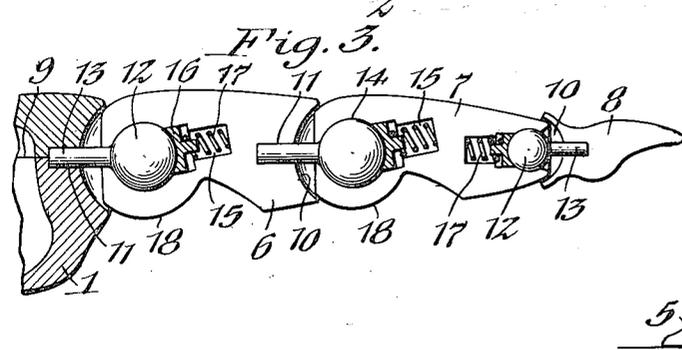
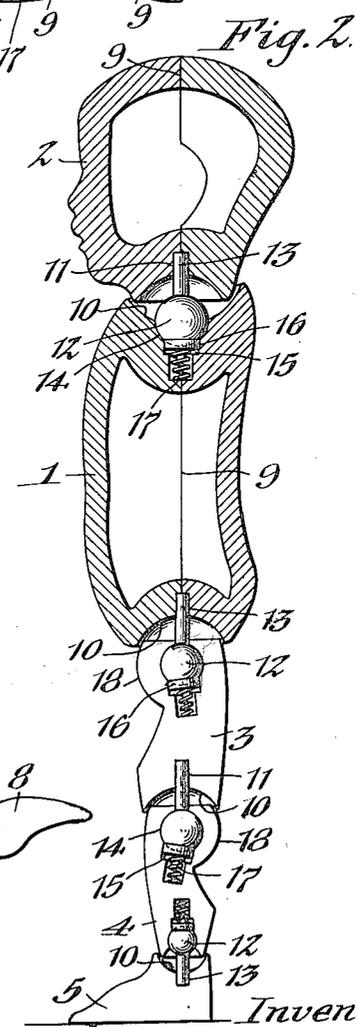
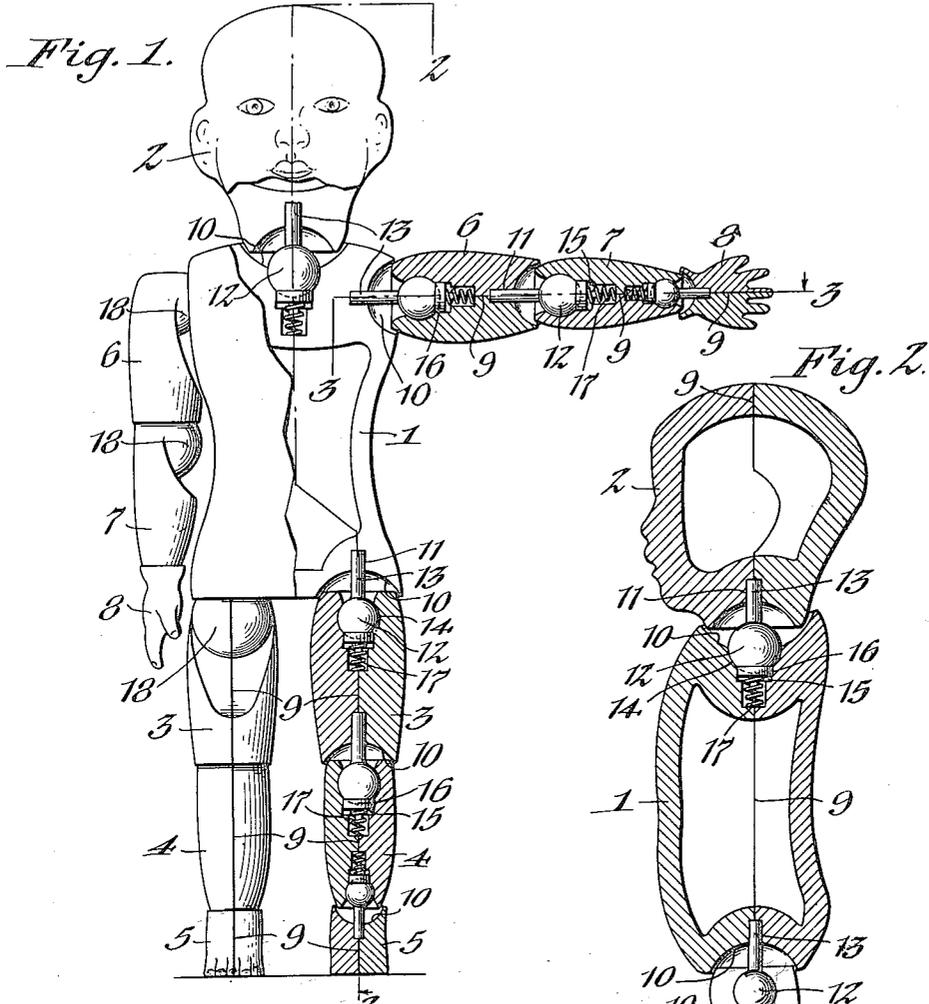


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 BALL AND SOCKET JOINT.
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1,289,385.

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BALL-AND-SOCKET JOINT.

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To all whom it may concern:

Be it known that I, CHARLES CABANA, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Ball-and-Socket Joints, of which the following is a specification.

This invention relates to a ball and socket joint which is more particularly designed for pivotally connecting different members of toys, such as dolls and animals, so that the same may be turned freely one relatively to the other into different positions, but the same may also be used for display figures or manikins and other purposes.

The object of this invention is to provide a joint of this character which is simple and durable in construction, which can be produced at a comparatively low cost and which can be easily shifted into the desired positions relatively to each other and remain frictionally in place.

In the accompanying drawings:

Figure 1 represents a front elevation of a doll, partly in section, having different members thereof pivotally connected by means of a ball and socket joint, embodying my improvements. Fig. 2 is a vertical section thereof, taken on line 2—2, Fig. 1. Fig. 3 is a fragmentary horizontal section, on an enlarged scale, taken on line 3—3, Fig. 1.

Similar characters of reference indicate corresponding parts in the several views.

Although my improved ball and socket joint may be employed in various parts of a doll for producing an articulate connection between the same, the doll which is shown in the drawings and embodies my invention comprises a body 1, a head 2 mounted on top of the body, two thighs 3 connected at their upper ends with the lower part of the body, two legs 4 each connected at its upper end with the lower end of one of the thighs, two feet 5 each connected on its upper side with the lower end of one of the legs, two arms 6 each connected at its inner end with the upper part of one side of the body, two forearms 7 each connected at its inner end with the outer end of one of the arms, and two hands 8 each connected at its inner end with the outer end of one of the forearms.

Each of these members is preferably constructed of two sections, the division or joint 9 between which preferably extends lengthwise thereof, as shown in the drawings. Although the material from which these mem-

bers are constructed may be varied, it is preferable to make the same of papier mâché, and to secure the sections of each member together by means of cement applied to the opposing surfaces of the same.

Inasmuch as the ball and socket joint between every two adjacent members of the doll are substantially alike, the following description referring to one of these joints will apply equally to all of the remaining joints wherever used in the doll.

10 represents a cavity which is formed in one of the doll members and is preferably, though not necessarily, of semi-globular or substantially semi-globular form. On the central part of the bottom of this cavity in the respective doll member, it is provided with a cylindrical seat 11 which is arranged radially with reference to the axis or center of the respective cavity.

12 represents a ball arranged adjacent to the mouth of the cavity and concentrically, or substantially so, with the center of the same. On its inner side this ball is provided with a reduced stem or neck 13, the front end of which engages with the seat 11. This ball and its stem are preferably constructed of wood, although any other suitable material may be used, if desired, and the stem is preferably secured in the seat 11 by means of cement, although any other suitable means for securing the same therein may be employed.

The adjacent or companion doll member is provided with a spherical socket 14 which opens to the end of this member and which receives the respective ball 12. The spherical area of this socket is somewhat more than one-half the area of the ball, so that when these parts engage with one another they are free to turn or swivel one with reference to the other but cannot become disengaged. At the inner end or bottom of the ball socket, the respective doll member is provided with a recess 15 in which is arranged a presser block 16 which engages with the inner side of the ball in the respective socket, and a spring 17 is provided which bears at one end against said presser block and at its opposite end against the bottom of said recess. By this means a tension or pressure is exerted by the block upon the ball which operates to hold the two members of the doll frictionally and yieldingly in their adjusted position relatively to each other. The respective end of one doll mem-

ber containing the ball socket projects slightly into the cavity of the companion doll member, so as to practically bridge the gap between the same at all times and thus produce a neat and closely fitting appearance.

The joints between the sections of the several doll members are so arranged that the planes of the same extend centrally through the ball and socket connections between the same. Accordingly, each of the cavities and the companion seat is formed in halves in the respective body member, and each of the ball sockets and the companion recesses at the bottom thereof will also be formed in halves in the respective doll member. By means of this construction, the spring, presser block and ball of one joint may be first engaged with the recess and ball socket of the respective doll member and then retained therein by cementing the two sections of this doll member together, and the stem of this ball may be then in like manner inserted in the two halves of the seat in the companion doll member, this stem being secured in this seat and the respective doll members being secured to each other by cement for completing this joint of the doll.

In applying this form of joint to the several doll members, the size of the ball and socket and the tension of the spring which engages the respective presser block is proportioned to the size and weight of the doll members. For instance, the dimensions of the ball and socket and the parts associated therewith which pivotally connect the head with the body, are comparatively large, those between the arms and the body, between the forearms and the arms, between the thighs and the body and between the legs and thighs are somewhat smaller than the ball and socket between the head and body, while the dimensions of the ball and socket and associated parts between the hands and the forearms and between the feet and the legs are smallest, as is clearly shown in the drawings, thereby adapting the size of the joint to the dimensions of the members which the same pivotally connects.

The lower end of the neck on the head projects into the cavity at the upper end of the body but clears the same on all of its sides sufficient to permit the head to turn not only about its longitudinal axis but also tilted bodily in all directions to a limited extent, the head being retained frictionally in any of its adjusted positions by means of the tension device associated therewith. Each of the arms, forearms, thighs, and legs is capable of turning about its longitudinal axis, and each of these members is also capable of tilting or swinging laterally on three

of its sides to a limited extent and also capable of swinging bodily laterally toward its fourth side to a considerable extent by providing this fourth side with a semi-globular portion 18 which is adapted to turn into the companion cavity of the adjacent body member. The hands and feet are capable of turning on the forearms and legs about their longitudinal axes and they are also capable of turning laterally to a limited extent by reason of the cavities of the hands and feet being spaced a sufficient distance apart from the adjacent ends of the forearms and legs which project into these cavities.

By this means the various members of the doll may be turned, shifted or adjusted into practically all the positions which the corresponding members of the human body are capable of, thereby permitting of posing the doll in a large variety of positions and increasing the entertainment afforded by this capacity accordingly.

All of the several members of this doll can be produced at comparatively low cost, the same can be easily and readily assembled, the parts are not liable to get out of order inasmuch as the working elements are concealed from view, and the several members of the body may be frictionally held in the various positions to which they may be adjusted.

I claim as my invention:

1. An article comprising two relatively movable members, one of said members having a cavity and a ball arranged in the mouth of said cavity and mounted on the innerside of said cavity, and the other member having a spherical socket which receives said ball, said members being divided in the planes extending through said ball and socket, said cavity in the end of one member receiving the adjacent end of the other member.

2. An article comprising two relatively movable members, one of said members having a cavity and a seat at the bottom of said cavity and being divided in a plane extending through said cavity and seat, the other member having a socket and a recess at the bottom of said socket and divided in a plane extending through said socket and recess, a ball arranged in said socket and provided with a reduced stem engaging said seat, a presser block arranged in said recess and bearing against said ball, and a spring arranged in said recess and bearing against said block, said cavity in one of said members receiving the adjacent end of the other member.

CHARLES CABANA.