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P. J. ALWART  
SCREENING APPARATUS  
Filed Feb. 18, 1921

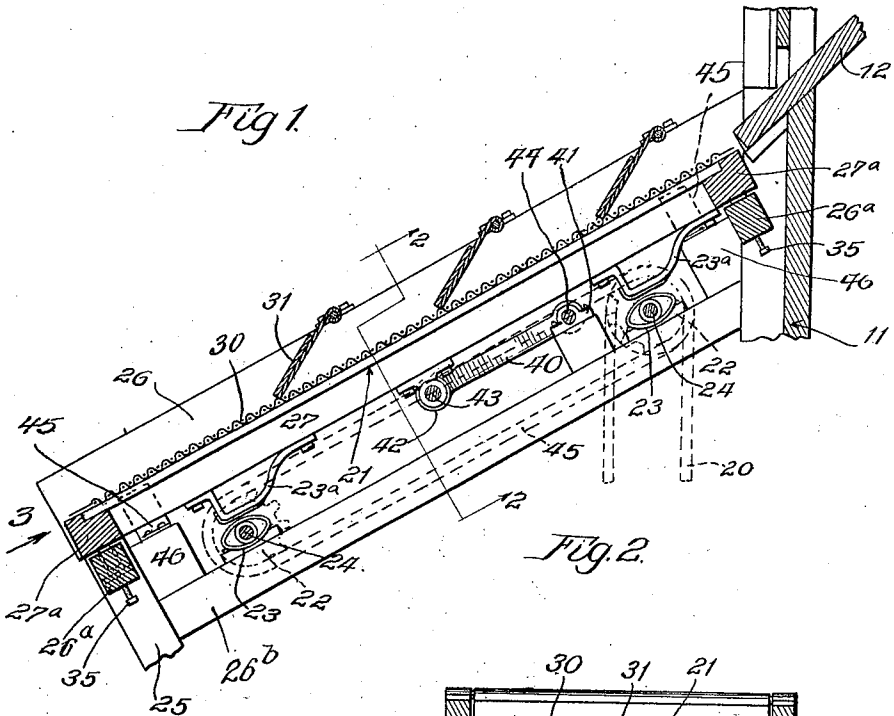


Fig. 1.

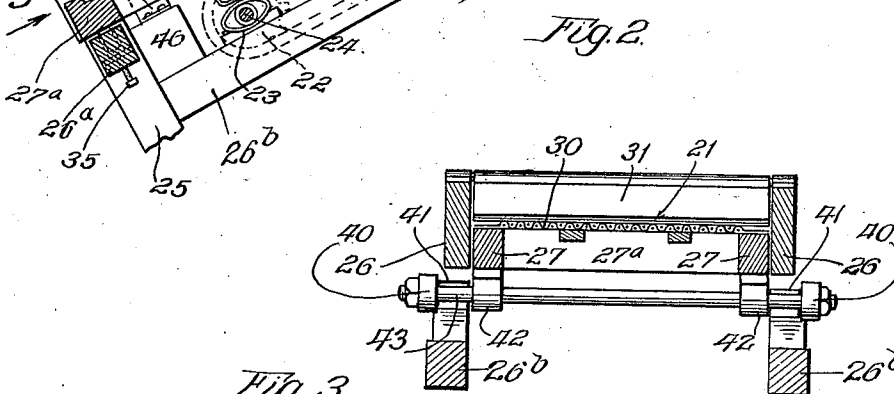


Fig. 2.

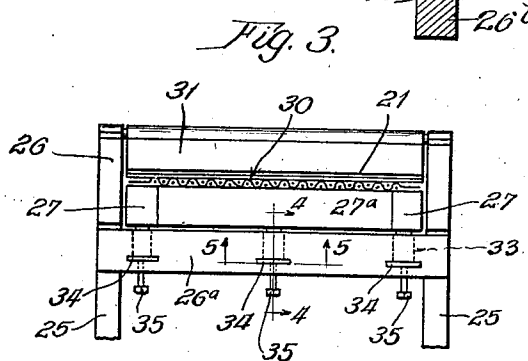


Fig. 3.

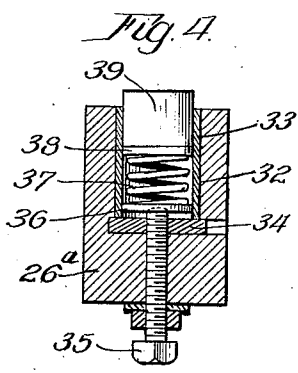


Fig. 4.

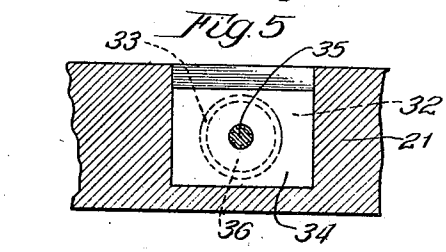


Fig. 5.

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Paul J. Alwart.  
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## UNITED STATES PATENT OFFICE.

PAUL J. ALWART, OF CHICAGO, ILLINOIS.

## SCREENING APPARATUS.

Application filed February 18, 1921. Serial No. 445,980.

*To all whom it may concern:*

Be it known that I, PAUL J. ALWART, a citizen of the United States, and a resident of Chicago, Cook County, and State of Illinois, have invented certain new and useful Improvements in Screening Apparatus, of which the following is declared to be a full, clear, and exact description.

This invention relates to screening apparatus and it has reference more particularly to cushioning means, whereby the constant jars and shocks, which are due to the vibratory or shaking movement imparted to the screen by the agitating means, may be taken up, whereby the wear and tear on the various parts is reduced to a minimum. This invention pertains to coal screens or other screens for screening heavy, coarse material, such as gravel, and so forth. The wear and tear on such screens is considerable and one of the objects of the present invention is to lessen the jar and shock, and thereby prevent the usual rapid breaking down of the structure. Another object is to provide simple and efficient means in an inclined screening apparatus for holding the screen against lengthwise or endwise movement. The invention consists in the several novel features hereinafter fully set forth and claimed.

The invention is clearly illustrated in the accompanying drawings, in which:—

Fig. 1 is a vertical longitudinal section of a screening apparatus embodying a simple form of the present invention; Fig. 2 is a cross section taken on the line 2—2 of Fig. 1; Fig. 3 is an end view looking in the direction of the arrow 3 in Fig. 1; Fig. 4 is a detail, vertical, longitudinal section taken on line 4—4 of Fig. 3, and Fig. 5 is a detail section taken on line 5—5 of Fig. 3.

Referring to said drawings which illustrate a simple embodiment of the invention, the reference character 11 designates the main frame or structure and 12 an inclined chute or hopper bottom of a hopper or container for the material to be screened. The screen 21 is preferably rectangular in form and inclines downwardly from the lower end of said hopper bottom 12 and comprises lengthwise screen frame members 27 and end screen frame members 27<sup>a</sup> which are securely fastened together to make up a strong and substantial screen frame. A wire mesh or perforated plate screen 30 is secured to the screen frame. The screen 21

is located between two lengthwise extending stationary frame members 26, which run parallel with the screen and are supported at one end by the main structure and at the other end legs or braces 25. End frame members 26<sup>a</sup> connect the inclined frame members 26. Hinged material retarding gates 31 are hingedly supported by the stationary frame members 26 and extend therebetween with their lower edges resting on the screen.

Cams 23, located near each end of the screen, are employed for vibrating or agitating the screen, said cams being mounted on shafts 24 journaled in bearing brackets secured to and extending up from other stationary frame members 26<sup>b</sup>. The screen 21 has bearing shoes 23<sup>a</sup> secured to the lower sides of the lengthwise extending screen frame members 27, against which shoes the cams strike and throw the screen upwardly each time the working faces of the cams engage the bearing shoes. Balance wheels 24<sup>a</sup> may be mounted on the shafts 24.

The shafts 24 may be driven from any suitable source of power, and, as shown, they are connected by a sprocket chain 45, trained around sprocket wheels 22 on the shafts. A driving sprocket chain 20 trained around a sprocket wheel on one of the shafts may be employed for rotating the cam shafts. Said cams strike the shoes and throw the screen upward and the cushioning device is provided to receive the impact from the screen when it drops after being struck upward by the cams. In some instances the cams are provided only at the lower end of the screen and in such case the cushioning devices are provided only at the lower end. The cushioning means employed will now be described.

In the transverse frame beams 26<sup>a</sup> are formed a plurality of sockets or recesses 32 (see Fig. 4) which extend down from the upper face of said beams and in each of said sockets is placed a short tube or pipe 33 which forms a lining or facing for the wall of the socket. Below the tube or pipe 33, a block or plate 34 is let into the beam, which block or plate is provided with a threaded aperture in which is threadedly mounted an adjusting screw 35. Resting upon the upper end of each screw is a disc 36, and resting on said disc is a coiled compression spring 37. Supported by said spring 37 is a second disc 38 upon which

rests a block 39 formed of rubber or other resilient material. Said rubber block protrudes from the tube or pipe 32 and receives the impact from the screen, each time it falls after being struck up by the cams. The several cushioning members are spaced along the beam 26<sup>a</sup> and as many may be employed as is found necessary for properly cushioning the load.

The screen frame with its screen is held against lengthwise movement by links 40, which may be in the form of bars or cables attached to the stationary frame members 26<sup>b</sup> and the screen frame by brackets 41, 42 or other suitable fastening devices. For convenience, I have shown rods 44, 43, for connecting the links to the brackets 41, 42. This link connection between the stationary frame and inclined screen frame permits of the up and down vibratory movements imparted to it by the cams, but holds it against lengthwise movement, preventing it from sliding down on the cams. Said links extend in lines approximately parallel with the screen, whereby the movement of the latter may be substantially in line with the cushioning devices, thereby minimizing the wear on the cushioning blocks. With this arrangement, the screen frame strikes them squarely on their ends and does not cause any rubbing action thereon.

For preventing any side play of the screen I provide guide members at the corners thereof, said guide members comprising angle iron pieces 45 mounted on blocks 46 carried by the frame members 26<sup>b</sup>. Said angle iron pieces extend up along the outer sides of the screen frame and prevent any side play thereof.

It will be observed that the cushioning members receive the shock and impact when the screen falls after being struck upward by the cams, and that by adjusting the position of the cushioning blocks 39 more or less fall may be given to the screen, which enables the screen to act more or less violently upon the material, depending upon the character of the material which is being screened.

I have found that screens equipped with these cushioning members outlast others considerably; they are less noisy and are not subject to the usual shocks and jars to which they heretofore were.

More or less variation of the exact details of construction is possible without departing from the spirit of this invention; I desire, therefore, not to limit myself to the exact form of construction shown and described, but intend, in the following claims, to point out all of the invention disclosed herein.

I claim as new and desire to secure by Letters Patent:

1. In a screening apparatus, the combination of a stationary frame having a horizontal frame member, an inclined screen frame and a screen carried thereby, a cam shaft mounted on said stationary frame, screen agitating cams mounted on said shaft, and a plurality of resilient cushioning members spaced along and mounted in and projecting upward and out from said horizontal frame member under one end of said screen frame, and adapted to receive impact from the screen.

2. In a screening apparatus, the combination of a stationary frame having a horizontal frame member, an inclined screen frame and a screen carried thereby, a cam shaft mounted on said stationary frame, screen agitating cams mounted on said shaft, a plurality of separately adjustable adjusting screws mounted in said horizontal frame member under said screen frame, discs on said screws, coiled compression springs, confined in recesses and resting on said discs, other discs resting on said springs, and blocks of resilient material resting on said last mentioned discs and projecting upward and out from said frame member, said springs and blocks acting to receive impact from said screen.

3. In a screening apparatus, the combination of a stationary frame having a wooden horizontal frame member, an inclined screen frame and a screen carried thereby, a cam shaft mounted on said stationary frame, screen agitating cams mounted on said shaft, said horizontal frame member being formed with recesses under said end of said screen frame, tubes in said recesses, screw carrying blocks secured in said horizontal frame member below said recesses, adjusting screws threaded in said blocks, coiled compression springs in said tubes and supported by said screws, and blocks of resilient material supported by said springs and protruding from said tubes and adapted to receive impact from said screen.

4. In a screening apparatus, the combination of a stationary frame, an inclined screen frame and a screen carried thereby, cam shafts mounted on said stationary frame adjacent each end of said screen and screen agitating cams mounted on said shafts, and link connections between said stationary frame and screen frame secured to the screen frame intermediate the upper and lower cams, for holding said screen frame against endwise movement.

PAUL J. ALWART.