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M. J. MEYER
BALL-AND-SOCKET JOINT FOR CONTROL TRANSMISSIONS
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Serial No.
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Fig. 1

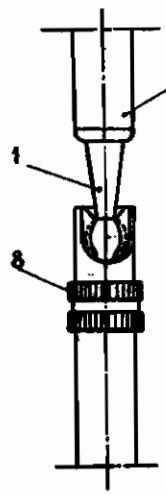

Fig. 2

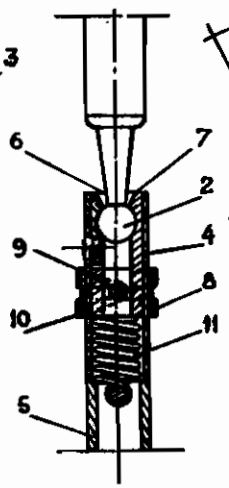

Fig. 3

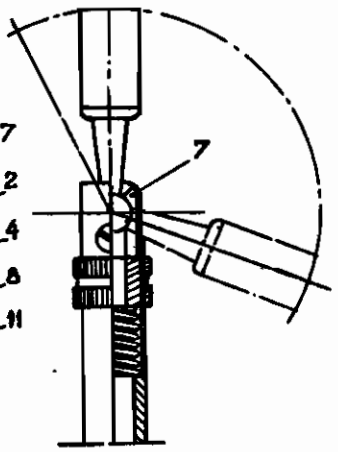

Fig. 4

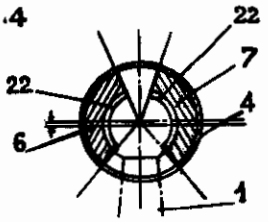

Fig. 6

Fig. 8

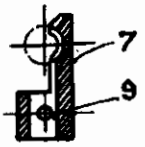

Fig. 5

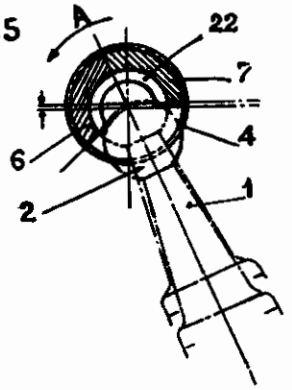

Fig. 7

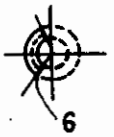

Fig. 9

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ALIEN PROPERTY CUSTODIAN

BALL-AND-SOCKET JOINT FOR CONTROL TRANSMISSIONS

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The present invention has for object a system of ball-and-socket joints serving to connect control members and generally speaking for all applications.

The various ball-and-socket joint systems commonly used as method of articulation, particularly in the controls of auxiliary movements present, in their applications, inconveniences which are obviated by the ball-and-socket joint system forming the subject-matter of the present patent.

For instance, in the common case which consists in connecting two rods transmitting a longitudinal stress to members moving in different planes, it is established that the actual method consisting in connecting said rods by a transverse finger having a spherical part, generates torsional and bending stresses abnormally straining the parts concerned and creating lateral reactions prejudicial to satisfactory operation. However, these arrangements cannot allow said ball-and-socket joints to function according to an angle sufficiently important for satisfying the requirements of many cases.

Besides this, said ball-and-socket joints are not always provided with the indispensable arrangement for taking up the play, and which must be, in these circumstances, easily adjustable; also, they do not present the advantage of being positively unable of getting out of order. Moreover, they lack, above all things, the indispensable advantage of being rapidly and easily coupled and uncoupled involving complete accessibility.

The present ball-and-socket joint system remedies these inconveniences and has other advantages: it ensures a rational transmission of the stress by eliminating the lateral coupling as well as the prejudicial reactions resulting therefrom, it directly transmits the stress through the axis of the rods carrying the ball-and-socket joint. The spherical part of the ball-and-socket joint located at the end of said rods, constitutes the point about which said rods can pivot in all possible planes up to a maximum amplitude encircling half the spherical part. Said system allows of obtaining rectilinear controls, as the axes of the elements ball and rods can be in alignment with each other; likewise, it allows of obtaining lateral control, so-called right-angular control, under a very large leading angle.

Said ball-and-socket joint system resides in the principle of gripping the male spherical part by means of suitable jaws belonging to the corresponding female part. There are two methods of spacing apart and gripping said jaws which can be obtained either automatically, or by hand, and the movement of said jaws takes place in a plane at right angles to the longitudinal axis of thrust, or axis of the rods, so as to laterally encircle as largely as possible, the periphery of the spherical part contrarily to the actual method of procedure, in which these spherical joints are carried at the end, that is to say in the axis of the rods.

In the accompanying drawing, the representation of which is given merely by way of indication, it will be noted that the gripping method of said jaws consists in causing said jaws to move circularly, by hand, by means of a simple knob and the action of a spring.

In this drawing:

Fig. 1 illustrates an external view of the ball-and-socket joint having circular jaws.

Fig. 2 is a longitudinal section of said pincers showing the method for coupling both parts united.

Fig. 3 is a complementary view of the two first ones showing an external half-view and half-section.

Fig. 4 is a cross section on an enlarged scale, showing the detail of a coupling member called circular jaw, in its closing and locking position.

Fig. 5 is a similar view but showing said member in "open" position during uncoupling.

Fig. 6 is a longitudinal section of a fixed jaw.

Fig. 7 is a plan view of said jaw.

Fig. 8 is a longitudinal section of a movable jaw.

Fig. 9 is a plan view.

The ball-and-socket joint having circular jaws is composed of the two main parts to be connected: on the one hand, the finger 1 having a spherical end 2 rigid with its control member, in this case, the rod 3; on the other hand: the part which receives the spherical end of said finger and which is constituted by a sheath 4 also rigid with the control member 5. Within said sheath is secured a jaw 6 having a spherical cavity, forming one with the same.

Opposite this fixed jaw is arranged a circular movable jaw 7 having a spherical cavity, capable of moving circularly under the action of an outer milled ring 8, to which it is connected by a pin 9 passing through the sheath through a circular opening 10; a torsional spring 11 placed within said sheath restores the circular jaw 7 to its locking position.

The operation which consists in connecting the said control elements is very simple, as well as that consisting in uncoupling them. In these "circular jaws" it suffices to rotate the movable ring 8 in the direction of the arrow A to bring the movable jaw 7 from the position shown in Fig. 4

to the spaced position shown in Fig. 5, the spherical part 2 of the latter, once placed in its recess, it suffices to abandon the ring 8, which, under the action of the spring 11, Fig. 2, is restored in the reverse direction to that of the arrow, that is to say, to the position shown in Fig. 4; at this moment, the finger is trapped between both jaws 8 and 7 and cannot possible become released therefrom.

For ensuring perfect adhesion of the spherical walls of the circular jaws on the spherical part, and consequently for eliminating play, the central recess of the spherical part 22 is slightly out of center relatively to the external diameter of said jaws; it will be seen that, under the action of the spring 11, the latter grip said spherical part with a normal pressure which automatically ensures the taking up of the play, as well as a safety locking of said spherical part.

It is to be noted that all these improvements are thus united in a simple member of relatively reduced cumbersomeness, which constitutes, among others, one of its main characteristic features.

This system can be applied to all controls by means of levers, links, coupling rods, segment controls, remote controls, and, in short, to all transmission controls which are particularly included in: machine-tools, motor cars, aviation, electric apparatus.

MICHEL JOSEPH MEYER.