Sept. 2, 1952 D. B. DIMICK 2,608,828

CRADLE INVERT SUBSOIL DRAINAGE PIPE

Filed Feb. 4, 1949

FIG. 1.

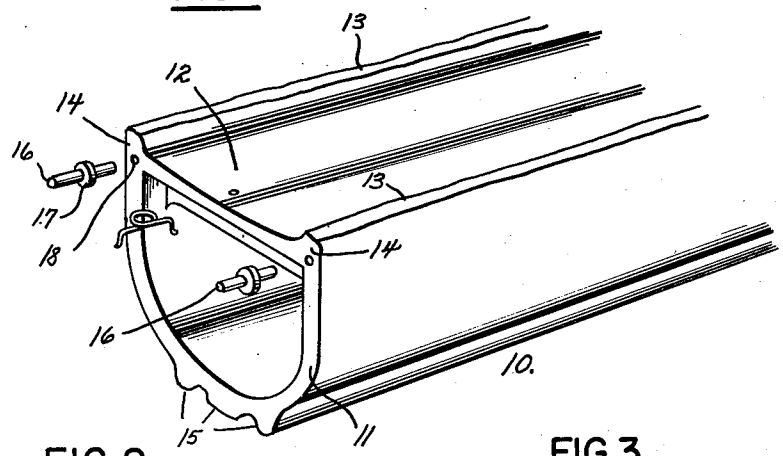


FIG. 2.

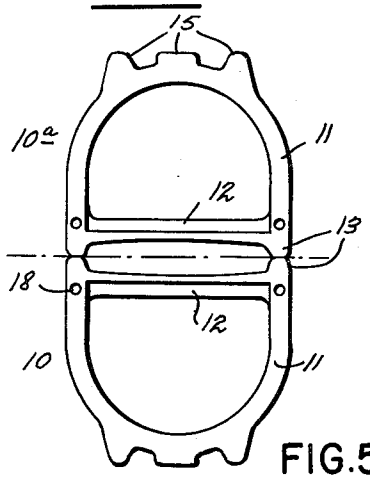


FIG. 3.

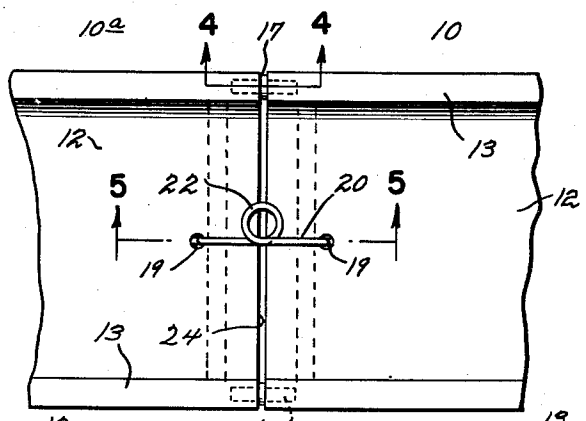


FIG. 4.

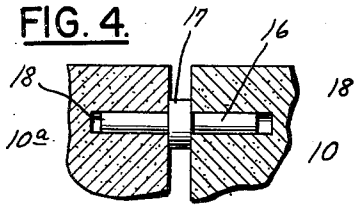


FIG. 5.

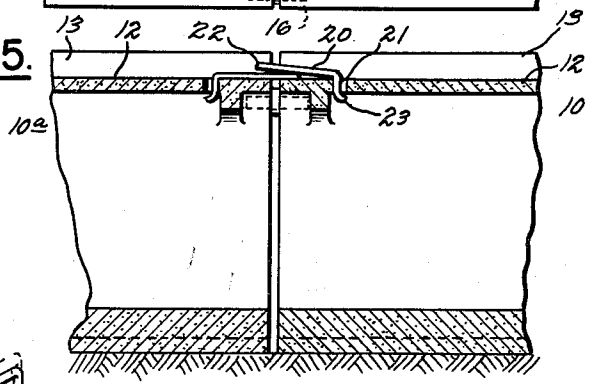
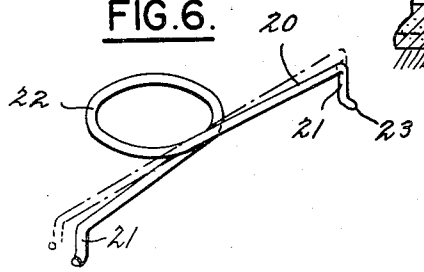


FIG. 6.



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CRADLE INVERT SUBSOIL DRAINAGE PIPE

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9 Claims. (Cl. 61—11)

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The present invention relates to improvements in cradle invert sub-soil drainage pipe and constitutes certain improvements over the sub-drainage pipe disclosed in my prior Patent 2,089,115, granted August 3, 1937, and re-issued May 24, 1938, Reissue 20,736.

It is an object of the present invention to provide a sub-drainage pipe which is without bell and spigot for augur machine production. The elimination of the bell and spigot gives rise to certain problems in accurately aligning the sections of the pipe and in controlling the port area of the openings between adjacent pipe sections and it is a further object of the invention to provide alignment and orienting means between the pipe sections for correctly relating one pipe section to another so that the internal passage of the entire pipe line will accurately register as to all of the member sections thereof to insure the most efficient carry-off continuity.

A still further object of the invention is to provide means for coupling the sections together on the alignment and spacing devices whereby the element of human error will be eliminated in the laying of the pipe section in the trench and of locating the pipe sections relatively to one another in the line of the drainage pipe.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein the symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a fragmentary perspective view of a section of the improved drainage pipe with the coupling means and alignment devices exploded,

Figure 2 is an end view showing two units of the improved drainage pipe as the same emerge from the augur machine,

Figure 3 is a fragmentary top plan view of two adjacent sections of the pipe showing the dowels and spring couplers in position,

Figure 4 is a fragmentary vertical section taken on the line 4—4 of Figure 3,

Figure 5 is a longitudinal sectional view taken on the line 5—5 in Figure 3, and

Figure 6 is a perspective view of a form of spring coupler employed.

Referring more particularly to the drawings 10 and 10a designate adjacent sections of the improved pipe which may be manufactured of metal, clay or other appropriate material. Each section has a body wall 11 of generally semi-cylindrical form and a cradle or top wall 12 which may or may not slope from end to end of the pipe section and which cradle or top wall is preferably made integral with the body wall 11 and is connected with the body wall near but somewhat below the upper edges 13 thereof. The cradle or top wall 12 may or may not be transversely curved. Feet or projections 15 are preferably cast or otherwise formed or provided on

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the lower external central portion of the body wall 11 to embed themselves in the bottom of the trench or ground to properly maintain the pipe sections in erect position with the cradle wall 12 uppermost and substantially horizontal.

Dowel pins 16 having intermediate spacers or collars 17 are adapted to fit into sockets 18 provided in the shoulders 14 of adjacent pipe sections 10 and 10a.

At the ends of the pipe sections and in intermediate portions of the top walls 12 are holes 19 adapted to receive the spring coupler which is shown more particularly in Figure 6 to comprise a shank 20 having down-turned legs 21 with a spring helix or convolution 22 centrally of the shank 20 and out-turned terminals 23 on the lower ends of the legs 21.

In the use of the device, it will be seen that unlike the sub-drainage pipe in my prior patent, the present pipe is completely devoid of the bell and spigot ends and accurate alignment of the pipe sections 10 and 10a is obtained by the fitting of opposite ends of the dowel pins 16 into the sockets 18 of opposing pipe sections 10 and 10a as shown more particularly in Figure 4. The spacers of the collars 17 are of larger diameter than the pins 16 so that the shoulders 14 of the adjacent pipe sections 10 and 10a abut against opposite faces of the spacers 17. Accordingly the width of the spacer 17 determines the drainage opening 24 between the adjacent pipe sections 10 and 10a.

By way of example, these dowels 16 may be a quarter inch in diameter and three inches long with the spacer 17 in the center one-eighth to one-quarter inch thick according to the port area of drainage opening 24 desired.

In accordance with this construction it is not necessary that the top wall 12 shall incline from one end of the pipe section to another but this top wall 12 may be in a straight line. The flow will be induced by laying the pipe line on an inclination so as to induce the flow of water down along the cradle tops 12 to the drainage openings 24 through which the sub-drainage water finds its way downwardly into the interior of the pipe section which is the carry-off section. The control of the width of the drainage opening 24 between pipe sections 10 and 10a is very important to prevent extraneous matter such as fines, from finding its way into the interior or carry-off section as such fines or extraneous matter tend to clog the carry-off section and impede the evacuation of the sub-drainage water by the pipe.

The steel clip or spring coupler is used to initially hold the two pipe sections together on the dowel pins 16 and against the spacers 17. The clip is preferably placed in the middle of the cradle 12 through the two holes 19 provided in the opposed pipe sections. The distance between the legs 21 in the unsprung condition of the clip or coupling is somewhat shorter than the distance between the holes 19 of adjacent pipe sec-

tions 10 and 10a when these pipe sections are abutted tightly against the opposite faces of the spacer 17, so that it becomes necessary to contract the helix 22 and pull out opposite shank portions 20 to stretch the legs 21 so that they may be inserted downwardly into the holes 19. The inherent resiliency in the spring clip acting through the helix 22 will thus tend to draw the legs 21 together and in so doing will set up the pipe sections 10 and 10a firmly against the spacers 17. This is to insure that the selected port area of the drainage opening 24 will be arrived at irrespective of unskilled labor or inattention on the part of the laborers laying the pipe. The outturned terminals 23 will tend to engage the bottom walls of the holes 19 to prevent the clip from being accidentally dislodged. The clips may be made of spring steel which will be consumed by rust after installation. However this is unimportant as the pipe sections will then be held in proper alignment and relationship by the backfill placed over and around the same.

The dowels may be made of hard rubber, steel, die cast metal or the like.

The manufacture of the pipe without the bell permits the same to be produced by the augur method horizontally rather than by the exuded die method vertically. The augur method of manufacture is faster and cheaper than the old method of exuding from the die vertically. One of the main disadvantages of bell construction on pipe of this design is breakage of the bell sections in shipment and handling. Furthermore a decided economy is obtained in burning bell-less vitrified pipe in the kiln as it permits closer stacking and safer stacking in the kiln. Another advantage of this design lies in the fact that it maintains a definite predetermined drainage opening 24 between joints as it eliminates the human element of error in laying the pipe. Where semi-bells are used the workmen fail to push the pipe in a snug manner close together but they just throw the pipe sections in loose and as one length or pipe section is fit opposite another the same may back away from each other and thus an opening 24 that is predetermined to be of a width of a quarter inch enlarges to say three-quarters of an inch which becomes a very serious departure as such wider opening allows stones or foreign material to get into the run-off section, thus clogging the pipe.

While I have disclosed herein the best form of the invention known to me at the present time, I desire it to be understood that I reserve the right to make changes and modifications in the herein described embodiment of the invention provided such changes fall within the scope of the following claims.

What I claim is:

1. In sub-drainage pipe, adjacent pipe sections each having an imperforate cradle top wall along which seepage water is adapted to flow, spacing means between the ends of the pipe sections to space the ends of the sections apart to provide drainage openings down through which the water from the imperforate cradle top walls finds its way into the run-off sections, and means for urging the pipe sections toward one another upon said spacing means.

2. Sub-drainage pipe as claimed in claim 1 characterized by the fact that said spacing means comprises dowel pins fitting in opposed sockets at opposite ends of the pipe sections and having collars outstanding from the intermediate portions thereof of greater diameter than said sockets and of substantial axial width to receive on opposite sides thereof the ends of the opposed pipe sections, with a substantial space maintained between the pipe sections by said collars to afford predetermined drainage spaces between the pipe sections.

3. A sub-drainage pipe as claimed in claim 1 in which said last named means comprises a resilient device for yieldably drawing the two pipe sections towards one another on said spacing means.

4. A sub-drainage pipe as claimed in claim 1 in which said last named means is a spring clip comprising a spring helix, shank sections extending in opposite directions from said helix and feet extended off said shank sections and inserted through holes in the adjacent pipe sections.

5. A sub-drainage pipe, as claimed in claim 4 characterized by the fact that said feet have out-turned ends.

6. In a sub-drainage pipe adjacent pipe sections each having an imperforate cradle substantial top flat wall along which the drainage water is adapted to flow by gravity, said sections having aligned sockets spaced apart at substantially opposite ends of said flat cradle wall, dowel pins fitted in opposing sockets of said sections and having spacing collars outstanding from intermediate portions thereof for determining the degree of spacing of the end walls of the sections, and means for drawing the sections toward one another on said dowel pins with the ends of the sections abutting opposite faces of said collars to insure the predetermined spacing of the sections.

7. Sub-drainage pipe as claimed in claim 6 in which holes are made through said cradle walls adjacent ends of the sections, and further comprising a spring clip having feet relatively movable with a spring device connecting said feet and normally holding the feet spaced apart a distance less than the distance between the holes of adjacent pipe sections when the ends of such pipe sections are closely abutted against opposite sides of said collars, said feet sprung apart and inserted into said holes to draw the pipe sections resiliently together.

8. A sub-drainage pipe as claimed in claim 7 in which the feet have out-turned terminals to engage the inner walls of said pipe sections.

9. In sub-drainage pipe, adjacent pipe sections each having a cradle top wall along which seepage water is adapted to flow, spacing means to axially space the ends of the sections apart to provide drainage openings down through which the water from the cradle top walls finds its way into the run-off sections, and means for urging the pipe sections in an axial direction toward one another upon said spacing means.

DANIEL B. DIMICK.

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