United States Patent [19]

Nobbe

[11] **3,915,422**

[45] **Oct. 28, 1975**

[54] **MOLD FOR PRODUCING CONCRETE SLOTTED FLOOR FOR SUPPORTING ANIMALS**

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[52] **U.S. Cl.** **249/97;** 249/134; 249/142; 249/168

[51] **Int. Cl.**[2] **B28B 7/18**

[58] **Field of Search**..... 249/10, 142, 145, 148–149, 249/168–169, 97, 134

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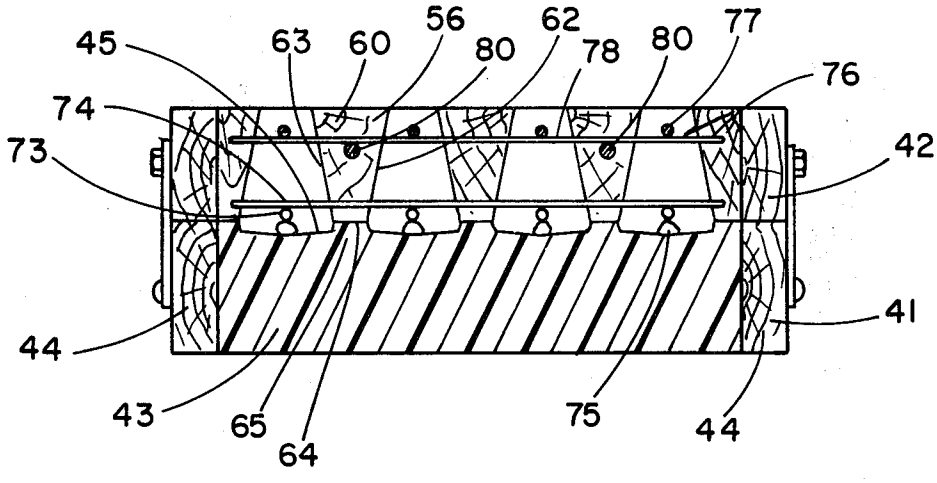
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Primary Examiner—Francis S. Husar
Assistant Examiner—John McQuade
Attorney, Agent, or Firm—Woodard, Weikart, Emhardt & Naughton

[57] **ABSTRACT**

A method and mold for producing a concrete slotted floor for supporting animals. The mold includes a bottom part with a smooth top surface with lengthwise extending ridges formed thereon. The top part of the mold locks to the bottom part and includes a plurality of parallel slab separators seatable upon the ridges. The top part includes end walls and side walls defining an enclosure for receiving the poured concrete. The slab separators are spaced apart from the end walls allowing the concrete to extend completely around each separator to form integrally joined concrete slabs. A plurality of metal rods are welded together and extend between each separator and across the ends of the separators forming a first metal grid. A second metal grid is held above the first metal grid by a plurality of metal rods extending partially into the top part of the mold. Concrete is poured into the top part of the mold between each separator and across the ends of the separators. The mold is vibrated and the concrete is allowed to solidify. The top part of the mold is then lifted upwardly and the solidified concrete is removed and turned over in order that the smooth surface of the concrete contacting the bottom part of the mold faces upwardly. Upstanding pins on the bottom part locate the top part of the mold.

7 Claims, 7 Drawing Figures



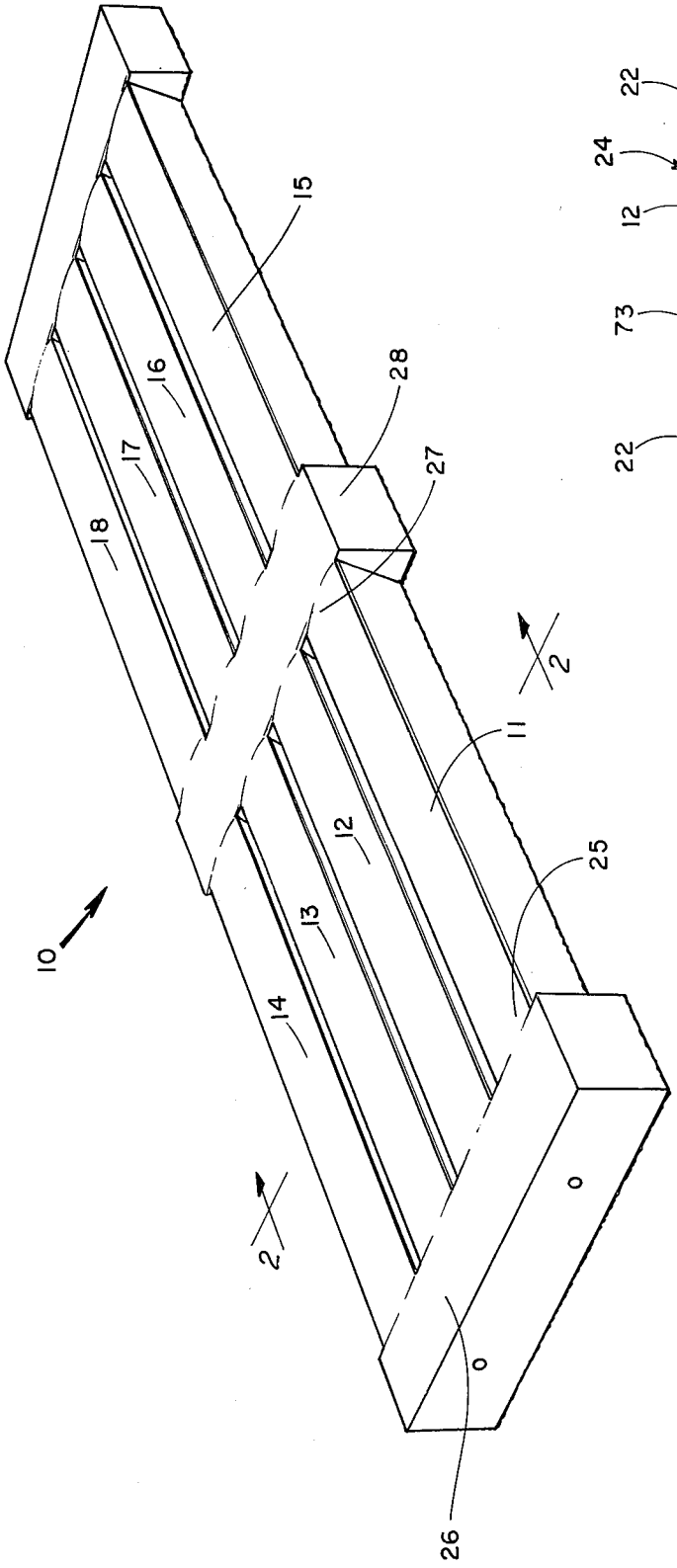

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FIG. 1

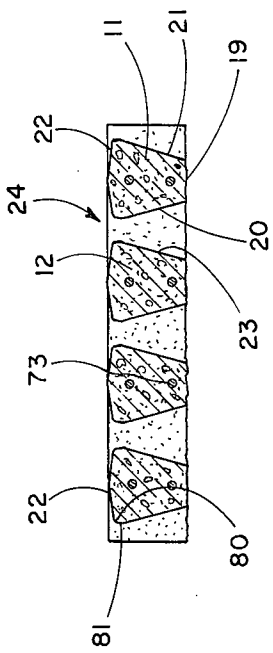

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FIG. 2

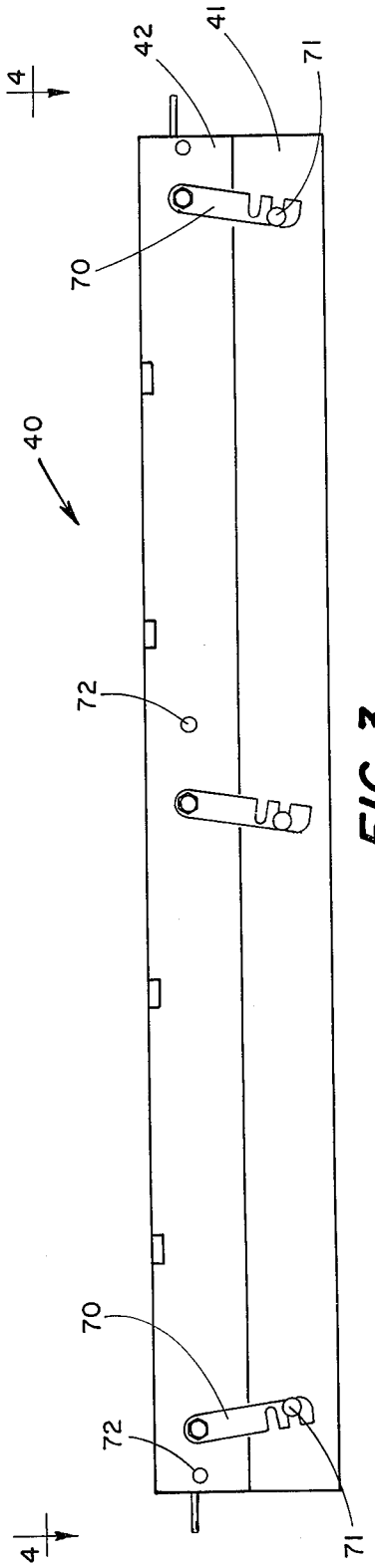

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FIG. 3

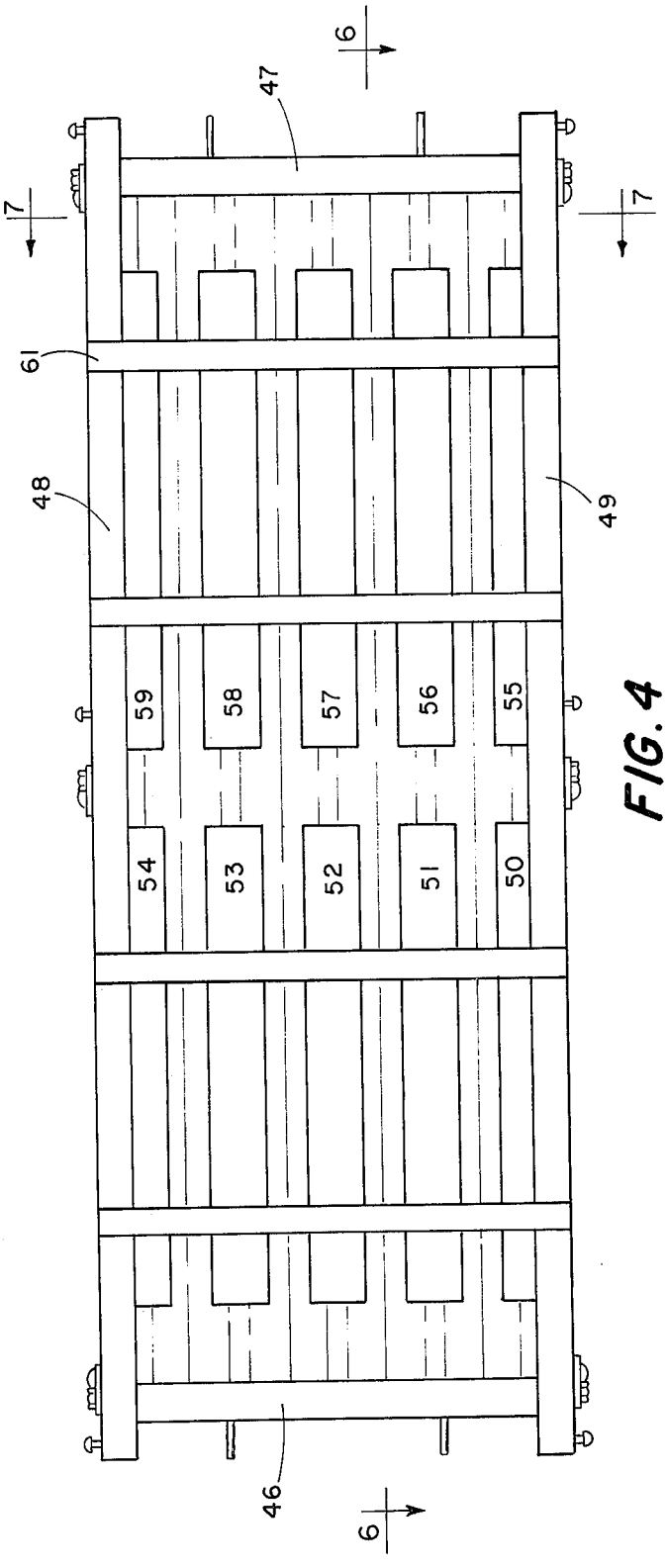

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FIG. 4

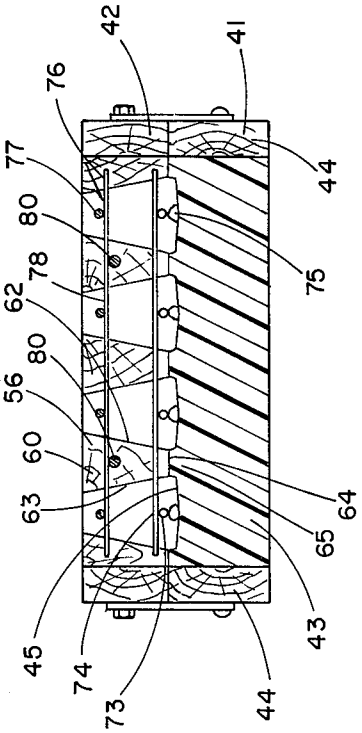


FIG. 7

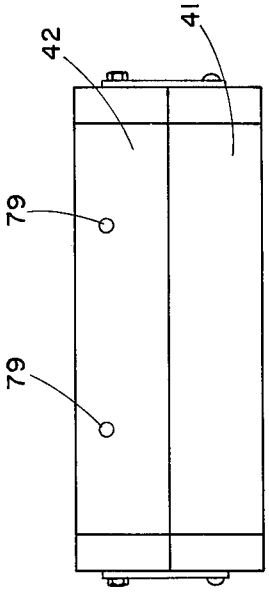


FIG. 5

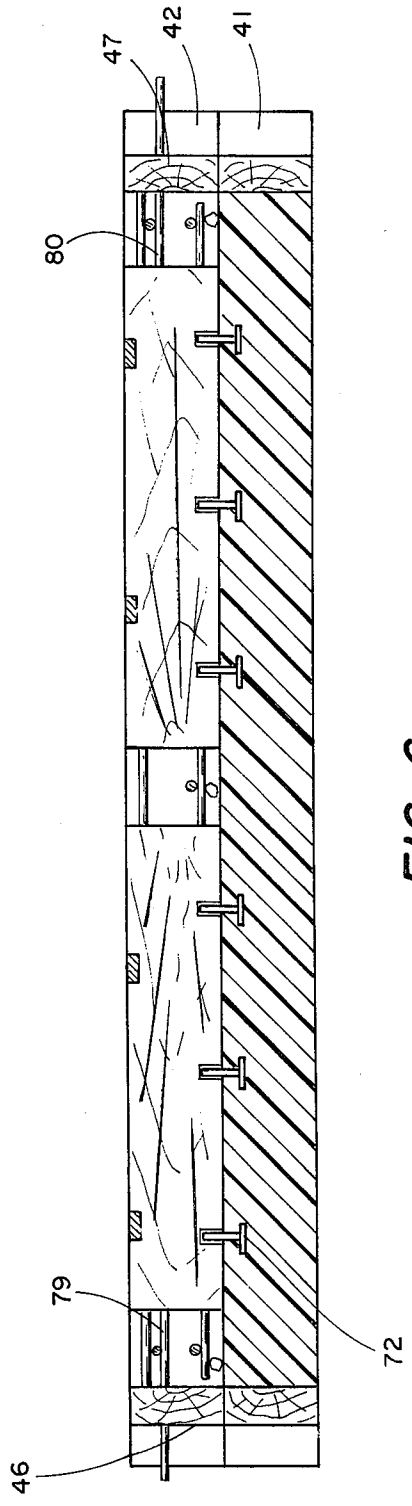


FIG. 6

MOLD FOR PRODUCING CONCRETE SLOTTED FLOOR FOR SUPPORTING ANIMALS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to concrete slotted animal floor construction.

2. Description of the Prior Art

The use of concrete slabs in parallel spaced relationship to form a slotted floor for supporting animals is well known. The slabs are spaced apart to allow for the animal droppings to pass therethrough to a pit or ditch located beneath the floor. Various methods have been used to construct the slotted floor. A common method is to produce the concrete slabs one at a time and then to manually space the slabs apart. The slabs are then mortised together so as to form a unified construction. The increased labor time and expense required to mortise the slabs together is an undesirable feature of this method. Time is required not only to mortise the slabs together but also to correctly space the slabs apart. The floor structure disclosed in U.S. Pat. No. 3,626,904, issued to Edward J. Hatten, utilizes precast concrete slabs having protrusions formed thereon to allow the slabs to be self-spacing; however, the slabs must still be mortised together. In the U.S. Pat. No. 3,228,376, issued to W. J. Conover, there is disclosed precast concrete slabs which are connected together by metal straps. Two other patents of interest in this field are the U.S. Pat. Nos. 3,360,230, issued to A. B. Clements et al., and 2,275,080, issued to W. Kelly. Disclosed herein is a new method and mold for simultaneously forming a plurality of concrete slabs which are spaced apart but integrally joined together at their opposite ends.

It is desirable for the concrete slabs to have a smooth top surface thereby allowing for the easy removal of the animal droppings from the slabs. In order to obtain the smooth top surface for each slab, it has been the practice to manually smooth the top surface of each slab prior to solidification of the concrete. This smoothing operation increases the labor time required to produce each slab and, as a result, it is undesirable due to the increased cost. In the U.S. Pat. No. 3,455,279, issued to R. R. Krevit, the slabs are poured upside down with a rubber pad positioned in the bottom of the mold thereby being attached to the slab allowing for a smooth top surface of the slab when removed from the mold. The Krevit slabs subsequent to solidification are mortised together. A problem with the prior art floor construction is the relatively low strength of long slabs. Long slabs will bow apart intermediate the slab ends thereby allowing the animal, such as a hog, to catch its foot between slabs. The floor construction disclosed herein is provided with center strengthening ribs which prevent the slabs from bowing apart. In addition, metal grids are provided within the floor so as to increase the overall strength of the floor construction.

SUMMARY OF THE INVENTION

Disclosed is a method of producing a concrete floor having integrally connected slabs for supporting animals comprising the steps of providing a bottom mold having a smooth top surface extending thereacross, mounting a top mold having longitudinally extending spacers atop the bottom mold so the spacers contact the smooth top surface, placing first metal rods between the spacers, placing second metal rods perpendicular to the first rods and at ends of the spacers, pouring concrete between the spacers to form slabs and across ends of the spacers to integrally join the slabs, allowing the concrete to solidify, lifting the top mold off the bottom and removing the solidified concrete from the bottom mold and turning the solidified concrete over so the concrete in contact with the smooth top surface faces upwardly.

The present invention is a mold for producing a floor with a smooth top surface and having integrally joined concrete slabs for supporting animals comprising a bottom part with a smooth top surface extending thereacross to form the smooth top surface of the floor, a top part removably mounted atop the bottom part, the top part includes a pair of side walls and end walls connected together forming an enclosure for holding poured concrete, the top part further includes spaced apart slab separators extending in the direction of the side walls, the separators are spaced from the end walls allowing concrete to extend completely around each separator forming the integrally joined concrete slabs, each separator has a bottom end contacting the bottom part and opposite side surfaces diverging from said bottom end.

A further object of the present invention is to provide a new and improved mold for producing a concrete slotted floor for supporting animals.

Yet another object of the present invention is to provide a mold for producing a concrete floor having integrally joined spaced apart slabs.

Related objects and advantages of the present invention will be apparent from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a concrete slotted floor produced by the method and mold disclosed herein.

FIG. **2** is a cross-sectional view taken along the line **2—2** of FIG. **1** and viewed in the direction of the arrows.

FIG. **3** is a side view of the mold incorporating the present invention and which is used to produce the floor shown in FIG. **1.**

FIG. **4** is a top view of the mold shown in FIG. **3** viewed in the direction of arrows **4—4.**

FIG. **5** is an end view of the mold shown in FIG. **4.**

FIG. **6** is a cross-sectional view taken along the line **6—6** of FIG. **4** and viewed in the direction of the arrows.

FIG. **7** is a cross-sectional view taken along the line **7—7** of FIG. **4** and viewed in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the embodiments illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

Referring now more particularly to FIG. 1, there is shown a concrete slotted floor 10 for supporting animals. Floor 10 includes four parallel concrete and spaced apart slabs 11 through 14 integrally joined together and integrally joined and aligned with four additional parallel slabs 15 through 18. Slab 11 will now be described it being understood that a similar description applies to the remaining seven slabs.

Slab 11 (FIG. 2) has a rough bottom surface 19 with a pair of diverging side surfaces 20 and 21 extending upwardly therefrom to a convex top surface 22. Surface 20 of slab 11 is spaced apart from surface 23 of slab 12 forming a gas 24 for receiving animal droppings. Gap 24 increases in width from the top surfaces of the slabs to the bottom surfaces of the slabs.

End 25 of slab 11 is integrally joined to slabs 12 through 14 by a concrete cross portion 26. Likewise, end 27 of slab 11 is integrally joined to the opposite ends of slabs 12 through 14 and to the ends of slabs 15 through 18 by concrete cross portion 28.

Mold 40 (FIG. 3) is used to produce floor 10 and includes a bottom part 41 and a top part 42. Bottom part 41 (FIG. 7) may be produced from concrete within a wood frame with a layer of fiber glass forming a smooth top surface for bottom part 41. Likewise, bottom part 41 (FIG. 7) may be produced entirely from fiber glass 43 within a wood frame 44 with the top surface 45 of bottom part 41 being smooth. The important feature of part 41 is that the top surface 45 be completely smooth for forming the top smooth surface of the slotted floor.

Top part 42 is removably mounted atop bottom part 41 and includes a pair of end walls 46 and 47 (FIG. 4) connected to side walls 48 and 49. Walls 46 through 49 may be produced from wood and form an enclosure for holding poured concrete. A plurality of spaced apart slab separators 50 through 54 are arranged in a first group with additional separators 55 through 59 being arranged in a second group. The separators extend in the direction of side walls 48 and 49 and are spaced from end walls 46 and 47 allowing the poured concrete to completely extend around each separator 51 through 53 and 56 through 58 forming the integrally joined concrete slabs. The mutually facing ends of separators 50 through 54 are spaced apart from separators 55 through 59 and are aligned therewith. All separators are parallel.

Separator 56 will now be described it being understood that a similar description applies to separators 51 through 53 and 57 through 58. Separator 56 (FIG. 7) includes a top end 60 fixedly secured to metal band 61 (FIG. 4) having opposite ends mounted to side walls 48 and 49. The side surfaces 62 and 63 of separator 60 converge downwardly to bottom end 64 which is removably seated atop upraised portion or ridge 65 of bottom part 41.

Bottom part 41 has a plurality of lengthwise extending ridges upon which the separators are seated. The ends of separators 50 through 54 are spaced apart from the ends of separators 55 through 59 allowing the concrete to be poured between the first group of separators and the second group of separators. Separators 50 and 55 are fixedly attached to side wall 49 whereas separators 54 and 59 are attached to side wall 48. As shown in FIG. 7, the top surface of bottom part 41 is concave between the ridges or between the separators thereby providing the convex top surface 22 as shown in FIG. 2 for the concrete slabs.

A plurality of members 70 (FIG. 3) are pivotally mounted to the top part of the mold having a slotted bottom end to slidably receive projections 71 for locking parts 41 and 42 together. Additional projections 72 are provided on part 42 thereby allowing members 70 to be swung upwardly so as to unlock parts 41 and 42 and to rest upon projections 72 when not in use.

As previously discussed, the top surface 45 of bottom part 41 is formed by fiber glass so as to provide a smooth surface. The separators and side and end walls of top part 42 may be produced from wood with bands 61 being metal. A plurality of upstanding pins 72 (FIG. 6) project through ridges 65 and are received by complementary shaped holes provided in the separators thereby locating part 42 with respect to part 41. If desired, pins 72 may be located only on the two outermost ridges.

The method of producing the concrete floor includes providing a bottom mold having a smooth top surface extending thereacross. A metal rod 73 (FIG. 7) is then placed between each separator and extends the length of the mold from end wall 46 to end wall 47. Additional metal rods 74 are then welded perpendicular to rods 73 with rods 74 being positioned between end wall 46 and the ends of separators 50 through 54, between each wall 47 and the ends of separators 55 through 59 and between the mutually facing ends of the first group of separators 50 through 54 and the second group of separators 55 through 59. The resulting metal grid formed is elevated slightly above surface 45 (FIG. 7) by positioning rocks 75 beneath rods 73. A second metal grid 76 is then positioned over the grid formed by rods 73 and 74. Grid 76 includes a plurality of rods 77 positioned between the separators and extending along the lengths of rods 73. Cross metal rods 78 are likewise positioned over rods 74 and are welded to rods 77. Rods 78 are perpendicular to rods 77. Part 42 is then mounted atop part 41 with the upstanding pins 72 projecting into the separators. Members 70 are then locked to projections 71.

The grid 76 formed by rods 77 and 78 is elevated above the grid formed by rods 73 and 74 by inserting rods 79 and 80 through holes extending through end walls 46 and 47. Rods 80 project through end wall 47 and into separators 56 and 58. Likewise, rods 79 project through end wall 46 into separators 51 and 53. The grid formed by rods 76 and 77 is then seated atop rods 79 and 80.

The concrete is then poured into the mold so as to completely surround the metal rods as well as the separators. The mold is then vibrated with the concrete then being allowed to solidify. Rods 79 and 80 are then withdrawn from the mold and the top part 42 is unlocked from the bottom part 41 and removed therefrom. The solidified concrete is lifted from bottom part 41 and turned over so that the surface of concrete in contact with surface 45 faces upwardly. It is permissible for the bottom surface of the slotted floor to be rough and, as a result, it is unnecessary to smooth the uppermost surface of the concrete when the concrete is positioned within the mold.

A problem with the prior art concrete producing molds is that many of the molds break apart on either side of the individually cast slab thereby providing a dirt collecting seam mark extending the length and on the top surface of the slab. Such a seam is not present

on slabs produced in accordance with the present invention.

As shown in FIG. 2, the top edges of each slab are formed by a very small radius and a vertically extending downward portion. Radius **80** and vertical surface **81** (FIG. 2) prevents the edges of each slab from being chipped away by the foot of the animal.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiments have been shown and described and that all changes and modifications that come within the spirit of the invention are desired to be protected.

I claim:

1. A mold for producing a floor with a smooth top surface and having integrally joined concrete slabs for supporting animals comprising:

a bottom part with a smooth finish top surface extending thereacross to form said smooth top surface of said floor, said bottom part including a plurality of longitudinally extending ridges extending upwardly from said top surface, said bottom part includes a separate recess formed in said top surface between each of said ridges, each recess is concave and includes opposite longitudinally extending and radiused edge portions blended into said ridges;

a top part removably mounted atop said bottom part, said top part includes a pair of sidewalls and end walls connected together forming an enclosure for holding poured concrete, said top part further includes spaced apart slab separators having an elongated configuration extending in the direction of said sidewalls, said separators are spaced from said end walls allowing concrete to extend completely around each separator forming said integrally joined concrete slabs, each separator has a bottom end contacting said ridges of said bottom part and opposite side surfaces diverging from said bottom end allowing said separators to be withdrawn upon solidification of concrete within said mold and surrounding said separators;

locating means on said mold to align said ridges with said separators.

2. The mold of claim **1** wherein:

said locating means includes a plurality of upstanding locating pins, fixedly mounted to said bottom part and positioned on said ridges, said separators including holes mountedly and slidably receiving said pins, said mold has locking means operable to secure said top part to said bottom part.

3. A mold for producing a floor with a smooth top surface and having integrally joined concrete slabs for supporting animals comprising:

a bottom part with a smooth finish top surface extending thereacross to form said smooth top surface of said floor, said bottom part including a plurality of longitudinally extending ridges extending upwardly from said top surface, said bottom part includes a separate recess formed in said top surface between each of said ridges, each recess is concave and includes opposite longitudinally extending and radiused edge portions blended into said ridges;

a top part removably mounted atop said bottom part, said top part includes a pair of sidewalls and end walls connected together forming an enclosure for holding poured concrete, said top part further includes spaced apart slab separators having an elongated configuration extending in the direction of said sidewalls, said separators are spaced from said end walls allowing concrete to extend completely around each separator forming said integrally joined concrete slabs, each separator has a bottom end contacting said ridges of said bottom part and opposite side surfaces diverging from said bottom end allowing said separators to be withdrawn upon solidification of concrete within said mold and surrounding said separators, said top part has rod receiving holes extending through said end walls;

locating means provided on said mold being operable to align said ridges with said separators.

4. The mold of claim **3** wherein said ridges each have a width equal to the width of said bottom end of each separator, said separators are arranged in a first group and a second group, said separators in said first group are parallel and aligned with said separators in said second group and have ends spaced apart from said separators in said second group allowing concrete to extend between said first group and said second group.

5. The mold of claim **4** wherein:

said bottom part includes a main body and an external wood frame extending peripherally around said main body, said smooth finish top surface of said bottom part extends across said main body at least a portion of which is fiber glass forming said smooth finish top surface, said top part includes a pair of side ribs mounted to each of said sidewalls, said ribs being aligned with said separators and extending lengthwise therewith, each rib including a rib surface facing an adjacent separator with each rib surface diverging outwardly toward said bottom part.

6. The mold of claim **5** wherein said main body is fiber glass.

7. The mold of claim **5** wherein said main body is concrete.

* * * * *