Nov. 20, 1956

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ARRANGEMENT FOR THE TRANSPOSITION OF A HOLLOW CYLINDRICAL SLIDE

2,771,239

Filed May 15, 1952

2 Sheets-Sheet 1

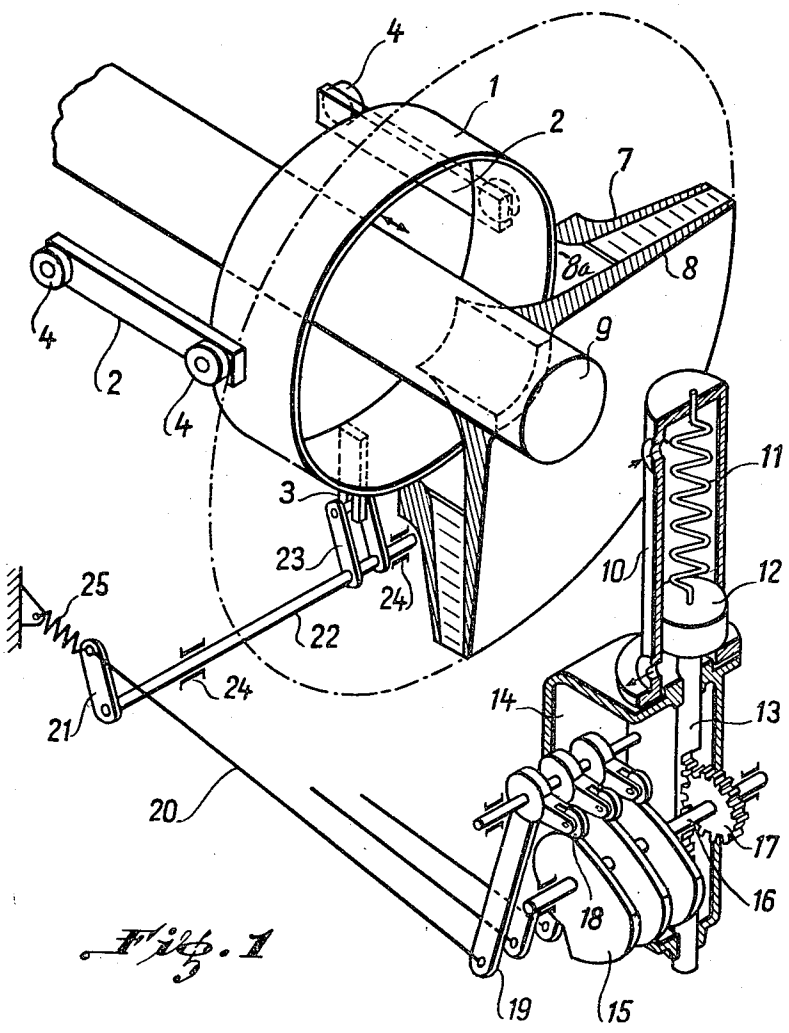


Fig. 1

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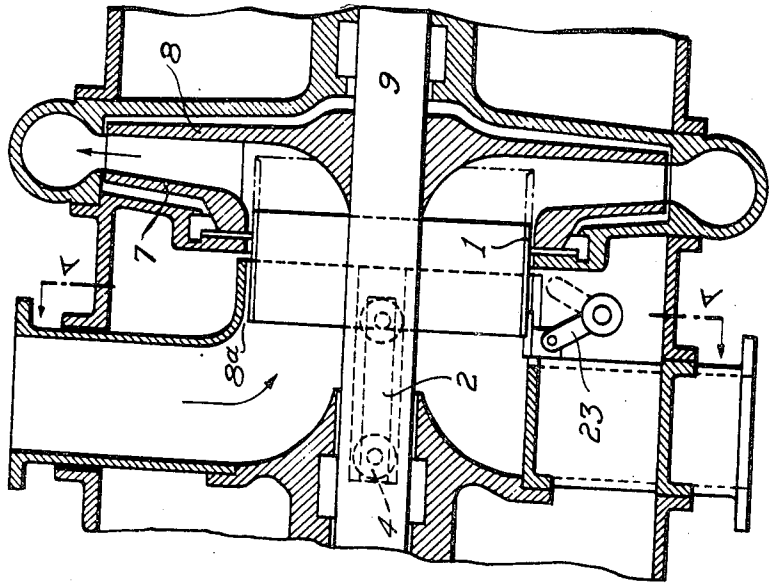


Fig. 2

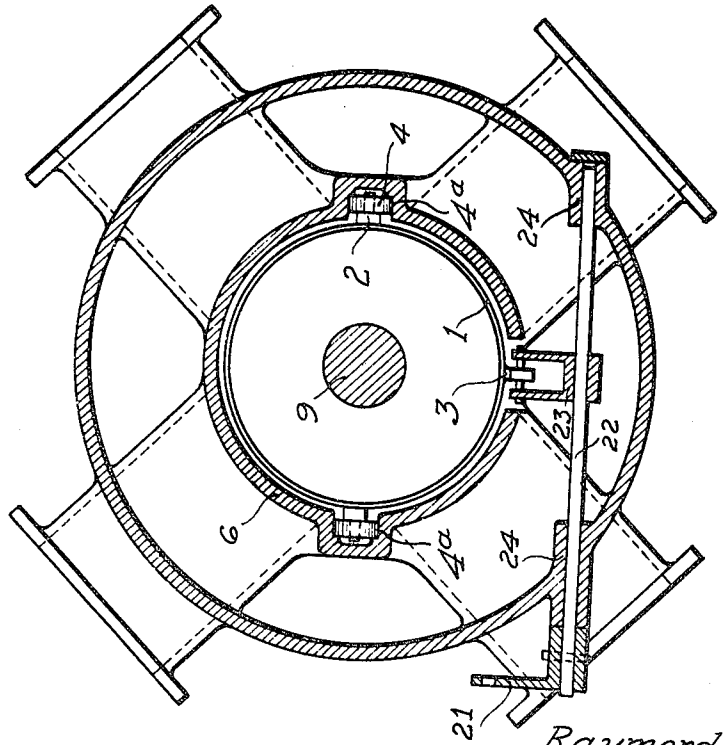


Fig. 3

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ARRANGEMENT FOR THE TRANSPOSITION OF A HOLLOW CYLINDRICAL SLIDE

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Application May 15, 1952, Serial No. 287,991

Claims priority, application Switzerland June 8, 1951

4 Claims. (Cl. 230—114)

It is known that in a radial turbo-compressor the pumping limit can be shifted by means of a suction throttling process or that pumping can be entirely prevented. Said throttling may be accomplished, at least in one stage of the compressor by means of a hollow cylinder transposable in the axial direction by means of which the cross section of the intake for the medium may be reduced at least at the output at which pumping would occur.

The present invention concerns an arrangement for the shifting of such a hollow cylindrical shell in the intake channel of a radial wheel for the purpose of influencing the pumping limit of at least one stage of a turbo-compressor. In the present invention the slidable shell is designed as a movable frame transposable by means of a linkage system.

In the drawings, Fig. 1 shows diagrammatically in perspective a form of embodiment of the invention for one stage of a turbo-compressor with coordinate drive box and servomotor.

Fig. 2 is a cross-sectional elevational view, showing the turbo-compressor fluid impelling wheel, the fluid suction opening thereof, and the improvements of the invention with relation to said opening.

Fig. 3 is a cross-sectional transverse elevational view, taken on line A—A of Fig. 2.

The hollow cylindrical shell **1** forms a mobile frame with its two carriers **2** and the four riding wheels **4**, which frame is guided in grooves of tracks **4***a* of the housing of the intake connection, as shown in Fig. 2, and can be transposed axially by means of a lobe **3** fixed at the bottom of the shell **1**. The shell **1** is surrounded by a covering disc **7** of a hollow wheel **8** on the compressor shaft **9** with the required play.

In the throttling process the shell **1** is introduced into the range of the suction opening **8***a* of the radial wheel **8** so as to decrease the cross section for the intake of the medium. The mechanism for affecting the movement of the shell **1** is herein shown for the actuation of three throttling shells **1** of a multistage compressor. It consists of a pressure controlled servomotor with a cylinder **10**, a tension spring **11** and a piston **12** connected to a rack **13**. In the gear case **14** there are three cam discs **15** on the cam shaft **16** which is driven by a gear wheel **17** by means of a rack **13**. The roller **18** of the lever **19** rolls off on the cam disc **15** and determines the position of the shell **1** by means of a linkage comprsing a drawbar **20**, the lever **21**, the shaft **22**, the lever **23** and the lobe **3**. The bearings **24** are part of the compressor housing. The drawbar **20** is acted on by the tension spring **25** to cause the roller **18** to be pressed continuously on its cam.

Having thus described my invention, I claim:

1. A compressor having the combination of a rotatable hollow wheel for receiving and impelling fluid, a shaft for carrying and driving said wheel, said wheel having an opening surrounding said shaft for suction intake of said fluid, a cylindrical shell concentric with and surrounding said shaft and movable axially into and out of said opening for regulating the extent of said suction, said shell carrying a series of guide rollers, a housing for said wheel having tracks parallel to the axis of said shaft and shell for receiving and guiding said rollers, and means for moving said shell.

2. A compressor having the combination of a rotatable hollow wheel for receiving and impelling fluid, a shaft for carrying and driving said wheel, said wheel having an opening surrounding said shaft for suction intake of said fluid, a cylindrical shell concentric with and surrounding said shaft and movable axially into and out of said opening for regulating the extent of said suction, said shell carrying a series of guide rollers, a housing for said wheel having tracks parallel to the axis of said shaft and shell for receiving and guiding said rollers, a linkage mechanism including a cam follower for moving said shell, a disk cam pressing said follower, a spring drawing said linkage to exert counter pressure against said cam, and a shaft for rocking said cam.

3. In a radial flow centrifugal compressor, a rotor having an axial intake chamber, a shaft for said rotor, and means influencing the pumping limit of said compressor comprising a cylindrical shell in said intake chamber concentric with said shaft and movable axially to vary the cross-sectional area of said intake chamber, and a carriage supporting said shell and provided with guide rollers, said compressor including a housing provided with longitudinal guide channels within which said rollers operate.

4. In a compressor, the elements defined in claim 3, in combination with a means for moving said shell, comprising a cam shaft, a cam thereon, a spring-pressed follower engaging said cam, and mechanism responsive to movements of said follower for shifting said shell axially.

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