CLAIMS

1- ~~Bearing arrangements in a~~A refrigeration reciprocating compressor ~~of the type which~~ including bearing arrangements and comprises: a crankcase ~~(10)~~ carrying a cylinder ~~(20)~~ and a bearing hub ~~(40)~~ defining a radial bearing ~~(41)~~; a crankshaft ~~(50)~~ mounted in the radial bearing ~~(41)~~ and having an eccentric end portion ~~(55)~~ and a free end portion ~~(56)~~ which project outwards from a first and second end portions ~~(40a, 40b)~~, respectively, of the bearing hub ~~(40)~~,~~;~~ a piston ~~(30)~~ housed in the cylinder ~~(20)~~; a connecting rod ~~(60)~~ coupling the eccentric end portion ~~(55)~~ of the crankshaft ~~(50)~~ to the piston ~~(30)~~, ~~said arrangements being characterized in that~~ wherein the first and second end portions ~~(40a, 40b)~~ of the bearing hub ~~(40)~~ are each defined by a respective bushing extension ~~(45, 46)~~ affixed in the interior of the bearing hub ~~(40)~~ and presenting an end portion ~~(45a, 46a)~~, the end portion of the respective bushing extensions ~~which~~ projects axially outwards from the bearing hub ~~(40)~~, so as to be elastically and radially deformed outwardly when pressed by a confronting portion of the crankshaft ~~(50)~~, which presents a coaxiality deviation of ~~its~~ the axis (Y1) of the crankshaft in relation to the axis (X1) of the radial bearing ~~(41)~~.

2- The ~~bearing arrangements~~refrigeration compressor, as set forth in claim 1, ~~characterized in that~~wherein each of the end portions ~~(45a, 46a)~~ of the bushing extensions ~~(45, 46)~~ defines, with a confronting part of the crankshaft ~~(50)~~, in the elastically deformed condition, a confronting region (CR) of surfaces having dimensions, in the axial and circumferential directions, capable of maintaining, in said regions, an oil film which separates, at least partially, the surfaces which form said confronting region (CR) of surfaces.

3- The refrigeration compressor~~bearing arrangements~~, as

set forth in claim 2, ~~characterized in that~~ wherein the end portion ~~(45a, 46a)~~ of the respective bushing extensions ~~(45, 46)~~ presents the same radial thickness of the remainder of the bushing extension ~~(45, 46)~~.

4- The refrigeration compressor~~bearing arrangements~~, as set forth in any of claims 2 or 3, ~~characterized in that~~ wherein the confronting region (CR) of surfaces takes a nearly semi-elliptical form, with ~~its~~ an end edge of the confronting region of surfaces coinciding with the marginal edge of the adjacent end portion ~~(45a, 46a)~~ of the respective bushing extension ~~(45, 46)~~.

5- The refrigeration compressor~~bearing arrangements~~, as set forth in any of claims 1 to 4, ~~characterized in that~~ wherein the bushing extensions ~~(45, 46)~~ define end parts of a single piece.

6- The refrigeration compressor~~bearing arrangements~~, as set forth in any of claims 1 to 5, in which the connecting rod ~~(60)~~ has a larger eye ~~(61)~~ mounted around the eccentric end portion ~~(55)~~ of the crankshaft ~~(50)~~ and being coupled, by an opposite end, to the piston ~~(30)~~, ~~characterized in that~~ wherein the end portion of the larger eye ~~(61)~~ of the connecting rod ~~(60)~~, facing the crankcase ~~(10)~~, is defined by a bushing extension ~~(65)~~ affixed in the interior of the larger eye ~~(61)~~ and presenting an end portion ~~(65a)~~, ~~which~~ the end portion of the bushing extension affixed in the interior of the larger eye projects axially outwards from the larger eye ~~(61)~~, so as to be elastically and radially deformed outwardly when pressed by a confronting portion of the eccentric end portion ~~(55)~~ of the crankshaft ~~(50)~~ which presents a coaxiality deviation of its axis (Y2) in relation to the axis (X2) ~~do~~ of the larger eye (61).

7- The refrigeration compressor~~bearing arrangements~~, as

set forth in claim 6, ~~characterized in that~~ wherein the end portion ~~(65a)~~ of the bushing extension affixed in the interior of the larger eye ~~(65)~~ defines, with the confronting portion of the eccentric end portion ~~(55)~~ of the crankshaft ~~(50)~~ and in the elastically deformed condition, a second confronting region (CR) of surfaces, having dimensions, in the axial and circumferential directions, capable of maintaining, in said second region~~s~~, an oil film which separates, at least partially, the surfaces which form said second confronting region (CR) of surfaces.

8- The refrigeration compressor~~bearing arrangements~~, as set forth in claim 7, ~~characterized in that~~ wherein the end portion ~~(65a)~~ of the bushing extension affixed in the interior of the larger eye ~~(65)~~ presents the same radial thickness of the remainder of the bushing extension affixed in the interior of the larger eye ~~(65)~~.

9- The refrigeration compressor~~bearing arrangements~~, as set forth in any of claims 6 to 8, ~~characterized in that~~ wherein the second confronting region (CR) of surfaces takes a nearly semi-elliptical form, with ~~its~~ an end edge of the second confronting region (CR) of surfaces coinciding with the adjacent marginal edge of one of the parts of radial bearing ~~(40a, 40b, 45a, 46a)~~ and of the larger eye ~~(61)~~.

10- The refrigeration compressor~~bearing arrangements~~, as set forth in any of claims 1, 2, 4 to 7, and 9, ~~characterized in that~~ wherein the end portion ~~(45a, 46a, 65a)~~ of each bushing extension ~~(45, 46, 65)~~ presents a radial thickness reduced in relation to that of the remainder of the respective bushing extension ~~(45, 46, 65)~~.

11- The refrigeration compressor~~bearing arrangements~~, as

set forth in claim 10, ~~characterized in that~~wherein the reduced radial thickness of the end portion ~~(45a, 46a, 65a)~~ of at least one of the bushing extensions ~~(45, 46, 65)~~ is constant.

12- The refrigeration compressor~~bearing~~, as set forth in any of claims 1 to 11, ~~characterized in that~~wherein at least one of the bushing extensions ~~(45, 46, 65)~~ is made in a metal alloy selected from iron, aluminum and nickel.

13- The refrigeration compressor~~bearing arrangements~~, as set forth in claim 12, ~~characterized in that~~wherein at least one of the bushing extensions ~~(45, 46, 65)~~ is made in a self-lubricating material defined by a metallic alloy matrix incorporating a dispersion of non-metallic solid lubricant.

14- The refrigeration compressor~~bearing arrangements~~, as set forth in claim 12, ~~characterized in that~~ wherein at least one of the bushing extensions ~~(45, 46, 65)~~ is provided with a surface treatment for reducing wear and/or the friction coefficient.

15- The refrigeration compressor~~bearing arrangements~~, as set forth in any of claims 1 to 11, ~~characterized in that~~ wherein at least one of the bushing extensions ~~(45, 46, 65)~~ is formed in a single material defined by an engineering polymer.

16- The bearing arrangements, as set forth in any of claims 1 to 11, ~~characterized in that~~ wherein at least one of the bushing extensions ~~(45, 46, 65)~~ comprises an inner anti-friction layer (AF), obtained in a polymeric material and ~~which~~ the at least one of the bushing extensions is housed and retained in the interior of a jacket (S) in a metallic material and to be affixed inside the bearing hub~~(40)~~.

The compliant regions, in the end portions of the bearing hub 40, allow that the radial deformation of the bushing extensions 45, 46 produces a confronting region CR of surfaces, whose axial and circumferential dimensions are increased from a nominal condition of linear tangency between said parts, to a support condition provided by axial and circumferential extensions sufficient to avoid interruption of the oil film.

As illustrated in figures 4, 5 and 6, the confronting region CR of surfaces of the deformed end portion 45a, between the crankshaft 50 and the bushing extension 45, in the first end portion 40a of the bearing hub 40, takes a nearly semi-elliptical form, with its end edge coinciding with the marginal edge of the adjacent end portion 45a of the respective bushing extension 45. It should be understood that the confronting region of surfaces, between the crankshaft 50 and the bushing extension 46, in the second end portion 40b of the bearing hub 40, present, according to the present invention, the same configuration illustrated in figures 5 and 6.

Thus, it can be said that the invention produces a confronting region CR of surfaces, between the crankshaft 50 and the bushing extensions 45, 46 of the radial bearing 41, in the first and second end portions 40a, 40b of the bearing hub 40, take a nearly semi-elliptical form, with its end edge coinciding with the marginal edge of the adjacent end portion 45a, 46a of the respective bushing extension 45, 46.

Therefore, the solution proposed by the invention allows increasing the effective bearing area between said relatively moving parts of crankshaft 50 and of radial bearing defined by the bushing extensions 45, 46, from a condition of tangential contact in pieces, assumed as rigid, according to a circumferential arc line, to a condition in which said contact occurs according to the confronting region CR of surfaces, which is increased in