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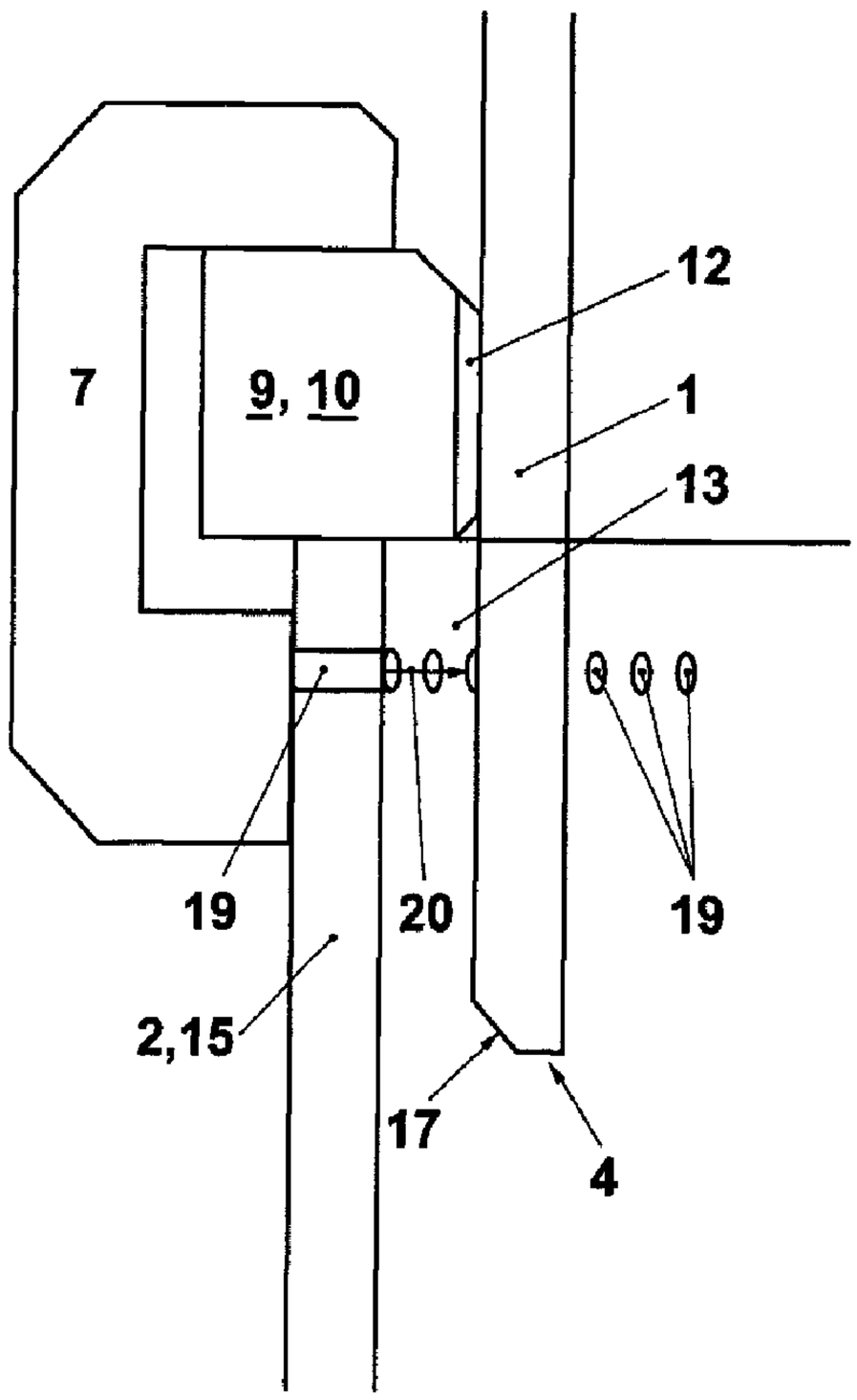
(54) Titre : CHAMBRE DE COMBUSTION PERMETTANT DE FAIRE FONCTIONNER UNE TURBINE A GAZ
(54) Title: COMBUSTION CHAMBER ARRANGEMENT FOR OPERATING A GAS TURBINE



(57) Abrégé/Abstract:
A combustion chamber arrangement is described for operating a gas turbine, with a combustion chamber wall (1) which encloses the combustion chamber space (3) and in the region of the combustion chamber outlet encloses a flow passage for hot gases

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(57) Abrégé(suite)/Abstract(continued):
which develop inside the combustion chamber, has a combustion chamber wall edge (4) which freely terminates in the axial flow direction of the hot gases and with an axial overlapping (5) and also with a radial clearance (6), leads downstream into a hot gas housing (2) which radially encompasses the combustion chamber wall (1) and indirectly or directly upon which are attached individual collar-like fastening means (7) which project upstream over the hot gas housing (2), are arranged in a distributed manner in the circumferential direction of the hot gas housing (2), and serve for axial fixing of an annular seal (9) which can be attached on the outer side on the combustion chamber wall (1) upstream to the combustion chamber wall edge (4) and completely encompasses the combustion chamber wall (1) in the circumferential direction, the seal comprising a multiplicity of individual sealing segments (10) which on the end face can be joined to each other in each case in pairs via connecting structures (11), on one side axially indirectly or directly adjoin the hot gas housing (2) and with the outer-side combustion chamber wall (1) delimits axially oriented flow passages (12) which on one side lead into an annular spatial area (13) which is radially delimited by means of the axially mutually overlapping combustion chamber wall (1) and hot gas housing (2).

Abstract

A combustion chamber arrangement is described for operating a gas turbine, with a combustion chamber wall (1) which encloses the combustion chamber space (3) and in the region of the combustion chamber outlet encloses a flow passage for hot gases which develop inside the combustion chamber, has a combustion chamber wall edge (4) which freely terminates in the axial flow direction of the hot gases and with an axial overlapping (5) and also with a radial clearance (6), leads downstream into a hot gas housing (2) which radially encompasses the combustion chamber wall (1) and indirectly or directly upon which are attached individual collar-like fastening means (7) which project upstream over the hot gas housing (2), are arranged in a distributed manner in the circumferential direction of the hot gas housing (2), and serve for axial fixing of an annular seal (9) which can be attached on the outer side on the combustion chamber wall (1) upstream to the combustion chamber wall edge (4) and completely encompasses the combustion chamber wall (1) in the circumferential direction, the seal comprising a multiplicity of individual sealing segments (10) which on the end face can be joined to each other in each case in pairs via connecting structures (11), on one side axially indirectly or directly adjoin the hot gas housing (2) and with the outer-side combustion chamber wall (1) delimits axially oriented flow passages (12) which on one side lead into an annular spatial area (13) which is radially delimited by means of the axially mutually overlapping combustion chamber wall (1) and hot gas housing (2).

(Fig. 5)

Patent claims

1. A combustion chamber arrangement for operating a gas turbine, with a combustion chamber wall (1) which encloses the combustion chamber space (3) and in the region of the combustion chamber outlet encloses a flow passage for hot gases which develop inside the combustion chamber, has a combustion chamber wall edge (4) which freely terminates in the axial flow direction of the hot gases and with an axial overlapping (5) and also with a radial clearance (6), leads downstream into a hot gas housing (2) which radially encompasses the combustion chamber wall (1) and indirectly or directly upon which are attached individual collar-like fastening means (7) which project upstream over the hot gas housing (2), are arranged in a distributed manner in the circumferential direction of the hot gas housing (2), and are attached on the outer side on the combustion chamber wall (1) upstream to the combustion chamber wall edge (4) for axial fixing of an annular seal (9), wherein the combustion chamber wall (1) is completely encompassed in the circumferential direction by the annular seal (9) which comprises a multiplicity of individual sealing segments (10) which on the end face side are joined to each other in each case via connecting structures (11), on one side axially indirectly or directly adjoin the hot gas housing (2) and with the outer-side combustion chamber wall (1) are delimited by axially oriented flow passages (12) which on one side lead into an annular spatial area (13) which is radially delimited by means of the axially mutually overlapping combustion chamber wall (1) and hot gas housing (2), characterized in that the combustion chamber wall edge (4) is formed in a profiled manner in such a way that as a result of this profiling (17) blocking or at least repressiving of diffuser action ensues when a cooling air flow (K), which is guided axially through the flow passages (12)

into the annular spatial area (13), flows over the combustion chamber wall edge (4).

2. The combustion chamber arrangement as claimed in claim 1, characterized in that the profiling of the combustion chamber wall edge (4) is formed by a bevel with a bevel surface (17) which faces the hot gas housing (2) and with the combustion chamber wall (1), which encloses the flow passage (S), includes an angle α, where $90^{\circ} < \alpha < 20^{\circ}$, especially $\alpha = 40^{\circ} \pm 10^{\circ}$.

3. The combustion chamber arrangement as claimed in claim 1 or 2, characterized in that the collar-like fastening means (7) are incorporated in the circumferential direction on the outer side around a flange wall (15) which upstream is connected to the hot gas housing (2).

4. The combustion chamber arrangement as claimed in claim 3, characterized in that the flange wall (15) is connected to the hot gas housing (2) via a releasable or non-releasable connection (14) which extends in the circumferential direction of the hot gas housing (2).

5. The combustion chamber arrangement as claimed in one of claims 1 to 4, characterized in that the individual sealing segments (10) have a longitudinal extent which is oriented in the circumferential direction of the combustion chamber wall (1) and with a curvature which is adapted to the combustion chamber wall (1), in that the connecting structures (11) of each individual sealing segment (10), which are provided in each case on the end face in the longitudinal extent, are formed in such a way that the connecting structures (11) of two interconnected sealing segments (10) in each case provide mutually overlapping and contacting surface sections in the form

of a labyrinth seal at least in the circumferential direction.

6. The combustion chamber arrangement as claimed in claim 5, characterized in that the labyrinth seal which exists between two sealing segments (10) has a step contour (18) with a step section (18) which is oriented in the circumferential direction, and in that the step section (18) which is oriented in the circumferential direction, between all the sealing segments (10) which are attached around the combustion chamber wall (1) and interconnected in pairs in each case, is overlapped in axial projection by the wall thickness (D) of the hot gas housing (2).

7. The combustion chamber arrangement as claimed in one of claims 3 to 5, characterized in that the labyrinth seal which is provided between two sealing segments (10) has a step contour (18) with a step section (18) which is oriented in the circumferential direction, and in that the step section (18) which is oriented in the circumferential direction, between all the sealing segments (10) which are attached around the combustion chamber wall (1) and interconnected in pairs in each case, is overlapped in axial projection by the wall thickness (D) of the flange wall (15).

8. The combustion chamber arrangement as claimed in one of claims 3 to 7, characterized in that in the region of the flange wall (15) a multiplicity of radially oriented through-passages (19) are formed and arranged in a distributed manner in the circumferential direction around the flange wall (15) in such a way that a cooling air flow (K) which is directed through the through-passages (19) penetrates into the annular spatial area (13) between the flange wall (15) and the combustion chamber wall (1).

9. The combustion chamber arrangement as claimed in claim 1, characterized in that the sealing segments (10) are joined to each other in pairs in each case via the connecting structures (11).

Patent claims

1. A combustion chamber arrangement for operating a gas turbine, with a combustion chamber wall (1) which encloses the combustion chamber space (3) and in the region of the combustion chamber outlet encloses a flow passage for hot gases which develop inside the combustion chamber, has a combustion chamber wall edge (4) which freely terminates in the axial flow direction of the hot gases and with an axial overlapping (5) and also with a radial clearance (6), leads downstream into a hot gas housing (2) which radially encompasses the combustion chamber wall (1) and indirectly or directly upon which are attached individual collar-like fastening means (7) which project upstream over the hot gas housing (2), are arranged in a distributed manner in the circumferential direction of the hot gas housing (2), and are attached on the outer side on the combustion chamber wall (1) upstream to the combustion chamber wall edge (4) for axial fixing of an annular seal (9), wherein the combustion chamber wall (1) is completely encompassed in the circumferential direction by the annular seal (9) which comprises a multiplicity of individual sealing segments (10) which on the end face side are joined to each other in each case via connecting structures (11), on one side axially indirectly or directly adjoin the hot gas housing (2) and with the outer-side combustion chamber wall (1) are delimited by axially oriented flow passages (12) which on one side lead into an annular spatial area (13) which is radially delimited by means of the axially mutually overlapping combustion chamber wall (1) and hot gas housing (2), characterized in that the combustion chamber wall edge (4) is formed in a profiled manner in such a way that as a result of this profiling (17) blocking or at least repressiving of diffuser action ensues when a cooling air flow (K), which is guided axially through the flow passages (12)

into the annular spatial area (13), flows over the combustion chamber wall edge (4).

2. The combustion chamber arrangement as claimed in claim 1, characterized in that the profiling of the combustion chamber wall edge (4) is formed by a bevel with a bevel surface (17) which faces the hot gas housing (2) and with the combustion chamber wall (1), which encloses the flow passage (S), includes an angle α, where $90^{\circ} < \alpha < 20^{\circ}$, especially $\alpha = 40^{\circ} \pm 10^{\circ}$.

3. The combustion chamber arrangement as claimed in claim 1 or 2, characterized in that the collar-like fastening means (7) are incorporated in the circumferential direction on the outer side around a flange wall (15) which upstream is connected to the hot gas housing (2).

4. The combustion chamber arrangement as claimed in claim 3, characterized in that the flange wall (15) is connected to the hot gas housing (2) via a releasable or non-releasable connection (14) which extends in the circumferential direction of the hot gas housing (2).

5. The combustion chamber arrangement as claimed in one of claims 1 to 4, characterized in that the individual sealing segments (10) have a longitudinal extent which is oriented in the circumferential direction of the combustion chamber wall (1) and with a curvature which is adapted to the combustion chamber wall (1), in that the connecting structures (11) of each individual sealing segment (10), which are provided in each case on the end face in the longitudinal extent, are formed in such a way that the connecting structures (11) of two interconnected sealing segments (10) in each case provide mutually overlapping and contacting surface sections in the form

of a labyrinth seal at least in the circumferential direction.

6. The combustion chamber arrangement as claimed in claim 5, characterized in that the labyrinth seal which exists between two sealing segments (10) has a step contour (18) with a step section (18) which is oriented in the circumferential direction, and in that the step section (18) which is oriented in the circumferential direction, between all the sealing segments (10) which are attached around the combustion chamber wall (1) and interconnected in pairs in each case, is overlapped in axial projection by the wall thickness (D) of the hot gas housing (2).

7. The combustion chamber arrangement as claimed in one of claims 3 to 5, characterized in that the labyrinth seal which is provided between two sealing segments (10) has a step contour (18) with a step section (18) which is oriented in the circumferential direction, and in that the step section (18) which is oriented in the circumferential direction, between all the sealing segments (10) which are attached around the combustion chamber wall (1) and interconnected in pairs in each case, is overlapped in axial projection by the wall thickness (D) of the flange wall (15).

8. The combustion chamber arrangement as claimed in one of claims 3 to 7, characterized in that in the region of the flange wall (15) a multiplicity of radially oriented through-passages (19) are formed and arranged in a distributed manner in the circumferential direction around the flange wall (15) in such a way that a cooling air flow (K) which is directed through the through-passages (19) penetrates into the annular spatial area (13) between the flange wall (15) and the combustion chamber wall (1).

9. The combustion chamber arrangement as claimed in claim 1, characterized in that the sealing segments (10) are joined to each other in pairs in each case via the connecting structures (11).

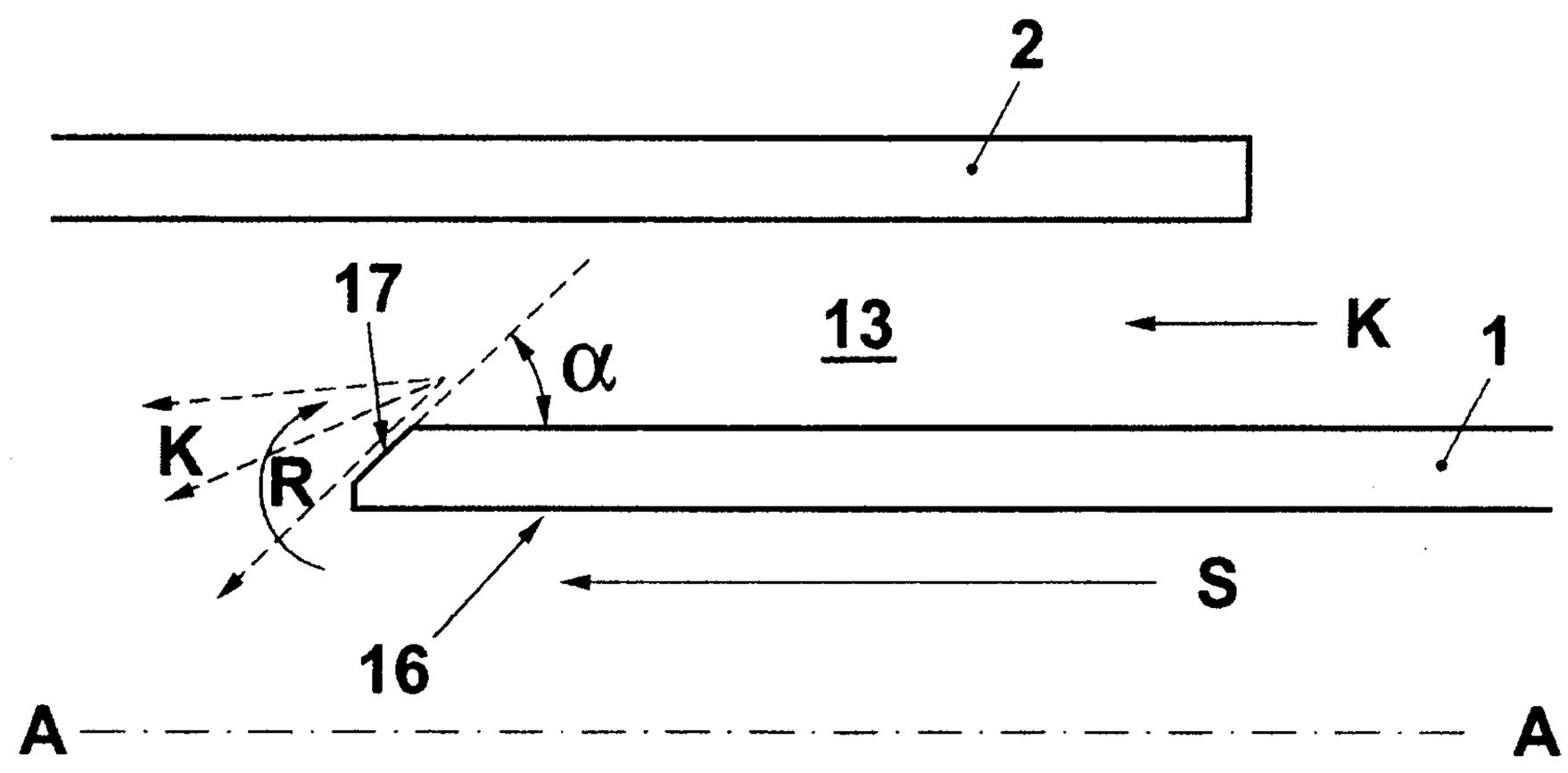


FIG. 1

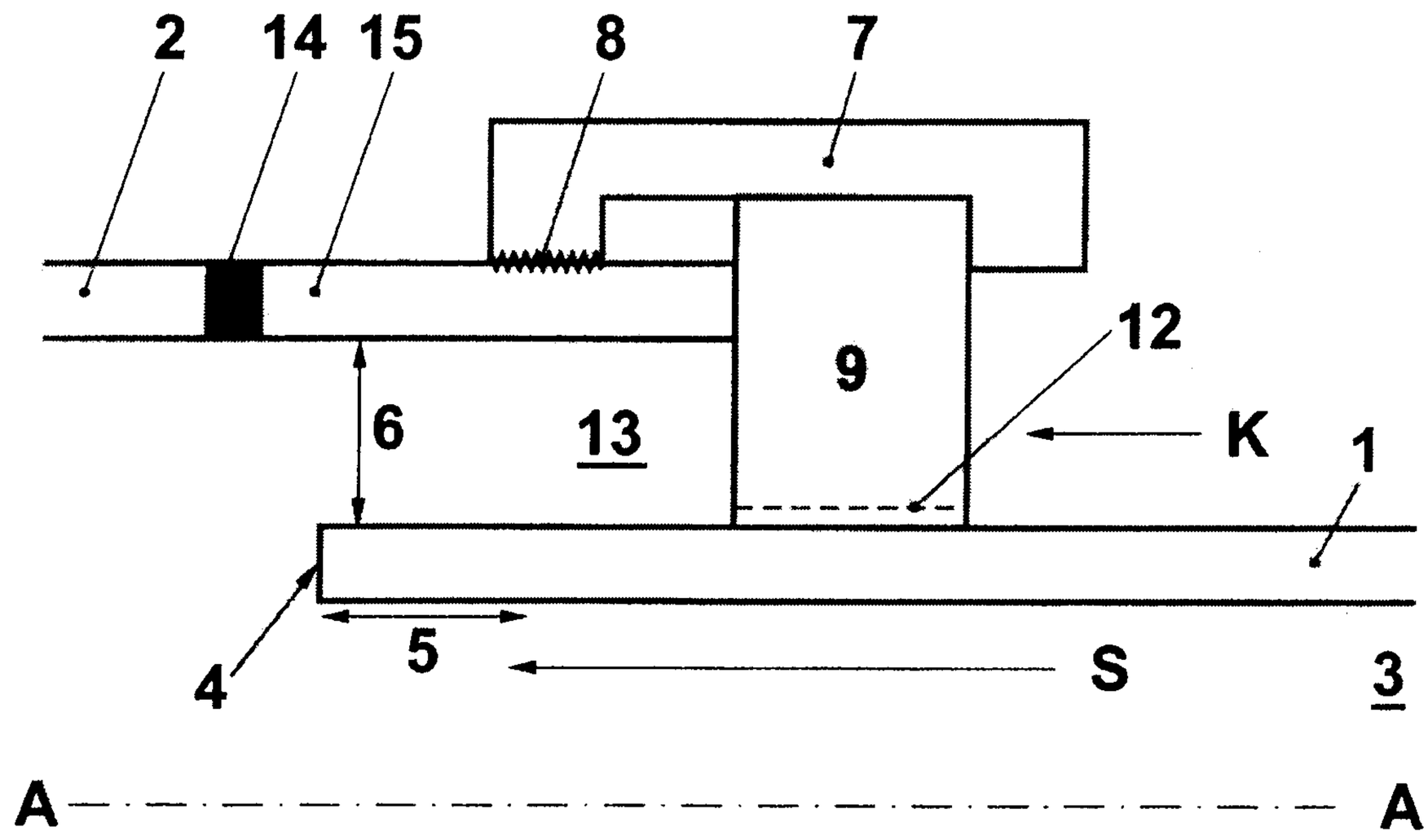


FIG. 2

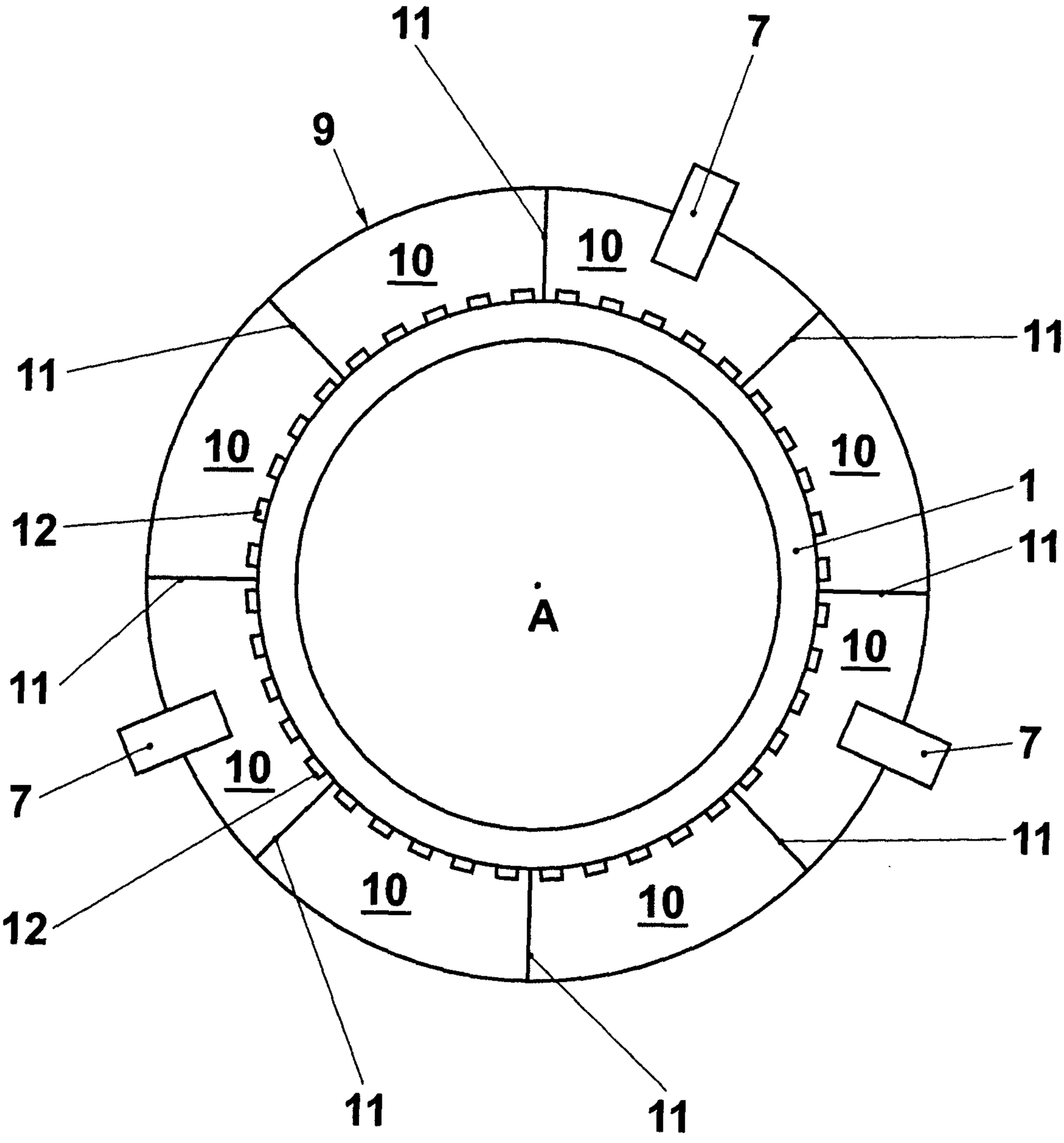


FIG. 3

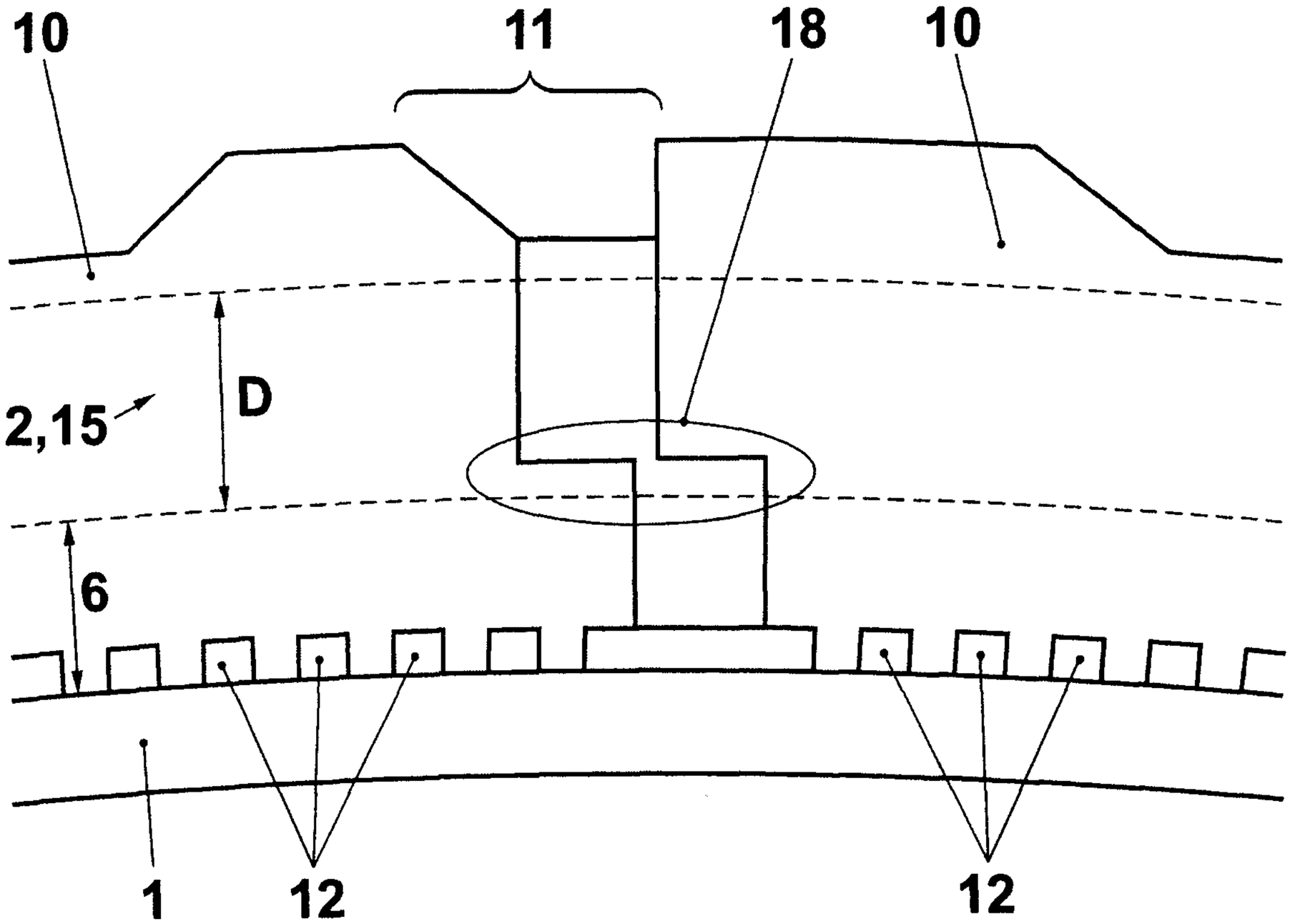


FIG. 4

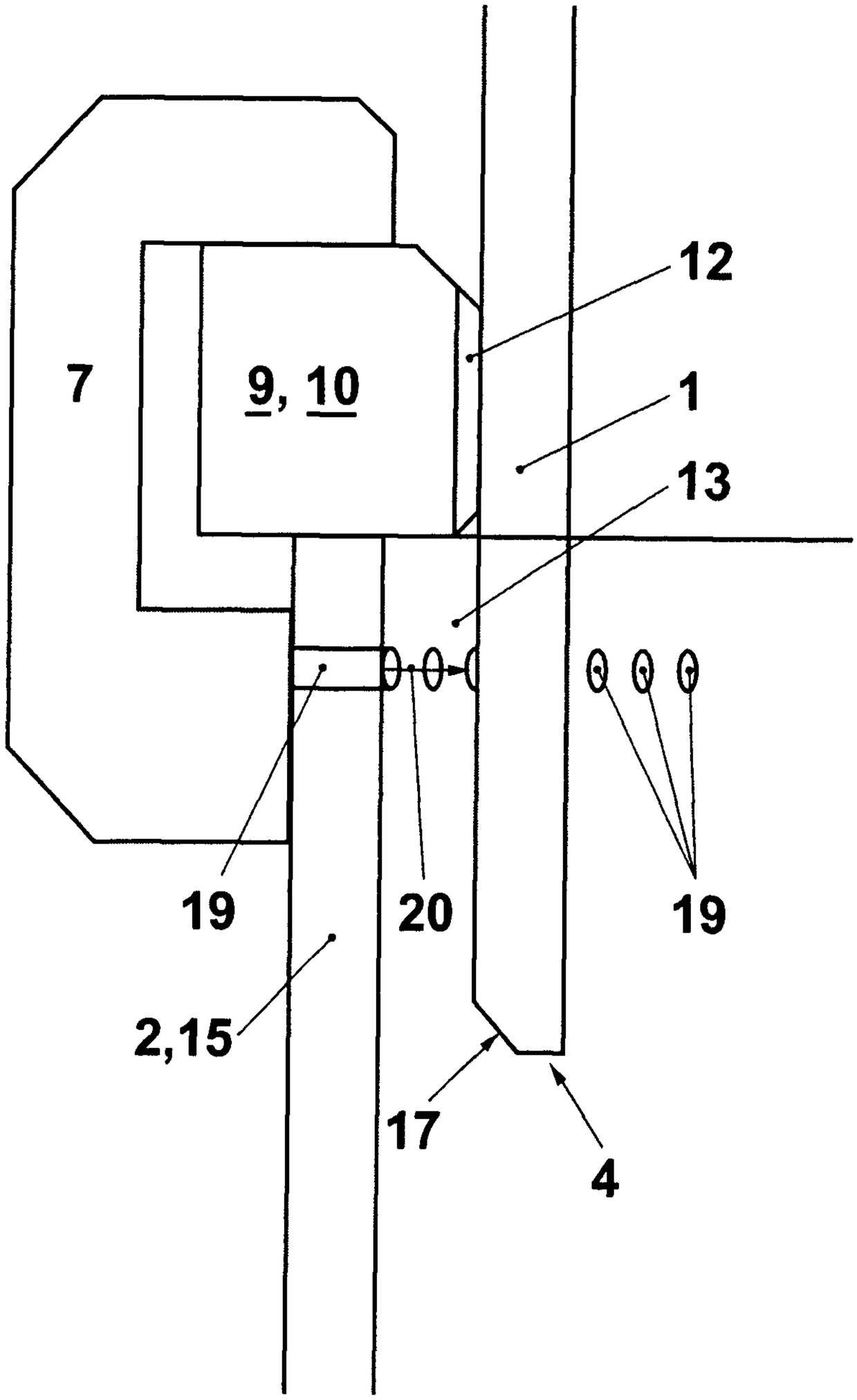
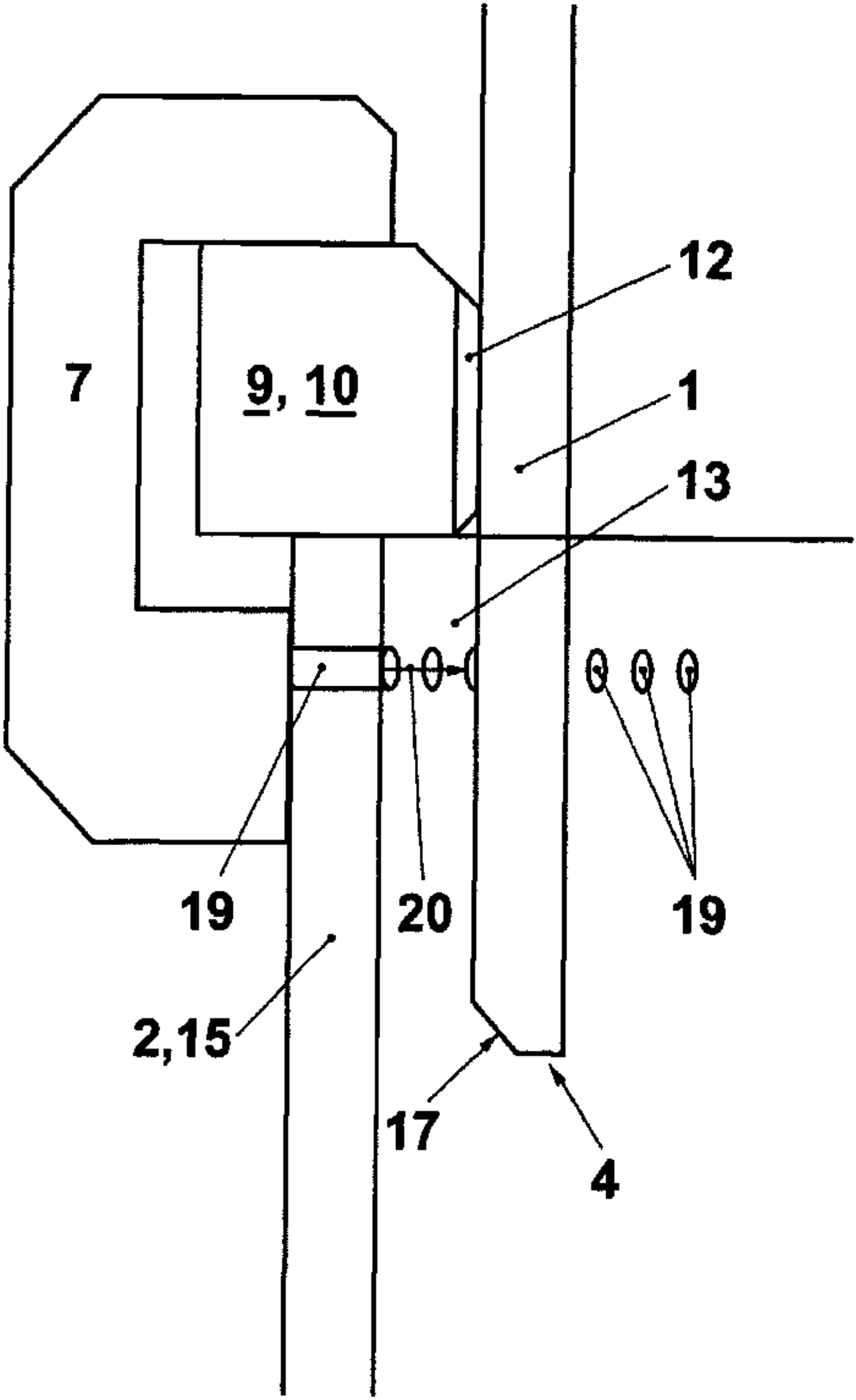


FIG. 5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