

Nov. 5, 1935.

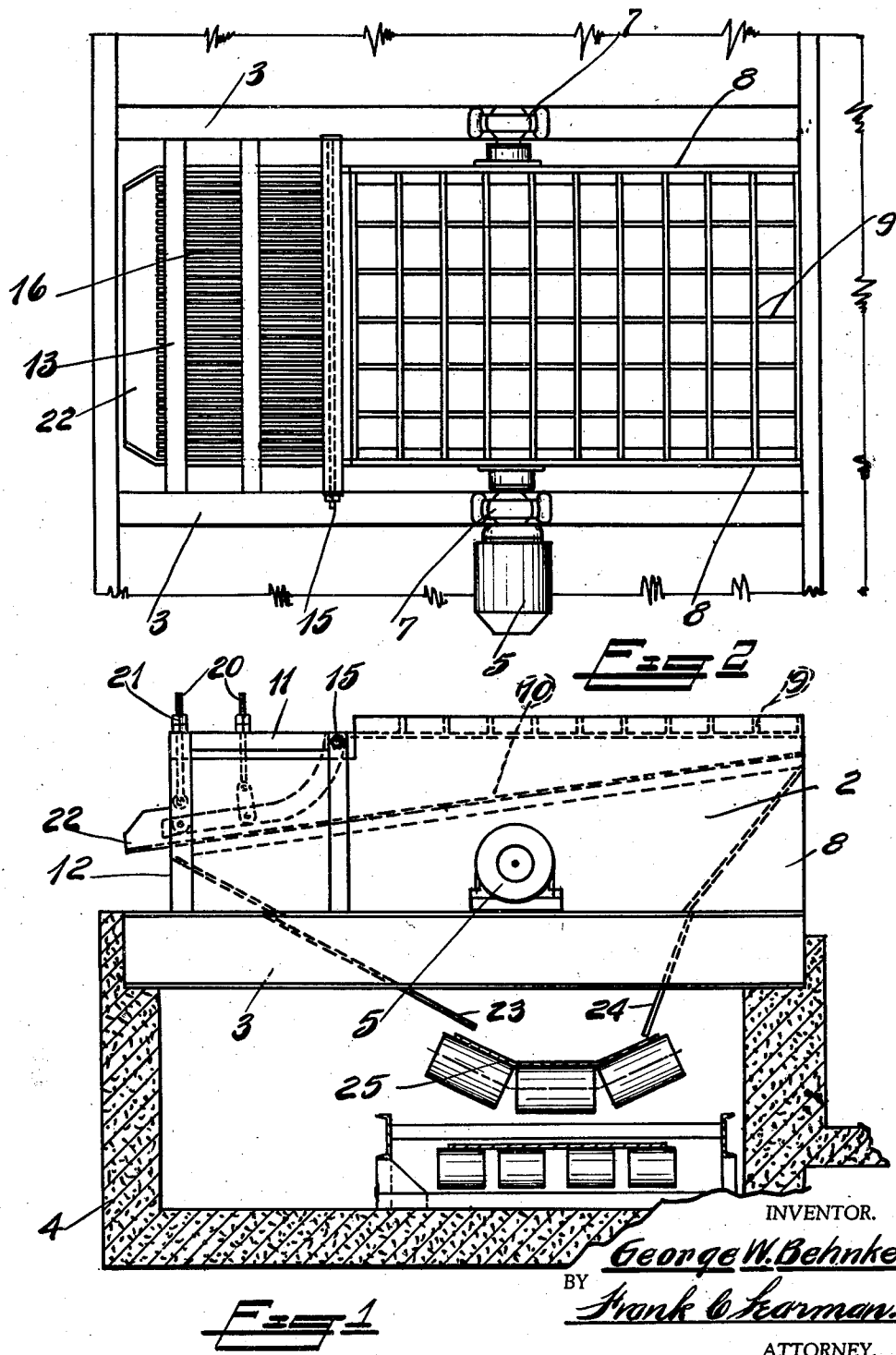
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2,020,131

APPARATUS FOR SHAKING OUT CHILLS AND CASTINGS

Filed Nov. 25, 1933

3 Sheets-Sheet 1



**Nov. 5, 1935.**

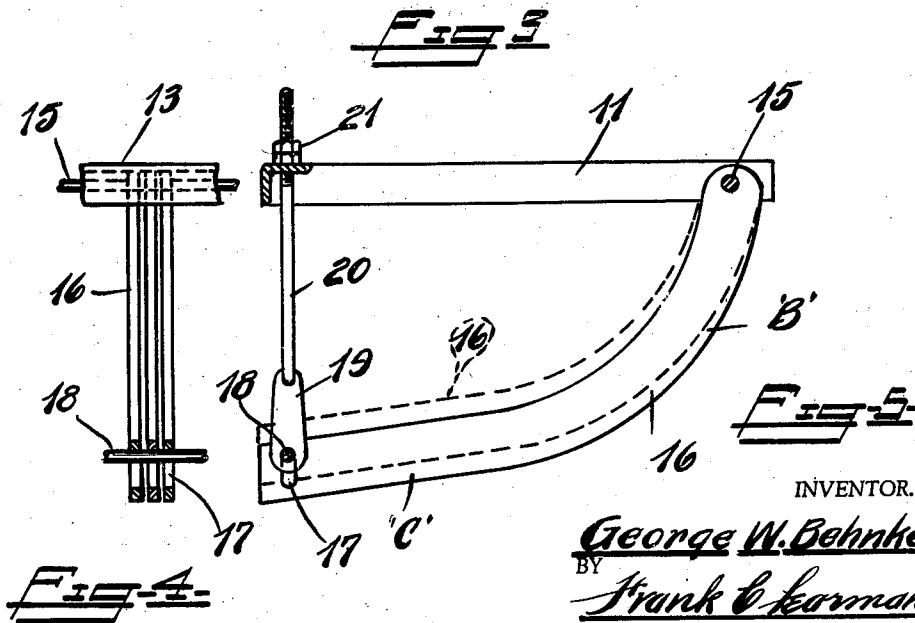
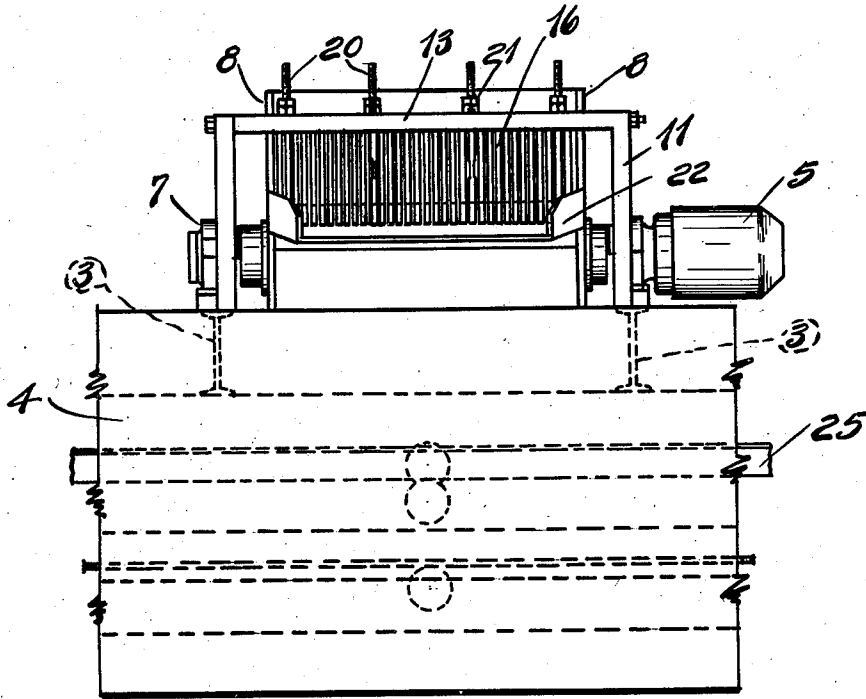
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# APPARATUS FOR SHAKING OUT CHILLS AND CASTINGS

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3 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

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APPARATUS FOR SHAKING OUT CHILLS  
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6 Claims. (Cl. 22-1)

This invention relates to a method and apparatus for shaking out castings, chills, sand, or other granular material from moulds.

One of the prime objects of the invention is to design an apparatus which shakes the sand, castings, and chills from moulds, which breaks up and grades the sand, which reduces and crushes burnt lumps of sand, and which discharges the chills into a suitable conveyer means for transporting to a suitable bin or other receptacle.

Another object is to provide a simple, practical, and adjustable crushing means for reducing hard and burnt lumps of sand without retarding the passage of the chills.

A further object resides in the various steps for shaking out the moulds, screening the sand, shaking out the casting and chills, crushing the lumps, and conveying the chills to a suitable receptacle or storage bin.

The above and other objects will appear as the specification progresses, reference being had to the accompanying drawings in which I have shown the preferred embodiment of my invention, and in which like reference numerals indicate like parts throughout the several views thereof.

In the drawings—

Fig. 1 is a part sectional side view showing the shakeout screen, conveyers, etc.

Fig. 2 is a top plan view.

Fig. 3 is a front view.

Fig. 4 is an enlarged part sectional detail of the crushing plate.

Fig. 5 is an enlarged detail side view of the crusher bars, the broken line position illustrating the bars raised to permit the passage of the chills.

Fig. 6 is a fragmentary side view of the shakeout screen showing an alternate crushing means.

Fig. 7 is a front view thereof.

Fig. 8 is an enlarged detail of the crushing discs and bearing supports.

Fig. 9 is an end view thereof.

Referring now more particularly to the drawings, the numeral 2 indicates a gyrating screening machine such as used for screening sand, gravel, coal, and other fragmentary materials; this is supported on a main frame comprising beams or standards 3 which are in turn mounted on a base 4, the screen being driven by means of a motor 5 which is connected to any suitable source of electrical supply.

This screening device can be of any desired design, and I shall not describe it in detail, excepting to point out the parts which make possible the various steps in the method.

A gyrator shaft assembly 6 is journaled in bearings 7 which are mounted on the beams 3, and side plates 8 are mounted on said gyrator shaft and form a screen frame, a grizzly or shakeout screen 9 being secured on said plates and on which the cope of the mould (not shown) is placed by a workman stationed alongside the machine.

A perforated screen 10 is mounted on the side plates below said grizzly, and the sand from the cope falls thereon and sifts through said screen, with the exception of the burnt lumps which are not broken up by the screen action, together with pieces which are too large to pass the openings in the screen 10; these lumps travel toward the discharge end of the screen and are reduced by means of a crushing attachment to be hereinafter described.

An angle iron frame 11 is mounted on the beams 3 at the discharge end of the screen and comprises corner member 12 connected by means of horizontally disposed angles 13, spaced apart longitudinally disposed members 14 being secured to said angles 13 so that a rigid superstructure is provided.

A horizontally disposed rod 15 is mounted in the angle 13 which spans the frame, and a plurality of crushing bars 16 are pivotally secured thereto, the inner end of these bars being curved as shown at "B", terminating in a straight outer end section "C" which normally rides on the face of the screen.

Vertically disposed elongated openings 17 are provided in said bars, and a transversely disposed rod 18 is mounted in said openings, links 19 being connected pivotally to said rod, the upper ends of said links being connected to an eye bolt 20, the upper end of the eye bolt being threaded and which is mounted in the cross members 13, the nuts 21 serve to hold the bolts in position, and also serve as an adjusting means for raising or lowering the bars to accommodate chills of various thicknesses, and it will be obvious that as the burnt lumps of sand and the chills travel towards the crushing plate that the large lumps of sand will engage the curved section "A" of the bars and be gradually crushed to size to pass the screen 10, the chills passing beneath the crushing bars and discharging off the apron 22 into a receptacle, bin, or onto a conveyer (not shown).

These bars which make up the crushing unit are free to raise and lower (within certain units), independent of each other, consequently, one or more of said bars may be raised to permit passage of chills or other solid objects, the remain-

ing bars being in normal low position to crush lumps of sand or slag.

In operation the top half of the cope is placed on the grizzly 9, and all the sand is shaken out; this sand, together with any hard lumps, drops onto the perforated screen 10, and the sand is screened through onto hoppers 23 and 24, which direct it onto an endless belt conveyer 25.

The burnt sand lumps which are too large to pass this perforated plate are carried to the lower end of the screen and against the curved section "B" of the bars 16, and are gradually crushed so that they readily pass the screen 10. After the cope has reached the lower end of the grizzly it is disposed of as desired.

The workman next takes the lower half of the mould or flask which is termed the "drag", and which contains the cast parts, burnt sand, and chills; this is placed on the upper end of the grizzly, the fine sand, burnt lumps, and chills pass the grizzly and fall onto the perforated plate, the castings and flask remaining on said grizzly until thoroughly cleaned of sand and chills, after which it is removed as usual.

The burnt lumps of sand together with the chills travel down the screen 10, the lumps being crushed as hereinbefore described, the chills passing beneath the crushing bars, raise only the bars necessary to permit their passage, the adjacent bars remaining in normal position.

An alternate crushing means is shown in Figs. 6 to 9 inclusive, and comprises a plurality of discs 26 having a hub 27 formed integral therewith, said hub serving to space the discs from each other. These discs are mounted on a transversely disposed shaft 28, the end of the shaft being mounted in a slotted opening 29 provided in a bearing hanger 30, the upper end of the hanger terminating in a cylindrical threaded section 31 which projects through the frame members 13, and a nut 32 is provided so that the shaft assembly may be adjusted vertically.

In the present illustration, I have shown three separate shaft assemblies "C", "D", and "E"; these are identical in every respect and are longitudinally spaced and at different elevations so that burnt lumps of sand or slag readily travel downwardly and are crushed by engagement with these discs. The discs are independent of each other, and the slotted bearing hanger permits a limited vertical movement of the shaft assembly.

In the construction shown in Figs. 8 and 9 of the drawings, the discs are rotatable on the shaft 28 and are rotated by contact with the gyrating screen, but it will be clearly understood that these discs may be keyed on the shaft and positively driven if desired by providing a motor (not shown), which can be geared to the shaft assemblies.

From the foregoing description it will be obvious that I have perfected a very simple, practical method and apparatus for shaking out sand, chills, and castings from flasks or the like.

What I claim is:

1. An apparatus for shaking out chills, comprising a main frame, a screen frame mounted thereon, a sand screen mounted on the screen frame, a grizzly spaced above the sand screen, a vertically movable crushing mechanism mounted on the main frame and cooperating with the lower end of the sand screen for crushing lumps of fragmentary materials, and means for gyrating said screen frame.

2. An apparatus for shaking out sand and solid objects from moulds and comprising a main frame, a screen frame mounted thereon, vertically spaced screens mounted on said screen frame, a vertically adjustable crushing apparatus mounted on the main frame and in engagement with the lower end of the lower screen, and means for gyrating said screen frame.

3. An apparatus for shaking out sand and solid objects from moulds, comprising a main frame, a gyrating mechanism journaled on said frame, vertically spaced screens mounted on said gyrating mechanism, a vertically adjustable crushing mechanism pivotally mounted on the main frame with its lower end engaging the face of the lower screen, and means for driving said gyrating mechanism.

4. An apparatus for shaking out sand and solid objects from moulds comprising a main frame, a gyrating unit journaled on said main frame, a screen frame mounted on said unit and including spaced apart screens, and a crushing unit pivotally mounted on the main frame at the discharge end of the lower screen and comprising a plurality of bars mounted to move independently of each other, and means for adjusting the height of said bars with relation to the face of the screen.

5. An apparatus of the class described and comprising a main frame, a gyrating unit journaled thereon, a screen frame mounted on said unit and including vertically spaced screens, a crushing unit mounted on the main frame and in contact with the face of the lower screen, said unit comprising a plurality of pivotally mounted individual bar members having vertically disposed slotted openings in the lower end thereof, and a rod hung from the main frame and mounted in said slotted openings to provide for a limited vertical movement of one bar with relation to the other.

6. An apparatus of the class described and comprising a main frame, a gyrating unit journaled thereon, a screen frame mounted on the gyrating unit and comprising vertically spaced screens, with the lower screen extending beyond the end of the upper screen, a crushing unit pivotally mounted on the main frame at the end of the upper screen and comprising a plurality of crushing bars, slotted openings in said bars, a transversely disposed rod extending through said slotted openings, and means connected to said rod and to said main frame for adjusting said crushing unit with relation to the lower screen.

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