

Dec. 31, 1940.

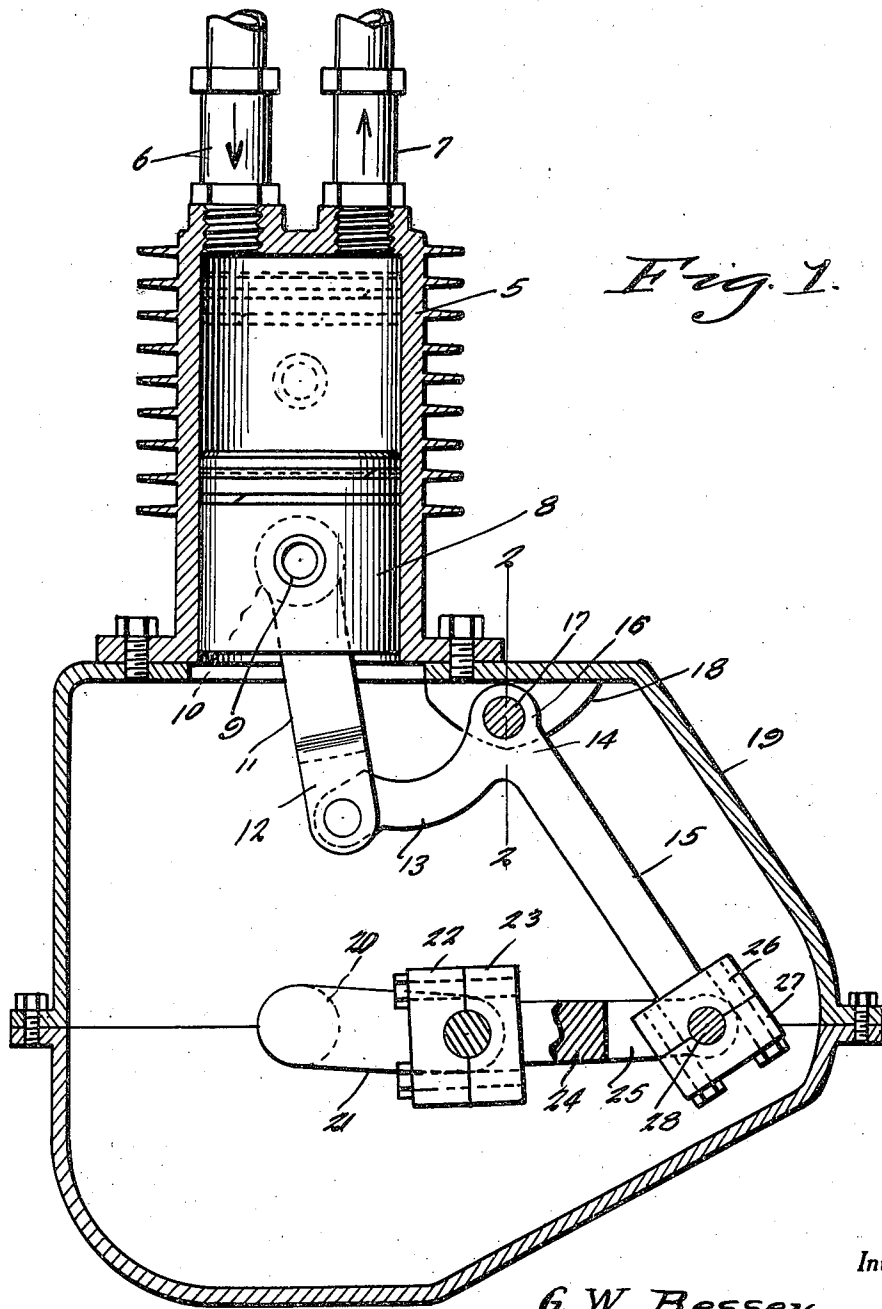
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2,226,800

CRANK MECHANISM.

Filed Nov. 29, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

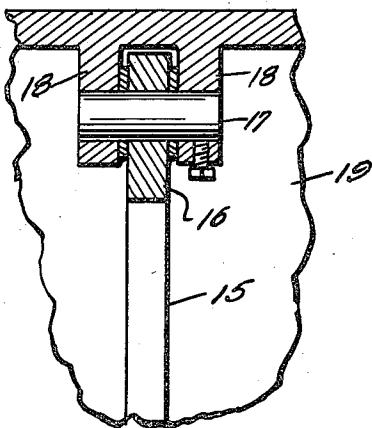


Fig. 3.

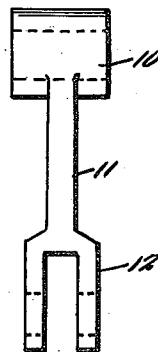


Fig. 5.

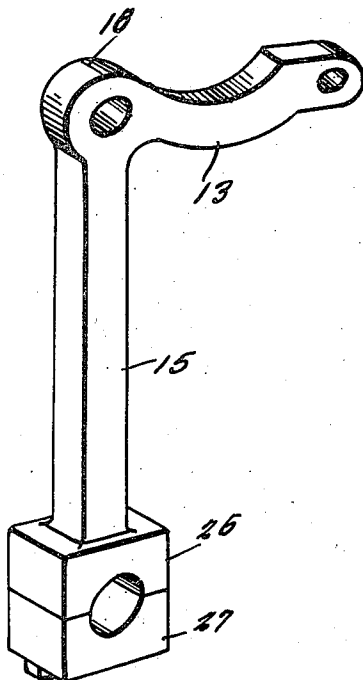
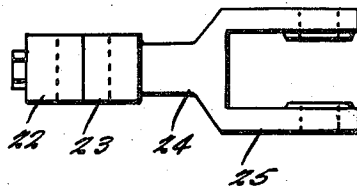


Fig. 4.



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CRANK MECHANISM

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Application November 29, 1938, Serial No. 243,026

1 Claim. (Cl. 74—40)

This invention appertains to new and useful improvements in compressors and more particularly to the crank drive mechanism thereof.

The principal object of the present invention is to provide a crank and lever assembly which in operation in conjunction with the usual piston and crank shaft will substantially increase the power effort of the piston.

During the course of the following specification other objects and advantages of the invention will become apparent to the reader of the following specification.

In the drawings—

Figure 1 represents a vertical sectional view through a compressor cylinder and its associate mechanism.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is a side elevational view of the connecting rod.

Figure 4 is a top plan view of the link.

Figure 5 is a perspective view of the lever.

Referring to the drawings, wherein like numerals designate like parts, it can be seen in Figure 1 that numeral 5 represents the usual compressor cylinder having the inlet pipe 6 and the outlet pipe 7 and in which the piston 8 operates. The piston 8 is provided with the wrist pin 9 extending through the collar 10 of the connecting rod 11, the lower end of which is bifurcated as at 12 to straddle the short leg 13 of the lever 14, which lever also includes the elongated depending leg 15. This lever is of general inverted L-shape with the short leg 13 curved longitudinally in the manner substantially shown in Figure 1. Furthermore, the heel portion 16 is bored to form an opening for receiving the fulcrum of pin 17 which extends between the ears 18 depending from the top of the crank case 19.

Numeral 20 represents the crank case and numeral 21 represents one of the cranks which extend between the bearing blocks 22—23 at one end of the link 24. The other end of the link 24 is bifurcated as at 25 to straddle the bearing blocks 26—27 at the lower end of the lever arm 15, this bifurcated end 25 of the link 24 having the pin 28 disposed therethrough and through the bearing blocks 26—27. Thus the piston is connected to the lever 14 by the connecting rod 11, while the lever 16 is also connected to the crank shaft 20 by the link 24.

It can now be seen that as the crank 21 swings downwardly from the three o'clock position shown in Figure 1 to the vertical or six o'clock position,

the effect of the lever 16 to increase power of compression is substantially nil. However, as the crank 21 moves upwardly from the six o'clock position action starts to take place on the short side of the lever 16 with the lever operating on the fulcrum pin 17 to the end that a remarkable increase in power of compression is obtained.

This mechanism is adaptable for use in pumping air, gas and various liquids. The mechanism incorporates only one fulcrum between the crank shaft and piston, as illustrated in the drawings, but obviously two or more levers may be linked together to meet the desired application.

Manifestly, the ratio between the short leg of the lever 14 and its radius increases efficiency in the same manner as the radius of the opposite end or the long arm of the lever 14 between the six and nine o'clock positions. The downstroke of the piston represents less than one-third of the crank travel, but about two-thirds of the crank travel represents the compression stroke which results in a lap where two cylinders are used. If three cylinders are used, this lap would complete the crank travel and in this way give an even power input as well as an even flow of compressed substance.

By changing the location of the points of oscillation or bearings as well as the length of the crank, the radius will become changed and in this manner can be applied for different applications, at the same time changing the compression radius of the crank.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having described the invention, what is claimed as new is—

In a compressor, a cylinder, a piston operative in the cylinder, a drive shaft including a crank and being located on a plane with the longitudinal axis of the cylinder and piston, a bell crank fulcrumed at a point adjacent the crank end of the cylinder, said bell crank consisting of a long leg and a short leg, a pitman extending from the piston and pivotally connected to the short leg of the bell crank, the long leg of the bell crank being longer than the distance between the fulcrum point of the bell crank and the axis of the drive shaft, and a pivotal link between the outer end of the long leg and the crank, said link being longer than the distance of throw of the crank.

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