

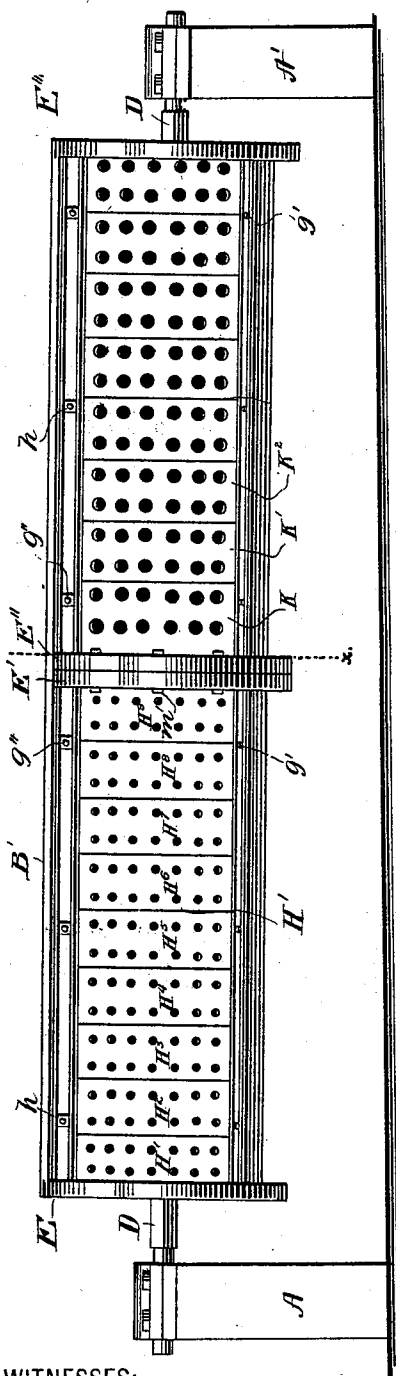
(No Model.)

J. J. DONOVAN.
STONE SCREEN.

No. 521,209.

Patented June 12, 1894.

Fig. 1.



WITNESSES:

Frank S. Ober
Herbert P. Bowen

Fig. 3.

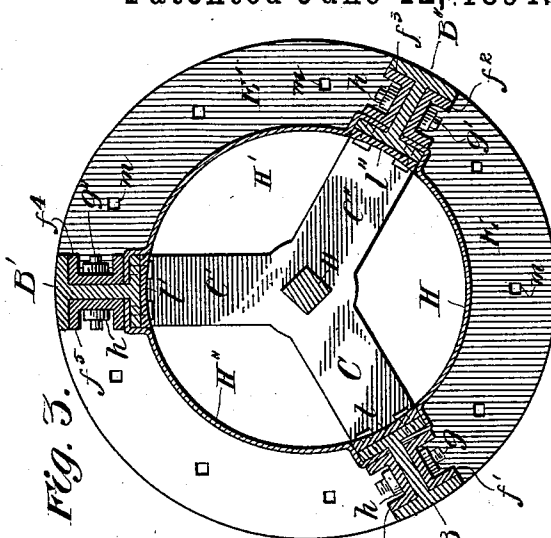
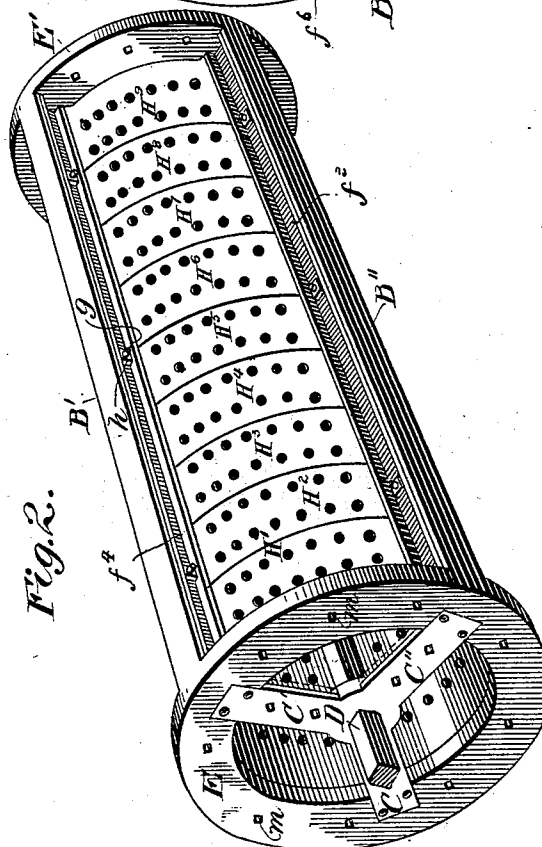


Fig. 2.



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JOHN J. DONOVAN, OF KINGSTON, NEW YORK.

STONE-SCREEN.

SPECIFICATION forming part of Letters Patent No. 521,209, dated June 12, 1894.

Application filed August 4, 1893. Serial No. 482,327. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. DONOVAN, a citizen of the United States, residing at Kingston, Ulster county, in the State of New York, have invented certain new and useful Improvements in Stone-Screens, of which the following is a specification.

My invention relates to improvements in the construction of "stone screens" so called, being screens adapted to sift and separate automatically into separate collections of uniform size, the different sized pieces of broken stone which are passed through the apparatus. These screens have heretofore been constructed out of perforated boiler iron, in large sheets, bent and retained by suitable fastenings into the form of hollow cylinders of very considerable length, through which the broken stone was passed during rotation on a central longitudinal axis. The wear upon the interior of such cylinders or screens is very great, owing to the nature of the contents and is not uniform, so that certain portions wear or deteriorate more rapidly than others, and very large screens and extensive surfaces of perforated boiler iron are often rendered useless by the destruction or wearing out of limited portions thereof.

My invention relates to improvements in the method of constructing these stone screens, and the object of my invention is to provide a screen in which worn portions may be readily separated and removed, and replaced without impairing the usefulness of the remainder of the screen, and without diminishing its strength or capacity to perform its aforesaid function of separating the stone. I obtain these objects by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a side elevation of two sections bolted together of one of my screens; Fig. 2 a perspective view of a single section detached; Fig. 3 a cross-section at line X X of Fig. 1.

Similar letters refer to similar parts throughout the several views.

A A' are vertical supports provided with bearings, within which turns the main shaft D, which may be rotated by any suitable power in any well-known way, E E' E'' E''' are flanges connected together permanently

by longitudinal bars B, B' B''. These parts may be either cast in one piece or frame, or the bars may be bolted or otherwise, in any convenient manner, permanently fixed to the flanges. I prefer to make these portions of my screen of cast iron, but other metal or materials sufficiently strong and rigid to endure the strain might be employed without departing from my invention. The flanges are provided with cross-arms or spokes C C' C'' permanently bolted or otherwise rigidly secured thereto at their extremities and united permanently into a central hub perforated for the reception of the shaft of square cross-section D. The bars B B' B'' are preferably constructed also of cast iron and are H shaped in cross-section, as shown in Fig. 3. They are perforated for the reception of bolts g g' g'' in the drawings. f' f² f³ f⁴ f⁵ f⁶ are inner, flanged, retaining bars of angular or shaped cross-section as shown in Fig. 3 and shaped to fit and extend throughout the longitudinal recesses of the large bars B B' B''.

H H' H'', H H, &c., are plates of hardened iron or steel having longitudinal edges bent or flanged into the shape shown in cross-section in said Fig. 3, and of such width as to be conveniently handled and provided with perforations of such diameter as may be desired. These perforated plates are secured in position as shown in Fig. 3 by inserting their longitudinal flanged or bent edges or extremities so as to bear and lie against the inner longitudinal flange or wall of the H-shaped longitudinal connecting bars aforesaid; and the said perforated plates are thereafter held rigidly and firmly in such position by inserting between their said edges and the retaining edge of the said H-shaped bars the aforesaid retaining bars or clamping pieces f' f' f², &c., these being secured into position by bolts g, g', &c., passing through both main bar and its pair of retaining bars, or fixed to the main bar and passing through the retaining bar, and held in place by screw nuts, h.

l' l'' are wearing pieces or facings, which over-lie throughout their entire extent the inner faces of the main bars B B' and are secured to the latter by screws, bolts and nuts, or any other convenient device. The flanges, arms or spokes, are provided with bolt holes,

m, m, whereby they may be firmly bolted and secured to contiguous arms and flanges of an adjoining section of my screen, as shown in Fig. 1. As many sections as are desired may be thus united in using my invention. I have illustrated but two in the drawings, but many others might be employed if desired and united together in the manner described. The screen being constructed as aforesaid, the broken stone is introduced at one end thereof, the screen caused to rotate, and since the main shaft is set at a pitch or angle the stone is thereby gradually driven throughout the extent of the screen, the small pieces falling out of the smaller holes and the larger out of those sufficiently large to accommodate them, and so on until the separation into separate collections of uniform or approximately uniform size is thus accomplished.

By means of my invention whenever any portion of the screen becomes injured so as to be useless, the frame-work can be readily opened, the injured plate or plates removed and others substituted and the screen thus kept in operative condition with great ease and economy. The interior is so constructed as to present to the wear of the passing stone only surfaces of moderate size and readily replaced, while all the structural framework of the screen, with the exception of the arms, is protected from any wear or contact with the stone, the protecting plates *l l' l''* completely covering the inner surface of the bars and all other inner surfaces being those of the removable perforated plates.

In addition to the foregoing advantages my said method of fastening the perforated plates into position adds to their ability to resist the wear and impact of the stone during revolution, since the angular bend or flange along the longitudinal edges acts to some extent like a spring and enables the plate to yield

slightly under any unusually heavy shock or fall of stone against its inner surface.

I have shown my sectional plates of such dimensions and so combined with the longitudinally recessed bars and holding bars as to cover the circumference of the inner surface of the screen by three plates and three main bars with their accompanying wearing pieces; but it is of course possible to divide the cylinder into four or more divisions, involving the use of as many separate plates and bars. I find, however, that the division shown in the drawings is the most economical and is entirely operative.

What I claim as new, and desire to secure by Letters Patent, is the following:

1. In a stone screen, the sectional curved perforated plates *H H' H''*, having their straight longitudinal edges flanged or bent, in combination with *H*-shaped longitudinal bars *B B'*, &c. and *U*-shaped retaining bars *f⁵ f⁶*, all bolted together substantially as and for the purpose described.

2. In a stone screen, the sectional curved perforated plates *H H' H''*, having their straight longitudinal edges flanged or bent in combination with *H*-shaped longitudinal bars *B B'*, &c. and *U*-shaped retaining bars *f⁵ f⁶* and the longitudinal wearing pieces *l l'*, all bolted together substantially as and for the purpose described.

3. In a stone screen the combination of sectional curved perforated plates *H H' H''*, &c. with *H*-shaped longitudinal bars *B B'* &c. and *U*-shaped retaining bars *f⁵ f⁶*, longitudinal wearing-pieces *l l'*, end flanges *E E'*, arms or spokes *C C'* and shaft *D*.

JOHN J. DONOVAN.

Witnesses:

THOS. C. BYRNES,
CHRISTIAN J. BODE.