Oct. 24, 1967 W. J. SACKETT, SR 3,348,781

APPARATUS FOR REDUCING SIZE OF MATERIALS

Filed Sept. 3, 1964 2 Sheets-Sheet 1

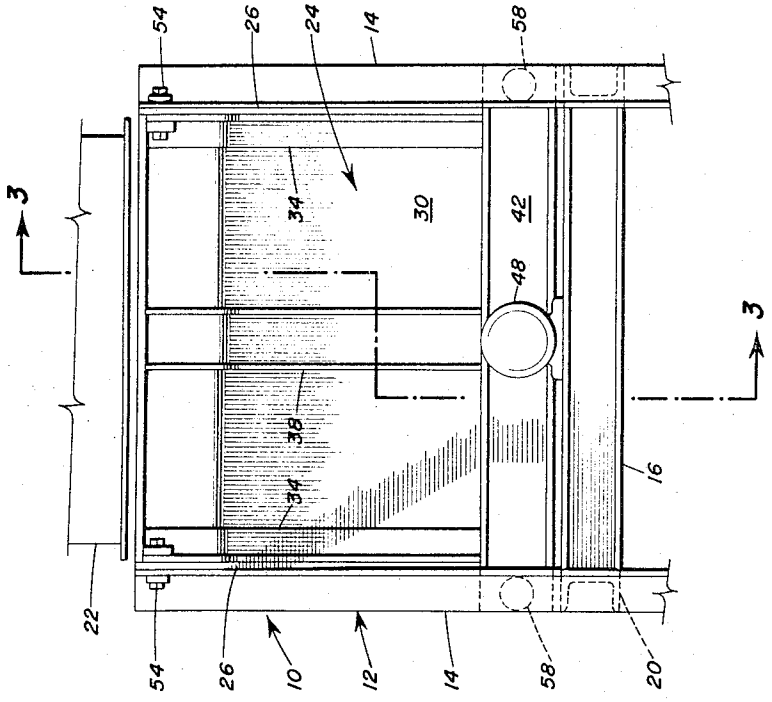


FIG. 2.

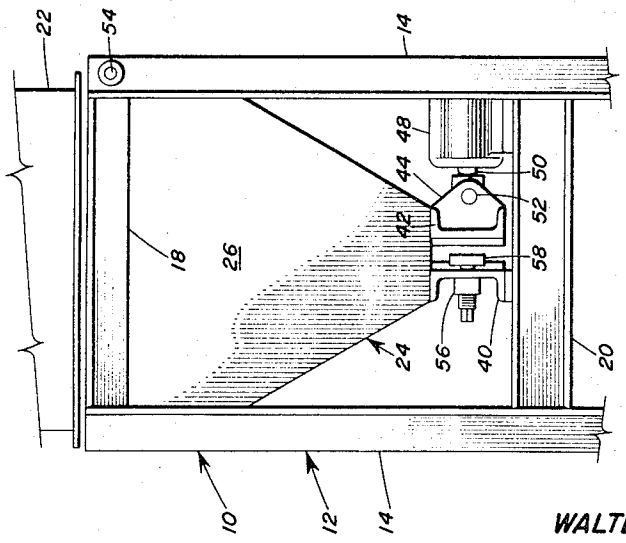


FIG. 1.

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FIG. 3.

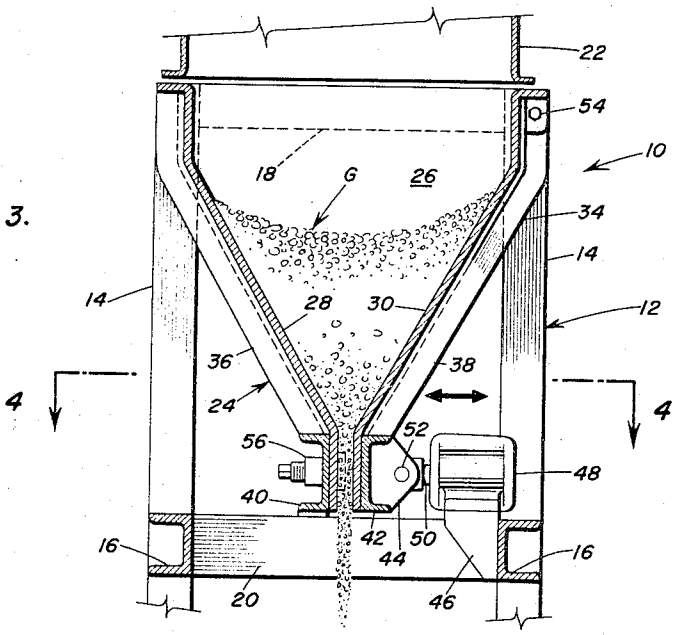
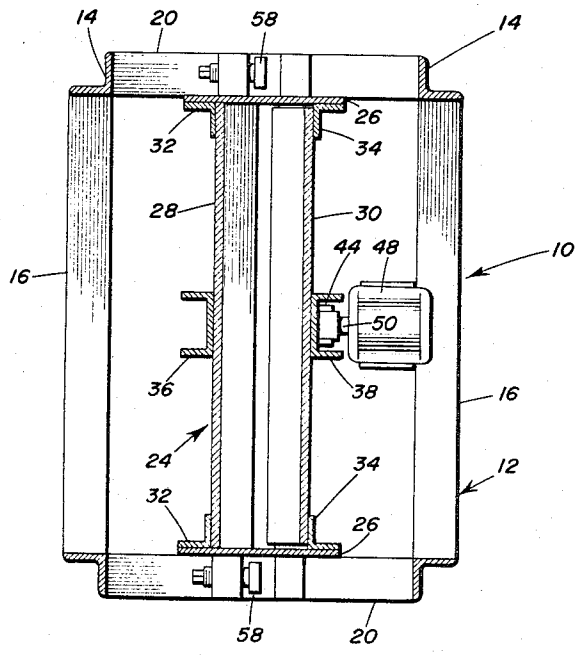


FIG. 4.



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APPARATUS FOR REDUCING SIZE OF MATERIALS

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1 Claim. (Cl. 241—264)

This invention relates generally to comminution apparatus, and more particularly it pertains to a crusher especially adapted to reducing oversize material.

Low-hinged jaw crushers for reducing ore, coal, stone and other heavy materials are well known in the art and are required where the strong leverage they produce is important. Where materials such as chemical fertilizers are involved, it is more important that a certain size of particle is maintained without the excessive production of fines.

Accordingly, it is a principal object of this invention to provide an apparatus for reducing the size of materials without excessive pulverizing action.

Another object of the invention is to provide a sizing apparatus which is free from clogging and "gates" material of only a predetermined size.

Still another object of this invention is to provide comminution apparatus including a crusher especially designed to reduce oversize material.

And even other objects of this invention are to provide sizing and crushing apparatus which is economical to manufacture, efficient and reliable in operational use and which is compact and easy to maintain.

Other objects and attendant advantages of this invention will become more readily apparent and understood from the following detailed specification and accompanying drawings in which:

FIG. 1 is a side elevation of apparatus for reducing size of materials incorporating features of this invention;

FIG. 2 is a front elevation taken at right angles to FIG. 1;

FIG. 3 is a vertical section taken on line 3—3 of FIG. 2; and

FIG. 4 is a horizontal section taken on line 4—4 of FIG. 3.

Referring first to FIGS. 1 and 2, reference numeral **10** indicates generally the apparatus for reducing the size of materials, including lump or granular materials. This apparatus **10** consists of a rectangular framework or supporting structure **12** of structural iron comprising four vertical legs **14**. The legs **14** are secured in spaced relationship at the sides by upper transverse beams **18** and lower transverse beams **20** while longitudinal beams **16** are used only across the front and back thereof at the lower level.

A delivery chute **22** is shown positioned at the top of the apparatus **10** for introducing material at the top thereof to a hopper **24**. The hopper **24** consists of a pair of spaced vertical endwalls **26** secured to the sidelegs **14** and therebetween, steeply angled, a stationary sidewall **28** and a movable sidewall **30** as best shown in FIGS. 3 and 4.

The stationary sidewall **28** is provided with corner angles **32** at the sides and these are welded to the endwalls **26**. The movable sidewall **30** similarly has a pair of corner angles **34** but these are not fastened but only abut with the endwalls **26**.

The sidewall **28** has an outer vertical stiffener or central channel member **36** and similarly the movable sidewall **30** is provided with a vertical center channel member **38**.

Bottom channels **40** and **42** are welded transversely across the outsides of the sidewalls **28** and **30**, respectively, and the latter channel further has a spaced pair of apertured plates **44** secured at the center thereof.

A vibrator **48** is secured on the structure **12** by a bracket **46** and arranged to thrust in the line of direction of the double pointed arrow in FIG. 3. The drive rod **50** of the vibrator **48** is linked to the apertured plates **44** by means of a pin **52**.

Hinge pins **54** in the frame structure **12** provide an upper support for the movable side wall **30** and a pivot around which to oscillate. This degree of oscillation is limited in one direction by the vibrator **48**. In the other direction, the provision of stops **58** threaded in bosses **56** in the ends of the bottom channel **40** limit the movement by contact with the other channel **42**.

In operation, the material G (generally of lump or granular form but not limited thereto) is caused to agitate by the swinging movement of the movable sidewall **30** of the hopper **24** and gradually feed to the gate formed by the lower parallel faces of the walls **28** and **30** where they are secured on the bottom channels **40** and **42**, respectively.

All the particles of material G below this gap size pass through the apparatus **10**, while oversize particles are caught and reduced in size without pulverizing until they too can pass.

To change the maximum size of particle desired, it is only necessary to adjust the stop **58**.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claim the invention may be practiced otherwise than as specifically described.

What is claimed is:

Apparatus for reducing oversize materials, comprising, structure defining a hopper having a spaced pair of fixed vertical endwalls and therebetween a steeply angled stationary sidewall, a pivotally mounted steeply angled movable sidewall converging toward each other at their lower ends, with said sidewalls terminating in spaced parallel sections, a vibrator secured to the lower end of said movable sidewall for oscillating said movable sidewall toward and away from said fixed sidewall at a predetermined rate, whereby when granules of said materials to be reduced in size are fed into said hopper, the vibration of said movable sidewall causes said material granules to pass downwardly therethrough and between said parallel sections of said sidewalls to be reduced in size, said vibrator limiting the oscillation of said movable sidewall away from said stationary sidewall and stop means adjustably mounted to the lower end of said stationary sidewall and extending toward the lower end of said movable sidewall for limiting the oscillation of said movable sidewall towards said stationary sidewall.

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