H. H. CHILDERS.

SCREENING DEVICE.

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1,380,289. Patented May 31, 1921.

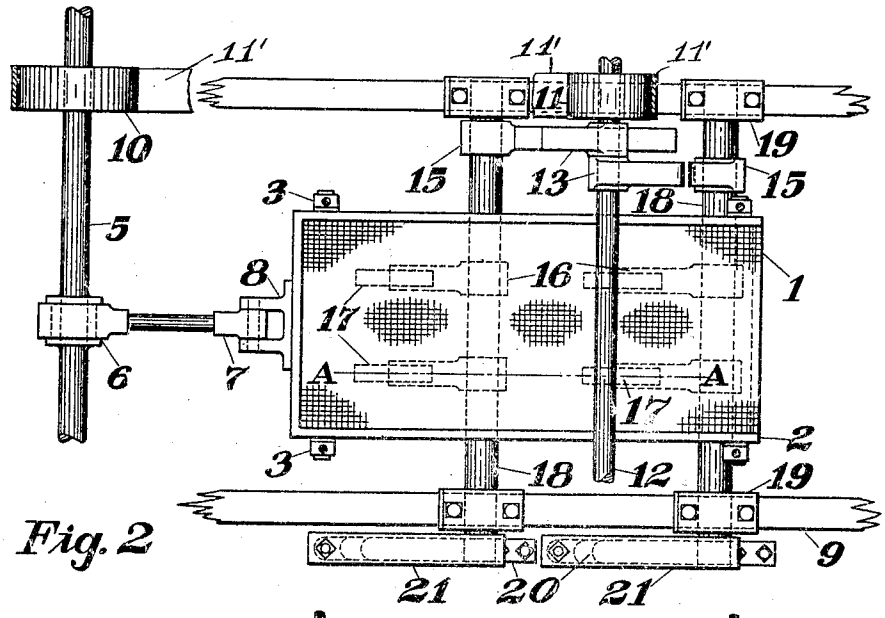


Fig. 2

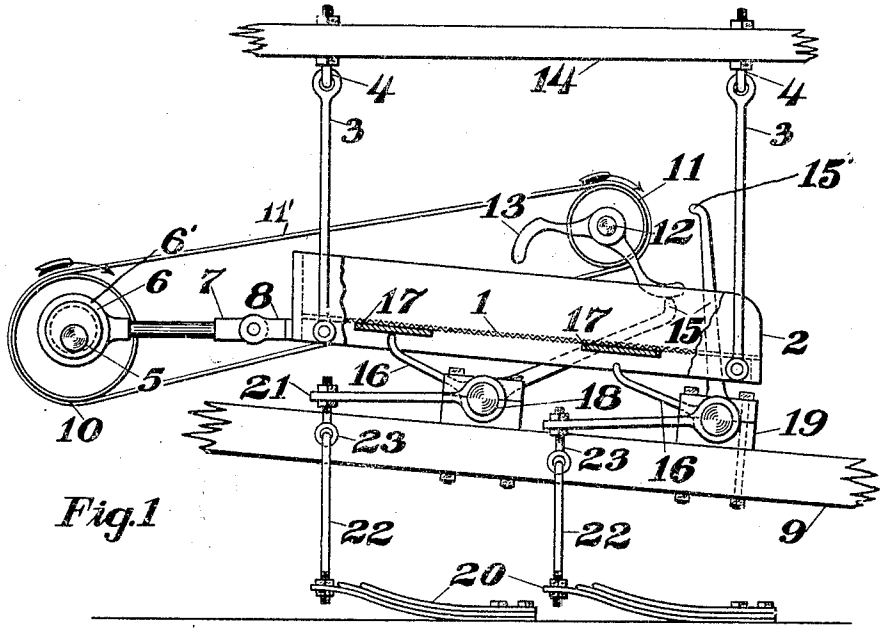


Fig. 1

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SCREENING DEVICE.

1,380,289. Specification of Letters Patent. **Patented May 31, 1921.**

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To all whom it may concern:

Be it known that I, HENRY H. CHILDERS, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Screening Devices, of which the following is a specification.

My invention relates to screening devices.

An important object of the invention is to provide simple and reliable means for striking or vibrating the screening element in the device, at proper intervals, for maintaining the same open or clean during operation.

A further object of the invention is to provide hammering or vibrating means, of the above mentioned character, the driving elements of which may be arranged wholly upon one side of the screening box, and hence out of the path of travel of the material discharging through the screen.

A further object of the invention is to provide means whereby the speed of operation of the hammers may be varied, and means for instantaneously retracting the hammers from the hammer plates, after the blows have been struck.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of a screening device embodying my invention, parts being in section on line A—A of Fig. 2, and,

Fig. 2 is a plan view of the device, parts being omitted.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 1 designates a screen, which may be of wire fabric of any suitable gage, as may be required for the particular work to be done. This screen is arranged within and secured to a horizontally or longitudinally vibrating screen box 2, having its forward end closed and its rear end open. The screen 1 is inclined toward the open rear end of the screen box, to discharge through this end the material which is too large to pass through the screen 1. The screen box 2 is pivotally supported by hangers 3, having pivotal connection with eye-bolts 4, which are in turn secured to beams 14.

The screen box 2 is longitudinally reciprocated or vibrated by means including a drive shaft 5, having an eccentric 6, engaging an eccentric strap 6′. This eccentric strap is connected with a rod 7, pivotally connected with a bracket 8, secured to the forward end of the box 2.

The drive shaft 5 has a pulley 10 rigidly secured thereto, to engage with a belt 11′ engaging a pulley 11, rigidly secured to a horizontal cam shaft 12, extending transversely above and spaced from the box 2. The cam shaft is supported in suitable bearings.

The cam shaft 12 has cams 13, rigidly secured thereto, the ends of which are preferably curved, as shown. These cames are arranged in different longitudinal vertical planes, and are disposed to engage with cam rockers 15, normally assuming an upstanding position. These cam rockers preferably have their upper or free ends bent laterally toward the cams, forming trip extensions 15′, for effecting a quick disengagement between the hammers and hammer plates, after the blows are struck.

The numeral 16 designates hammers or striking elements, the free ends of which are preferably slightly bent upwardly. These hammers are arranged to impinge against hammer plates 17. These hammer plates are disposed beneath the screen 1 and are secured thereto and extend longitudinally thereof. In the drawings I have shown four hammers 16 and hammer plates, but the invention is in no sense restricted to this number, as the same may be varied, as may be found advantageous. The hammers 16 are rigidly secured to horizontal transverse hammer rock shafts 18, arranged beneath the screen 1, and journaled in bearings 19, secured to beams 9. Springs 20, preferably of the leaf type, are secured to the floor, and serve to move arms or cranks 21 downwardly, being connected therewith by rods 22, having pivotal connection with eye-bolts 23, as shown. The arms 21 are rigidly secured to the hammer rock shafts 18.

Particular attention is called to the fact that the cams 13 and cam rockers 15 are arranged wholly upon one side of the box 2, while the arms 21, and associated elements

are arranged wholly upon the opposite side of the box, with the cam shaft 12 above the box. The hammer rock shafts 18 and hammers 16 are therefore the only elements disposed beneath the screen, in the path of travel of the descending material.

The operation of the device is as follows:

The material to be treated, such as lime, plaster, or the like, is introduced into the box 2, at the upper closed end thereof. The shaft 5 is rotated in the direction of the arrow, in Fig. 1, and the screen is longitudinally vibrated or reciprocated. The shaft 12 is also rotated in the direction of the arrow, Fig. 1, and the cams 13 are successively brought into engagement with the trip sections 15′ of the cam rockers, whereby the hammer rock shafts 18 are turned. The hammers 16 are thereby moved upwardly quickly, and impinge against the hammer plates 17, thus vertically vibrating the screen 1. As soon as the cams 13 turn off of the trip sections 15′, the springs 20 and associated elements move the hammers 16 downwardly, substantially instantaneously, a sufficient distance so that these hammers disengage the hammer plates 17, the hammers moving downwardly a farther distance, when the cams move away from the cam rockers.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of my invention, or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a device of the character described, a longitudinally vibrating member embodying a screen, means to vibrate the member longitudinally, hammer rock shafts arranged beneath and extending transversely of the longitudinally vibrating member and projecting outwardly beyond the sides of the same, a transverse cam shaft arranged above the longitudinally vibrating member and extending outwardly beyond one side thereof, cams disposed upon one side of the vibrating member and carried by the cam shaft, cam rockers disposed upon the same side of the vibrating member and secured to the hammer rock shafts and arranged to be engaged by said cams, yielding means arranged upon the opposite side of the vibrating member and connected with the hammer rock shafts to turn them in one direction, hammers arranged beneath the screen of the vibrating member and secured to the rock shafts to be operated thereby, and hammer plates secured to the lower surface of the screen and arranged to be struck by said hammers.

2. In a device of the character described, a vibrating member embodying a screen, means to vibrate the member in a substantially horizontal direction, hammer rock shafts extending transversely beneath the vibrating member and projecting outwardly beyond the sides thereof, a transverse cam shaft arranged above the vibrating member and extending outwardly beyond one side thereof, cams arranged wholly upon one side of the vibrating member and carried by the cam shaft, cam rockers disposed upon the same side of the vibrating member and secured to the hammer rock shafts and arranged to be engaged by said cams, arms arranged wholly upon the opposite side of the vibrating member and connected with the hammer rock shafts, springs arranged beneath the arms, means connecting the springs and arms, hammers arranged beneath the screen of the vibrating member and secured to the rock shafts, and hammer plates secured to the lower side of the screen to be engaged by the hammers.

3. In a device of the character described, a box, a screen held within the box, pivot means supporting the box, means to move the box upon its pivot means, a hammer rock shaft arranged beneath the box and projecting outwardly beyond the same, a cam shaft extending above the box and projecting outwardly beyond the same, a cam secured to the outer portion of the cam shaft, a cam rocker carried by the outer portion of the hammer rock shaft to engage with the cam, a hammer arranged beneath the screen and secured to the hammer rock shaft, a hammer plate carried by the screen and arranged to be struck by the hammer, yielding means to turn the rock shaft in one direction, and means to drive the cam shaft.

4. In a device of the character described, a box, a screen held within the box, pivot means supporting the box, means to move the box upon its pivot means, hammer rock shafts arranged beneath the box and extending transversely of the box, cam rockers carried by the hammer rock shafts, a cam shaft arranged above the box and extending transversely thereof, cams secured to the cam shaft and arranged to engage the cam rockers, leaf springs arranged beneath the hammer rock shafts, arms secured to the rock shafts, means connecting the leaf springs and arms, hammers carried by the rock shafts, hammer plates secured to the screen and adapted to be struck by the hammers, and means to drive the cam shaft.

5. In a device of the character described, a movable member embodying a screen, hammer plates secured to the screen, a hammer rock shaft arranged near the screen, hammers carried by the rock shaft and arranged beneath the hammer plates to strike the same, a cam rocker secured to the hammer

rock shaft and provided with a laterally extending trip element, a rotable cam shaft, and a cam secured to the cam shaft and adapted to engage the trip element, and means to turn the rock shaft in one direction to quickly move the hammers away from the hammer plates when the cam disengages the trip element.

6. In a device of the character described, a movable member embodying a screen, means to move the member, a hammer plate secured to the screen, a rock shaft arranged near the screen, a hammer carried by the rock shaft to strike the hammer plate when the rock shaft is positively turned in one direction, a cam rocker secured to the rock shaft to positively turn it in the said one direction and having a laterally extending trip element, yielding means connected with the rock shaft to turn it in an opposite direction to quickly move the hammer from contact with the hammer plate, a cam arranged to engage with the trip element, and means to rotate the cam.

In testimony whereof I affix my signature.

HENRY H. CHILDERS.