swing jaw, and as exemplary of such a means, a jaw toggle arm 80, slightly inclined with respect to a horizontal plane, extends between the pitman head and swing jaw. For the accommodation of the toggle arm, a cylindrical socket 81, carried by the rear wall 37 of the swing jaw, seats an associated cylindrical extremity 82 of the toggle arm, and a similar cylindrical socket 81a is provided in the shoe intermediate its height so as to face outwardly thereof and form a seat for a correspondingly formed extremity 82a of the toggle arm. It will be noted, therefore, that the toggle arm 80 is freely movable in its accommodating sockets within certain predetermined limits.

Extending between what may be considered the rear extremity of the housing side walls is a rear beam or bulkhead 7a of skeletonized form comprising longitudinally spaced front and rear vertical walls 9a and 10a, respectively, which are united adjacent their top and bottom edges by webs 11b and 11c, respectively, and adjacent their side edges by end webs 12a. The front and rear walls of the rear bulkhead are reinforced by vertically spaced intermediate webs 13a which also merge with the associated side webs. Shear lugs 14a are arranged to oustand from the rear bulkhead side webs to extend into suitably disposed and correspondingly formed recesses 15a to prevent the rear bulkhead from shifting or being urged outwardly of the housing from its illustrated position by means of service forces being imparted thereto.

By referring particularly to Figure 1 of the drawings, it will be noted that the side wall webs are bulged or thickened, as at 16a, adjacent the areas of the grooves to compensate for the portion of the side wall webs removed by the introduction of the grooves. The rear bulkhead is secured to the side walls by means of transversely extending tie rods 17a which extend through bosses 18a formed on the side wall webs to outstand therefrom. Vertically spaced and longitudinally directed ribs 48a connect the bosses 18a to extend therebeyond a predetermined distance toward the center of the housing to reinforce the side wall webs. Ribs 49a, interposed between the bosses, extend toward the other extremity of the housing where they merge with the aligned ribs 49 with both the ribs 48a and 49a being preferably thickened where they pass the transverse extended plane of the grooves 15a to additionally reinforce the webs about the area of the grooves.

Brackets or supporting shelves 83 are formed integrally with the side wall webs to extend inwardly of the housing therefrom. A tail piece or block 84, positioned in subjacent relation with respect to the brackets, is supported thereby through the bolts 85. Shims 86 are interposed between the tail piece and brackets so that the bearing blocks may be adjusted vertically. The tail piece is also arranged to react against the rear bulkhead and is removably secured thereto by means of bolts 87 which extend through the rear bulkhead front and rear webs. Shims 88 are interposed between the tail piece and front web 9a so that the tail piece may be adjusted or shifted horizontally, as desired. By reason of the present construction and association of parts the effective lengths of the bolts 85 and 87 may be varied so as to add additional shims 86 and 88 as the surfaces 81b and 82b wear during service. Also the bolts can be removed without dismantling in case of breakage. The tail piece carries a cylindrical outwardly facing cavity 81b which accommodates a correspondingly formed surface 82b forming an extremity of a toggle arm or lever 80a. The opposite extremity of the toggle lever 80a has an outwardly facing cylindrical surface 82c which is seated in a cylindrical socket 81c, the latter of which is formed in the wear block or shoe 79, desirably in the same horizontal plane as the socket 81a. The toggle lever 80a is slightly inclined with respect to a horizontal plane, and, as will be noted, the axes of the toggle arms 80 and 80a intersect substantially on the vertical axis of the pitman so that no turning moments will be created in the pitman.

It will be noted that both toggle arms are inclined downwardly toward their connection to the pitman head so that they may at no time reach a dead center and that the pitman is illustrated in its foremost elevated position. Accordingly, a rotary motion of the drive axle from illustrated position will result in a lowering of the pitman and thus enable the swing jaw to move away from the stationary jaw. When the pitman, by reason of the rotation of the eccentric, reaches its lowermost position and is again urged upwardly, the swing jaw will be forced toward the stationary jaw to crush material deposited between the jaws. Upon such an upward movement of the pitman only tensional forces are created in the pitman arms.

The junctures between the toggle arm extremities and sockets are protected against dirt or any foreign substance entering therein by means of overlying aprons or covers 89 each of which

desirably comprises a flexible skirt 90 anchored to a related element through the medium of a bracket 91.

Stops 92, suitably spaced, are provided in the machine so that if the toggles are subjected to such strains as to result in failure of one or both of the toggles, the swing jaw will only move through a predetermined arc and stop short of the pitman, thereby ensuring the latter against damage by the swing jaw through the failure of either toggle.

From the preceding description, considered together with the accompanying drawings, it will be noted further that various changes and alterations may be made to the illustrated form of the invention without departing from within the spirit and scope of the appended claims.

I claim:

1. In a crushing machine of the type having a housing formed by spaced side walls with a drive axle spanning and journaled to said walls, a stationary jaw and a swing jaw, the combination of a bearing block spaced from said stationary jaw, means for actuating said swing jaw comprising an eccentric formed on said drive axle, a vertically adjustable pitman having a box formed by segmental top and bottom bearings encircling said eccentric, a head spaced from said box and interposed between said swing jaw and bearing block, means extending between said swing jaw and bearing block and head, a plurality of rods joining said segmental top bearing and head, said head having a lower tie bar Y-shaped in vertical cross section, and a top connecting plate inverted L-shaped in vertical cross section, a wear block interposed between said tie bar and top connecting plate, and a retainer bar removably secured to said top plate and adapted to maintain said wear block in fixed position.

2. In a crushing machine of the type having a housing formed by spaced side walls with a drive axle spanning and journaled to said walls, a stationary jaw and a swing jaw, the combination of, a bearing block spaced from said stationary jaw, means for actuating said swing jaw comprising an eccentric formed on said drive axle, a vertically adjustable pitman having a box formed by segmental top and bottom bearings encircling said eccentric, a head spaced from said box and interposed between said swing jaw and bearing block, means extending between said swing jaw and bearing block and head, a plurality of rods joining said segmental top bearing and head, said head having an integral lower cross bar Y shaped in vertical cross section and an integral top cross connecting plate of inverted L shape in vertical cross section, a removable wear block interposed between and contacting said bar and plate, and a retainer bar removably secured to said top plate and adapted by contact therewith to also maintain said wear block in fixed relation.

3. In a crushing machine of the type having a housing formed by spaced side walls with a drive axle spanning and journaled to said side walls, a stationary jaw and a swing jaw, the combination of, means for oscillating said swing jaw comprising an eccentric formed on said drive axle, a pitman having a box formed by segmental top and bottom bearings encircling said eccentric, a head spaced from said box, a plurality of rods joining said segmental top bearing only and said head, said head having integrally formed top and bottom cross members, a removable central shoe having wedge shaped surfaces engaging correspondingly disposed surfaces on said members, and a bar removably secured to one of said members for retaining said central shoe in fixed position.

4. In a crushing machine of the type having a housing formed by spaced side walls with a drive axle spanning and journaled to said side walls, a stationary jaw and a swing jaw, the combination of, means for oscillating said swing jaw comprising an eccentric formed on said drive axle, a pitman having a box formed by segmental top and bottom bearings encircling said eccentric, a head spaced from said box, said head having transversely spaced stanchions, a plurality of rods joining said segmental top bearing and stanchions, a lower cross bar extending between said stanchions, a cross connecting plate spaced from said cross bar and extending between said stanchions, a removable wear block interposed between and contacting said bar and plate, and a retainer bar removably secured to said top plate and adapted to contact said wear block for retaining it in fixed position.

5. In a crushing machine of the type having a housing formed by spaced side walls with a drive axle spanning and journaled to said side walls, a stationary jaw and a swing jaw, the combination of, means for oscillating said swing jaw comprising an eccentric formed on said drive axle, a pitman having a box formed by segmental top and bottom bearings encircling said eccentric, a head spaced from said box, said head comprising transversely spaced vertically disposed stanchions, a plurality of rods joining said segmental top bearing only and said stanchions, a lower cross bar connecting and formed integrally with said stanchions, a top connecting plate formed integrally with and extending between said stanchions, a removable wear block interposed between and contacting said bar and plate, and a retainer bar removably secured to said top plate and adapted to maintain said wear block in fixed position.

6. In a crushing machine of the type having a housing formed by spaced side walls and a drive axle spanning and journaled to said side walls, a stationary jaw and a swing jaw, the combination of, means for oscillating said swing jaw comprising an eccentric formed on said drive axle, a pitman having a box encircling said eccentric, a head spaced from said box, said head having transversely spaced stanchions, a plurality of rods joining said box and stanchions, a bar member extending between and connected to said stanchions, a plate member extending between and connected to said stanchions in spaced relation to said bar member, angularly disposed surfaces on said members, a removable wear block interposed between said members and having angularly disposed surfaces in bearing relation with said first named surfaces, and a retaining bar removably secured to one of said members and adapted by contact therewith to maintain said wear block in fixed position.

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