(No Model.)

J. N. POTT.

SCREEN FOR COAL OR OTHER MATERIAL.

No. 543,780. Patented July 30, 1895.

Fig. 1.

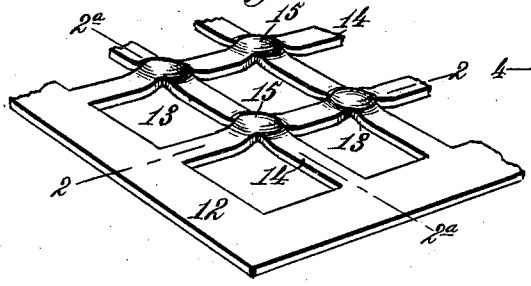


Fig. 2.

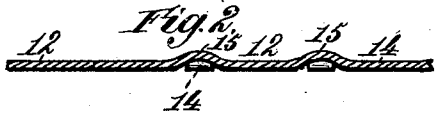


Fig. 3.

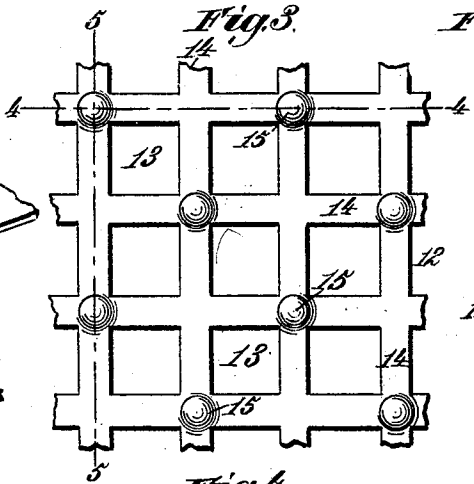


Fig. 4.

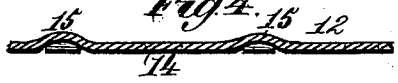


Fig. 5.

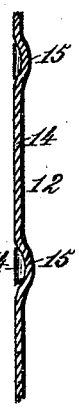


Fig. 6.

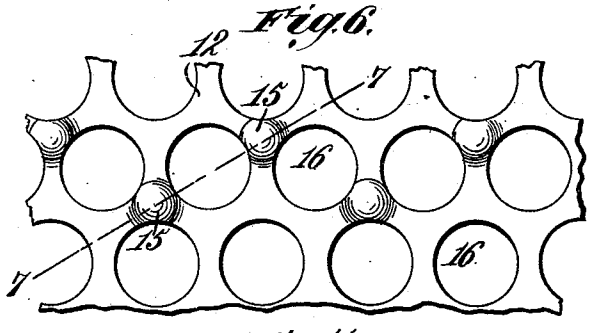


Fig. 7.

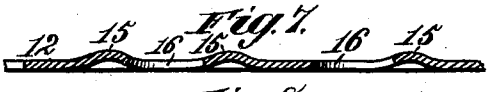


Fig. 8.

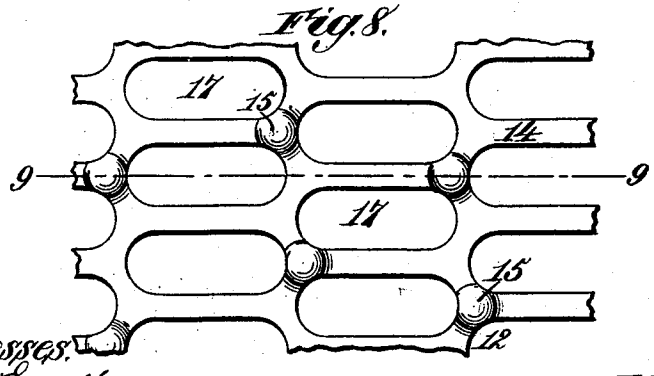
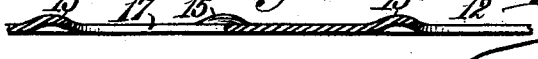


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOHN N. POTT, OF CHICAGO, ILLINOIS.

SCREEN FOR COAL OR OTHER MATERIAL.

SPECIFICATION forming part of Letters Patent No. 543,780, dated July 30, 1895.

Application filed October 11, 1894. Serial No. 525,591. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. POTT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Screens for Coal or other Materials, of which the following is a specification.

This invention relates to perforated-metal screens for cleaning and sizing coal, coke, ores, gravel, stone, &c.

The object of the invention is to provide the screening or working surface of a perforated-metal screen-plate with an effective arrangement of rounded protuberances or protrusions, forming double reverse curves with the plate, distributed at suitable intervals and located at intersections of the portions of metal left between the holes that are formed through the plate. By this construction there is provided an uneven screening-surface which will prevent the material being screened from passing over it in mass and that will cause a slight undulatory movement in the said material, thereby assisting the smaller particles to descend to the surface of the screen, so that such as are small enough may readily pass through. The protuberances will also prevent the larger lumps of material from coming in contact with the sharp edges of the holes in the screen-plate, thereby avoiding considerable waste, as frail materials are liable to be broken by striking against such edges.

Other advantages of the invention, in simplicity and comparatively small cost of the screen and in the economy and efficiency of its operation, will hereinafter more fully appear.

My invention consists in a perforated-metal screen-plate having its working surface provided at intervals with rounded protuberances forming double reverse curves with the plate and located at some or all of the intersections of the portions of metal left between the perforations of the plate, whereby the cleaning and sizing of various materials are facilitated and the breaking of large lumps prevented, as hereinafter described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a perspective of a portion of a perforated-metal screen-plate having square holes arranged in parallel lines both lengthwise and crosswise of the plate and provided on the working surface with protuberances that are struck up from the plate at all the intersections of the portions of metal left between said holes. Fig. 2 is a sectional view of the screen on the lines 2 2 and 2^a 2^a of Fig. 1. Fig. 3 is a plan of a portion of a screen similar to that shown in Figs. 1 and 2, except that the perforations are smaller and the protuberences are located only at some of the intersections of the portions of metal left between the perforations, preferably at every other intersection. Figs. 4 and 5 are respectively sections on the lines 4 4 and 5 5 of Fig. 3. Fig. 6 is a plan of a portion of a screen having circular perforations and provided on its working face with rounded protuberances arranged at suitable intervals in spaces or intersections of the plate between perforations. Fig. 7 is a section on the line 7 7 of Fig. 6. Fig. 8 is a plan of a portion of a screen having oblong holes and provided on its working surface with protuberances located upon or struck up from the metal between the ends of said holes and suitably spaced. Fig. 9 is a section on the line 9 9 of Fig. 8.

In assorting coal, gravel, ores, and other materials it is customary to employ screens composed of perforated metal plates or sections having such form and dimensions as will best adapt them for attachment to the frame of a preferred kind of screen, whether revolving, chute, shaking, oscillating, or gyrating. Perforated-metal screen-plates are more durable than woven-wire screens; but in order to prevent the material being screened from sliding off in mass it is desirable that the working surface of the screen-plate should be made somewhat uneven or irregular. The punched apertures of a perforated-metal screen-plate by reason of their sharp edges are liable to cut up or break the larger pieces of any frail material thrown or forced against them, and for the purpose of obviating this objection it is of great advantage to so form and arrange the irregularities of the screening-surface as to keep the large lumps of material away from the screen-openings, thus preventing breakage and waste and at the same time permitting the small particles of material to pass readily to and through the screening-apertures.

I have shown in Figs. 1 and 3 portions of perforated-metal screen-plates 12, provided with substantially square holes 13, arranged

preferably in parallel lines both lengthwise and crosswise of the plate. The perforations 13 may be formed in the metal plate by cutting or punching in any well-known manner.

On the working surface of the screen-plate 12, at intersections of the integral webs 14, or portions of uncut metal left between the perforations 13, I form a number of spaced-apart and rounded protuberances 15, that are integral with the webbing portions of the plate from which they are stuck up or protruded and are so shaped as to form double reverse curves. The humps or protuberances 15 are preferably formed by the pushing outward beyond the working face of the screen-plate of portions of metal subjected to the pressure of a round or oval ended punch applied to the opposite face of the plate. If the screen-plate is provided with perforations of a large size—say one inch or more across—as shown in Fig. 1, the protuberances 15 on the working face of said plate may be advantageously located at all the intersections of the webs or portions of metal left between the perforations. Where the square perforations are smaller—say under one inch across—as in Fig. 3, the protuberances 15 will be preferably located only at every other intersection of the intermediate webbings, or they may be formed at such intersections as will afford the required spacing to enable the protuberances to serve as guards for the perforations through the plate.

Instead of square perforations the screen-plate may be provided with any suitable arrangement of circular holes 16, Figs. 6 and 7, with the humps or rounded protuberances 15 located at such intervals as may be required and in spaces between the holes at intersections of the webbing by which they are separated.

As shown in Figs. 8 and 9, the screen-plate may be formed with oblong perforations 17 of any preferred size, and the protrusions or protuberances 15 will be located upon the working face of the plate, in the metal between the ends of the oblong holes, and may be spaced apart as desired.

It will be observed that in each variety of screen illustrated in the drawings the rounded humps or protuberances 15 are located on the working face of the screen at intersections of the webbing between the perforations or screen-holes. These protuberances are integral with and protrude beyond the working face of the screen in such manner as to form double reverse curves therewith and may be spaced apart or arranged at any suitable intervals to impart the required irregularity or unevenness to the screening-surface. By reason of the irregularities of surface thus produced the material to be screened is prevented from rapidly sliding off from the screen, and receives a somewhat undulatory and retarding movement that facilitates the passage of the smaller particles toward and through the screen-perforations. The rounded protuberances 15 not only retard the sliding movement of material on the screen but they also act as guards to keep the larger lumps away from the screen openings or holes. In this way a more free passage is afforded for access of small particles to the screen-apertures, thereby rendering the operation of screening more thorough and effective. At the same time a wasteful breakage or cutting to pieces of large lumps from contact with sharp edges of punched screen-holes is avoided; and it will also be observed that as the protuberances 15 are rounded and rise gradually from the metal plate they present no sharp angles, points, edges, or projections that would be liable to break up large pieces of material and thus add to the waste, as in some forms of construction.

The rounded protuberances 15 may be formed on the working face of the screen-plate, in the intersections of the webbing, at the same time that the perforations are cut or punched. This may be readily accomplished by means of any suitable punching or die mechanism.

It is obvious that the screen-plates or sections may be either flat or somewhat curved, according to the character of screen in which they are to be used.

The perforated screen-plates, with the rounded protuberances, shaped to prevent double reverse curves in section, may be formed from any suitable sheet metal by means of appropriate punching devices, or they may be made by casting if preferred. In this construction the perforated screen plates are comparatively simple and inexpensive, while the form and distribution of the gradually-rounded protuberances on the working surface will effect economical results in the screening, cleansing and sorting of various materials without breakage and consequent waste of the larger pieces or lumps.

What I claim as my invention is—

The herein described metal screen plate having rounded protuberances forming double reverse curves with said plate and located on and integral with its working surface at inter-sections of the integral webbing or portions of metal left between the perforations, the said rounded protuberances being spaced apart to serve as guards for the perforations and prevent breakage of large lumps or pieces of material being screened and to impart a retarded undulatory movement to the material that will prevent a rapid sliding off from the screen and facilitate the passage of smaller particles through the perforations of the screen, substantially as specified.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

JOHN N. POTT. [L. S.]

Witnesses:
EDWARD RUHE,
S. A. BUTZ.