

No. 678,118.

Patented July 9, 1901.

H. O. KRUSCHKE.

HEATING ATTACHMENT FOR CULVERTS, &c.

(Application filed July 24, 1900.)

(No Model.)

Fig. 1.

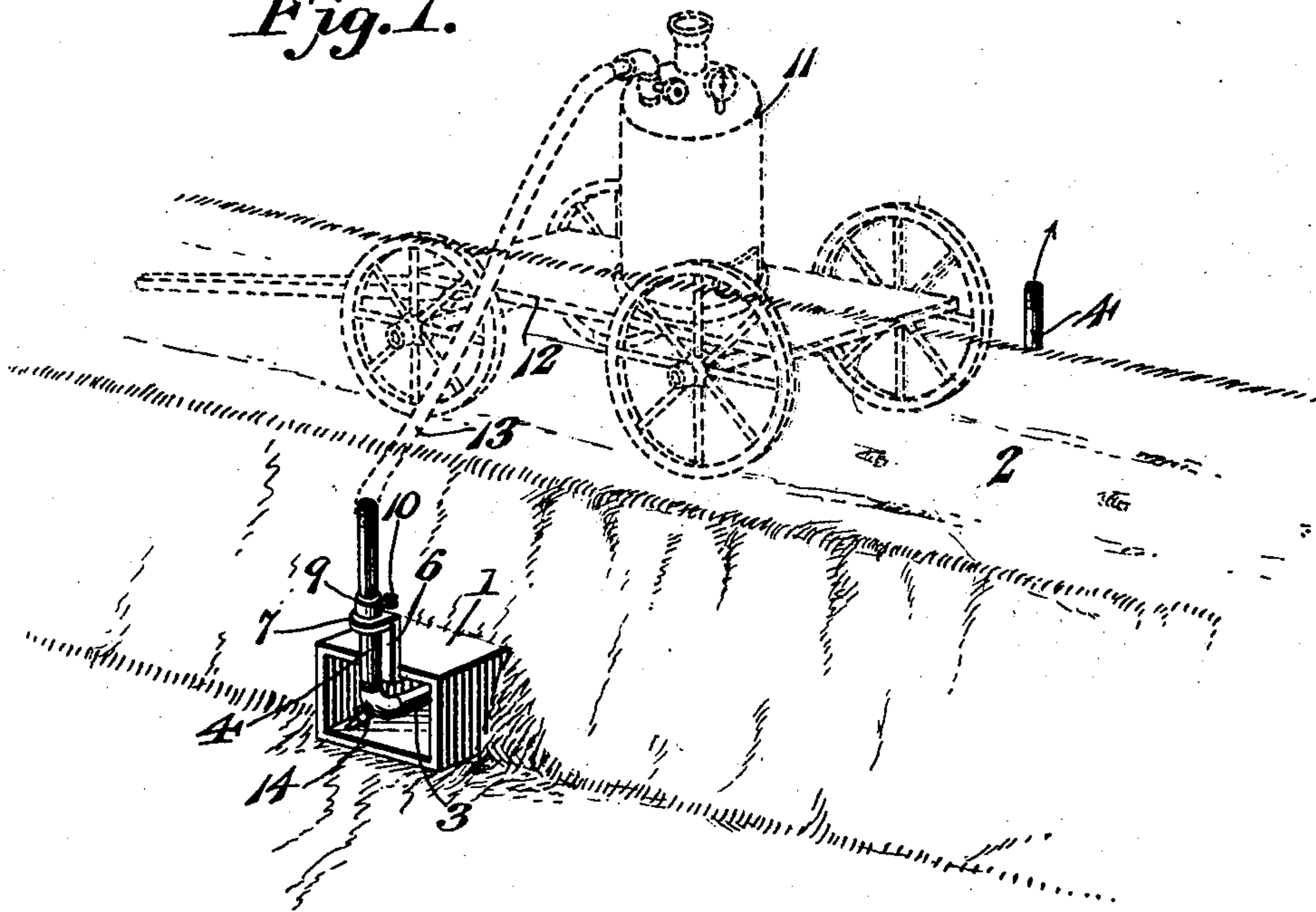
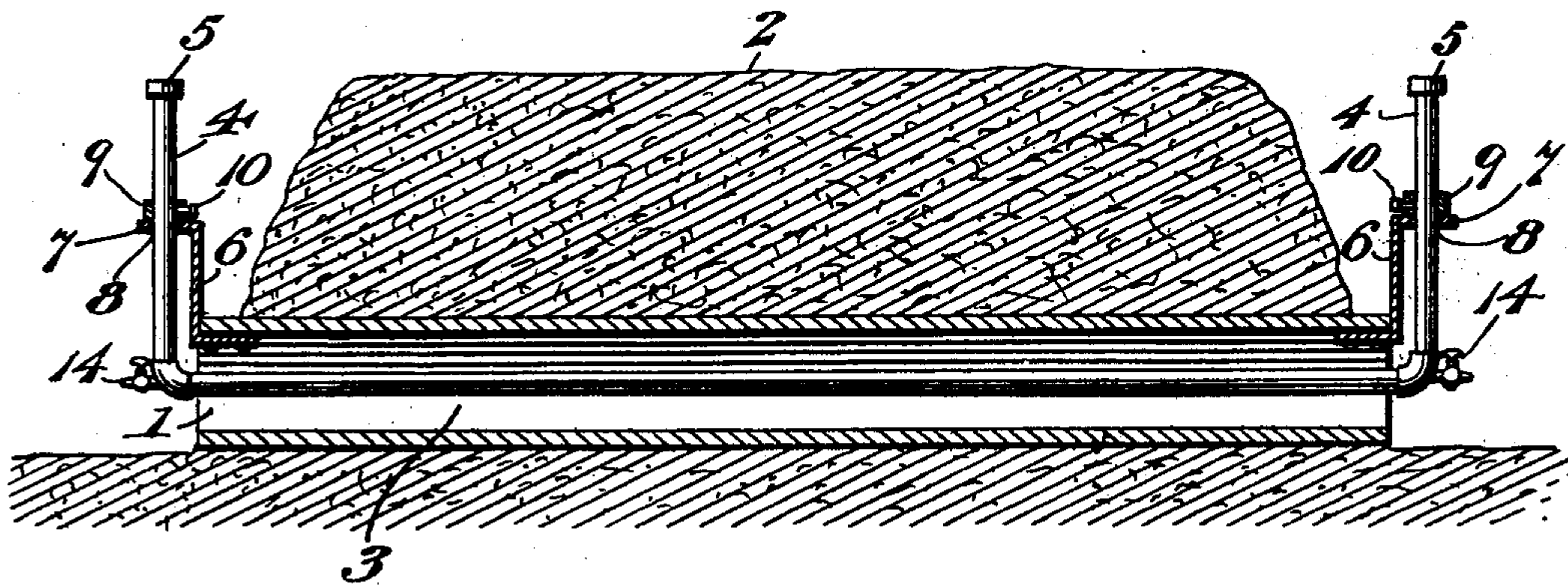


Fig. 2.



Herman O. Kruschke Inventor

Witnesses
Edwin G. McKee
S. P. Holmquist

By *E. G. Siggers* Attorney

UNITED STATES PATENT OFFICE.

HERMAN O. KRUSCHKE, OF AURORAHVILLE, WISCONSIN.

HEATING ATTACHMENT FOR CULVERTS, &c.

SPECIFICATION forming part of Letters Patent No. 678,118, dated July 9, 1901.

Application filed July 24, 1900. Serial No. 24,692. (No model.)

To all whom it may concern:

Be it known that I, HERMAN O. KRUSCHKE, a citizen of the United States, residing at Aurorahville, in the county of Waushara and State of Wisconsin, have invented a new and useful Heating Attachment for Culverts and the Like, of which the following is a specification.

This invention relates to an apparatus for freeing culverts and the like from ice and snow to facilitate the thawing out of frozen matter therein, and thereby open up communication through the same.

To this end the invention primarily contemplates a heating attachment designed for use in connection with culverts and the like and so arranged with relation thereto as to insure an effective thawing out of ice and the reestablishment of a waterway therethrough.

While the invention is applicable to almost any form of culvert or like structure in any location, still the same possesses special utility in connection with that class of culverts which are employed beneath road-beds. In nearly all northern localities during the winter the culverts beneath the road-beds become completely choked with ice, and frequently before the same are thawed out in warm weather and a passage-way reestablished therethrough the water from the melting snows floods the road-bed and greatly impairs the same by washing gulleys therein. Other disastrous results arise from the freezing up of the culverts or drain-tiles employed along highways; and it is therefore the purpose of the present invention to provide a simple, inexpensive, and effective heating attachment which may be utilized as a permanent fixture for a culvert or like structure, while at the same time providing convenient means for quickly and readily thawing out a sufficient portion of the ice therein to establish communication through the same.

With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction and arrangement of attachment hereinafter more fully described, illustrated, and claimed.

The essential features of the invention involved in the arrangement and peculiar mounting of the heating-pipe to permit of the

self-adjustment or falling thereof as the thawing progresses are necessarily susceptible to modification without departing from the spirit or scope of the invention; but the preferred embodiment of the improvement is shown in the accompanying drawings, in which—

Figure 1 is a general perspective view illustrating the application of the invention to an ordinary road-culvert and also illustrating one means of applying a heating agent to the heating-pipe within the culvert. Fig. 2 is a sectional view of a road bed and culvert, showing a heating attachment applied thereto and embodying the present invention.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

In carrying out the present invention the form of the culvert is unimportant as well as the manner in which the same is used, as it will be understood that the heating attachment forming the subject-matter of this application may be utilized in connection with any of the different types of culverts or similar structures which provide for the drainage of water therethrough and which are exposed to the weather, so that the same are subject to becoming readily choked with ice during the cold weather in northern climates. However, for illustrative purposes there is shown in the drawings an ordinary culvert 1, arranged beneath the road-bed 2 and of the type which is usually constructed of plank, although it is obvious that masonry culverts, as well as drain pipes and tiles, may be readily fitted with the heating attachment, which essentially involves the employment of the heating-pipe 3, which is arranged to be located inside of the culvert or like structure and to extend longitudinally thereof from end to end, as plainly shown in Fig. 2 of the drawings.

In the adaptation of the heating-pipe to a culvert or drain of the general nature shown in Fig. 2 of the drawings it is necessary that the said pipe be provided at both extremities thereof at the ends of the culvert or drain with the upstanding arms 4, which are provided at their upper extremities with the screw closures or caps 5, which serve to keep the pipe in an open condition during the cold weather, so that when brought into use it is

only necessary to remove said closures or caps to provide for circulating the heating agent therethrough. The said upstanding arms 4 at the ends of the heating-pipe 3 project a sufficient distance above the culvert so as to obviate possibility of becoming flooded and embedded in the ice, which would thus destroy the efficiency of the attachment. In order to insure the proper mounting of the heating-pipe attachment to facilitate the use thereof in thawing out the ice within the culvert or drain, the upstanding arms 4 are preferably arranged to work through supporting-brackets 6, located at the ends of the culvert or drain. These supporting-brackets may be of any suitable shape or form and attached directly to the projecting ends of the closure or drain at the sides of the road-bed or sustained in a position independently thereof; but in connection with the type of culvert shown in the drawings the said supporting-brackets 6 may be bolted or otherwise fastened directly to projecting end portions of the culvert, as plainly shown in Fig. 2 of the drawings. In any form of supporting-bracket that may be employed it is only necessary that the same be provided with the guide member 7, having an opening 8 therein loosely receiving the upstanding arms 4 of the heating-pipe, so as to permit such arms to freely slide therethrough.

In connection with the supporting-bracket 6 for the end portions of the heating-pipe there are preferably employed adjusting-collars 9, fitting upon the upstanding arms 4 of the pipe and arranged above the guiding members 7 of the supporting-brackets, said adjusting-collars being fitted with set-screws 10, adapted to impinge upon the pipe-arms 4 to provide for holding the same stationary in an adjusted position, while also limiting the vertical play or movement of the main longitudinal portion of the pipe 3 within the culvert or drain. These details of construction, however, may be varied and suitable mechanical equivalents substituted so long as means are provided for supporting and guiding the pipe-arms 4 and also for holding the pipe fixed in an adjusted position.

Although the heating-pipe attachment may be in the nature of a permanent fixture to the culvert or drain, it is desirable in the fall, immediately preceding cold weather, to inspect the heating-pipe to ascertain if there is a free passage through the same, after which the closures or caps 5 are tightly fitted in position and the main longitudinal portion of the pipe drawn up against the roof of the culvert or drain, in which position it is held by adjusting the collars 9 so as to rest on the supporting-bracket 6 and then tightening the set-screws 10. When the culvert or drain has become choked with ice and the season arrives when the same must be thawed out, the set-screws 10 are loosened, so as to release the pipe and make the same free to gravitate downward as the ice supporting it is thawed.

After freeing or releasing the heating-pipe, so that it may gravitate or float downward from the roof of the culvert or drain to the bottom thereof, both of the closures or caps 5 are removed and the heating agent introduced into one end of the pipe, so that it may readily flow through the entire length thereof and out of its opposite end. This heating agent may be hot water or steam; but a convenient way of carrying the necessary heating agent from one culvert to the other is to mount a steam generator or boiler 11 upon a wheeled truck 12 and to attach to the said generator or boiler a steam hose or pipe 13, which may be readily coupled to and removed from one of the upstanding arms 4 of the heating attachment. A continued supply of the heating agent to the pipe, so as to circulate the same throughout its entire length, necessarily causes the thawing of the ice about the pipe, and as the thawing progresses the said pipe will slide downward to the bottom of the culvert or drain or may be arrested at any point desired by tightening the set-screws 10, it only being necessary that a sufficient portion of the ice within the culvert be thawed to reestablish a passage-way therethrough and permit water to flow through the same. When communication has once been reestablished through the culvert or drain, the continued flow of water therethrough will necessarily complete the freeing of the same from the ice and snow.

It may be desirable to provide the heating-pipe 3, at the juncture thereof with the upstanding arms 4, with suitable drain-cocks or equivalent devices 14, which can be utilized should it be necessary to draw off from the pipe water of condensation or other accumulations therein.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described heating attachment for culverts and the like will be readily apparent to those familiar with the art without further description, and it will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A heating attachment for culverts and the like, comprising a movable heating-pipe adapted to be arranged within the structure, supports arranged at the end portions of the structure to loosely receive the end portions of the pipe, and releasable holding means associated with said support, substantially as set forth.

2. A heating attachment for culverts and the like, comprising a vertically-movable heating-pipe adapted to be arranged longitudinally within the structure, supports arranged at the end portions of the structure

to loosely receive the end portions of the pipe, and releasable holding means associated with said support to permit of its gravitation within the structure, substantially as set forth.

5 3. A heating attachment for culverts and the like comprising a heating device adapted to extend longitudinally within the structure, and means for loosely supporting and guid-
10 ing said heating device to permit of its gravitation within said structure.

4. A heating attachment for culverts and the like comprising a heating-pipe adapted to be arranged within the structure, and supporting means for said heating-pipe permit-
15 ting it to have a transverse movement within the culvert or similar structure, substantially as set forth.

5. A heating attachment for culverts or the like comprising a heating-pipe extending lon-
20 gitudinally through the structure and provided with upturned end arms, and supporting means for the pipe for holding the same in an adjusted position and also permitting it to gravitate within the structure, substan-
25 tially as set forth.

6. A heating attachment for culverts and

the like, comprising a heater adapted to be arranged longitudinally within the structure, and means for detachably supporting the heater in the upper portion of said structure, 30
whereby it may be released from said support to permit its resting upon frozen matter accumulated within the structure and gravitate as said matter is melted.

7. A heating attachment for culverts and 35
the like comprising a heating-pipe extending longitudinally through the structure and provided with upturned end arms having removable closures, supporting-brackets secured to the structure and having guide members 40
loosely receiving the said pipe-arms, and collars adjustably arranged upon said pipe-arms above the supporting-brackets and provided with set-screws to clamp the same to the arms, substantially as set forth. 45

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HERMAN O. KRUSCHKE.

Witnesses:

W. H. WELLS,

C. E. WELLS.