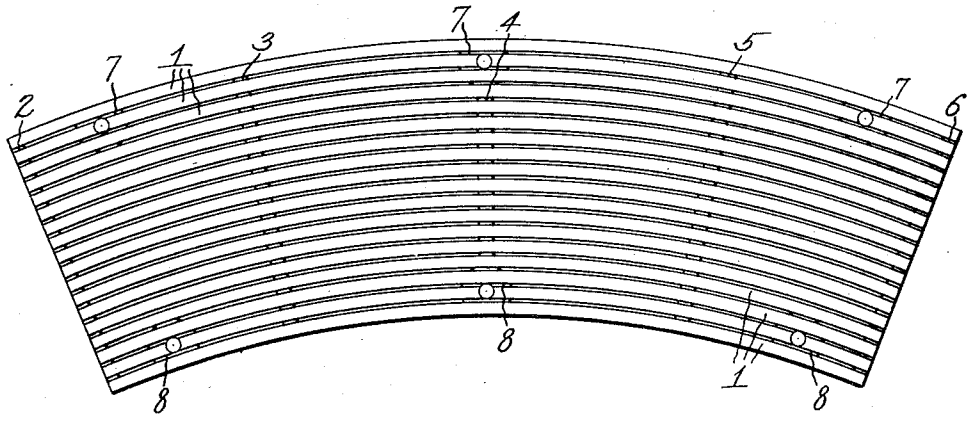
May 24, 1932. W. E. McMURRAY 1,859,784

METHOD OF MAKING SCREEN PLATES

Filed Sept. 4, 1930 3 Sheets-Sheet 1

Fig. 1.



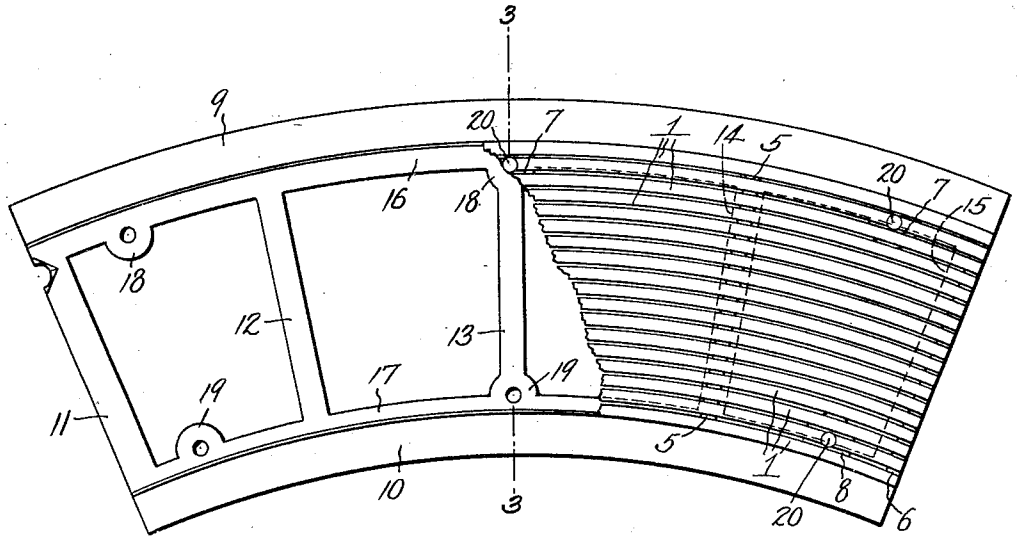


Fig. 2.

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METHOD OF MAKING SCREEN PLATES

Filed Sept. 4, 1930 3 Sheets-Sheet 2

Fig. 5.

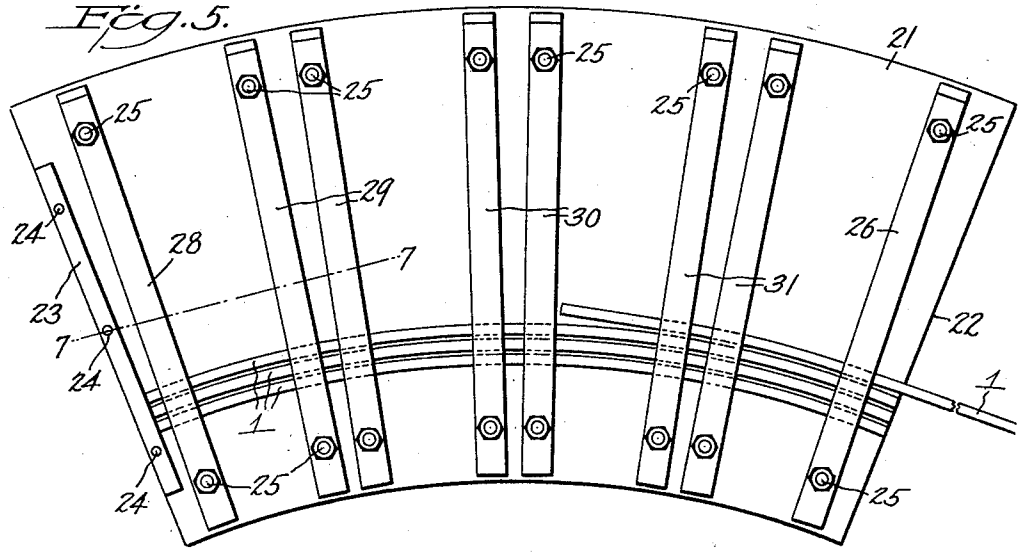


Fig. 3

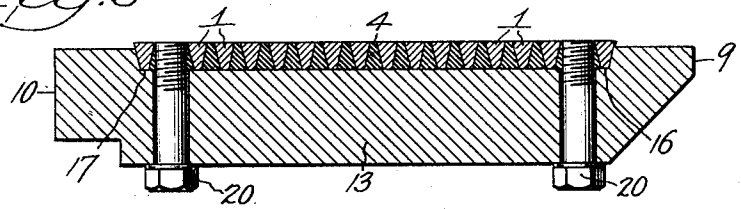


Fig. 4.

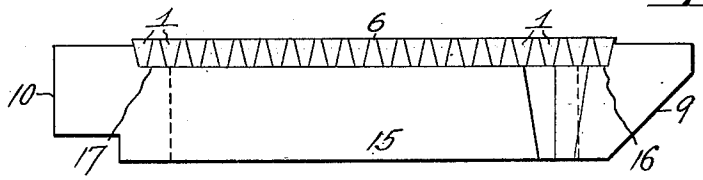
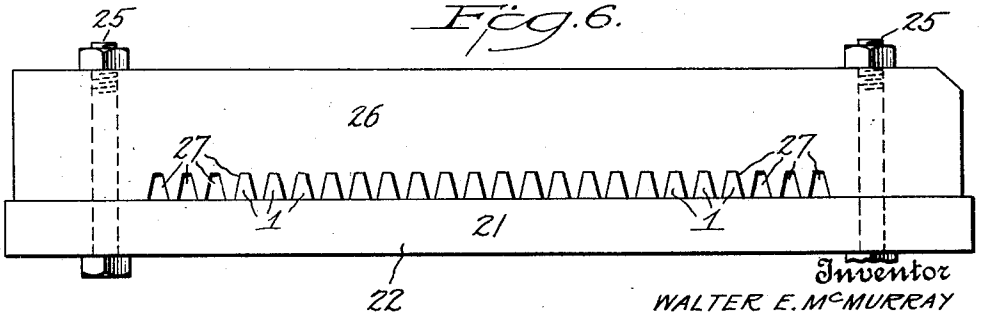


Fig. 6.



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METHOD OF MAKING SCREEN PLATES

Filed Sept. 4, 1930 3 Sheets-Sheet 3

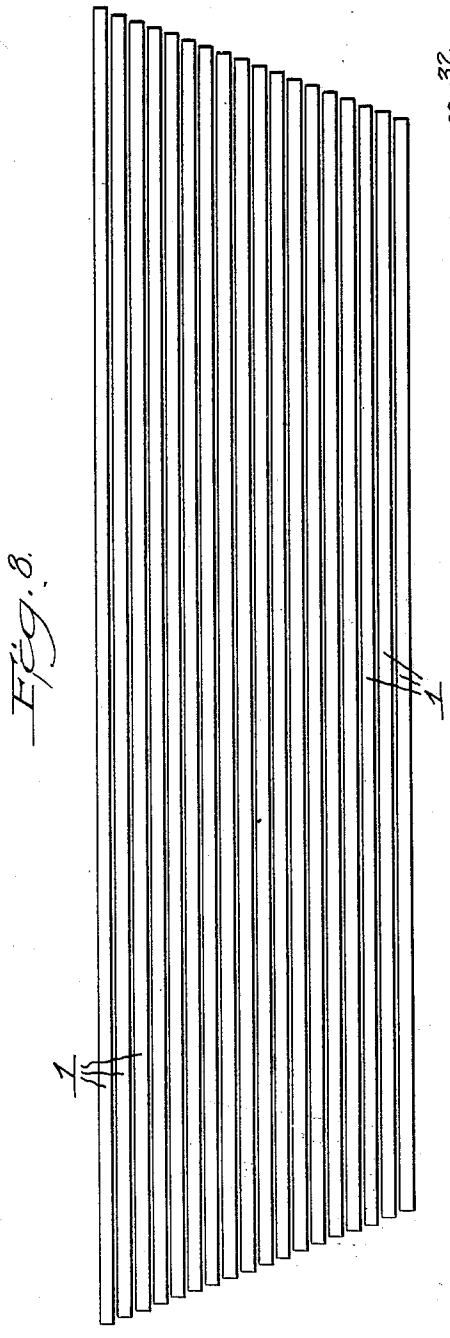


Fig. 8.

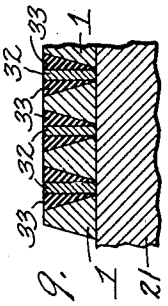


Fig. 9.

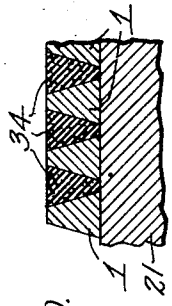


Fig. 10.

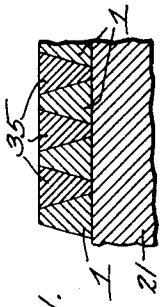


Fig. 11.

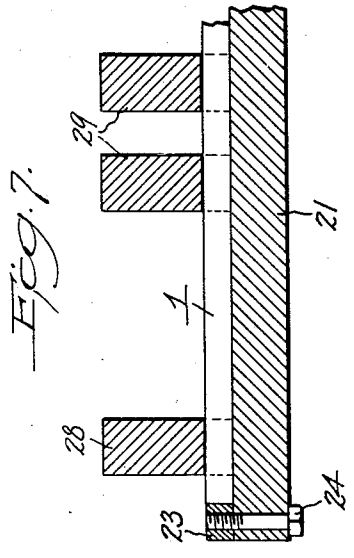


Fig. 7.

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UNITED STATES PATENT OFFICE

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METHOD OF MAKING SCREEN PLATES

Application filed September 4, 1930. Serial No. 479,649.

This invention relates more especially to screen plates in which the screening slots are of arcuate form and concentrically arranged with respect to a common axis of revolution.

The primary object of my invention is to provide an improved method for constructing screen plates of this character for the purpose of providing a maximum screening area; for improving the form and arrangement of the screen bars; and for economizing the first cost and replacement values of the screen plates.

My invention furthermore contemplates a built-up construction of parts which may be previously formed and dimensioned prior to their assembly and union in a practically unitary structure.

Another object of my invention is to provide an improved method for constructing segmental screen plates from predetermined lengths of straight bars of proper form, said method contemplating the separate bending of said straight bar lengths which after flexure and assembling are rigidly united into a simple unitary structure.

In the drawings which represent a preferred embodiment of my invention as applied to a screen for dry pans in rotary mills,

Figure 1 is a top plan view of a screen plate constructed in accordance with the principle of this invention.

Figure 2 is a top plan view of the segmental supporting frame therefor with the screen plate in position, portions of said screen plate being broken away.

Figure 3 is an enlarged radial section of the screen plate and supporting frame on the line 3—3, of Figure 2.

Figure 4 is an enlarged end elevation of Figure 2.

Figure 5 is a top plan view of a preferred form of jig or former within which the straight bars or blanks are curved or bowed while they are being assembled in their screen-forming arrangement some of the bars being shown in assembly position and another one shown in process of being bowed and positioned.

Figure 6 is an enlarged end elevation of the jig shown in Figure 5 with the screen bars in assembly positions.

Figure 7 is an enlarged fragmentary section on the line 7—7 of Figure 5.

Figure 8 is a plan view of a group of straight bar sections or blanks arranged in the order of their graded lengths in readiness to be inserted into the bending and assembling jig.

Figures 9, 10 and 11 are enlarged fragmentary representations of radial sections of the assembled screen bars showing different forms of welding which may be used advantageously for joining the screen bars into a unitary structure.

In Figure 1 of the drawings is shown an illustrative embodiment of a segmental screen plate to the construction of which my improved method may be adapted. As shown, this screen plate comprises a series of arcuate screen bars 1 which are graded in length and concentrically arranged with their opposite ends in radial alinement, said arcuate bars being rigidly united along the radial lines 2, 3, 4, 5, and 6 by welding operations as hereinafter described. In this way, the screen plate is provided with radial bars which may be arranged to correspond with the similarly arranged bars of a supporting frame by which it is to be carried. At angularly-spaced intervals around the outer and inner peripheries of the screen plate, inserts are welded in between some of the arcuate bars 1 in such a way as to form attachment bosses 7 and 8. All of the bosses thus formed are adapted to be arranged above and to be connected to similarly arranged bosses with which said supporting frame is provided. As shown in Figures 3 and 4, the screen bars 1 are provided with inverted cuneiform cross-sections which provide downwardly enlarged intervening slots. As shown in Figures 2, 3 and 4, the above-described segment screen plate is adapted to be seated in a rotary supporting frame segment which comprises inner and outer arcuate bars 9 and 10 and integrally formed radial bars 11, 12, 13, 14 and 15. The upper edges of said radial bars are depressed with respect to the upper surfaces of the inner and outer arcuate bars 9 and 10,

said arcuate bars being provided with annular seats 16 and 17 for supporting the inner and outer arcuate edges of the screen plate. It will be seen that when the screen plate is properly positioned on the arcuate supporting frame, the radial bars of said screen plate which are formed along the radial lines 2, 3, 4, 5 and 6, will be arranged over and rest upon the upper edges of the radial bars 11, 12, 13, 14 and 15 of the supporting frame segment. Said frame segment may be provided with apertured bosses 18, arranged respectively below the attachment bosses 7 of the screen plate and other apertured bosses 19 arranged respectively below the attachment bosses 8 of said screen plate. As indicated in Figure 3 of the drawings, a bolt 20 may be passed upwardly through each of the apertured bosses 18 and 19 and have their upper ends threaded into the respective attachment bosses 7 and 8 of the screen plate. Suitable means for manufacturing the screen plate described above from straight bars of proper cross section and graded in length, may be provided as follows. A group of straight bars suitably graded in lengths to make up the desired screen plate, is shown in Figure 8. Referring now to Figures 5, 6 and 7, the straight bars or blanks shown in Figure 8, may be bent and assembled in a jig such as that shown in Figures 5, 6 and 7. For this purpose, a heavy flat base plate 21 which is longer and wider than the completed screen plate, may be provided with a radial edge 22 with which the alined ends of all screen bars will register when said screen bars have their opposite ends in abutment with a radial strip or stop bar 23 which is secured to the other radial edge of the base plate 21 by means of bolts 24 as shown in Figure 7. Spaced inwardly from the radial edge 22 of the base plate 21 and removably secured thereto by bolts 25, as shown in Figure 6, is a gage bar 26 which is provided with a series of downwardly-enlarged notches 27 of suitable size and shape to permit the several straight bar sections or blanks to be driven endwise therethrough, said notches being uniformly spaced one from another to correspond to the spacing of the arcuate screen bars in the finished screen plate. Spaced inwardly from the stop bar 23, is a second gage bar 28 of exactly similar form to the gage bar 26. Interposed between the gage bars 26 and 28, are a plurality of laterally-spaced gage bars 29, 30 and 31, similar in construction to the gage bars 26 and 28, and arranged in pairs as shown in Figure 5. All of the gage bars are removably secured to the base plate 21 so as to permit the removal of the finished screen plate after the several screen bars have been united into a unitary structure in the manner to be presently explained. As each of said screen bars is tapped through one after another of the notches 27 in each arcuately arranged series of said notches, the forward end of that screen bar is continually deflected into position to enter the notch next in front so that by the time it has come into abutment with the stop bar 23, it has become bowed into its arcuate form of the finished screen plate. It will be understood from this description that after all of the screen bars have been driven home with their forward ends alined against the radial stop-bar 23, their rear ends will also be in alinement along the radial edge 22 of the base plate 21. Said bars are now assembled in position to be rigidly united into a unitary structure. For this purpose, I preferably employ any approved method of welding for uniting spaced bars of this character, the necessary welding operations in the present case being performed along the radial lines 2, 3, 4, 5 and 6 which respectively correspond to the spaces between stop bar 23 and end gage bar 26; between the paired bars 29, 30 and 31; and along the radial edge 22 of the base plate. For example, any of the three forms shown in Figures 9, 10 and 11 may be employed. Thus, according to Figure 9, a series of steel filler blocks 32 may be interposed between adjacent screen bars along each of the radial lines 2, 3, 4, 5 and 6, the adjacent spaces being filled by the welding stock 33. If preferred, the intervening spaces between the neighboring bars may be completely filled with small separate masses 34 of the welding stock as shown in Figure 10. According to Figure 11, the spaces intervening between the screen bars 1 are filled by wedge-shaped blocks 35 which may be brazed to the adjacent rods.

While I have described a preferred method of procedure in respect to cutting the straight screen bars in accurately graded lengths so that when flexed and positioned in properly spaced relation, their ends will come into radial alinement to correspond with the radial ends of the finished segmental screen plate, the straight screen bars may be flexed and positioned prior to a cutting operation along either or both radial lines corresponding to the ends of the finished screen plate. Furthermore, I desire to have it understood that the proper lengths of the several screen bars may be determined by a cutting operation by a cutting torch or other suitable means before the welding operation and while said screen bars are held in flexed position, or the screen plate may be finished off by a trimming operation along its radial edges after the welding operation is completed.

I claim:

1. The method of constructing segmental screen plates, which method consists in cutting a plurality of straight bars in lengths corresponding respectively to the lengths of said bars in a completed screen plate, in arcuately bending said bars, in arranging said bars in proper spaced relations correspond-

ing to their relative positions in the completed screen plate by means of the bending operation, and finally in rigidly uniting said bars together at longitudinally spaced points.

2. The method of constructing segmental screen plates, which method consists in cutting a plurality of straight bars in lengths corresponding substantially to the lengths of the arcs formed by said bars in the completed screen plate, in bending said bars into their final arcuate form, and in assembling them in their final relative positions during the progress of the bending operation, and finally in permanently uniting said bars together.

3. The method of constructing segmental screen plates, which method consists in cutting a plurality of straight bars in lengths corresponding respectively to the lengths of the arcs formed by said bars in the completed screen plate, in bending each of said bars into its final arcuate form under a stress less than that required to permanently distort it, and finally in permanently uniting said bars together while they are held in spaced flexed positions.

4. The method of constructing segmental screen plates, which method consists in cutting a plurality of straight bars in graded lengths corresponding respectively to the lengths of arcuate screen-bars in a segmental screen plate in bending said bars into concentric arcs while arranging them in equidistant positions between the inner and outer peripheries of the completed segmental screen plate, and finally, in permanently uniting said arcuate screen bars to form a unitary screen plate.

5. The method of constructing segmental screen plates, which method consists in cutting a plurality of straight bars in lengths corresponding respectively to the lengths of the arcuate bars in a segmental screen, in arcuately bending the longest of said bars while placing it in position to form the outer border of said segmental screen, in arcuately bending the shortest of said bars while placing it in position to form the inner border of said segmental screen, in bending the remaining bars in concentric arcs of graded lengths while placing them in equi-spaced positions between said inner and outer borders and with their opposite ends in radial alinement, and finally, in uniting the radially-alined ends of said arcuate screen bars to form a unitary segmental screen plate.

6. The method of constructing segmental screen plates, which method consists in cutting straight bars in graded lengths, in flexing said bars under insufficient stress to permanently distort them, and finally in welding said bars together to form a unitary segmental screen plate.

7. The method of constructing segmental screen plates, which method consists in cutting a plurality of straight bars in lengths corresponding respectively to the arcs occupied by said bars in a finished segmental screen plate, in flexing said straight bars to their proper arcuate forms while arranging them in the relatively spaced relations to be occupied by them in the completed screen plate, and in welding said screen bars together along radial lines corresponding to the underlying bars of a supporting frame upon which the completed segmental screen plate is to be superimposed.

8. The method of constructing segmental screen plates, which method consists in cutting a plurality of straight bars in lengths corresponding respectively to the arcs of a finished segmental screen plate, in arcuately bending said straight bars while arranging them in suitably spaced concentric positions with their ends in radial alinement, and in welding said arcuate screen bars together along lines and at places corresponding to the supporting surfaces of a supporting frame upon which the completed segmental screen plate is to be superimposed.

9. The method of constructing segmental screen plates, which method consists in flexing a plurality of straight screen bars of graded lengths and similar cross-section with corresponding surfaces disposed in a common plane, in arranging said screen bars in parallelly-spaced relations during the progress of the flexing operation, and in welding the flexed screen bars together in their grouped arrangement.

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