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(54) **Drain with siphon**

(57) The invention relates to a drain (1), comprising:
- a collecting housing (2) with an inflow opening on the upper side, an outflow opening and a tunnel (22) extending to the outflow opening;
- an upright wall (10) arranged around the outflow opening;
- a siphon cover (13) arranged over the upright wall; and

an inner cover (17) which is arranged in and at a distance from the siphon cover (13) and which connects to the outflow opening, and wherein a bridge part (16) hanging over the tunnel (22) is arranged between the inner cover (17) and the siphon cover (13).

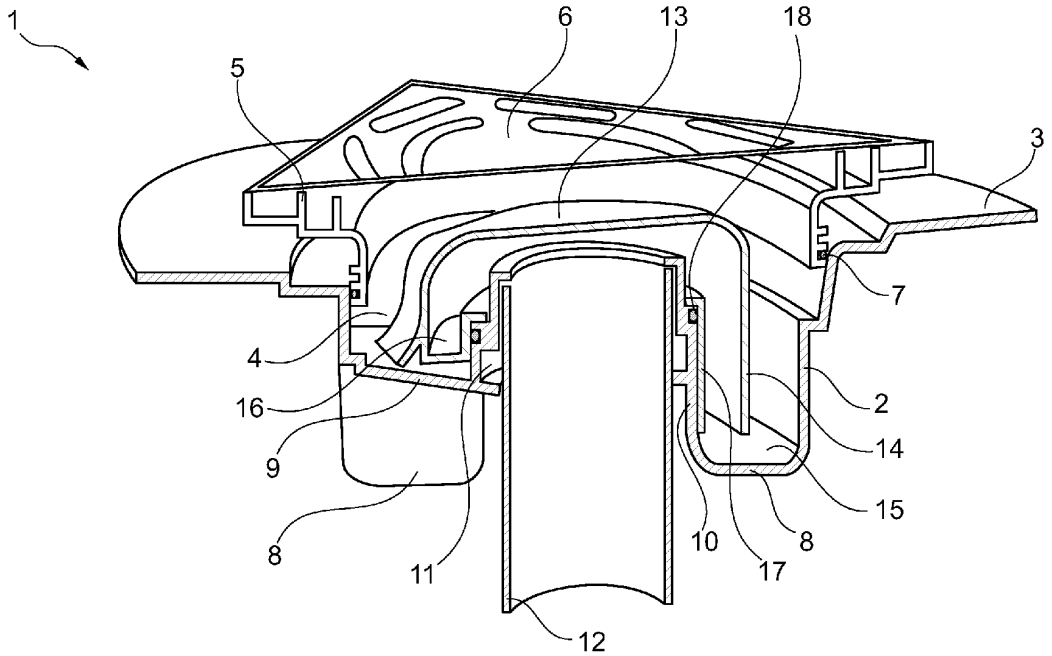

Fig. 1

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Description

[0001] The invention relates to a drain comprising:

- a collecting housing with an inflow opening on the upper side, an arranged outflow opening and a tunnel extending to the outflow opening;
- an upright wall arranged around the outflow opening; and
- a siphon cover arranged over the upright wall.

[0002] Such a drain is known from EP 1518969. In the case of this drain a vertical outlet pipe as well as a horizontal outlet pipe with pipe bend can be inserted into the outflow opening. In the case of the horizontal outlet pipe the upward inclining bottom ensures that a relatively flat drain with siphon is obtained, while the collecting housing still has a great maximum depth, whereby a relatively high water trap can be obtained.

[0003] The siphon cover is arranged over the upright wall and together with the upright wall and the collecting housing provides for the siphon action. The siphon cover extends here over the upright wall and has downward directed wall parts extending to a position just above the bottom of the collecting housing.

[0004] In this known drain the downward directed wall parts of the siphon cover must connect sealingly to the raised bottom in order to guarantee a full height of the water trap. The theoretical height of the water trap is determined by the lowest point of the underside of the siphon cover and the upper edge of the upright wall around the outflow opening. Practical experience has however shown that the siphon cover does not connect sealingly to the raised bottom, whereby leakage of air occurs and the effective height of the water trap is determined by the highest point of the siphon cover at the raised bottom and the upper edge of the upright wall around the outflow opening. As a result of the air leakage it is possible for unpleasant odours to escape from the sewer via the siphon.

[0005] It is also possible for an overpressure to occur in the sewer. In order to prevent the water in the siphon being pressed out there has to be a minimum height of water. This minimum water height is typically 4 centimetres.

[0006] It is now an object of the invention to reduce or even obviate the above stated drawbacks.

[0007] This object is achieved with a drain according to the preamble which is characterized by an inner cover which is arranged in and at a distance from the siphon cover and which connects to the outflow opening, and wherein a bridge part hanging over the tunnel is arranged between the inner cover and the siphon cover.

[0008] The bridge part hangs over the raised bottom part in which the tunnel is formed. Together with the siphon cover, the bridge part and the inner cover a space is thus formed from which the tunnel or a raised bottom part is separated. This prevents the chance of leakage along the tunnel or the raised bottom part, thereby guaranteeing that the water trap always has the maximum height.

[0009] The invention ensures that the outflow opening, which due to the upright wall debouches high in the collecting housing, forms a connection to the lowest part of the collecting housing.

[0010] The tunnel can either be incorporated into the bottom of the collecting housing or be provided as a tube protruding through the side wall of the housing and debouching in the outflow opening.

[0011] In a preferred embodiment of the drain according to the invention the bridge part comprises an upper wall arranged above the tunnel and side walls directed downward from the upper wall on either side adjacently of the tunnel.

[0012] Such a bridge part provides a siphon cover which is kept separate from the raised bottom part for the tunnel, so that the problem of sealing is no longer an issue.

[0013] In another embodiment of the drain according to the invention the inner cover seals against the upright wall arranged around the outflow opening.

[0014] The seal on the upright wall is easily possible by means of for instance an 0-ring. In addition, this also provides the option of removing the entity of siphon cover, bridge part and inner cover in one operation so that the drain can be easily cleaned.

[0015] In a further embodiment of the drain according to the invention the tunnel is arranged in the bottom of the collecting housing for the purpose of receiving an outlet pipe arranged on the outflow opening.

[0016] With this embodiment it is possible to connect a vertical outlet pipe or a horizontal outlet pipe to the outflow opening, wherein the horizontal pipe is received in the tunnel.

[0017] At least a part of the inner cover can optionally be integrated with the upright wall of the inflow opening. In addition, the bridge part and the downward directed wall parts can be at least partially integrated with the wall of the tunnel.

[0018] A closable cover can further be provided in the siphon cover in order to allow access to the outflow opening without having to remove the siphon cover.

[0019] The invention further relates to a combination of a drain according to the invention and an outlet pipe, wherein the outlet pipe is inserted into the outflow opening.

[0020] In a preferred embodiment of the combination according to the invention the outlet pipe comprises a pipe bend and pipe parts arranged on either side of the pipe bend, wherein a first pipe part is inserted into the outflow opening and wherein the second pipe part is received in the tunnel.

[0021] Because the second pipe part is received in the tunnel, the overall depth of the drain is no more than the height of the drain itself. This is particularly advantageous when the floor thickness is limited.

[0022] With this construction according to the invention it is also possible to embody the siphon in a continuous tube. A double tunnel then has to be arranged here so that the continuous tube can run therethrough.

[0023] In addition, it is further possible to allow the inner cover to run on into the bottom of the collecting housing.

[0024] These and other features of the invention are further elucidated with reference to the accompanying drawings.

Figure 1 is a perspective cross-sectional view of an embodiment of the drain according to the invention with a vertical outlet pipe.

Figure 2 shows the embodiment according to figure 1 with a horizontal outlet pipe.

Figure 3 is a cross-sectional view along the line III-III in figure 2.

Figure 4 shows a second embodiment of the invention with partially cut-away parts.

[0025] Figure 1 is a perspective cross-sectional view of a drain 1 according to the invention. The drain has a collecting housing 2 provided on the upper side with an outward directed horizontal flange 3. This flange 3 is arranged around inflow opening 4 of the collecting housing.

[0026] A height-adjustable grating holder 5 with grating 6 is arranged in inflow opening 4. Grating holder 5 is sealed with an 0-ring 7 against collecting housing 2.

[0027] Collecting housing 2 has a bottom with a low bottom part 8 and a high bottom part 9. An outflow opening with upright wall 10 is provided in this bottom 8, 9. Provided in this upright wall 10 is a groove 11 for a seal (not shown) with which an outlet pipe 12 is sealed relative to upright wall 10.

[0028] The high bottom part 8 forms a tunnel 22 (see figure 3) for receiving a horizontal outlet pipe (see figure 2).

[0029] A siphon cover 13 is arranged over upright wall 10. This siphon cover 13 has an upper surface with a downward directed wall 14 which leaves clear a passage 15 at the low bottom part 8 and lies more or less against the high bottom part 9.

[0030] In order to prevent leakage along the high bottom part 9 and siphon cover 13, a bridge part 16 is arranged here on the downward directed wall 14 and hangs over the high bottom part 9. Bridge part 16 connects to an inner cover 17 which is arranged around upright wall 10 and sealed thereagainst by means of 0-ring 18.

[0031] Figure 2 shows drain 1 according to figure 1. A horizontal outlet pipe 19 with a pipe bend 20 and a free end 21 is inserted here instead of a vertical outlet pipe 12 into the outflow opening and upright wall 10. Because the raised bottom part 9 forms a tunnel 22 in bottom 8, 9 to outflow opening 10, the horizontal part of pipe 19 can be received in this tunnel 22, whereby the height of drain 1 is not affected.

[0032] Figure 3 is a cross-sectional view along the line III-III in figure 2. It will be apparent from this cross-section that bridge part 16 has an upper wall with downward directed side walls 23 extending on either side of tunnel 22.

[0033] Bridge part 16 with the downward directed side walls 23 thus ensures that passage opening 15 is always close to the low bottom part 8 so that a maximum height for a water trap is obtained.

[0034] In this embodiment the water which has flowed via passage opening 15 between siphon cover 13 and inner cover 17 has the option of flowing into outlet pipe 21 from all radial directions. It is however also possible to reduce the distance between siphon cover 13 and inner cover 17 at the position of bridge part 16 such that siphon cover 13 and inner cover 17 lie against each other. There is however still a bridge part 16 here which provides the transition between inner cover 17 and the siphon cover 13 in the deeper part of collecting housing 2.

[0035] Figure 2 shows a second embodiment 20 of a drain according to the invention. In this figure 2 parts are cut away for a better view.

[0036] Embodiment 20 has a collecting housing 21 with an inflow opening 22 bounded by upper edge 23 of the collecting housing. Running through collecting housing 21 is an outlet pipe 24 which provides an outflow opening 25 with upright walls in collecting housing 21.

[0037] A siphon cover 26 is provided over this outflow opening 25. Further arranged on the inner side and at a distance from this siphon cover 26 is an inner cover 27 which, as seen in longitudinal direction of outlet pipe 24, connects on either side via a bridge part to siphon cover 26.

[0038] Siphon cover 26, inner cover 27 and bridge parts provide a passage opening 28 close to the bottom of collecting housing 21 so that a maximum height for the water trap is obtained.

Claims

1. Drain, comprising:

- a collecting housing with an inflow opening on the upper side, an outflow opening and a tunnel extending to the outflow opening;
- an upright wall arranged around the outflow opening; and
- a siphon cover arranged over the upright wall;

characterized by

an inner cover which is arranged in and at a distance from the siphon cover and which connects to the outflow opening, and wherein a bridge part hanging over the tunnel is arranged between the inner cover and the siphon cover.

2. Drain as claimed in claim 1, wherein the bridge part comprises an upper wall arranged above the tunnel and side walls directed downward from the upper wall on either side adjacently of the tunnel.

3. Drain as claimed in claim 1 or 2, wherein the inner cover seals against the upright wall arranged around the outflow opening.

4. Drain as claimed in any of the foregoing claims, wherein the tunnel is arranged in the bottom of the collecting housing for the purpose of receiving an outlet pipe arranged on the outflow opening.

5. Combination of a drain as claimed in claims 1-4 and an outlet pipe, wherein the outlet pipe is inserted into the outflow opening.

6. Combination as claimed in claim 5, wherein the outlet pipe comprises a pipe bend and pipe parts arranged on either side of the pipe bend, wherein a first pipe part is inserted into the outflow opening and wherein the second pipe part is received in the tunnel.

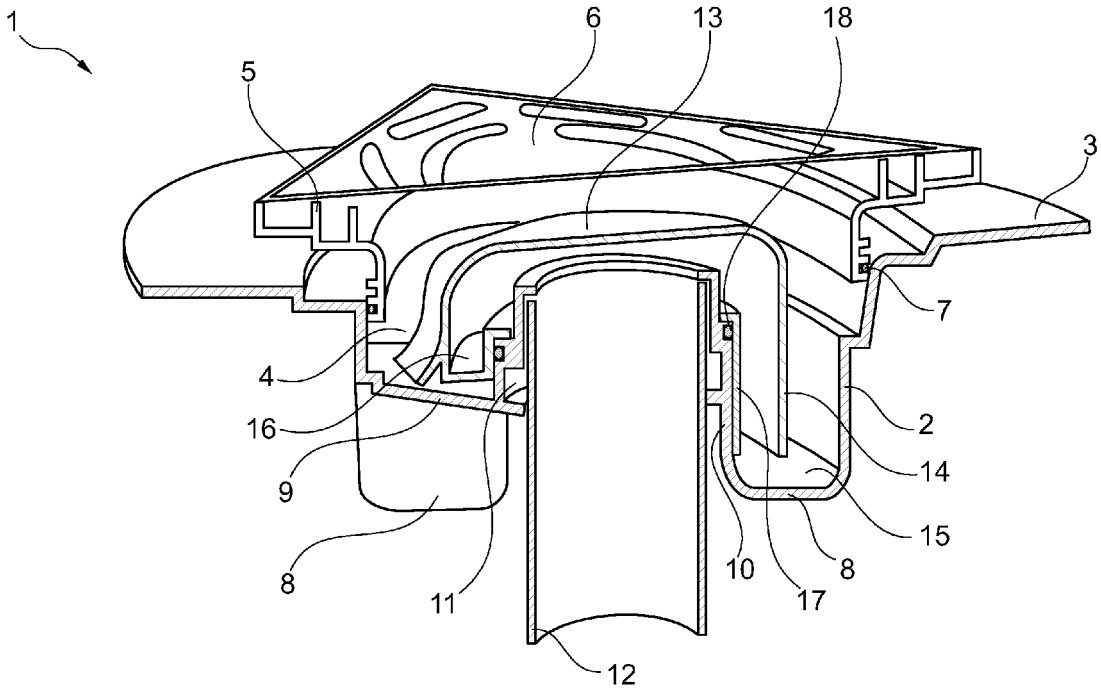

Fig. 1

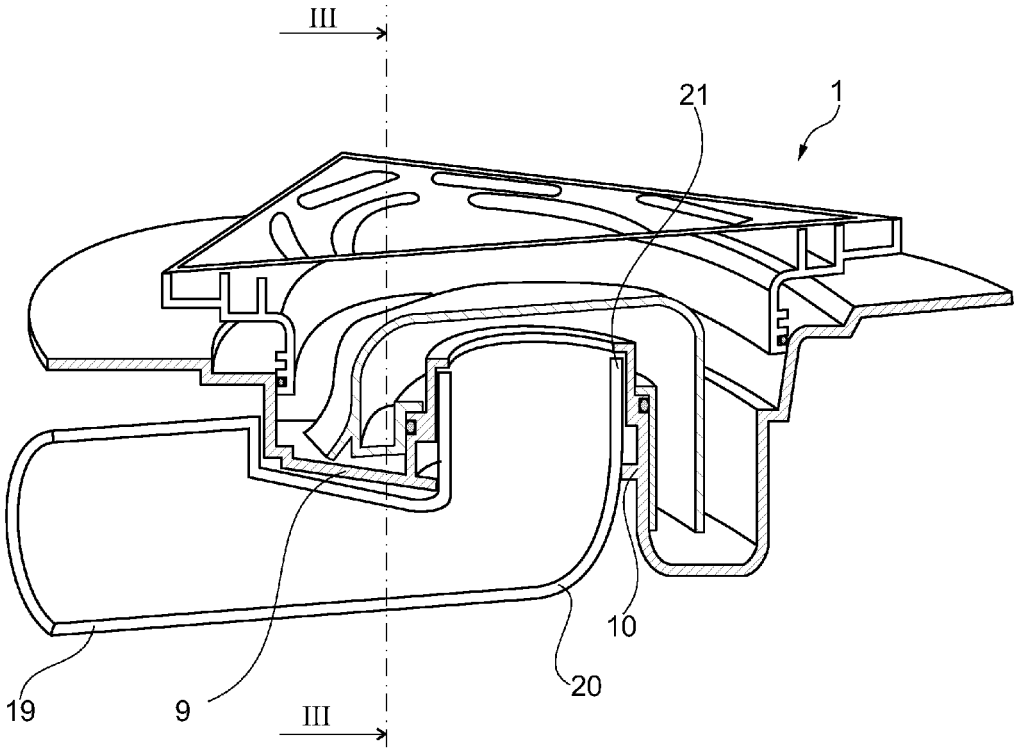

Fig. 2

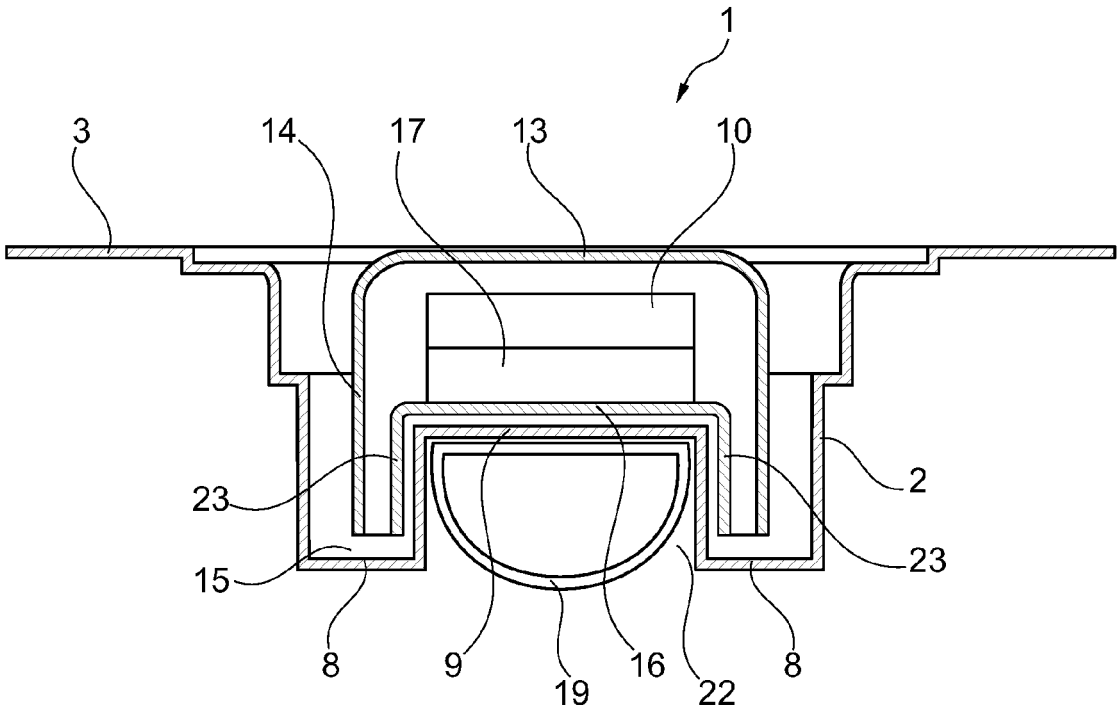

Fig. 3

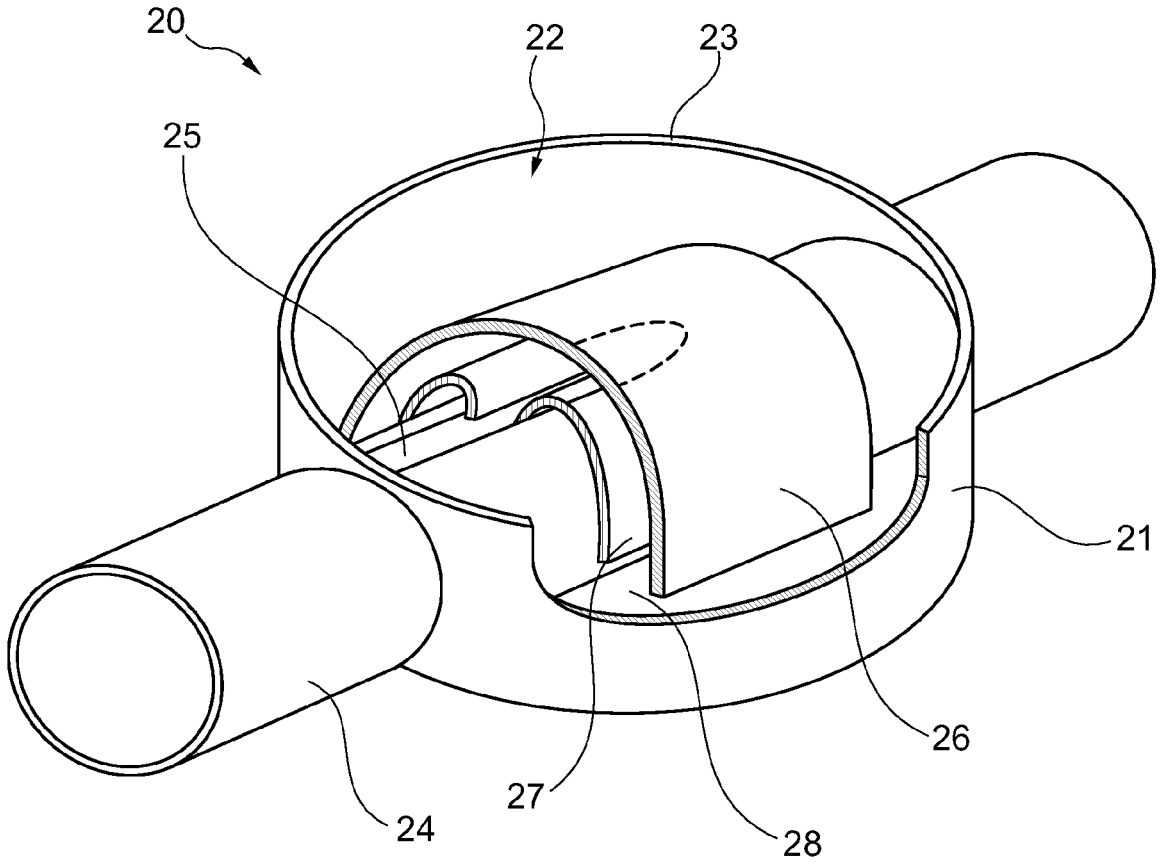

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 13 17 0831

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 518 969 A1 (BLUECHER METAL APS [DK]) 30 March 2005 (2005-03-30) * abstract * -----	1	INV. E03F5/04
A	DE 41 19 561 A1 (KESSEL BERNHARD [DE]) 16 January 1992 (1992-01-16) * abstract * -----	1	

TECHNICAL FIELDS SEARCHED (IPC)

E03F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 September 2013	Flygare, Esa

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 17 0831

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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20-09-2013

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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