CLAIMS

1. A chain link of an energy guiding chain (1) for guiding lines, such as hoses, cables or the like, between two connection points of which at least one is relatively movable, the chain link (10) being composed of several individual parts (2A, 2B, 3), comprising
two side plates (2A, 2B), each comprising a plate body made of plastic comprising an interior side (I) facing ~~the~~ an interior of the chain link, an exterior side (A) facing away therefrom and two narrow sides (4A, 4B) running substantially parallel to ~~the~~ a longitudinal direction, and at least one separate transverse connecting piece (3), in particular two separate transverse connecting pieces (3) opposite one another, for the detachable connection of the side plates, the at least one transverse connecting piece (3) comprising a center part (7) and a fastening portion (6) on both sides at each end,
the side plates each comprising a corresponding fastening region on at least one, in particular on both narrow sides, which interacts by ~~form-fit and/or~~ force-fit~~frictional connection~~, in particular by force-fit and form-fit, with a fastening portion of ~~a~~ the at least one transverse connecting piece,
each fastening region of a side plate (2A, 2B) comprises a clamping seat (5) in the plate body, which has two clamping surfaces (5A, 5B) of the plate body opposite one another in the longitudinal direction (L), between which a complementarily shaped fastening portion (6) of the at least one separate transverse connecting piece (3) is clamped through a clamping force;
~~characterized in that~~
the at least one transverse connecting piece (3) is produced in one piece from plastic and has, in ~~the~~ an end region adjacent each fastening portion (6) and protruding on both sides opposite the center part (7), two support protrusions (12) each having a support

surface (13) for resting against ~~the~~ an interior side of the side plate (2A, 2B).

2. The chain link according to claim 1, characterized in that each of the two fastening portions (6) of a transverse connecting piece (3) comprises two counter-clamping surfaces (6A, 6B) facing in the longitudinal direction, which are designed complementary to the clamping surfaces (5A, 5B), and each of the two fastening portions (6) comprises a solid material region continuous between these counter-clamping surfaces (6A, 6B).

3. The chain link according to claim 2, characterized in that the solid material region of the fastening portions (6) has a material thickness in ~~the~~ a direction of ~~the~~ a longitudinal axis (M) of the transverse connecting piece (3) substantially equal to the material thickness of the side plate (2A, 2B) around the clamping seat (5) and/or has a greater material thickness in ~~the~~ a height direction (H) compared to a plate-like central region (7) of the transverse connecting piece.

4. The chain link according to claim 1, claim 2 or claim 3, characterized in that each clamping seat (5) has an elongated transverse locking protrusion (5C) extending in the longitudinal direction and, correspondingly, each fastening portion (6) has a complementary elongated transverse locking groove (6C) which hold against displacement perpendicular to ~~the~~ a main plane of the plate and in particular hold the support surfaces (13) of the support protrusions (12) in contact with the interior side of the side plate (2A,2B).

5. The chain link according to claim 2 and claim 4, characterized in that the transverse locking protrusion (5C) and the transverse locking groove (6C) extend in the longitudinal direction over at least a predominant part of ~~the~~ a distance between the clamping surfaces (5A, 5B) or counter-clamping surfaces (6A, 6B) and/or taper or come to a point in ~~the~~ a direction of the main plane of the plate.

6. The chain link according to any one of claims 1 to 5, characterized in that the two clamping seats (5) on the narrow sides (4A, 4B) of a side plate (2A, 2B) are shaped identically, in particular centrally and symmetrically to ~~the~~ a plate height center plane (A-A), wherein both clamping surfaces (5A, 5B) each have at least one convex and/or concave surface region.

7. The chain link according to claim 2 and claim 6, characterized in that each clamping surface (5A, 5B) has a convex surface region, which preferably represents a predominant surface portion of the clamping surface and widens towards the narrow side (4A, 4B), and that the counter-clamping surfaces (6A, 6B) are designed with at least one corresponding concave surface region, wherein at least the surface regions (5A, 5B; 6A, 6B) are preferably designed rounded in cross- section.

8. The chain link according to any one of claims 1 to 7, characterized in that each clamping seat (5)
   - is designed in ~~the~~ a form of an edge recess opening on both sides to the interior side (I) and to the exterior side (A) of the side plate (2A, 2B) on the narrow side (4A, 4B); and/or
   - is designed as an edge recess continuous at least partially between the interior side (I) and exterior side (A) integrally in the plate body.

9. The chain link according to any one of claims 1 to 8, characterized in that the chain link comprises two side plates (2A, 2B) and two separate transverse connecting pieces (3) opposite one another for detachably connecting the side plates (2A, 2B) to one another, and that each side plate (2A, 2B) and each transverse connecting piece (3) is produced as a one- piece body made of plastic, in particular as an injection-molded part without undercuts.

10. **A transverse connecting piece** (3) for a chain link (10) of an energy guiding chain, in particular according to any one of claims 1 to 9, the transverse connecting piece (3) being produced as a one-piece body made of plastic extending along a longitudinal axis (M), in particular symmetrically to a center plane perpendicular to the longitudinal axis, having a plate-like center part (7) and having a fastening portion (6) on both sides at each end for connection to a side plate, **characterized in that**

- each of the two fastening portions (6) comprises two counter-clamping surfaces (6A, 6B) facing away from one another and facing in ~~the~~ a direction perpendicular to the longitudinal axis of the transverse connecting piece, for a force-fit interaction with complementary clamping surfaces (5A, 5B) of a side plate (2A, 2B), and comprises a continuous solid material region between these counter-clamping surfaces;

and

- the transverse connecting piece in ~~the~~ an end region adjacent each fastening portion (6) and protruding on both sides opposite the center part (7) has two support protrusions (12), each with a support surface (13) for resting against ~~the~~ an interior side of the side plate (2A, 2B).

11. The transverse connecting piece according to claim 10, characterized in that between the center part (7) and each fastening portion (6), adjacent to the respective fastening portion, a through-hole (30) is provided on both sides perpendicularly through the transverse connecting piece (3), so that ~~a~~ the chain link can be fastened to a connection point by screw connection (32) by means of the transverse connecting piece.

12. The transverse connecting piece according to claim 10 or 11, characterized in that the transverse connecting piece has two reinforcing struts starting from each fastening portion, in particular on the exterior side, which, ~~in particular adjacent to the through-hole,~~ run towards the center of the plate-like center part and are produced from plastic in one piece with the body.

13. The transverse connecting piece according to claim 10, 11 or 12, characterized in that the transverse connecting piece (3) ~~has a plate-like center part (7) and~~, starting from each support protrusion (12), has a reinforcing strut (14) which runs to the plate-like center part (7).

14. **A side plate** (2A; 2B) for a chain link (10) of an energy guiding chain, in particular according to claim 1, comprising a plate body made of plastic comprising an interior side (I), an exterior side (A) facing away therefrom and two narrow sides (4A, 4B) running substantially parallel to a longitudinal direction of the side plate;
the plate body having two overlap regions (21A, 22A; 21B, 22B), each for an articulated connection to a corresponding overlap region of a side plate (2A; 2B) adjacent in the longitudinal direction, and a central region (23A; 23B) between the overlap regions,

preferably having greater wall thickness compared to the overlap regions; and the side plate having a fastening region (5) for a transverse connecting piece on each narrow side,

characterized in that

the plate body has two through-openings (24) from the exterior side (A) to the interior side (I), which are provided in the central region (23A; 23B) between the fastening regions (5) and each open into an associated functional recess (25) in the plate body, which has a larger diameter than the through-opening (24) and is provided on the interior side (I) of the plate body.

15. The side plate according to claim 14, characterized in that the through-openings (24) and functional recesses (25) are arranged symmetrically to ~~the~~ a longitudinal center plane and to ~~the~~ a height center plane (A-A) of the side plate (2A; 2B).

16. The side plate according to claim 14 or 15, characterized in that each through-opening (24) is circular in cross-section and the associated functional recess (25) is arranged coaxially thereto and has a polygonal, in particular hexagonal, cross-section.

17. An arrangement for ~~the~~ an end fastening of an energy guiding chain (1) at a connection point, comprising a chain link (10) having two side plates (3A, 3B) according to any one of claims 14 to 16 and two transverse connecting pieces opposite one another which connect the two side plates to one another,
an associated end fastening part (50) being provided for each side plate, which end fastening part comprises a base plate (51) which is designed for fastening at the connection point and overlaps a transverse connecting piece (3) and which comprises a

locking pin (53) for fixing in the longitudinal direction, which engages the associated side plate in the functional recess (25).

18. An arrangement for expansion of an energy guiding chain with an external line, comprising several chain links comprising side plates according to any one of claims 14 to 16, a holding adapter (60) for attaching ~~an~~ the external line (61), in particular for a corrugated hose holder (62), being provided at least on the exterior side (A) of some side plates (2A; 2B) of a plate strand, which holding adapter is fastened by means of connectors (40) which engage the functional recesses or are held in these functional recesses.

19. An arrangement for expansion of ~~the~~ a receiving space of an energy guiding chain (1) comprising several chain links made of two side plates (2A; 2B) according to any one of claims 14 to 16 and two transverse connecting pieces (3) opposite one another which connect the two side plates to one another, at least some chain links having a laterally attached extension arm (70) on both side plates, which extension arm is connected to the respective side plate (2A; 2B) by means of a form-fit and/or force-fit~~frictional connection~~, in particular a clip connection (40), by means of the functional recesses (25), two extension arms (70) each being preferably connected by a transverse connecting piece (3) of the same design as the chain links.

20. A parallel arrangement of two energy guiding chains (1) made of chain links (10) comprising side plates (2A; 2B) according to any one of claims 14 to 16, at least some side plates (2A; 2B) in a plate strand of the one energy guiding chain having side plates (2A; 2B) in a laterally adjacent plate strand of the other energy guiding chain being fastened to one another and

engage into functional recesses (25) or are held therein by means of connectors (80).

21. An energy guiding chain comprising a chain link according to any one of claims 1 to 9; a transverse connecting piece according to any one of claims 10 to 13; a side plate according to any one of claims 14 to 16 and/or an arrangement according to any one of claims 17 to 19.