W. H. PEARCE.

HEAT DISTRIBUTING SYSTEM.

APPLICATION FILED JUNE 20, 1910.

**1,008,432.**

**Patented Nov. 14, 1911.**

3 SHEETS—SHEET 1.

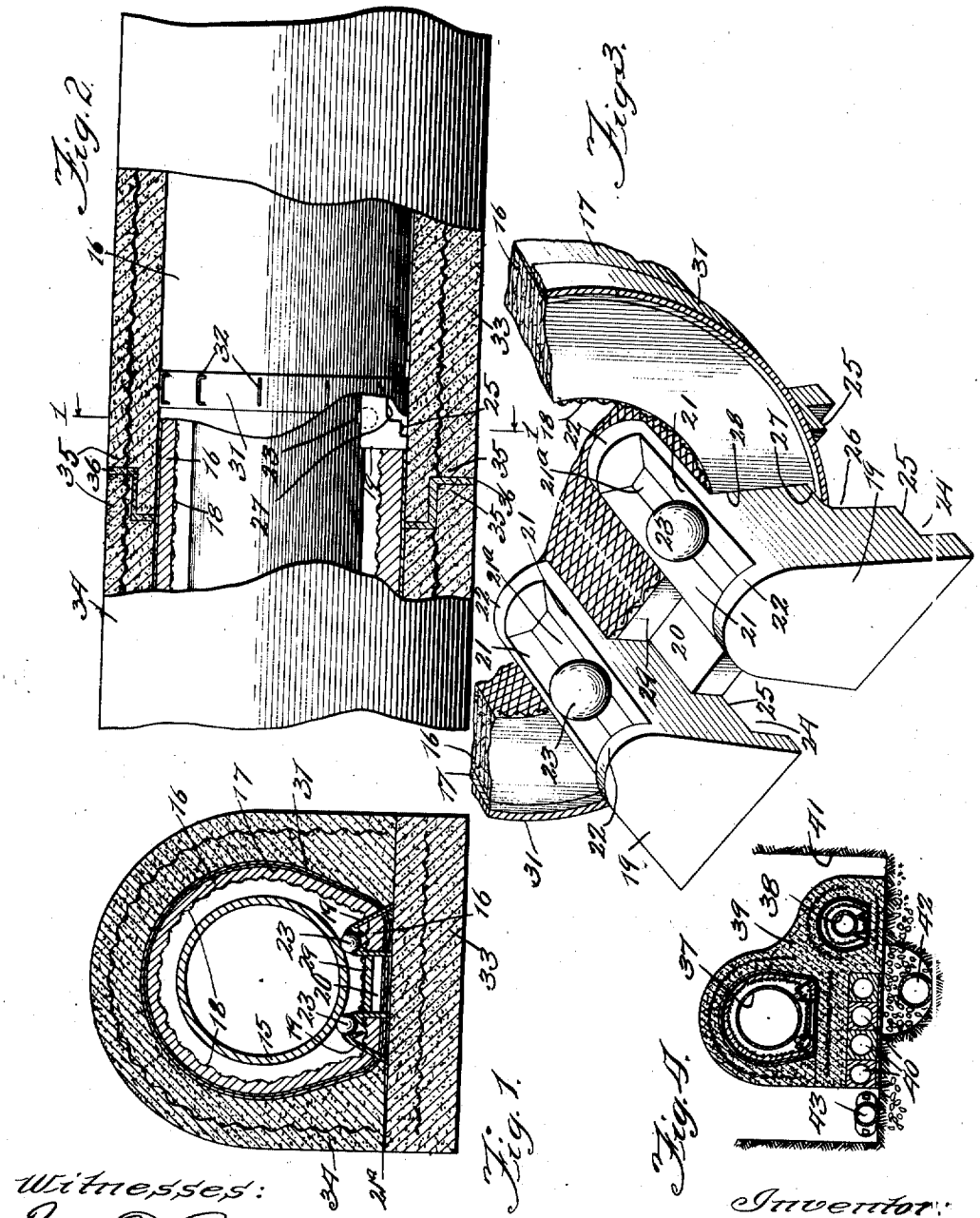


Fig. 2.

Fig. 3.

Fig. 1.

Fig. 4.

Witnesses:

Inventor:

William H. Pearce

By Brown & Hopkins,

Attys.

W. H. PEARCE.

HEAT DISTRIBUTING SYSTEM.

APPLICATION FILED JUNE 20, 1910.

1,008,432.

Patented Nov. 14, 1911.

3 SHEETS—SHEET 2.

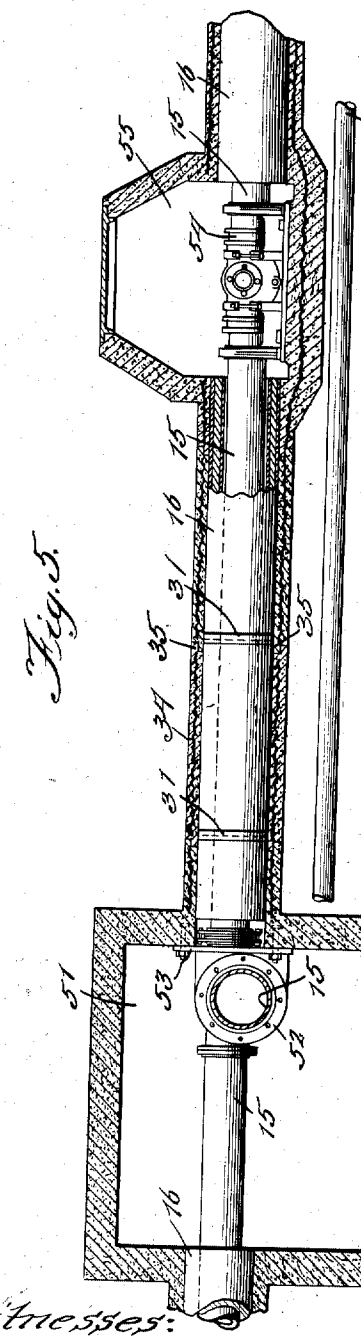


Fig. 5.

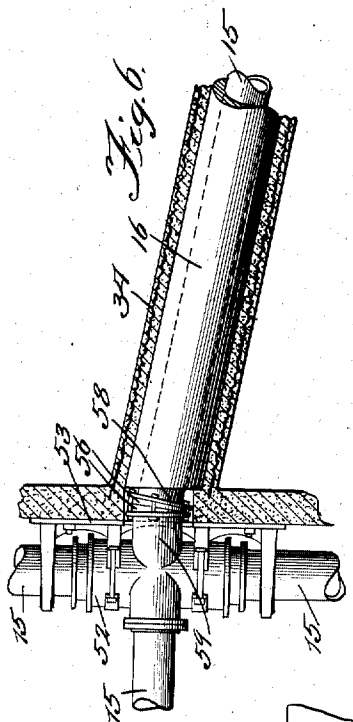


Fig. 6.

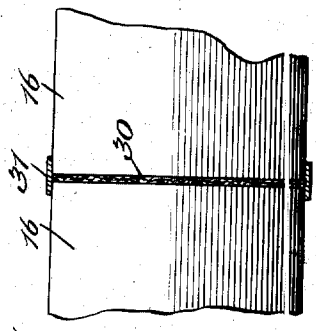


Fig. 7.

Witnesses:

Inventor:

William H. Pearce

By Brown & Hopkins

Attys.

W. H. PEARCE.

HEAT DISTRIBUTING SYSTEM.

APPLICATION FILED JUNE 20, 1910.

**1,008,432.**

**Patented Nov. 14, 1911.**

3 SHEETS—SHEET 3.

Fig. 10.

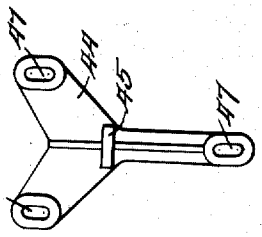



Fig. 13.

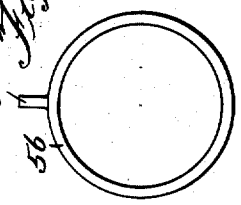



Fig. 12.

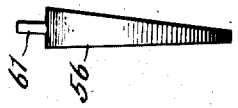



Fig. 9.

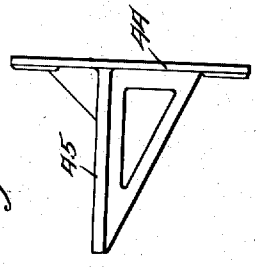



Fig. 11.

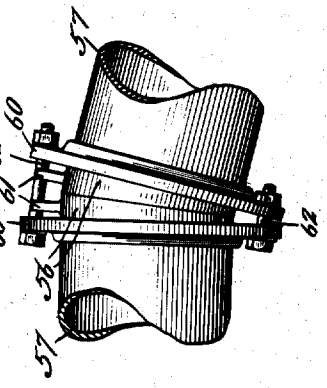
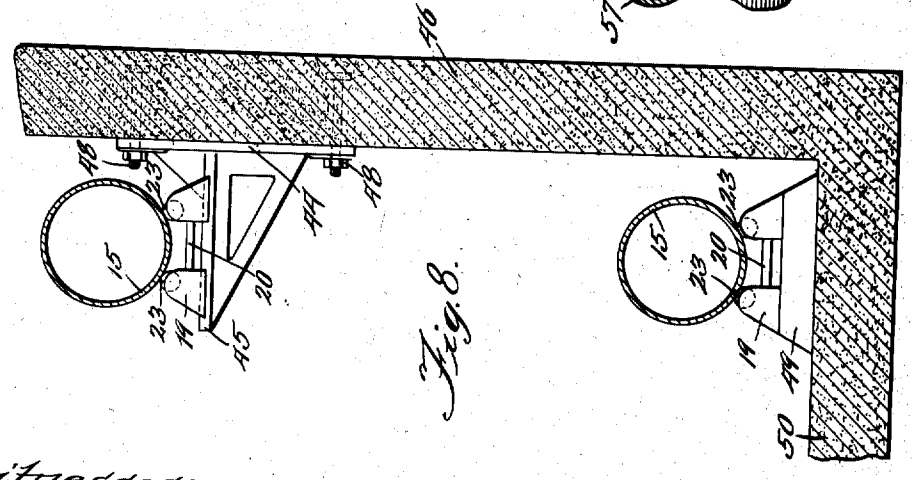



Fig. 8.




Witnesses:

Ira D. Perry

J. A. Hochuli, Jr.

Inventor:

William H. Pearce

By Brown & Hopkins

Atty's

# UNITED STATES PATENT OFFICE.

WILLIAM H. PEARCE, OF CHICAGO, ILLINOIS.

## HEAT-DISTRIBUTING SYSTEM.

1,008,432. Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed June 20, 1910. Serial No. 567,777.

*To all whom it may concern:*

Be it known that I, WILLIAM H. PEARCE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heat-Distributing Systems, of which the following is a specification.

This invention relates to improvements in heat distributing systems and more particularly to that class of systems in which the heating medium is delivered to different points of use through service pipes or mains located below the surface of the ground and which pipes are surrounded by an insulating casing or covering spaced therefrom to confine the heat radiated from the pipe and deflect it back to the surface of the pipe.

It is one of the objects of the present invention to provide an improved bearing for supporting and holding the pipe out of engagement with the insulating covering or casing, and improved means for anchoring the bearing against displacement whereby portions of the bearing may project through the insulation or casing without presenting an opening through which the heat may escape.

A further object is to provide an improved bearing for the pipe comprising a support having extended raceways for receiving cylindrical members or balls upon which the pipe rests and which members are adapted to travel in the raceways by the expansion and contraction of the pipes, and improved means whereby any dirt or foreign matters which are deposited in the raceways will be discharged therefrom to prevent the formation of an obstruction to the cylindrical members or balls and for keeping the bearings clean.

A further object is to provide improved means whereby the bearings may be adjustably mounted upon and secured to supporting brackets.

A further object is to provide improved means for joining or securing the ends of the sections of the insulating casing or covering together.

A further object is to provide an improved heat distributing system of this character in which the free dissipation of heat by radiation from the pipes will be prevented and in which the small number of heat units radiated from the exterior of the pipe insulating casing or covering may be employed for warming or heating an hydraulic pressure pipe arranged in the same ditch or trench, thereby rendering it possible to arrange the hydraulic pipe nearer to the surface of the ground than usual or above the frost line without the danger of the liquid in the hydraulic pipe freezing.

A further object is to provide an improved connection between adjacent ends of pipe sections whereby the ends of pipe sections which are arranged at an angle to each other may be securely connected.

A further object is to provide an improved system of this character which will be simple and durable in construction, readily installed and effective and efficient in operation.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating an embodiment, and in which—

Figure 1 is a sectional view on line 1—1 of Fig. 2. Fig. 2 is a view partly in elevation and partly in section of a portion of a system constructed in accordance with the principles of this invention. Fig. 3 is an enlarged detail perspective view of a portion of the heat main insulating casing or covering and the bearings for supporting the main out of contact with the casing. Fig. 4 is a view similar to Fig. 1 of a system showing the manner in which the several pipes may be arranged and also showing the manner in which an hydraulic pipe may be located within the same ditch or trench. Fig. 5 is a sectional view with parts in elevation of a system constructed in accordance with this invention and showing a manhole. Fig. 6 is a plan view partly in section showing the manner of joining two pipe sections which are arranged at an angle to each other. Fig. 7 is a side elevation partly in section showing the manner of connecting the ends of the insulating casing or covering. Fig. 8 is an enlarged view partly in elevation and partly in section of a manhole or junction box showing the manner in which the bearings for the heat main or pipe may be employed for supporting the pipe at different elevations. Fig. 9 is a side elevation of a supporting bracket. Fig.

10 is a front elevation of Fig. 9. Fig. 11 is a side elevation of the connecting joint between the ends of the pipe section. Fig. 12 is an end elevation of Fig. 13. Fig. 13 is a front elevation of one of the connecting rings.

Referring more particularly to the drawings and in the present exemplification of this invention, the numeral 15 designates a pipe section or heat conveying main, which is incased within a casing of fireproof insulating material 16 constructed of any suitable material, and arranged around the outer face of this casing is a waterproofing material 17. This casing 16 is adapted to completely surround the pipes 15 and is spaced therefrom so as to catch and confine the heat radiated from the pipe 15 and deflect it back to the pipe. In order to support the insulating casing 16 out of contact with the pipe and to prevent it from sagging, a support 18 of any suitable material is provided, which surrounds the inner face of the casing. The pipe 15 is held out of contact with the casing by means of suitable bearings, which latter preferably comprise spaced supports 19, which are connected by an intermediate member or connecting bar 20. This bar or connecting member 20 terminates short of the extremities of the bearings 19 and is located some distance below the top of the bearings. These bearings are hollow and preferably of pyramidal formation and are of some length. The tops of the bearings are provided with inclined sides 21, which converge toward the base of the bearing, and the extremities of the sides terminate short of each other to form a raceway having an open bottom $21^a$. The front and rear of the bearings 19 project above the raceway as at 22 to form stops for the balls 23, which are adapted to travel in the raceways. The sides of the bearings are cut away as at 24 to form shoulders 25 adjacent the bottom thereof, and the sides are further cut away as at 26 to form shoulders 27, as shown more clearly in Fig. 3. The bearings 19 are of a height somewhat greater than the thickness of the casing 16, and the extremities of the casing are cut away as at 28 so as to receive the extremities of the bearings. The portion of the casing between the bearings 19 is cut away as at 29, so that when the bearing is placed in position, the portion 29 of the casing will engage and extend over the connecting bar 20 of the bearings, while the recessed or cut away portions 28 will receive the ends of the bearings. The bearings are adapted to extend into the adjacent ends of two sections of the casing, and when these two sections of the casing are brought together as shown in Fig. 2, so that their extremities will abut, the bearings will be incased and only the lower extremities thereof will project through the casing as shown in Figs. 1 and 3. In order to secure the sections of the casing together when thus assembled, suitable adhesive material 30 is arranged between the adjacent extremities, and a flexible member 31 in the form of a band is applied around the periphery of the casing so as to extend across the joint formed by the adjacent ends. This band or flexible member 31 is seated within the openings 26 formed in the bottom of the bearings, and if desired, suitable fastening devices 32 may be employed which are inserted through the band 31 and into the body portion of the casing. It is not necessary, however, that these fastening devices be employed, but as an additional security they may be employed. When the sections of the insulating casing or covering and the bearings 19 are thus secured in position, the pipes 15 will engage and rest upon the balls 23, and as the latter rests in the extended raceways, the expansion and contraction of the pipe sections caused by rising and falling of temperature will not be interfered with and during its expansion and contraction the balls 23 will travel in the raceways according to the direction of movement of the pipe.

In order to insure a complete insulation and to prevent the escape of any of the heat radiated from the surface of the pipe 15, the portions of the insulating casing 16 which have been cut away to form the recesses or openings 28, and the portions which have been cut away to form recesses for the reception of the cross-bar member 20 between the bearings 19, may be inserted into the bottom of the hollow bearings 19 to fill the space therein.

In the form of the invention shown in Figs. 1 to 4, the insulating casing or covering thus formed and the bearings 19 are mounted upon a base or support 33, which may be constructed of any desired or suitable material, but preferably of a reinforced plastic structure, and when in position the portions of the bearings which protrude from the casing 16 will engage and rest directly upon the base 33. The casing and the bearings engage the supporting base 33 intermediate the ends thereof, and a covering 34 of any suitable material preferably of reinforced plastic material, is provided which completely covers the casing and the portions of the bearings which protrude therefrom so that the insulating casing 16 will be completely housed. The protruding portions of the bearings 19 will enter the plastic material forming the covering 34 when the latter is being formed and will be anchored thereby to prevent displacement of the bearings. If desired, the casing formed by the portions 33 and 34 may be provided with a suitable waterproofing coating, or they may be constructed of material which contains a suitable waterproofing in-

gredient so that the water will not percolate through the casing to contact with the insulating casing or covering 16. This outer casing 34 as well as the base 33 may be constructed in sections, shown more clearly in Fig. 2, and if so constructed the adjacent ends of the sections may be shouldered as at 35, and a suitable connecting material 36, such as cement or the like, may be employed for securing the ends to form a fluid tight joint. With this improved bearing for supporting the pipes it will be apparent that any foreign substances which are deposited upon the walls 21 of the raceways, will be discharged through the openings 21ª into the hollow body portion of the bearings 19, and thereby form a dirt-proof bearing for the balls.

In Fig. 4 there is shown two pipes or heat mains 37, 38, which are arranged in different planes with respect to each other, and an outer casing 39 similar to the casing formed by the base 33 and portion 34, and wire conduits 40 are also arranged to be incased within the casing 39. These pipes 38 and the inclosing outer casing 39 are arranged within a ditch or trench 41, and a drain pipe 42 is provided below the pipes 37, 38. Arranged within the same ditch or trench is an hydraulic pressure pipe 43, so that the heat units which are radiated from the outer casing 39 will serve to heat or warm the pipe 43. Heretofore it has been necessary in order to prevent the freezing of the hydraulic pipes, to arrange them in the ground a sufficient distance below the frost line, which frost line varies in different climates. By providing a heat distributing system of this character, it is possible to arrange the hydraulic pipe 43 within the same trench and in close proximity to the outer casing, and after the ditch is filled in, the heat units radiated from the outer casing 39 will prevent the freezing of the liquid in the pipe 43 and by this means it is possible to arrange the hydraulic pipe 43 closer to the surface of the ground and above the frost line without danger of the pipe freezing. With this improved construction of bearing it is also possible to suspend or support pipes at different heights within manholes or tunnels, and as shown in Figs. 8 to 10, there is provided a bracket 44 having a supporting arm 45 projecting laterally therefrom. The arm 45 is of a width substantially equal to the width of the cut away portion 24 of the bearings 19, and is adapted to extend into such cut away portion so that the shoulders 25 formed thereby will engage and rest upon the upper surface of the arm, as shown more clearly at the top of Fig. 8. When the bearing is thus placed upon the bracket, the pipe 15 will rest upon the balls 23 in the same manner as shown in Fig. 1 to permit the free longitudinal movement of the pipes. At the same time the bearing 19 may be adjusted longitudinally of the arm 45 of the bracket 44 and laterally with respect to the wall 46 of the tunnel. The bracket may be provided with elongated eyes 47, through which fastening devices 48 pass and which fastening devices engage or may be anchored to the wall of the tunnel. By the provision of these elongated eyes the bracket may be raised or lowered as desired. As shown at the bottom of Fig. 3, the bearing 19 may be mounted upon a pedestal 49 arranged upon the floor 50 of the tunnel.

In Fig. 5 a manhole 51 is arranged intermediate the length of the system and in which is a coupling or expansion joint 52, which is anchored to a suitable support 53, and a similar coupling or expansion joint 54 may be provided within another manhole 55, so as to permit the heat distributing main to readily expand and contract; the drain pipe 42 being arranged below and substantially parallel with the service mains 15. The specific construction of the anchors for the sleeves, however, forms no part of the present invention, but form the subject-matter of a separate application, Serial No. 567,778, filed June 20, 1910. In order to connect branch pipes to the sleeves 52 or to connect adjacent ends of the pipe sections together when the parts to be coupled are arranged at different angles, suitable rings 56 are provided, each of which is of a wedge-shaped formation. These rings are arranged between the extremities of two pipe sections 57, as shown more clearly in Fig. 11, or between a pipe section 58 and a branch opening 59 of the sleeve 52. These rings are arranged between two coupling members 60, and are each provided with an operating handle 61 projecting from the periphery thereof. The coupling rings 60 are connected by fastening devices 62 in the form of bolts or the like, and serve also as means for securing the rings 56 in position. In order to couple the two sections together with this improved joint, all that is necessary is to arrange the rings 56 between the coupling members 60 and place the fastening devices 62 in position, after which and before the fastening devices are tightened, the handle 61 of the rings may be grasped by the operator and either one or both of the rings rotated in the same or opposite directions. When properly adjusted, the fastening devices 62 may be tightened and a fluid tight joint will be formed.

What is claimed as new is—

1. In a heat distributing system, the combination of a supply pipe, an insulating casing entirely surrounding the pipe and spaced therefrom, means within the casing

for supporting the pipe out of contact with the casing, and means exterior of the surrounding wall of the casing for anchoring the pipe supporting means.

2. In a heat distributing system, the combination of a supply pipe, an insulating casing entirely surrounding the pipe, a base upon which the casing rests, a roller bearing within the casing for holding the pipe out of contact with the casing and including a support, a portion of the support protruding through and beyond the outer face of the surrounding wall of the casing and resting upon the said base, and a covering constructed of plastic material incasing the said insulating casing and the said protruding portion of the support for anchoring the latter.

3. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a base upon which the casing rests, means for holding the pipe out of contact with the casing comprising a support within the casing provided with a raceway, a roller movable in the raceway and with which the pipe has engagement, a portion of the support protruding through and beyond the outer face of the casing and resting upon the said base for anchoring the support.

4. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a base upon which the casing rests, means for holding the pipe out of contact with the casing comprising a support within the casing provided with a raceway, a roller movable in the raceway and with which the pipe has engagement, a portion of the support protruding through and beyond the outer face of the casing and engaging and resting upon the said base, and a covering constructed of plastic material surrounding the casing and the said protruding portion of the support and in which covering the said portion of the support is embedded.

5. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a base upon which the casing rests, means for holding the pipe out of contact with the casing comprising a support within the casing provided with a raceway, a roller movable in the raceway and with which the pipe has engagement, a portion of the support protruding through and beyond the outer face of the casing and resting upon the said base, and a covering constructed of waterproofed plastic material surrounding the casing and coöperating with the base to incase the casing, and in which covering the said protruding portion of the support is embedded.

6. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing within the casing for holding the pipe out of contact with the casing, said bearing comprising spaced parallel raceways, and a roller freely movable in each of the raceways and against which rollers the pipe rests.

7. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing within the casing for holding the pipe out of contact with the casing, said bearing being provided with a channel open at the top and bottom to form a raceway, and a roller freely movable in the raceway and against which roller the pipe rests.

8. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing within the casing for holding the pipe out of contact with the casing, said bearing being provided with a channel, the walls of the channel inclining toward and terminating short of each other to form a raceway having an opening at the bottom thereof, and a roller freely movable in and engaging the walls of the raceway and against which roller the pipe rests.

9. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing within the casing for holding the pipe out of contact with the casing, said bearing being provided with a channel, the walls of the channel inclining toward and terminating short of each other to form a raceway having an opening at the bottom thereof, a roller freely movable in and engaging the walls of the raceway and against which roller the pipe rests, said bearing protruding through and beyond the outer face of the casing, and means coöperating with the said protruding portion for anchoring the bearing.

10. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing for holding the pipe out of contact with the casing, said bearing extending into the casing from the outside thereof and comprising extended raceways spaced from each other and open at their bottoms, and rollers freely movable in the raceways, and against which the pipe rests, portions of said bearing being embedded in the casing.

11. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing for holding the pipe out of contact with the casing, said bearing extending into the casing from the outside thereof and comprising extended raceways spaced from each other and open at their bottoms, rollers freely movable in the raceways, and against which the pipe rests, portions of said bearing being embedded in the casing, and portions projecting beyond the outer face of

the casing, and means exterior of the casing and coöperating with the last recited portions for anchoring the bearing.

12. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing for holding the pipe out of contact with the casing, said bearing comprising a hollow support, shaped to form a raceway having an open bottom through which dirt may pass into the support, a roller mounted in the raceway and adapted to traverse the raceway by the expansion and contraction of the pipe, and means for anchoring the said support.

13. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing for holding the pipe out of contact with the casing, said bearing comprising a hollow support shaped to form spaced extended raceways having open bottoms forming communication with the hollow support, and rollers mounted and freely movable in the raceways and against which rollers the pipe rests, the body portion of the support being embedded in the casing and projecting beyond the outer face thereof, and means cooperating with the said projecting portion for anchoring the bearing.

14. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing for holding the pipe out of contact with the casing, said bearing comprising a hollow support shaped to form spaced extended raceways having open bottoms forming communication with the hollow support, and rollers mounted and freely movable in the raceways and against which rollers the pipe rests, the body portion of the support being embedded in the casing and projecting beyond the outer face thereof, and a covering constructed of plastic material engaging and surrounding the casing and in which covering the said projecting portion of the support is embedded.

15. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing for holding the pipe out of contact with the casing, said bearing comprising spaced hollow supports each being provided with an extended raceway open at their bottoms, rollers supported for free movement in the raceways by the expansion and contraction of the pipe and against which the pipe rests, and a connection between the supports, said casing being cut away to receive and incase the said connection and the body portions of the supports.

16. In a heat distributing system, the combination of a supply pipe, an insulating casing surrounding the pipe, a bearing for holding the pipe out of contact with the casing, said bearing comprising spaced hollow supports each being provided with an extended raceway open at their bottoms, rollers supported for free movement in the raceways by the expansion and contraction of the pipe and against which the pipe rests, a connection between the supports, said casing being cut away to receive and incase the said connection and the body portions of the supports, and a covering constructed of plastic material surrounding and incasing the said casing and bearings.

17. In a heat distributing system, the combination of a pipe, a sectional casing surrounding the pipe, a bearing for supporting the pipe out of contact with the casing, the proximate ends of adjacent sections of the casing being cut away to receive the bearing, portions of the bearing projecting through and beyond the outer face of the casing, and a flexible member extending across the joint and surrounding the said sections, said flexible member also engaging the protruding portion of the bearing.

18. In a heat-distributing system, the combination of a pipe, a sectional casing surrounding the pipe, a bearing for supporting the pipe out of contact with the casing, the proximate ends of adjacent sections of the casing being cut away to receive the bearing, portions of the bearing projecting through and beyond the outer face of the casing, a flexible member extending across the joint and surrounding the said sections, said flexible member also engaging the protruding portion of the bearing, and a covering constructed of plastic material engaging and surrounding the casing and flexible member and in which the protruding portion of the bearing is embedded.

19. In a heat distributing system, the combination of a pipe, a sectional casing surrounding the pipe, a bearing for supporting the pipe out of contact with the casing, the proximate ends of adjacent sections of the casing being cut away to receive the bearing, a portion of the bearing protruding through and beyond the outer face of the casing, said protruding portion being recessed, and means securing the ends of the casing together, said means including a flexible member encircling the joint, a portion of said flexible member being seated in the said recess in the protruding portion of the bearing.

20. In a heat distributing system, the combination of a pipe, a sectional casing surrounding the pipe, a bearing for supporting the pipe out of contact with the casing, the proximate ends of adjacent sections of the casing being cut away to receive the bearing, a portion of the bearing protruding through and beyond the outer face of the casing, said protruding portion being recessed, means securing the ends of the casing together, said means including a flexible

member encircling the joint, a portion of said flexible member being seated in the said recess in the protruding portion of the bearing, and fastening devices engaging said flexible member and the casing.

21. In a heat distributing system, the combination of a pipe, a sectional casing surrounding the pipe, a bearing for supporting the pipe out of contact with the casing, the proximate ends of adjacent sections of the casing being cut away to receive the bearing, a portion of the bearing protruding through and beyond the outer face of the casing, said protruding portion being recessed, means securing the ends of the casing together, said means including a flexible member encircling the joint, a portion of said flexible member being seated in the said recess in the protruding portion of the bearing, and a covering constructed of plastic material surrounding and engaging the casing and flexible member and in which the protruding portion of the bearing is embedded.

22. A bearing for the distributing pipe of a heating system comprising spaced connected supports, each of which is provided with an extended raceway, and a roller mounted in each of the raceways and against which the pipe rests, said rollers being adapted to freely traverse the raceways by the expansion and contraction of the pipe, the supports being provided with recesses opening through their base.

23. A bearing for the distributing pipe of a heating system comprising spaced connected supports, each of which is provided with an extended raceway, and a roller mounted in each of the raceways and against which the pipe rests, said rollers being adapted to freely traverse the raceways by the expansion and contraction of the pipe, the supports being provided with recesses opening through their base, and to form shoulders within their body portions adjacent the lower face of the base.

24. A bearing for the distributing pipe of a heating system comprising a body provided with spaced raceways, rollers mounted in the raceways, against which the pipe rests and which rollers are freely movable in the raceways by the expansion and contraction of the pipe, the said body being provided with a recess opening through one face to form shoulders adjacent the face, and an arm extending into the recess and upon which the said shoulders rest for supporting the bearing.

25. A bearing for the distributing pipe of a heating system comprising a hollow body portion provided upon one face with spaced and extended raceways each having an open bottom to form communication with the interior of the body portion and a roller mounted to freely traverse each of the raceways.

26. A bearing for the distributing pipe of a heating system comprising a hollow body portion provided upon one face with spaced and extended raceways each having an open bottom to form communication with the interior of the body portion and a roller mounted to freely traverse each of the raceways, said raceways being provided with closed ends to form stops for the rollers.

27. In a heat distributing system, the combination of a supply pipe, an insulating casing entirely surrounding the pipe, means within the casing for supporting the pipe out of contact with the casing, a base upon which the casing rests, a portion of the pipe supporting means protruding through the surrounding wall of the insulating casing and also resting upon the base, and a covering formed of plastic material surrounding the casing and coöperating with the base to inclose the casing, the protruding portion of the pipe support being embedded in the plastic material for anchoring the support.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 6th day of May A. D. 1910.

WILLIAM H. PEARCE.

Witnesses:
M. W. CANTWELL,
J. H. JOCHUM, Jr.