

(No Model.)

O. A. STEMPEL.
METAL BRACE FRAMED CONCRETE PIPE.

No. 468,269.

Patented Feb. 2, 1892.

Fig. I,

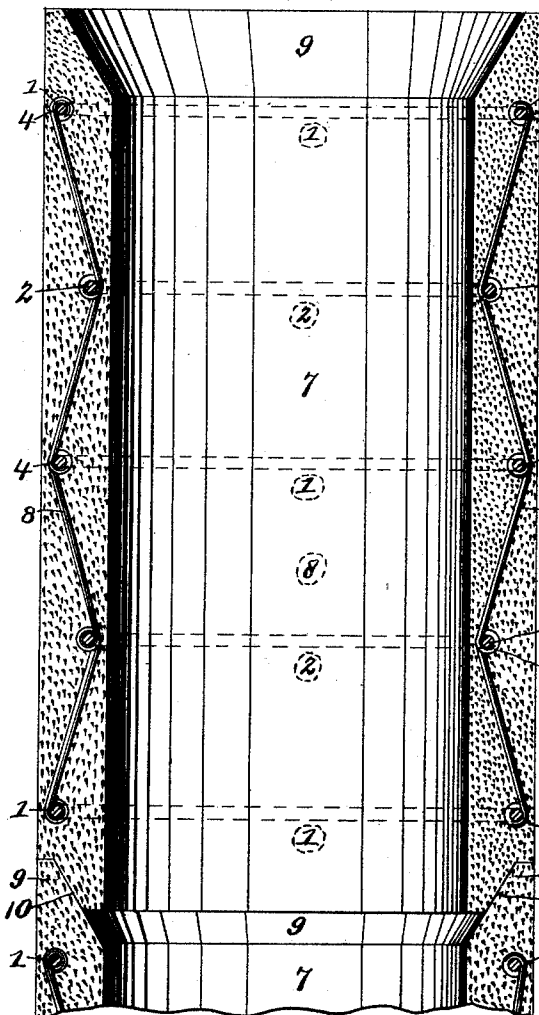


Fig. II,

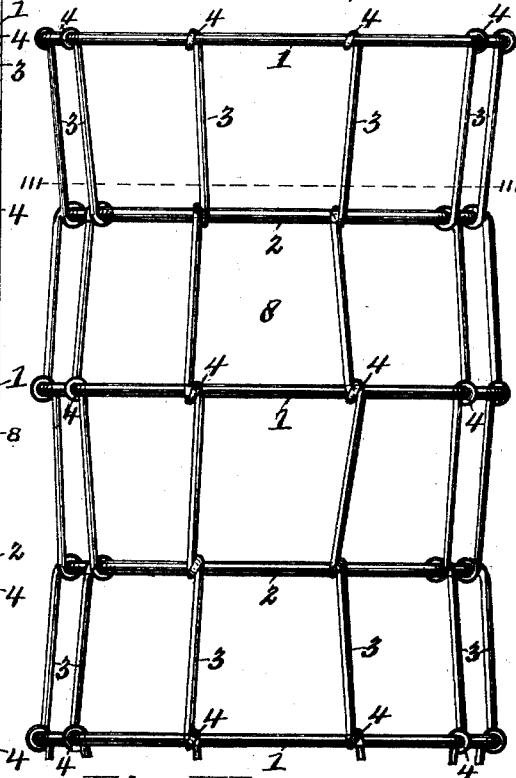


Fig. III,

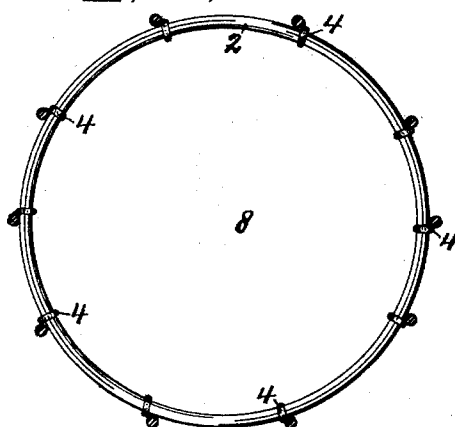


Fig. IV,

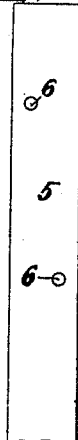
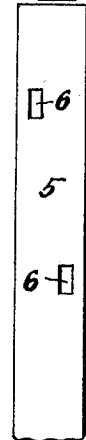


Fig. V,



ATTEST
A. W. Davis
A. M. Ebersole

INVENTOR
Omar. A. Stempel
By Knight Bros,
Attys

UNITED STATES PATENT OFFICE.

OMAR A. STEMPEL, OF ST. LOUIS MISSOURI.

METAL-BRACE-FRAMED CONCRETE PIPE.

SPECIFICATION forming part of Letters Patent No. 468,269, dated February 2, 1892.

Application filed September 14, 1891. Serial No. 405,651. (No model.)

To all whom it may concern:

Be it known that I, OMAR A. STEMPEL, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Metal-Brace-Framed Concrete Pipes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 This invention relates to a concrete conduit and other pipe-section for use in the construction of sewers, &c., that has embedded in it a metal frame, said frame having transverse rings of diverse diameter and having longitudinal metal ties whose connections with
15 the diverse diameters of said rings form braces that reinforce the strength of the pipe; and the invention consists in the features of novelty hereinafter fully described, and pointed out in the claim.

Figure I is a longitudinal section and shows a concrete pipe-section with a detail of one of its connecting sections and shows in broken lines the series of metal rings of diverse diameter and angling rods or wires that on brace-lines connect said rings. Fig. II is a perspective view of the brace-formed metal frame previous to its being embedded in the concrete in the pipe-mold. Fig. III is a transverse section of the same, taken on line III
25 Fig. II. Fig. IV is a longitudinal detail view of a modification in which perforate iron bars are used in the place of the longitudinal tie-rods, the perforations being alternately placed adjacent to opposite sides of said bar
30 to alternately expand and contract the diameter of the metal rings or coils that are threaded through said perforations to brace the frame and the concrete pipe it reinforces; and Fig.
35 V is a like view and shows oblong slots instead of round perforations for use where bars are used in the construction of the rings or coils instead of rods or wires.

Referring to the drawings, 1 represents the major rings, and 2 the minor rings, of the frame, and 3 are the longitudinal tie-rods, which are tied by their loops 4 around said major and minor rings at their points of intersection. All the parts of said frame are of metal and
40 may be of rod or bar iron or of wire. I have shown five of said rings alternately of major

and minor size, and ten longitudinal rods, which is about the right number in each case for the construction of a reinforce-frame for embedding in a concrete sewer-pipe section of eight-inch diameter; but the number may be increased or diminished to accord with the exigencies of the case for some sewer and other pipes are exposed to greater strains than others.

5 represents metal bar-ties that may be used in the place of the rod or wire ties, and which bar-ties have perforations or slots 6 adjacent alternately to opposite edges of the bar-ties. The alternate major circle rods and bars 1
55 and minor circle rods and bars 2, that are seated in said perforations and slots, may either be bent around in separate rings, as shown in Fig. II, or may be wound around in the modified form of a coil.

7 represents a sewer or other concrete molded pipe-section in which my metal reinforce-frame 8 is embedded in the course of molding. 9 represents the flaring-mouth joint of said pipe, and 10 its bevel insertion end.

It will be seen that the iron frame, independent of its brace construction, very largely reinforces the strength of the concrete pipe, and also binds it in case of accidents from frost or other ways that may crack the same, for even if under abnormal strains the pipe should crack the metal frame still holds it intact. One of the most important elements of strength in said iron frame is its brace form of construction. Thus it will be seen that as the major 1 and minor 2 alternate rings of the frame are of diverse diameter the longitudinal tie-rods 3 angle back and forth between the loop-ties of said rings and thus constitute counter-braces that when embedded in the concrete pipe secure it from accidents under great strains. It will also be seen that the longitudinal tie-rods are likewise angled laterally, both to conform to the different diameter of the rings and also to constitute lateral braces that still further stiffen the frame.

In the modifications shown in Figs. IV and V longitudinal flat tie-bars 5 are used in the place of said tie-rods, and said bars are perforated in Fig. IV and slotted in Fig. V alternately adjacent to opposite edges of said bars

and rods in the perforate bars, and light bars in the slotted bars may be threaded through a succession of said longitudinal tie-bars and bent in circles to form rings, as in the previously-described form, the ends of which rings may be secured together or not, as preferred, by either welding or looping. Otherwise a continuous rod or light bar may be threaded around in said perforations or slots in a coil from end to end of said metal reinforce-frame to effect a circuitous coil weaving of the succession of tie-bars 5 together; but whether individual rings or an integral coil is used in said modified frame the perforations and slots in said tie-bars are always located at alternate edges of said tie-bars, so as to carry out the principle of a brace-frame in the reinforce construction.

There may be the same number of longitudinal tie-bars 5 used as of the longitudinal rods 3; but I do not confine myself to any specific number of said tie bars or rods, for the number may be advantageously varied in accordance with the diameter of the pipe and from other considerations. Thus, also, I do not confine myself to the number of five al-

ternate major and minor rings, as shown in Figs. I, II, and III, for the number may be suitably changed to accord with any change made in the length of said pipe-sections. 30

I have my metal brace reinforce-frame embedded in a concrete sewer or other pipe, but I do not confine myself to the use of said reinforce metal frame in concrete pipes alone, for it may be advantageously also used when alike embedded in stoneware, clay, or other molded or constructed pipes. 35

I claim as my invention—

The combination, in a molded pipe for sewers, &c., of the major rings 1, the minor rings 2, the said major and minor rings placed in alternate position, the longitudinal ties 3, the loop-ties 4, that tie said rods to said rings, the said tie-rods angling between said major and minor rings to make a braced reinforced frame, and the material for forming the pipe molded around said frame, substantially as and for the purpose set forth. 45

OMAR A. STEMPEL.

In presence of—

BENJN. A. KNIGHT,

E. S. KNIGHT.