Oct. 15, 1929. C. JACKSON 1,731,576

BREAKING MACHINE

Filed March 7, 1927 2 Sheets-Sheet 1

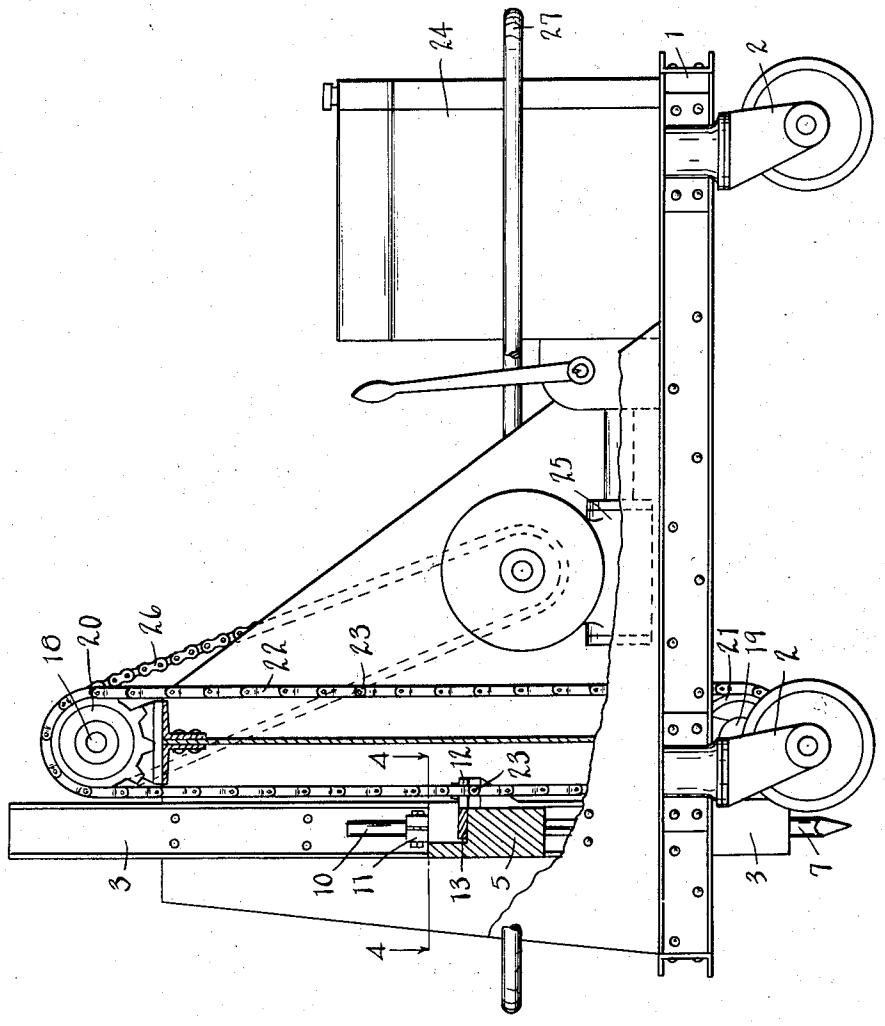


Fig. 1

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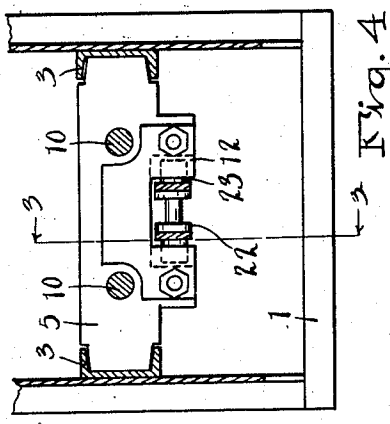


Fig. 4

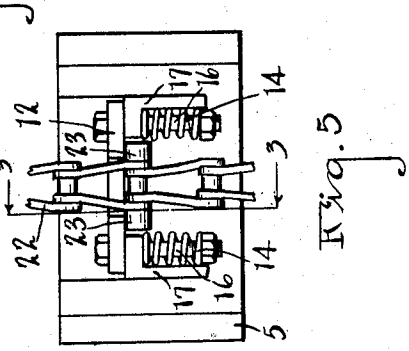


Fig. 5

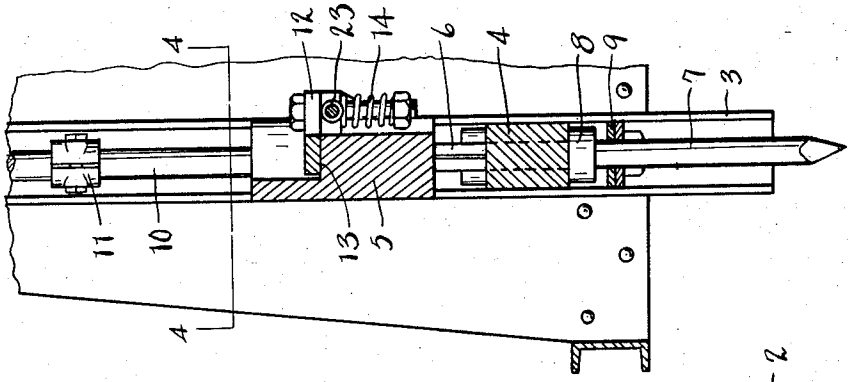


Fig. 3

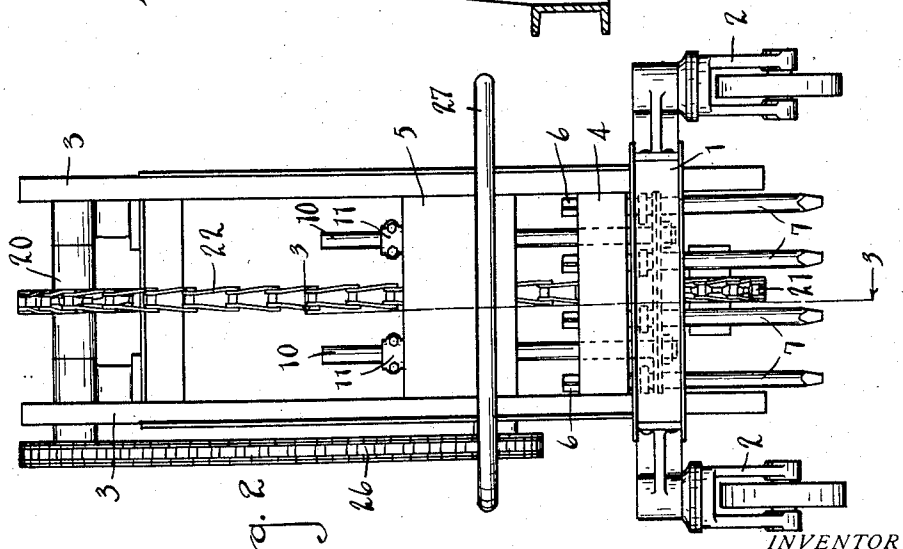


Fig. 2

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Patented Oct. 15, 1929 1,731,576

UNITED STATES PATENT OFFICE

CORWILL JACKSON, OF CHICAGO, ILLINOIS

BREAKING MACHINE

Application filed March 7, 1927. Serial No. 173,439.

The main objects of this invention are:

First, to provide an improved breaking machine for concrete road beds and other hard surfaces which is highly efficient and of large capacity.

Second, to provide a machine of the character described which is well adapted for the cutting or breaking of concrete pavements for excavation purposes where it is desired to cut a comparatively straight line without leaving uneven or extremely irregular edges.

Third, to provide a machine having these advantages which is very easy to operate and requires comparatively little power.

Objects relating to details and economies of construction and operation of my invention will appear from the detailed description to follow.

The invention is defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is illustrated in the accompanying drawing, forming a part of this application, in which:

Fig. 1 is a fragmentary side elevation of a machine embodying the features of my invention, parts being broken away to better illustrate the structural details, other parts being shown conventionally for convenience in illustration.

Fig. 2 is a front elevation of the structure shown in Fig. 1.

Fig. 3 is a detail vertical section on a line corresponding to line 3—3 of Figs. 2, 4 and 5.

Fig. 4 is a detail horizontal section on a line corresponding to line 4—4 of Figs. 1 and 3.

Fig. 5 is a fragmentary elevation showing details of the lifting lugs.

In the drawing similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

In the embodiment of my improvements illustrated in the accompanying drawings, I provide a truck frame designated generally by the numeral 1, this frame being carried by caster wheels 2 so that the frame may be easily pushed about in any direction and properly located relative to the work. On this frame are upright channel-shaped ways 3 in which a crosshead 4 and drop hammer 5 are reciprocatingly mounted, the drop hammer being disposed above the crosshead.

The crosshead has vertical openings therethrough to receive the shafts 6 of the chisels 7, the shafts 6 being preferably non-circular in form, the openings being of a corresponding cross section to prevent turning of the chisels, so that the chisels are properly presented to the work.

The chisels are provided with collar-like impact members 8 below the crosshead. Below these collars 8 I provide a cross bar 9 which serves the double purpose of an impact and lifting member, the main purpose being the lifting function, although it limits the relative movement of the chisels. This lifting member or cross bar 9 is provided with lifting rods 10 which are arranged through the crosshead 4 and through the drop hammer 5, the rods being provided with lifting collars 11 above the drop hammer. These lifting collars are preferably adjustably mounted on the rods, thus regulating the lost motion connection between the crosshead and chisels and drop hammer. When the drop hammer is raised, it engages these collars, and through the lifting rods, raises the crosshead and chisels. It will be noted that the drop hammer will move upwardly until the collars are engaged before any lifting movement is imparted to the crosshead so that the drop hammer is spaced from the crosshead and chisels. When the drop hammer is released, the parts fall together, but owing to the spaced relation of the drop hammer and crosshead, the blow of the crosshead is first imparted to the chisels to be succeeded by the blow or impact of the drop hammer.

In the structure illustrated, the drop hammer is provided with lifting lugs 12 which are held yieldingly upon the shoulder 13 of the drop hammer by means of the coiled springs 14 arranged on the lower ends of the bolts 16 disposed through the brackets 17 (see Figs. 3, 4 and 5).

At the side of the ways, I mount shafts 18 and 19 provided with sprocket wheels 20 and

21 for the sprocket chain 22. This sprocket chain 22 is provided with lugs 23 which engage the projecting lugs 12 on the upward movement of the lugs, passing from beneath the same as the lugs pass over the sprocket, thereby allowing the crosshead and drop hammer to fall as described.

In the embodiment illustrated, an engine 24 is mounted on the truck frame and connected to the upper shaft 18 by means of a suitable transmission, designated generally by the numeral 25 and the sprocket chain 26. This power means, however, forms no part of my present invention.

For convenience in manipulating the truck, a hand rail 27 is provided, this being preferably continuous so that the truck may be pushed about in any direction.

I have illustrated my improvements as I have embodied the same in a concrete or pavement breaking machine. The drop of the crosshead, in the embodiment illustrated, is substantially less than that of the drop hammer and delivers an initial blow, due to the weight of the crosshead and the chisels dropping by gravity. This blow starts a small initial fracture in the concrete and the chisels are in position to receive the major blow of the crosshead. The chisels are withdrawn from the crevice after each blow, and as stated, the truck may be moved about as desired. It is found that the cleavage in the concrete is very straight and regular which is an important item in breaking concrete for the laying of conduits, repair work and the like.

I have not attempted to illustrate and describe various other embodiments and adaptations of my improvements which I contemplate as I believe the disclosure made will enable those skilled in the art to embody or adapt my improvements as may be desired.

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

1. In a machine of the class described, the combination with a carrying frame provided with caster wheels, of vertical ways on said frame, a crosshead reciprocating in said ways, a plurality of chisels having rectangular shanks reciprocatingly supported in said crosshead with their shanks projecting above the same, said chisels being provided with impact collars below said crosshead, a drop hammer reciprocating in said ways above said crosshead to strike the ends of said chisel shanks, a lifting bar through which said chisels are loosely arranged disposed below said impact collars of said chisels, lifting rods for said lifting bar arranged through said crosshead and drop hammer for longitudinal movement relative to both, said lifting rods being provided with adjustable lifting collars above said drop hammer, a pair of shafts disposed at the side of said ways and provided with sprocket wheels, spring supported lifting lugs projecting from said drop hammer, and a sprocket chain on said sprocket wheels provided with lifting lugs coacting with said lifting lugs on said drop hammer to lift the drop hammer and through it said crosshead and chisels, for the purpose specified.

2. In a machine of the class described, the combination with a carrying frame provided with caster wheels, of vertical ways on said frame, a crosshead reciprocating in said ways, a plurality of chisels having rectangular shanks reciprocatingly supported in said crosshead with their shanks projecting above the same, said chisels being provided with impact collars below said crosshead, a drop hammer reciprocating in said ways above said crosshead to strike the ends of said chisel shanks, a lifting bar through which said chisels are loosely arranged disposed below said impact collars of said chisels, lifting rods for said lifting bar arranged through said crosshead and drop hammer for limited longitudinal movement relative to both, a pair of shafts disposed at the side of said ways and provided with sprocket wheels, lifting lugs on said drop hammer, and a sprocket chain on said sprocket wheels provided with lifting lugs coacting with said lifting lugs on said drop hammer to lift the drop hammer and through it said crosshead and chisels, for the purpose specified.

3. In a machine of the class described, the combination with a carrying frame provided with caster wheels, of vertical ways on said frame, a crosshead reciprocating in said ways, a plurality of chisels having rectangular shanks reciprocatingly supported in said crosshead with their shanks projecting above the same, said chisels being provided with impact collars below said crosshead, a drop hammer reciprocating in said ways above said crosshead to strike the ends of said chisel shanks, a lifting bar through which said chisels are loosely arranged disposed below said impact collars of said chisels, lifting rods for said lifting bar arranged through said crosshead and drop hammer for longitudinal movement relative to both, said lifting rods being provided with adjustable lifting collars above said drop hammer, and means for lifting said drop hammer.

4. In a machine of the class described, the combination with a carrying frame provided with caster wheels, of vertical ways on said frame, a crosshead reciprocating in said ways, a plurality of chisels having rectangular shanks reciprocatingly supported in said crosshead with their shanks projecting above the same, said chisels being provided with impact collars below said crosshead, a drop hammer reciprocating in said ways above said crosshead to strike the ends

of said chisel shanks, a lifting bar through which said chisels are loosely arranged disposed below said impact collars of said chisels, lifting rods for said lifting bar arranged through said crosshead and drop hammer for limited longitudinal movement relative to both, and means for lifting said drop hammer.

5. In a machine of the class described, the combination of vertical ways, a crosshead, reciprocating in said ways, a plurality of chisels reciprocatingly supported in said crosshead with their upper ends projecting above the same, said chisels being provided with impact number below said crosshead, a drop hammer reciprocating in said ways above said crosshead to coact with said chisels, a lifting bar through which said chisels are loosely arranged disposed below said impact members of said chisels and having a lost motion connection to said drop hammer, a pair of shafts disposed at the side of said ways and provided with sprocket wheels, spring supported lifting lugs projecting from said drop hammer, and a sprocket chain on said sprocket wheels provided with lifting lugs coacting with said lifting lugs on said drop hammer to life the drop hammer and through it said crosshead and chisels, for the purpose specified.

6. In a machine of the class described, the combination of vertical ways, a crosshead reciprocating in said ways, a plurality of chisels reciprocatingly supported in said crosshead with their upper ends projecting above the same, said chisels being provided with impact members below said crosshead, a drop hammer reciprocating in said ways above said crosshead to coact with said chisels, a lifting bar through which said chisels are loosely arranged disposed below said impact members of said chisels and having a lost motion connection to said drop hammer, and means for lifting said drop hammer.

7. In a machine of the class described, the combination of a truck, vertical ways on said truck, a plurality of chisels, a crosshead with which said chisels are reciprocatingly associated, said chisels having impact members receiving the blow of said crosshead, a drop hammer reciprocating in said ways above said crosshead to coact with said chisels, and means for raising said crosshead, chisels and drop hammer including a lost motion connection whereby the drop hammer is spaced from the crosshead and chisels on the upward stroke so that successive blows are imparted to the chisels by the crosshead and drop hammer.

8. In a machine of the class described, the combination of vertical ways, a plurality of chisels, a crosshead with which said chisels are reciprocatingly associated, said chisels having impact members receiving the blow of said crosshead, a drop hammer reciprocating in said ways above said crosshead to coact with said chisels, and means for raising said crosshead, chisels and drop hammer including a lost motion connection whereby the drop hammer is spaced from the crosshead and chisels on the upward stroke so that successive blows are imparted to the chisels by the crosshead and drop hammer.

9. In a machine of the class described, the combination of a truck provided with caster wheels, a crosshead and drop hammer reciprocatingly mounted on said truck with the drop hammer above the crosshead, a plurality of chisels reciprocatingly associated with said crosshead and provided with impact members with which said crosshead coacts, said chisels projecting above said crosshead to receive the impact of said drop hammer, and a lifting bar for said chisels disposed below said impact members and having a lost motion connection with said drop hammer whereby the chisels and crosshead are lifted on the up-stroke of the drop hammer and the chisels receive the successive impacts of said crosshead and drop hammer when the drop hammer is released.

10. In a machine of the class described, the combination of a truck, a crosshead and drop hammer reciprocatingly mounted on said truck with the drop hammer above the crosshead, a plurality of chisels reciprocatingly associated with said crosshead and provided with impact members with which said crosshead coacts, said chisels projecting above said crosshead to receive the impact of said drop hammer, and means for actuating said crosshead and drop hammer whereby their impacts are successively delivered to said chisels.

11. In a machine of the class described, the combination of a reciprocatingly mounted crosshead, a chisel disposed through said crosshead to receive the impact thereof, a drop hammer operatively associated with said chisel, and means for actuating said crosshead and drop hammer whereby their impacts are successively delivered to said chisels.

12. In a machine of the class described, the combination of a plurality of chisels, a plurality of impact members reciprocatingly mounted one above the other, said chisels having a lost motion connection with the lower of said impact members, and means for actuating said impact members whereby the chisels are subjected to successive blows of said impact members.

13. In a machine of the class described, the combination of a crosshead and a drop hammer reciprocatingly supported above the crosshead, a plurality of chisels reciprocatingly associated with said crosshead and provided with impact members with which said crosshead coacts, said chisels projecting above said crosshead to receive the impact of

said drop hammer, and a lifting bar for said chisels disposed below said impact members and having a lost motion connection with said drop hammer whereby the chisels and crosshead are lifted on the up-stroke of the drop hammer and the chisels receive the successive impacts of said crosshead and drop hammer when the drop hammer is released.

14. In a machine of the class described, the combination of a reciprocating crosshead and a drop hammer reciprocatingly supported above the crosshead, and a plurality of chisels reciprocatingly associated with said crosshead and provided with impact members with which said crosshead coacts on its down stroke, said chisels projecting above said crosshead to receive the impact of said drop hammer.

15. In a machine of the class described, the combination of a chisel, a plurality of impact members reciprocatingly mounted one above the other for independent movement, said chisel having a lost motion connection with the lower of said impact members, and means for actuating said impact members whereby the chisel is subjected to successive blows of said impact members.

16. In a machine of the class described, the combination of a chisel, a plurality of impact members reciprocatingly mounted one above the other for independent movement, a lifting means common to all of said impact members, said impact members being substantially spaced when in elevated position so that when released their blows are successively delivered to said chisel.

In witness whereof I have hereunto set my hand.

CORWILL JACKSON.