CLAIMS

1. A contact probe that is conductive and capable of expanding/contracting along an axial line direction, the contact probe comprising:

a first contact member configured to contact one contact target;

a second contact member configured to contact another contact target, and to house at least a portion of the first contact member; and

a spring member configured to couple the first contact member and the second contact member in a manner capable of expansion/contraction with both end parts of the spring member, wherein

the first contact member comprises:

a first tip part configured to contact the one contact target;

a first flange part provided at a base end of the first tip part; and

a boss part configured to couple with the spring member by fitting into the spring member, and

the second contact member comprises:

a second tip part configured to contact the other contact target,

a cylindrical part extending from the second tip part and having a cylindrical shape with an inner circumference having a uniform diameter, cylindrical part housing at least a portion of the spring member; and

a second flange part provided in an outer circumference of the cylindrical part,

the spring member is wound in a helical shape, and at least a diameter of an outer circumference in one of the end parts held by the second contact member is larger than diameters of other portions, and

a diameter of an inner circumference of an end part of the second contact member on a side housing the first contact member is equal to or larger than a maximum diameter of the first contact member.

2. The contact probe according to claim 1, wherein a length of the spring member in a natural state thereof in the axial line direction is smaller than a length of the cylindrical part in the axial line direction.

3. The contact probe according to claim 1, wherein a length of the spring member in a natural state thereof in the axial line direction is larger than a length of the cylindrical part in

the axial line direction.

4. The contact probe according to claim 1, further comprising a sleeve into which the first flange part is fit, an outer surface of the sleeve slidably contacting the cylindrical part.

5. The contact probe according to any one of claims 1 to 4, wherein

the spring member comprises:

a rough wound part wound with a previously set gap, an inner circumference of the rough wound part contacting the first contact member; and

a dense wound part extending from the rough wound part, an outer circumference of the dense part contacting the cylindrical part, and

a diameter of the dense wound part is larger than a diameter of the rough wound part.

6. A contact probe that is conductive and capable of expanding/contracting along an axial line direction, the contact probe comprising:

a first contact member configured to contact one contact target;

a second contact member configured to contact another contact target, and to house at least a portion of the first contact member; and

a spring member configured to couple the first contact member and the second contact member in a manner capable of expansion/contraction with both end parts of the spring member, wherein

the first contact member comprises:

a first tip part configured to contact the one contact target;

a first cylindrical part extending from the first tip part in a cylindrical shape; and

a first flange part provided in an outer circumference of the first cylindrical part,

the second contact member comprises:

a second tip part configured to contact the other contact target;

a second cylindrical part extending from the second tip part and having a cylindrical shape with an inner circumference having a uniform diameter; and

a second flange part provided in an outer circumference of the second cylindrical part, and

the spring member is wound in a helical shape and positioned in a hollow space formed with the first and the second cylindrical parts, and at least a diameter of an outer

circumference in one of the end parts held by the second contact member is larger than diameters of other portions, and

a diameter of an inner circumference of an end part of the second contact member on a side housing the first contact member is equal to or larger than a maximum diameter of the first contact member.

7. The contact probe according to claim 6, wherein

the spring member comprises:

a first dense wound part, an outer circumference of the first dense wound part contacting the first cylindrical part;

a rough wound part wound with a previously set gap, the rough wound part extending from the first dense wound part; and

a second dense wound part, an outer circumference that of the second dense wound part contacting the second cylindrical part, and the second dense wound part being provided at an end part of the rough wound part on an opposite side of the first dense wound part,

a diameter of the first dense wound part is smaller than a diameter of the second dense wound part, and

a diameter of the rough wound part is smaller than the diameter of the first dense wound part.

8. The contact probe according to claim 1 or 6, wherein the end part of the first flange part on an opposite side of a side continuous to the first tip part has a tapered shape.

9. A probe unit comprising:

contact probes, each of which is conductive, and capable of expanding/contracting along an axial line direction, each of the contact probes comprising:

a first contact member configured to contact one contact target;

a second contact member configured to contact another contact target, and to house at least a portion of the first contact member; and

a spring member wound in a helical shape and configured to couple the first contact member and the second contact member in a manner capable of expansion/contraction with both end parts of the spring member,

wherein a diameter of an outer circumference in the end part held by at least the second contact member being larger than diameters of other portions, and

a diameter of an inner circumference of an end part of the second contact

member on a side housing the first contact member is equal to or larger than a maximum; diameter of the first contact member; and

a probe holder including holder holes configured to hold the respective contact probes, wherein

the first contact member comprises a flange part having a maximum diameter of the first contact member, and

when the contact probe is held by the probe holder, at least a portion of the flange part is positioned inside the second contact member.

10. A probe unit comprising:

contact probes, each of which is conductive, and capable of expanding/contracting along an axial line direction, each of the contact probes comprising:

a first contact member configured to contact one contact target;

a second contact member configured to contact another contact target, and to house at least a portion of the first contact member; and

a spring member wound in a helical shape and configured to couple the first contact member and the second contact member in a manner capable of expansion/contraction with both end parts of the spring member,

wherein a diameter of an outer circumference in the end part held by at least the second contact member being larger than diameters of other portions, and

a diameter of an inner circumference of an end part of the second contact member on a side housing the first contact member is equal to or larger than a maximum; diameter of the first contact member; and

a probe holder including holder holes configured to hold the respective contact probes, wherein

the first contact member comprises a flange part having a maximum diameter of the first contact member, and

when the contact probe is held by the probe holder, the flange part is positioned outside the second contact member.

11. A probe unit comprising:

contact probes, each of which is conductive, and capable of expanding/contracting along an axial line direction, each of the contact probes comprising:

a first contact member configured to contact one contact target;

a second contact member configured to contact another contact target, and to house at least a portion of the first contact member; and

a spring member wound in a helical shape and configured to couple the first contact member and the second contact member in a manner capable of expansion/contraction with both end parts of the spring member,

wherein a diameter of an outer circumference in the end part held by at least the second contact member being larger than diameters of other portions, and

a diameter of an inner circumference of an end part of the second contact member on a side housing the first contact member is equal to or larger than a maximum; diameter of the first contact member; and

a probe holder made of a single plate, the probe holder including holder holes configured to hold the respective contact probes, wherein

the second contact member comprises:

a tip part configured to contact the other contact target;

a cylindrical part extending from the tip part and having a cylindrical shape with an inner circumference having a uniform diameter; and

a flange part provided in an outer circumference of the cylindrical part, and

a slit extending from the end part of the cylindrical part on an opposite side of the tip part is formed in the cylindrical part.