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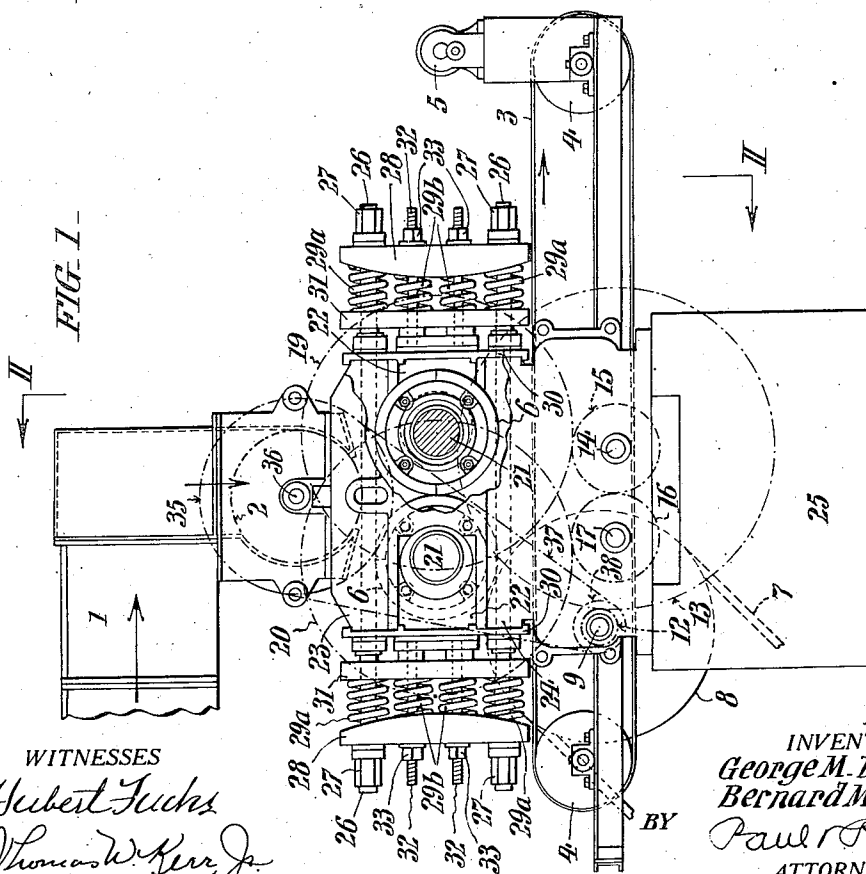
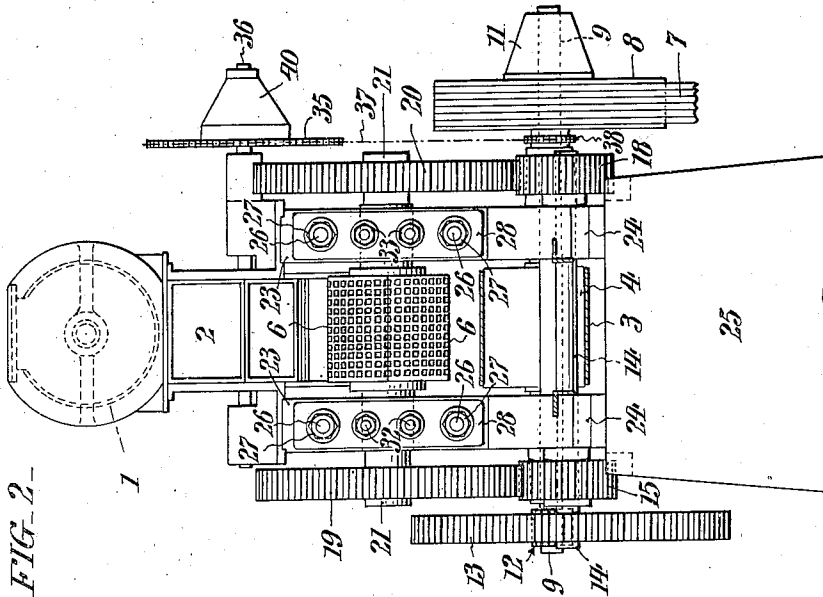
G. M. DALLAS ET AL

2,455,980

SPLIT ROLL FOR BRIQUETING MACHINES OR THE LIKE

Filed Sept. 5, 1947

3 Sheets-Sheet 1



WITNESSES

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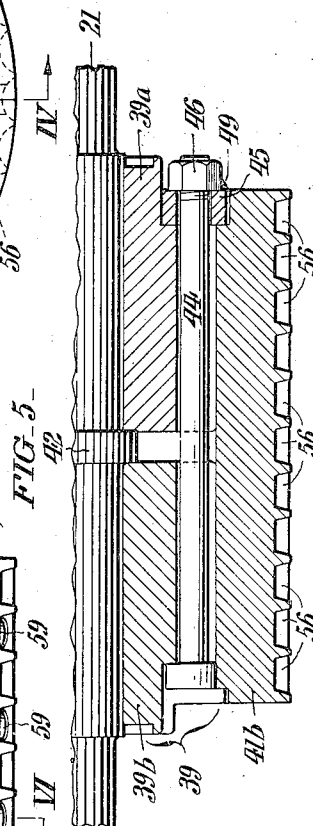
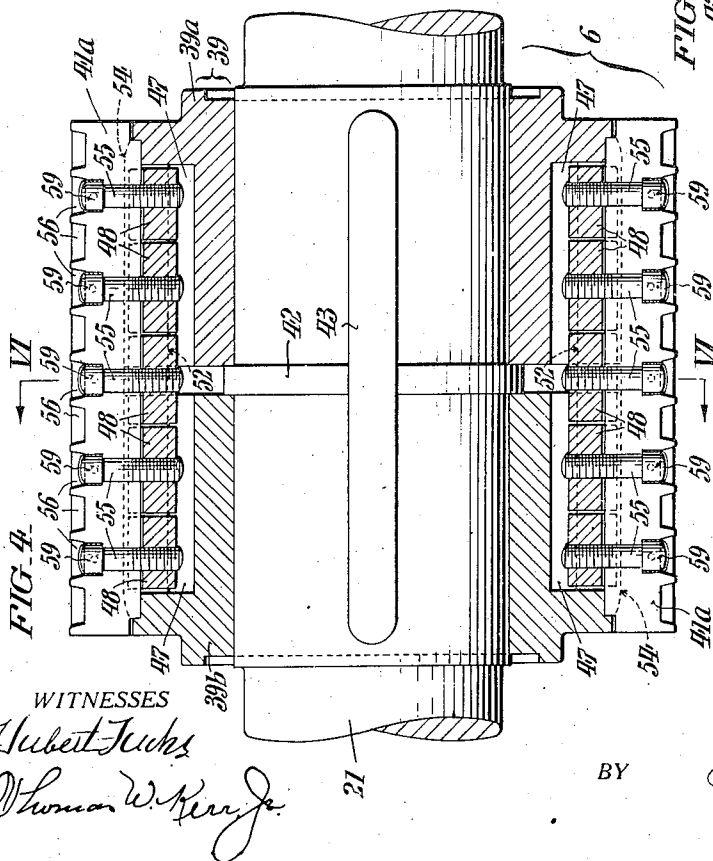
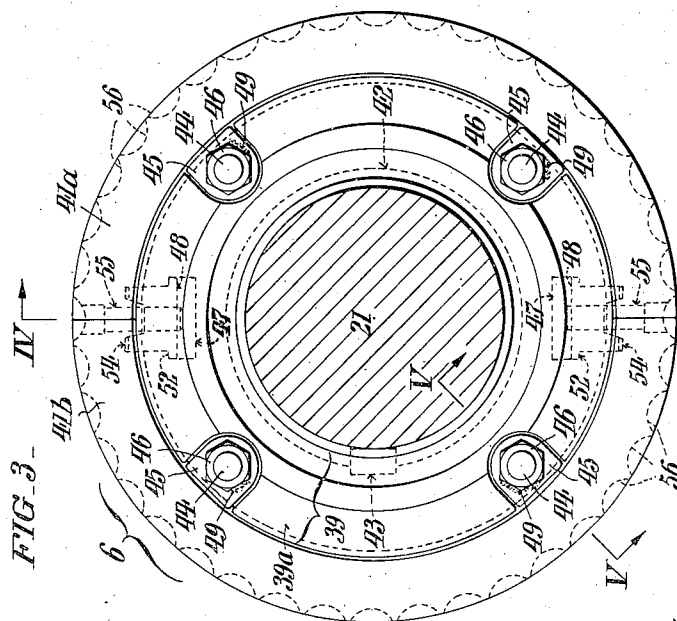
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SPLIT ROLL FOR BRIQUETTING MACHINES OR THE LIKE

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3 Sheets-Sheet 2



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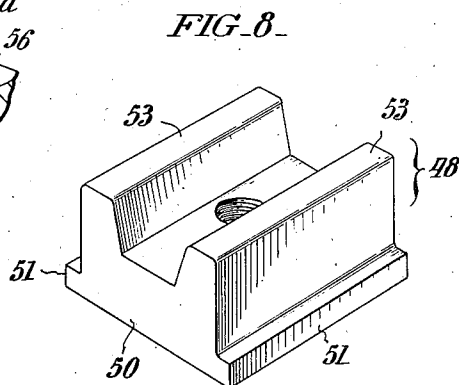
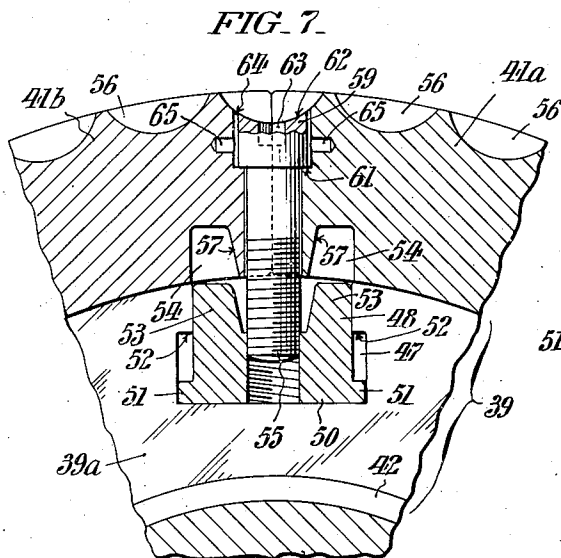
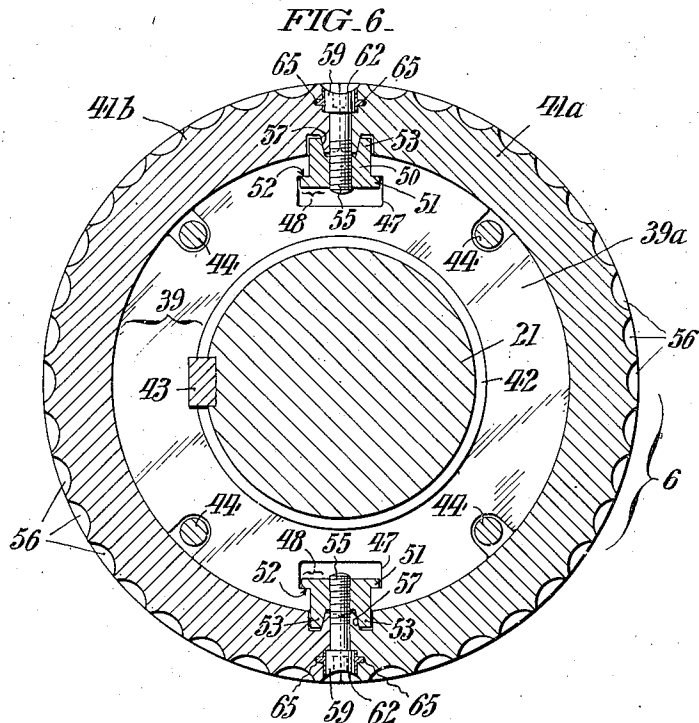
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SPLIT ROLL FOR BRIQUETTING MACHINES OR THE LIKE

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3 Sheets-Sheet 3



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2,455,980

SPLIT ROLL FOR BRIQUETTING MACHINES
OR THE LIKE

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11 Claims. (Cl. 18—21)

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This invention relates to split-rolls for briquetting machines or the like and more particularly to pressure rolls the surfaces whereof are subject to considerable wear necessitating periodic replacement or repair.

In briquetting machines it is customary to employ pressure rolls between which the briquets are molded, each consisting of a hollow cylindrical shell which is shrunk on and keyed to a central body affixed to a shaft. These rolls are of considerable size and weight and when it becomes necessary to replace a worn roll it is a most difficult and laborious operation to remove the roll from the machine because it requires the incidental disassembly of a large portion of the machine. Moreover, it is an expensive and time-consuming operation, after the rolls have been thus removed from the machine, to replace or repair the worn shells and to reassemble the parts of the roll and of the machine.

The principal object of the present invention is to overcome the above recited difficulties and this end we accomplish by the provision of a pressure roll having a split outer shell consisting of a number of arcuate segments and means whereby such segments may be securely attached to the body of the roll and to each other, and yet be readily removable so that as they become worn they may be withdrawn and replaced, with the rolls remaining in position within the machine, all without requiring disassembly of other parts of the machine.

Still other objects and advantages of the invention, including those derived from simplicity of manufacture and ease of assembly of the constituent parts of the pressure roll, will become more fully apparent from the detailed description of a preferred embodiment of the invention which follows hereinafter, having reference to the accompanying drawings.

Of the drawings:

Fig. 1 represents a side elevation of a briquetting machine equipped with split rolls embodying our invention;

Fig. 2 represents a vertical cross sectional view of the same taken as indicated by the arrows II—II of Fig. 1;

Fig. 3 represents an enlarged end elevation of one of the pressure rolls of the machine, the shaft to which it is splined being shown in cross section;

Fig. 4 represents a longitudinal cross section of the pressure roll taken as indicated by the arrows IV—IV of Fig. 3;

Fig. 5 represents a partial longitudinal section

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of the same taken as indicated by the arrows V—V of Fig. 3;

Fig. 6 represents a transverse section of the pressure roll taken as indicated by the arrows VI—VI of Fig. 4;

Fig. 7 represents a further enlarged transverse section of a portion of the pressure roll, showing the position of the parts of the roll preparatory to their assembly.

Fig. 8 represents an enlarged perspective view of one of the wedge blocks associated with the pressure roll.

The briquetting machine shown in Figs. 1 and 2 of the drawings is of a conventional type, except for the incorporation therein of pressure rolls embodying our invention. Fine coal is fed to the machine through a horizontal conveyor 1 and a rotary hopper diagrammatically indicated at 2. Briquets are discharged from the machine and carried to freight cars or trucks by means of an endless conveyor belt 3 passing over belt rollers 4 and driven by a motor 5.

The two pressure rolls 6 are driven from a suitable source of power (not shown) through a drive belt 7 which engages a sheave 8, the latter being connected to a shaft 9 by a friction clutch 11. On the shaft 9 there is a pinion 12 meshing with a large spur gear 13. Spur gear 13 is mounted on a shaft 14 having a pinion 15 which meshes with a similar pinion 16 mounted on shaft 17. At the opposite side of the machine shaft 17 carries another similar pinion 18. Pinions 15 and 18 respectively drive two large gears 19 and 20 attached to the shafts 21 of the pressure rolls 6 and cause such rolls to be rotated at the same speed in opposite directions.

The shafts 21 of pressure rolls 6 have their ends mounted in horizontally movable bearing blocks 22 suitably guided and supported by side frame elements 23 and 24 secured to the foundation 25 of the machine. Rods 26 pass through the side frame elements 23 and 24 and are provided with nuts 27 which serve to maintain the spring caps 28 in an adjustable fixed relation to the machine. Groups of springs 29a, 29b bear against the spring caps 28 at their outer ends and against movable pressure plates 31 at their inner ends, the intermediate springs 29b of each group being retained in position by rods 32 and secured to the spring caps 28 by nuts 33. The pressure plates 31 acting under the influence of the springs 29a, 29b urge the bearing blocks 22, which extend through the tie plates 30 at each end of the side frames, towards each other and hence maintain the pressure rolls 6 in close relation to each.

The feed hopper indicated at 2 is rotated by means of a sprocket 35 mounted on a shaft 36 and connected by a chain 37 with a sprocket 38 on the driving shaft 9. Sprocket 35 is connected to shaft 36 through a clutch 40.

It will be noted that in order to remove the pressure rolls 6 with their shafts 21 from the machine it is necessary first to remove gears 19 and 20 and to disassemble numerous other parts including spring caps 28, springs 29a, 29b pressure plates 31 and bearing blocks 22. In view of the size and weight of these parts this is a difficult and laborious operation. But as more fully explained hereinafter the pressure rolls 6 are so designed, constructed and assembled that they need not be removed from the machine even after long periods of service.

As shown in Figs. 3, 4, and 5 each pressure roll 6 consists of a generally cylindrical body 39 and an outer shell consisting of two arcuate segments 41a, 41b removably attached to the body 39. In the particular embodiment selected for illustration, the body 39 consists of two sections 39a, 39b (see Fig. 4) fitting over the medial portion of the shaft 21, one at each side of a collar 42 at the longitudinal center of such medial portion of the shaft. The body sections 39a, 39b are splined to the shaft 21 by a key 43 and are secured to each other by bolts 44, washers 45 and nuts 46. Each body section 39a, 39b has two perimetric cavities 47 extending axially and substantially throughout the length of the rolls. Within each perimetric cavity 47 a series of wedge blocks 48 are accommodated in end to end relation. After assembly of the body sections 39a, 39b it is generally desirable to secure the nuts 46 in place by welding, as shown at 49.

As shown more clearly in Figs. 6, 7 and 8 the wedge blocks 48 have nut portions 50 of generally rectangular shape with flanges 51 which are housed and fitted within the cavities 47 so as to restrain the wedge blocks against rotation, but with capacity for outward radial movement limited by the engagement of the flanges 51 with the internal shoulders 52 of the cavities. Each wedge block 48 has outwardly projecting lugs 53 which engage interior recesses 54 in the segments 41a, 41b of the outer shell, and each wedge block is threaded, as a nut, to receive the correspondingly threaded ends of bolts 55. The wedge blocks 48 are inserted within the cavities 47 before assembly of the body sections 39a, 39b upon the shaft 21.

The outer shell segments 41a, 41b are provided with rows of cup-shaped depressions 56 distributed over their surfaces and constituting conjugate molds within which the briquets are formed. It will be understood that the particular configuration of the depressions 56 may be greatly varied. Preferably the interior recesses 54 which receive the outwardly projecting lugs 53 of the wedge blocks are formed adjacent to the meeting edges of the arcuate segments 41a, 41b so that the wedge blocks span the joints of the shell. By providing inclined surfaces 57 at the sides of the recesses 54 adjacent to the joints, and by similarly inclining the corresponding faces of the lugs 53, as the wedge blocks 48 are drawn outwardly into engagement with the shell segments the wedge shaped lugs 53 will tend to press the shell segments towards each other at the joints.

Desirably the bolts 55 are disposed at the joints of the outer shell, as shown most clearly in Fig. 7, with their heads 59 engaging shoulders 61 and

buried at the bases of certain of the cup-shaped depressions 56. The bolt heads 59 are ground at the top, as indicated at 62, to conform to the curvature of the depressions 56 and are provided with sockets 63 so that they may be engaged by a wrench for turning. The sockets 63 and the tops of the bolt heads 59 may be filled and coated with tin or Babbitt metal or the like. Likewise the annular space 64 surrounding the bolt heads 59 may be filled with Babbitt metal or the like after the parts of the roll are fully assembled, thus preventing the bolts 55 from turning and forming a smooth surface at the base of each bolt receiving depression 56. By drilling holes in the adjoining walls of the shell segments 41a, 41b, as indicated at 65, and by knurling the bolt heads 59 it is insured that the bolts will be firmly locked in position so that they cannot become dislodged. Whenever it may be desired to remove the shell segments 41a, 41b it is a relatively simple matter to burn out the Babbitt metal or other material around the bolt heads 59, which are then readily accessible and free for turning, so that the bolts may be withdrawn and the parts of the rolls may be disassembled.

It will be apparent that all parts of the pressure roll of our invention which interconnect the constituent elements of the roll are designed so that they may be cheaply manufactured and yet be effective to maintain such elements firmly secured in interlocked relation to each other. The operations of assembly and disassembly may be performed with ease by means of simple tools and without the necessity of removing the rolls from their positions within the machine.

Although we have illustrated and described only one specific embodiment of our invention as applied to a particular kind of machine, it will be readily apparent that the invention may be applied to various types of rolls other than the pressure rolls of a briquetting machine; also that numerous modifications and variations may be made in the form of the body and outer shell sections, and in the means for interconnecting such elements, including reversals of parts; and that certain features of the invention may at times be used to advantage without the use of other features, all without departing from the spirit of our invention as defined in the annexed claims.

Having thus described our invention, we claim:

1. A roll for a briquetting machine or the like comprising a generally cylindrical body having perimetric cavities, wedge blocks having portions housed within said cavities with capacity for limited radial movement therein and having outwardly projecting lugs, a cylindrical shell surrounding said body and consisting of arcuate segments interiorly recessed to receive the outwardly projecting lugs of said wedge blocks, and bolting means passing through said shell and engaging said wedge blocks to secure said arcuate segments in firm engagement with said body.

2. A roll for a briquetting machine or the like comprising a shaft having a collar at its medial portion, a body consisting of generally cylindrical sections keyed to said shaft on each side of said collar and secured to each other, said body having perimetric cavities, wedge blocks having portions housed within said cavities with capacity for limited radial movement therein and having outwardly projecting lugs, a cylindrical shell surrounding said body and consisting of arcuate segments interiorly recessed to receive the outwardly projecting lugs of said wedge blocks, and bolting

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means passing through said shell and engaging said wedge blocks to secure said arcuate segments in firm engagement with said body.

3. A roll for a briquetting machine or the like comprising a generally cylindrical body having axially extending cavities at its perimeter, wedge blocks having nut portions fitting within said cavities with capacity for limited radial movement, but restrained against rotation therein, and having outwardly projecting lugs, a cylindrical shell surrounding said body and consisting of arcuate segments interiorly recessed to receive outwardly projecting lugs of said wedge blocks, and bolting means passing through said shell and having threads engaging the nut portions of said wedge blocks to secure said arcuate segments in firm engagement with said body.

4. A roll for a briquetting machine or the like comprising a generally cylindrical body having shouldered cavities extending axially substantially throughout the length thereof at its perimeter, a series of wedge blocks disposed end to end through said cavities, said wedge blocks having nut portions fitting within said cavities with capacity for limited radial movement, but restrained against rotation therein, and having outwardly projecting lugs, a cylindrical shell surrounding said body and consisting of arcuate segments interiorly recessed to receive the outwardly projecting lugs of said wedge blocks, and bolting means passing through said shell and having threads engaging the nut portions of said wedge blocks to secure said arcuate segments in firm engagement with said body.

5. A roll for a briquetting machine or the like comprising a generally cylindrical body having perimetric cavities, wedge blocks having portions housed within said cavities with capacity for limited radial movement therein and having outwardly projecting wedge-shaped lugs, a cylindrical shell surrounding said body and consisting of arcuate segments interiorly recessed to receive the outwardly projecting lugs of said wedge blocks, and bolting means passing through said shell and engaging said wedge blocks to secure said arcuate segments in firm engagement with said body and in firm engagement with each other, the latter by virtue of the wedging action of said lugs in the recesses of said arcuate segments.

6. A roll for a briquetting machine or the like comprising a generally cylindrical body having perimetric cavities, wedge blocks having portions housed within said cavities with capacity for limited radial movement therein and having circumferentially spaced outwardly projecting lugs, a cylindrical shell surrounding said body and consisting of arcuate segments with interior recesses formed adjacent to their meeting edges to receive the outwardly projecting lugs of said wedge blocks, said spaced lugs spanning the joints of said arcuate segments, and bolting means passing through said shell to secure said arcuate segments in firm engagement with said body and with each other.

7. A roll for a briquetting machine or the like comprising a generally cylindrical body having perimetric cavities, blocks having nut portions housed within said cavities with capacity for limited radial movement therein, a cylindrical shell surrounding said body and having a series of depressions distributed over its outer surface to form molds for material to be molded, said shell consisting of a plurality of arcuate segments, and

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bolts passing through said shell, each such bolt being in threaded engagement with the nut portion of one of said blocks and having its head accessible at the base of one of said depressions.

8. A roll for a briquetting machine or the like comprising a generally cylindrical body having perimetric cavities, blocks having nut portions housed within said cavities, a cylindrical shell surrounding said body and having rows of cup-shaped depressions distributed over its outer surface to form molds for material to be molded, said shell consisting of a plurality of arcuate segments having their edges joined along lines extending through the centers of certain of said rows of cup-shaped depressions, and bolts passing through said shell at the joints thereof, said bolts being in threaded engagement with the nut portions of said blocks and having their heads accessible at the bases of said depressions at the joints of said shell.

9. A roll for a briquetting machine or the like comprising a generally cylindrical body having perimetric cavities, blocks having nut portions housed within said cavities, a cylindrical shell surrounding said body and having a series of cup-shaped depressions distributed over its outer surface to form molds for material to be molded, said shell consisting of a plurality of arcuate segments, bolts passing through said shell, said bolts being in threaded engagement with the nut portions of said blocks and having their heads buried at the bases of certain of said cup-shaped depressions and having concavities at their top surfaces conforming to the curvature of said cup-shaped depressions.

10. A roll for a briquetting machine or the like comprising a generally cylindrical body having perimetric cavities, blocks having nut portions housed within said cavities, a cylindrical shell surrounding said body and having a series of cup-shaped depressions distributed over its outer surfaces to form molds for material to be molded, said shell consisting of a plurality of arcuate segments with bolt holes formed at their meeting edges, bolts passing through said holes to engage the nut portions of said blocks and having knurled heads buried within said bolt holes at the bases of certain of said cup-shaped depressions, the annular spaces between said bolt heads and bolt holes being filled with removable hard material.

11. A roll for a briquetting machine or the like comprising a shaft, a body consisting of generally cylindrical sections keyed to said shaft and secured to each other, said body having axially extending perimetric cavities, wedge blocks having portions housed within said cavities with capacity for limited radial movement therein and having outwardly projecting lugs, said perimetric cavities being closed at the ends of the body of the roll but open at the joints between the roll sections, whereby the wedge blocks may be inserted in said cavities prior to assembly of the roll sections, a cylindrical shell surrounding said body and consisting of arcuate segments interiorly recessed to receive the outwardly projecting lugs of said wedge blocks, and bolting means passing through said shell and engaging said wedge blocks to secure said arcuate segments in firm engagement with said body.

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No references cited.