Claims:

1. A pipe coupler for interconnecting two pipes each having a joining region and each extending along a pipe axis in a longitudinal direction, said pipe coupler comprising:

a first jaw unit including

a first jaw member which extends in a circumferential direction about the pipe axis to terminate at a first hinged end segment and a first locking end segment, and which has a first inner peripheral surface, and

a first jaw extension which extends from said first locking end segment along the circumferential direction, and which has a plurality of rack teeth displaced from each other in the circumferential direction;

a second jaw member which extends in the circumferential direction to terminate at a second hinged end segment and a second locking end segment, and which has a second inner peripheral surface, said second locking end segment defining therein an open channel which extends along the circumferential direction, and which has an inner guiding region and an outer mounting region, said second hinged end segment being hinged to said first hinged end segment about a hinge axis parallel to the pipe axis so as to permit said first jaw extension

to be movable among an unclamped position, where said first jaw extension is disposed outwardly of said inner guiding region, a partially clamped position, where said first jaw extension is partially extended into said inner guiding region, and a fully clamped position, where said first jaw extension is deeply extended into said inner guiding region such that said first and second inner peripheral surfaces of said first and second jaw members are tightened against the joining regions of the two pipes thereby allowing the two pipes to be brought into fluid-tight engagement with each other;

a mounting board extending outwardly from said outer mounting region, and having a mounting surface;

a ratchet mounted rotatably on said mounting surface about a rotation axis parallel to the pipe axis, and having a plurality of ratchet teeth which are angularly displaced from each other about the rotation axis, and which are configured to mesh with said rack teeth at said outer mounting region so as to permit said ratchet to be driven by said rack teeth to rotate about the rotation axis;

a first biasing member disposed such that said first jaw extension is permitted to drive said ratchet to rotate unidirectionally against a first biasing force of said first biasing member; and

a release member having

a pivot end segment which is mounted pivotally

on said mounting surface about a pivot axis, and which is configured to counteract the first biasing force of said first biasing member such that said pivot end segment is angularly movable between an actuated position, where said pivot end segment is disposed to ensure unidirectional rotation of said ratchet, and a non-actuated position, where said ratchet is relieved of the first biasing force of said first biasing member, and

a distal end segment which is angularly movable between a retained position, where said pivot end segment is in the actuated position, and an unretained position, wherein said pivot end segment is in the non-actuated position.

2. The pipe coupler according to Claim 1,further comprising a locking mechanism which includes

a first cantilever extending from one of said first and second locking end segments, and having a first guiding slot,

a second cantilever extending from said one of said first and second locking end segments, and having a second guiding slot in alignment with said first guiding slot,

an engaging member including a movable key which extends parallel to the pipe axis to terminate at a first end segment and a second end segment, said first and second end segments of said movable key being slidably

and respectively engaged in said first and second guiding slots so as to permit said movable key to be movable between a distal position and a proximate position relative to said one of said first and second locking end segments,

a second biasing member disposed to bias said movable key to the proximate position, and

an anchor member mounted on said the other one of said first and second locking end segments, said anchor member having a guide wall and an engaged surface defining a recess such that once said first jaw extension is in the fully clamped position, the movement of said movable key toward the distal position against a second biasing force of said second biasing member permits said engaging member to slip over said guide wall and be retained in said recess by virtue of the second biasing force.

3. The pipe coupler according to Claim 2, wherein said locking mechanism further includes a pivot pin extending through said one of said first and second locking end segments to terminate at a first pin end segment and a second pin end segment, said second biasing member being disposed to couple said movable key to said pivot pin so as to bias said movable key to the proximate position, each of said first and second cantilevers having a pivot end segment mounted pivotally to a corresponding one of said

first and second pin end segments of said pivot pin, and a connected end segment having a corresponding one of said first and second guiding slots, said engaging member further including

a first bar extending from said first end segment of said movable key in a direction away from said first cantilever to terminate at a first bar end segment so as to permit said first bar to move with said movable key,

a second bar extending from said second end segment of said movable key in a direction away from said second cantilever to terminate at a second bar end segment so as to permit said second bar to move with said movably key, and

an engaging pin interconnecting said first and second bar end segments, and configured to be retained in said recess.

4. The pipe coupler according to Claim 2, wherein:

each of said first and second cantilevers has

a mounted segment extending from said one of said first and second locking end segments to terminate at a joining region, and

a pivot segment having a joined region mounted pivotally to said joining region of said mounted segment, and a distal region having a corresponding one of said first and second guiding slots;

said locking mechanism further includes a pivot pin

which extends in the longitudinal direction, and which has

a first pin end segment configured to permit said joined region of said first cantilever to be pivotally mounted to said joining region of said first cantilever, and

a second pin end segment configured to permit said joined region of said second cantilever to be pivotally mounted to said joining region of said second cantilever;

said second biasing member is disposed to couple said movable key to said pivot pin so as to bias said movable key to the proximate position; and

said movable key is configured to be retained in said recess.

5. The pipe coupler according to Claim 2, wherein:

each of said first and second cantilevers has a proximate cantilever segment, a distal cantilever segment, and a mid segment which is disposed between said proximate and distal cantilever segments, and which has a corresponding one of said first and second guiding slots;

said locking mechanism further includes

an angular lever having

a fulcrum area pivotably mounted on said one of said first and second locking end segments about a pivot lever axis,

a power area which is angularly movable about the pivot lever axis between a loose position, where said power area is distal from said one of said first and second locking end segments, and a tightened position, where said power area is closer to said one of said first and second locking end segments, and

a weight area which is angularly displaced from said power region about the pivot lever axis,

a pivot pin extending through said weight area to terminate at a first pin end segment and a second pin end segment, said proximate cantilever segment of each of said first and second cantilevers being pivotally mounted to a corresponding one of said first and second pin end segments, and

a bridging bar interconnecting said distal cantilever segments of said first and second cantilevers; and

said second biasing member being disposed to couple said movable key to said bridging bar so as to bias said movable key to the proximate position such that when said power region of said angular lever is angularly moved from the loose position to the tightened position, said proximate cantilever segments of said first and second cantilevers are brought to angularly move with said weight region about the pivot lever axis to thereby permit said

movable key to be tightened against said engaged surface.

6. The pipe coupler according to Claim 5, wherein said proximate cantilever segment of each of said first and second cantilevers has a cantilever through bore, and said angular lever has a lever through hole configured to be in alignment with said cantilever through bores of said proximate cantilever segments of said first and second cantilevers when said power area of said angular lever is in the tightened position,

said pipe coupler further comprising a pin member having

a spring segment,

a first pin segment extending from said spring segment to terminate at a pin end, and

a second pin segment extending from said spring segment to terminate at a hook end, said first and second pin segments being arranged such that when said first pin segment extends through said lever through hole of said angular lever and said cantilever through bores of said proximate cantilever segments of said first and second cantilevers, said pin end of said first pin segment is permitted to be hooked by said hook end of said second pin segment so as to prevent said power area of said angular lever from moving away from the tightened position.

7. The pipe coupler according to Claim 2, wherein:

each of said first and second cantilevers has a pivot end segment, and a connected end segment which has a corresponding one of said first and second guiding slots;

said locking mechanism further includes

an angular lever having

a fulcrum area pivotably mounted on said one of said first and second locking end segments about a pivot lever axis,

a power area which is angularly movable about the pivot lever axis between a loose position, where said power area is distal from said one of said first and second locking end segments, and a tightened position, where said power area is closer to said one of said first and second locking end segments, and

a weight area which is angularly displaced from said power region about the pivot lever axis, and

a pivot pin extending through said weight area to terminate at a first pin end segment and a second pin end segment, said pivot end segment of each of said first and second cantilevers being pivotally mounted to a corresponding one of said first and second pin end segments;

said second biasing member is disposed to couple said

movable key to said pivot pin so as to bias said movable key to the proximate position;

said engaging member further includes

a first bar extending from said first end segment of said movable key in a direction away from said first cantilever to terminate at a first bar end segment so as to permit said first bar to move with said movable key,

a second bar extending from said second end segment of said movable key in a direction away from said second cantilever to terminate at a second bar end segment so as to permit said second bar to move with said movably key, and

an engaging pin interconnecting said first and second bar end segments, and configured such that when said power region of said angular lever is angularly moved from the loose position to the tightened position, said pivot end segments of said first and second cantilevers are brought to angularly move with said weight region about the pivot lever axis to thereby permit said engaging pin to be tighten against said engaged surface.

8. The pipe coupler according to Claim 7, wherein said pivot end segment of each of said first and second cantilevers has a cantilever through bore, and said angular lever has a lever through hole configured to be in alignment with said cantilever through bores

of said pivot end segments of said first and second cantilevers when said power area of said angular lever is in the tightened position,

said pipe coupler further comprising a pin member having

a spring segment,

a first pin segment extending from said spring segment to terminate at a pin end, and

a second pin segment extending from said spring segment to terminate at a hook end, said first and second pin segments being arranged such that when said first pin segment extends through said lever through hole of said angular lever and said cantilever through bores of said pivot end segment of said first and second cantilevers, said pin end of said first pin segment is permitted to be hooked by said hook end of said second pin segment so as to prevent said power area of said angular lever from moving away from the tightened position.

9. The pipe coupler according to Claim 1, wherein each of said first and second inner peripheral surfaces of said first and second jaw members has a jaw groove region which extends in the circumferential direction, and which is configured such that when said first jaw extension is in fully clamped position, the joining regions of the two pipes are permitted to be brought into fitting engagement in said jaw groove region.

10. The pipe coupler according to Claim 1, further comprising a pawl member having

a fulcrum region mounted pivotably on said mounting surface of said mounting board,

a weight region disposed to be biased by said first biasing member to engage with said ratchet such that said ratchet is driven to rotate unidirectionally, and

a power region disposed between said fulcrum region and said weight region, wherein

said pivot end segment of said release member has a cam surface which extends about the pivot axis, and which acts against said power region to generate a camming action such that when said pivot end segment of said release member is moved to the actuated position, said weight region is engaged with said ratchet, and such that when said pivot end segment of said release member is moved to the non-actuated position, said weight region is moved against the first biasing force of said first biasing member to be disengaged from said ratchet.

11. The pipe coupler according to Claim 1, further comprising a pivot shaft which is mounted on said mounting surface and which extends along the rotation axis, wherein:

said ratchet includes

a ratchet body mounted rotatably on said pivot shaft about the rotation axis, and having a rim surface formed with said ratchet teeth, and

a first abutment wall which extends from said ratchet body in the longitudinal direction adjacent to said ratchet teeth, and which has a first abutment surface facing said pivot shaft;

said pivot end segment of said release member includes

a top disc having a periphery and mounted pivotally on said pivot shaft about the pivot axis which is the same as the rotation axis, said top disc and said ratchet body being spaced apart from each other in the longitudinal direction, and

a second abutment wall extending from said periphery of said top disc toward said ratchet body, and having a second abutment surface which faces said pivot shaft, and which is opposite to said first abutment surface of said first abutment wall relative to said pivot shaft; and

said first biasing member is a torsion spring and has a curved segment mounted on said pivot shaft, a first end segment extending to abut against said first abutment surface of said ratchet, and a second end segment extending to abut against said second abutment surface of said release member such that when said distal end segment of said release member is in the retained position, said first end segment of said torsion spring delivers the first biasing force of said torsion spring to act on said first abutment wall to bias said ratchet

teeth to move into ratchet engagement with said rack teeth so as to permit said ratchet to rotate unidirectionally, and such that when said distal end segment of said release member is in the unretained position, said first abutment wall is relieved of the first biasing force of said torsion spring so as to permit said ratchet teeth to disengage from said rack teeth.

12. The pipe coupler according to Claim 1, wherein said second jaw member has two sidewall surfaces opposite to each other in the longitudinal direction, and a through bore extending through said two sidewall surfaces of said second jaw member, said distal end segment of said release member having a through hole which is in alignment with said through bore of said second jaw member when said distal end segment of said release member is in the retained position, said pipe coupler further comprising a pin member having

a spring segment,

a first pin segment extending from said spring segment to terminate at a pin end, and

a second pin segment extending from said spring segment to terminate at a hook end, said first and second pin segments being arranged such that when said first pin segment extends through said through bore and said through hole, said pin end of said first pin segment is permitted to be hooked by said hook

end of said second pin segment so as to prevent said distal end segment of said release member from moving away from the retained position.

13. The pipe coupler according to Claim 12, wherein each of said two sidewall surfaces of said second jaw member has a peripheral edge, said pipe coupler further comprising a shielding member which extends from said peripheral edge of a corresponding one of said two sidewall surfaces over said mounting board so as to cover said ratchet, said second jaw member, said shielding member, and said mounting board being integrally formed.