

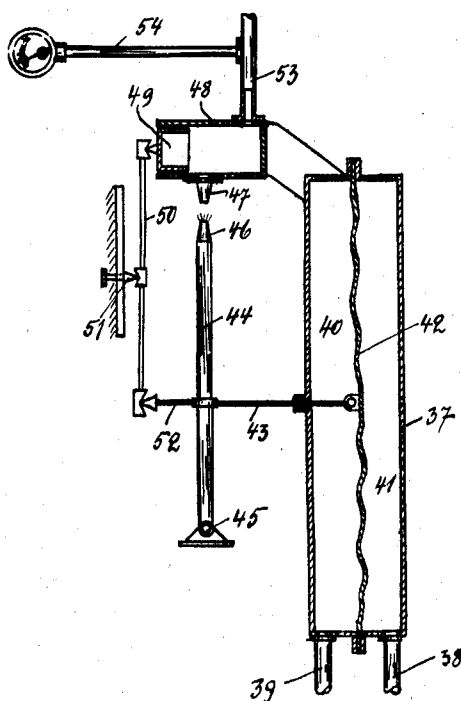
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1,558,530

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DEVICE FOR INCREASING SMALL PRESSURE DIFFERENCES

Original Filed Feb. 29, 1924



Inventor:
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UNITED STATES PATENT OFFICE.

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DEVICE FOR INCREASING SMALL PRESSURE DIFFERENCES.

Original application filed February 29, 1924, Serial No. 696,103. Divided and this application filed February 20, 1925. Serial No. 10,718.

To all whom it may concern:

Be it known that I, GUIDO WÜNSCH, a citizen of the German Empire, residing at 2 Stindestrasse, Steglitz, near Berlin, Germany, have invented certain new and useful Improvements in or Relating to a Device for Increasing Small Pressure Differences, of which the following is a specification.

10 My application for Letters Patent Serial No. 696,103 of which the present application is a divisional one relates to a process and means for the frictionless transmission of movement from a moving primary element to a secondary element to be moved, which can be utilized in various branches of industry. According to the said invention a very slight movement is transmitted from a primary element, for instance such as is usually automatically effected on the said element by an instrument, to a secondary controlling or setting element or to a servomotor, whereupon the said secondary element or servomotor effects the required operation.

15 The present invention relates to a practical application of the devices claimed in the said copending application and shows how the said process and means may be used in connection with devices for increasing small pressure differences.

20 The accompanying drawing illustrates diagrammatically a device for increasing small pressure differences according to the invention.

25 In the drawing 37 is a vessel to which are supplied by means of two pipes 38 and 39 the two pressures, the difference between which is to be measured or utilized for producing a movement. The pressure which is supplied through the two pipes spreads in the two chambers 40 and 41 into which the vessel 37 is divided by a diaphragm 42. The diaphragm 42 is connected by a rod 43 to a pipe 44 which corresponds to the pipe α or α' of Figures 1-3 of my copending application for U. S. Letters Patent; the pipe is freely rotatable about a pivot 45, and a compressed gas or a liquid under pressure flows through it. The outlet nozzle 46 for the compressed air or compressed gas is mounted opposite an inlet opening 47 which

leads to a cylinder 48. In the latter is adapted to move a piston 49 which may be pivoted to one end of a two-armed lever 50 or engage with the same by means of a knife edge. The two-armed lever 50 oscillates about a knife edge 51, and its other end is connected by a rod 52 to the pipe 44. From the cylinder 48 a pipe 53 leads to that point where the pressure difference is to be utilized, and to the pipe 53 could also be connected a pipe 54 leading to a pressure gauge or the like.

The working of the device described is as follows:

30 As long as the pressures passing through the pipes 38 and 39 into the chambers 40 and 41 remain equal to each other, the diaphragm will remain at rest. If the pressure changes, for instance if the pressure in the pipe 38 increases, the pressure in the chamber 41 will also increase. The diaphragm 42 will then be moved to the left in the figure and in that way will move the pipe 44 further to the left. Assuming that the pipe 44 was in such a position that the nozzle 46 was only partially in front of the inlet opening 47, the movement of the pipe 44 will bring the nozzle 46 further in front of the opening 47. More liquid under pressure will therefore pass into the cylinder 48, the pressure in the latter will therefore become higher and the piston 49 will be moved. The latter will then turn the lever 50 about the knife edge 51, owing to which the pipe 44 will be turned back again. In the end, a state of equilibrium will be reached in which the pressure in the cylinder 48 will be at a certain ratio to the excess of pressure in the chamber 41 over the pressure in the chamber 40. By suitable choosing the pressure of the compressed air admitted through the pipe 44, a comparatively high pressure can be produced in the cylinder 48 owing to the smallness of the diameter of the piston 49 relatively to the diameter of the diaphragm 42, the said pressure can then be read on the pressure gauge or transmitted through the pipe 53 to the point of use. If it is desired to increase the ratio of transmission still more, this could be done by suitably shifting the pivot 51 for the lever 50.

I wish it to be understood that I have shown and described merely one example of the invention in connection with a certain system of a device for increasing small pressure differences. However it will be evident to those skilled in the art that it may be used also in connection with other kinds of such plants without departing from the spirit of the invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In a device for increasing small pressure differences for the purpose of measuring or utilizing them in combination a pipe through which flows a pressure medium, means adapted to transmit the pressure variations to said pipe and thereby move it, a cylinder having fixed inlet opening opposite to the free movable opening of said pipe, a piston within said cylinder connected with said pipe and producing a return movement of the said pipe opposed to its forward movement by said means, so that the pressure in the cylinder becomes proportional to the pressure difference and means for measuring or utilizing the pressure within said cylinder.

2. In a device for increasing small pressure differences for the purpose of measuring or utilizing them in combination a pipe through which flows a pressure medium, means adapted to transmit the pressure variation to said pipe and thereby move it, further means having a fixed inlet opening opposite to the free movable opening of said pipe, the pressure within said means being varied according to the said movable opening being more or less opposite to said inlet opening and producing a return move-

ment of the said pipe opposed to its forward movement by said first mentioned means, and means for measuring or utilizing the pressure within said further means.

3. In a device for increasing small pressure differences for the purpose of measuring or utilizing them in combination a pipe through which flows a pressure medium a diaphragm adapted to transmit the pressure variations to said pipe and thereby move it, a cylinder having fixed inlet opening opposite to the free movable opening of said pipe, a piston within said cylinder connected with said pipe and producing a return movement of the said pipe opposed to its forward movement by said diaphragm, so that the pressure in the cylinder becomes proportional to the pressure difference and means for measuring or utilizing the pressure within said cylinder.

4. In a device for increasing small pressure differences for the purpose of measuring or utilizing them in combination a pipe through which flows a pressure medium, means adapted to transmit the pressure variations to said pipe and thereby move it, a cylinder having fixed inlet opening opposite to the free movable opening of said pipe, a piston within said cylinder, a lever having adjustable lever arms connecting said piston with said pipe and producing a return movement of the said pipe opposed to its forward movement by said means, so that the pressure in the cylinder becomes proportional to the pressure difference and means for measuring or utilizing the pressure within said cylinder.

In testimony whereof I have affixed my signature.

GUIDO WÜNSCH.