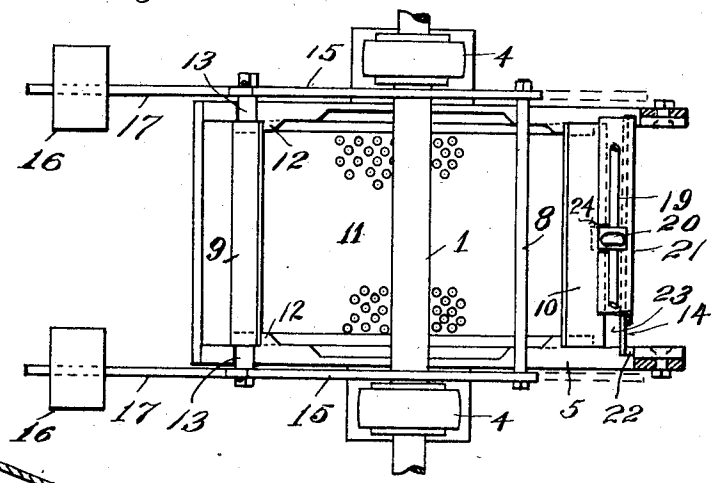
May 14, 1929. H. J. SHELTON 1,713,355

HINGED CAGE FOR GRINDERS

Filed March 2, 1928

Fig. 2.



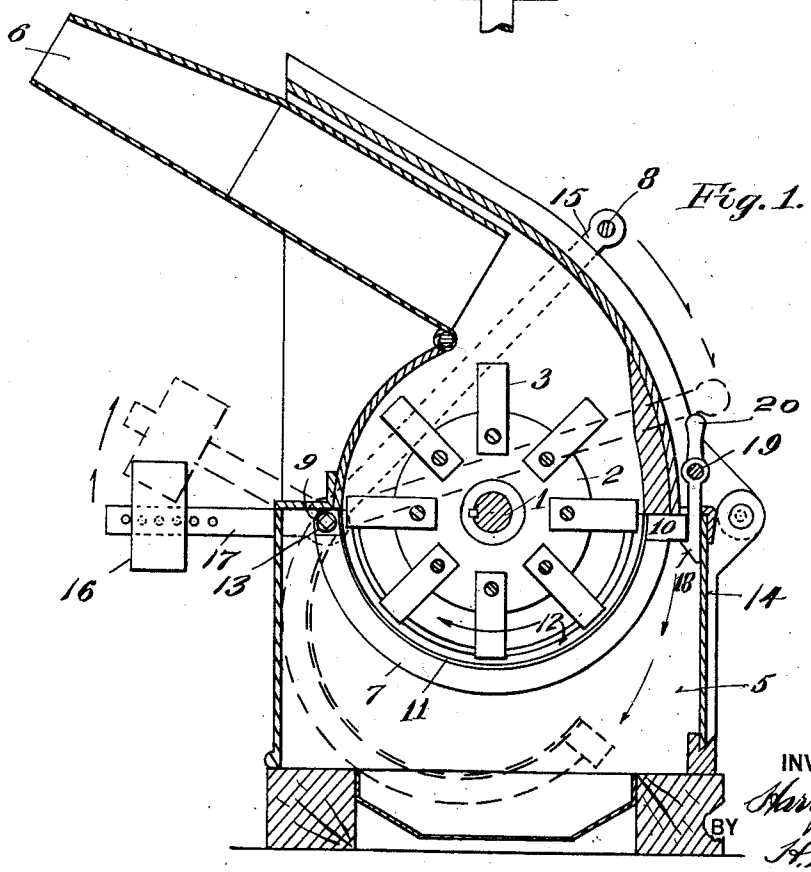


Fig. 1.

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UNITED STATES PATENT OFFICE.

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HINGED CAGE FOR GRINDERS.

Application filed March 2, 1928. Serial No. 258,493.

This invention relates to certain new and useful improvements in hinged gages for grinders for grain and other suitable material, the peculiarities of which will be hereinafter fully described and claimed.

The main object of my invention is to provide means for readily lifting a hinged or pivotally mounted cage to operative position after it has been lowered to change the screen; and secondly, means for holding the free end of the cage in operative position.

In grinding machines of the class described, arcuate screens of various size of perforations are generally used in a frame that is pivotally mounted at one end and suitably supported at the other end in operative position, but is lowered to allow of changing the screen frequently to a different degree of fineness. When one screen has been replaced by another of the desired degree of fineness the frame and its screen (constituting the cage) is general raised by hand to operative position. This requires considerable effort due to the weight of the free end of the cage, and the miller has to reach into the casing and down under the revolving hammers or beaters to grasp the free end of the cage and lift it into operative position again.

In my present construction I provide operating lever arms located outside of the casing for operating the cage. Also I provide means nearly to balance the cage on its pivoted end so that little effort need be exerted on said lever arms to lift the cage. Other advantages will be hereinafter described and claimed.

In the accompanying drawing in which like reference numerals indicate corresponding parts,

Fig. 1 represents a vertical sectional elevation of a grinder of the class described with my improvements applied thereto; and Fig 2, a plan view of the same with the casing above the center removed to show the cage and my improvements.

Referring to the drawing, the numeral 1 designates a horizontal shaft carrying discs 2, having hammers or beaters 3 pivotally mounted therein and constituting a revoluble cylinder that is carried in bearings 4 supported by a suitable casing 5 having an inlet hopper 6 for the material to be ground. Arcuate sides 7 with end bars 9 and 10 form a frame for a perforated screen 11 which is mounted adjacently below arcuate shoulders 12 in the casing. The frame and screen constitute the cage. One end bar 9 has projecting ends forming journals 13 mounted in the sides of the casing to constitute a pivotal mounting, so that the cage can swing downward as indicated and the screen can be removed from its frame through an opening in one end of the casing having a closing door 14.

The hinge end bar extends outside the casing and beyond the journals at one or both ends, and the extension is square or otherwise adapted to be fastened to a lever arm 15 close to the outside of the casing and extending over the shaft towards the end of the casing (preferably) where the door is located. It is preferred to have this operating lever arm 15 in duplicate and the ends connected by a handle 8, readily accessible to the miller at the door end of the casing when changing the screen.

In order to lessen the effort of lifting the cage, I provide counterbalance means such as a weight 16 on an arm 17 extending from the hinge in opposite direction to the said lever arm 15 like a double-arm lever, and preferably in duplicate as shown. The weight (or its equivalent) nearly balances the free end of the cage, so that the cage is operated easily. The weight is preferably adjustable on its arm. The dash lines indicate the position of the cage, lever arm and counterbalance when the cage is lowered for changing its screen.

The free end of the cage is held in its operative raised position by suitable means, preferably consisting of a hook 18 adapted to engage the said bar 10 when raised, and pivotally mounted on a rod 19 above or adjacent to the cage bar and carried by the side casing or otherwise so that the hook hangs in the path of the bar 10. A handle 20 or other means disengages the hook when the door is open. The said door backs against the depending hook and prevents disengagement from the cage bar when the door is closed as shown. A locking bar 21 preferably an angle, fits one flange in notches 22 in the side casing and holds the door firmly against the hook when engaging the cage bar. The other flange of the angle closes the opening 23 between the door and the cage bar, and is notched at 24 for said depending hook. The hook is shown mounted at the center but may be in duplicate and otherwise mounted, if desired.

The direction of rotation of the beaters is indicated by the arrow in Fig. 1. The door is preferably located at the rear end of the casing as shown, so that when opened and the cage lowered for removal of the screen, the beaters are revolving downward away from the miller and there is less danger of material being thrown in his face, and also from interference of the beaters and screen by carelessness in changing the screen. Also while it is more convenient to have the operating lever arm accessible to the miller at the door end of the casing, this arm 15 may be dispensed with and the arm 17 may be used as the operating lever in lifting the cage to its operative position.

I claim:

1. A grinder of the class described comprising a shaft, a casing having a door in one end, a cage comprising a detachable screen and a supporting frame therefor having one end opposite to the door pivotally mounted in the casing with lateral extensions projecting beyond the casing, a double-armed lever fastened on each extension—one arm of each lever extending over the shaft towards the door and connected by a cross-bar handle and the other arm extending in the opposite direction,—counter-balance means for the cage engaging said other arm, and means to support detachably the free end of the cage at the door end and allow access to the screen.

2. A grinder of the class described comprising a casing, an arcuate cage provided with lateral projections forming journals at one end pivotally mounted in the casing and one of said projections extending outside thereof, and a lever arm mounted outside the casing on the outside extension.

3. A grinder of the class described comprising a casing, an arcuate cage having an end bar journaled in the casing and extended beyond the journals and outside the casing, a lever with two arms mounted on the extension of said bar outside the casing, and means mounted on the other arm to counterbalance the free end of said cage.

4. A grinder of the class described comprising a casing having a door in one end, a cage comprising a screen and a supporting frame having an end bar journaled in the casing and extended outside the casing, and a lever arm outside the casing mounted on said bar extension and accessible from said door end of the casing for withdrawing and replacing the screen through said door.

5. A grinder of the class described comprising a casing having a door in one end, a cage comprising a screen and a supporting frame having an end bar pivotally mounted in the casing opposite the door and extended outside the casing, and a lever arm outside the casing mounted on said bar extension and having its handle end located adjacent to said door.

6. A grinder of the class described comprising a casing having a door in one end, a cage comprising an arcuate screen and supporting frame having an end bar pivotally mounted in the casing opposite the door and extended outside the casing, an operating lever arm outside the casing mounted on said bar extension and having its end located adjacent to said door, and means outside the casing to counterbalance the free end of said cage.

7. A grinder of the class described comprising a casing, a cage comprising an arcuate screen and supporting frame having an end bar pivotally mounted in the casing and extended outside the casing, a lever arm mounted on the bar extension, and counterbalance means for the free end of the cage acting on said arm.

8. A grinder of the class described comprising a casing, a cage having an end bar pivotally mounted in the casing and having an extension outside the casing, a lever arm mounted on said bar extension, and an adjustable balance weight for the free end of said cage mounted outside the casing on said arm.

9. A grinder of the class described comprising a casing, a cage having an end bar journaled in the casing and extended outside the journals, and a double-arm lever fastened to the bar extension and comprising an operating lever arm and an oppositely extended counterbalance arm, substantially as described.

10. A grinder of the class described comprising a casing having arcuate shoulders on the sides and a door in one end, a beater shaft mounted in the casing, a cage comprising a screen and a supporting frame having an end bar pivotally mounted in the casing opposite to the door and having an outside extension, and an operating lever arm outside the casing mounted on said extension and extending over said shaft outside and adjacent to the door, substantially as and for the purpose described.

11. A grinder of the class described comprising a casing having a door closing one end, a cage comprising a screen and a supporting frame having an end bar pivotally mounted in the casing at the opposite end from the door, a depending hook located above and adapted to engage the free end of said cage and backed by the closed door and thus prevented from disengagement till said door is opened.

12. A grinder of the class described comprising a casing having a door closing one end, a cage comprising an arcuate screen and supporting frame and having an end bar at the opposite end from said door and pivotally mounted in the casing, a depending hook pivoted above the free end and having a handle, the hook end extending inside the

casing and adapted to engage and support the free end of said cage and held engaged by said door when closed, and means to lock said door in closed position.

13. A grinder of the class described comprising a casing having a door closing one end, a cage having one end pivotally mounted in the casing at the opposite end from said door and the free end spaced from and even with the top of the door, a hook pivotally mounted above the cage and outside the casing and depending between the door and the free end of the cage when engaged, and an angle bar having one vertical flange adapted to engage said door as a locking bar and the other horizontal flange notched for said hook and adapted to extend above the door and adjacent cage bar for closing the interposed opening, substantially as described.

In testimony whereof I have affixed my signature.

HARRY J. SHELTON.