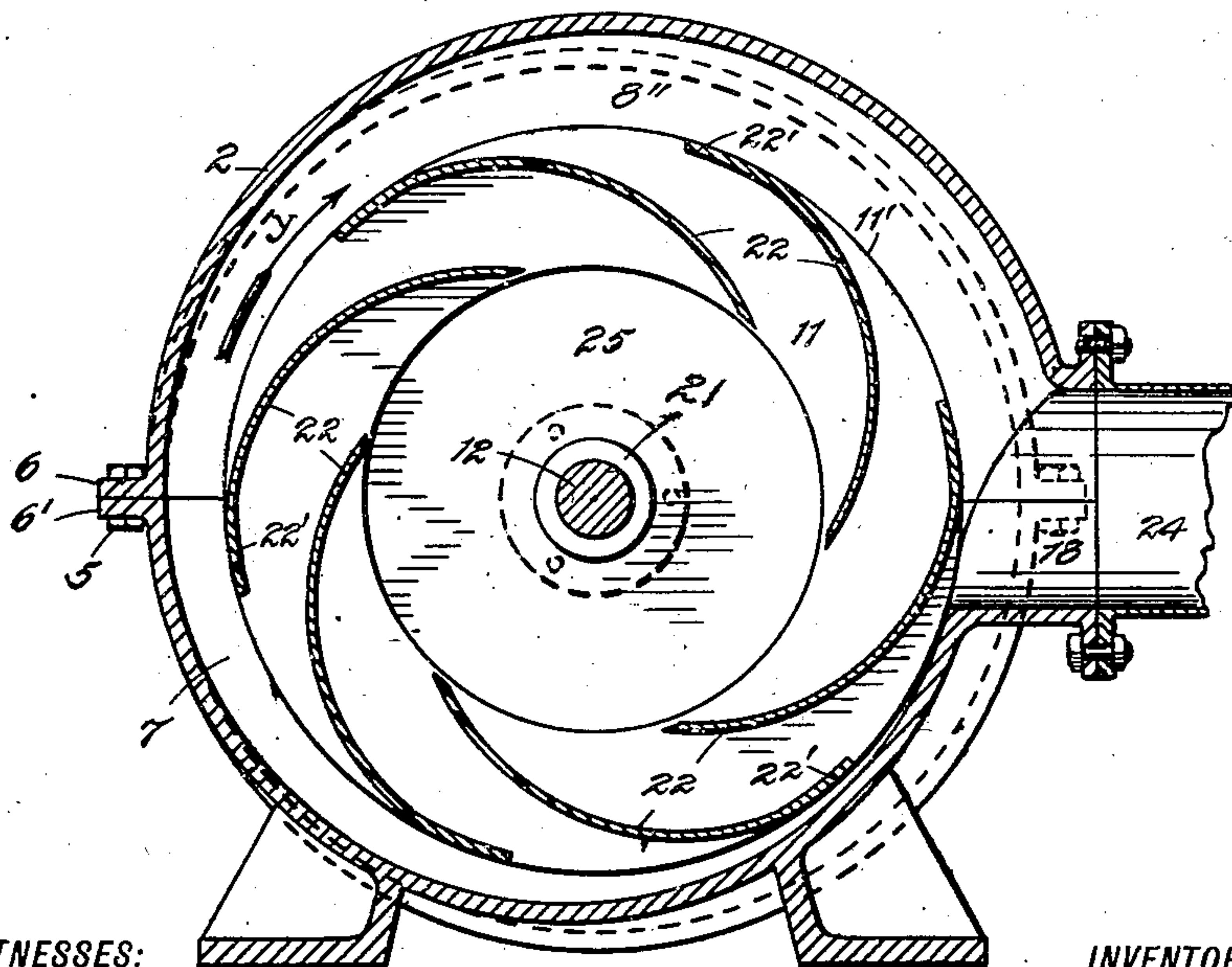
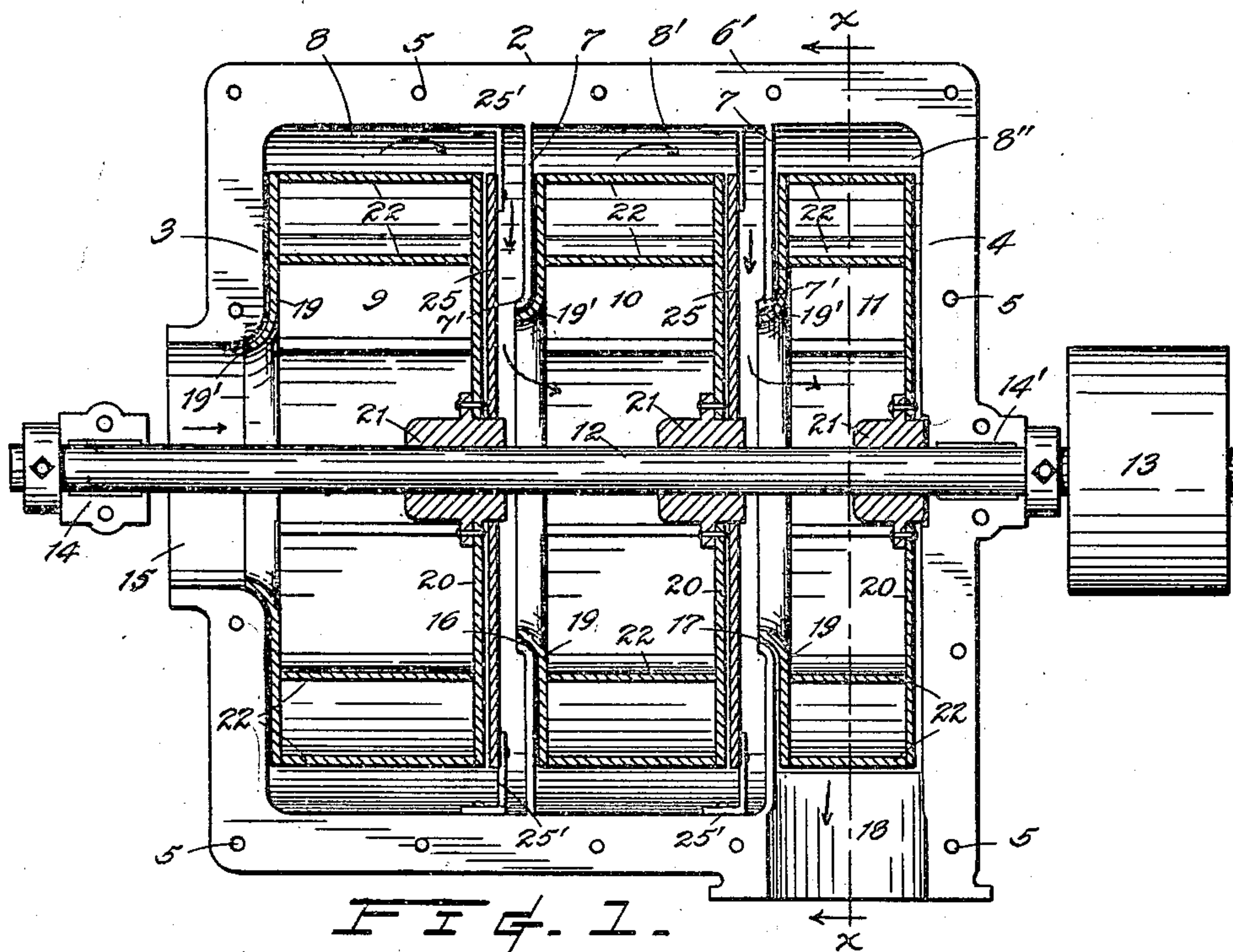


No. 860,905.

PATENTED JULY 23, 1907.

J. F. DAVIDSON.  
AIR COMPRESSOR.

APPLICATION FILED NOV. 3, 1905.



WITNESSES:

Chas E. S. Burch.  
Guy M. Thompson.

FIG. 2.

INVENTOR

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BY

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# UNITED STATES PATENT OFFICE.

JOHN F. DAVIDSON, OF GRANITE FALLS, WASHINGTON.

## AIR-COMPRESSOR.

No. 860,905.

Specification of Letters Patent.

Patented July 23, 1907.

Application filed November 3, 1905. Serial No. 285,757.

*To all whom it may concern:*

Be it known that I, JOHN F. DAVIDSON, a citizen of the United States, residing at Granite Falls, in the county of Snohomish and State of Washington, have  
5 invented certain new and useful Improvements in Air-Compressors, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a plan view, partly in section, of devices  
10 embodying my invention with the upper portion of the casing removed. Fig. 2 is a cross sectional view of the same on line  $x-x$ , with the top of the casing in place.

The principal object of my invention is the provision of a simple and inexpensively constructed air  
15 compressor or compound blower which will be extremely efficient in operation.

To this and other ends, the invention consists in the novel construction, arrangement, and adaptation of devices as will be particularly described hereinafter.

20 In said drawings, the reference numeral 2 designates a casing of substantially cylindrical form and provided with a front head 3 and a rear head 4. For convenience in manufacturing and assembling the operative parts the casing is desirably made of an upper and a lower  
25 section which are secured to each other by bolts 5 passing through marginal flanges 6, 6' provided upon the meeting edges of the respective said sections. Interiorly, the casing is provided with annular partitions 7 to divide the same into a plurality of compartments,  
30 8, 8', 8'', in which are respectively positioned the rotary blowers 9, 10 and 11 which are fixedly secured to a shaft 12 extending axially through the casing and driven by any suitable means such as by a power-belt passing around a pulley 13 upon the shaft. The shaft is  
35 mounted in suitably disposed journal boxes 14 and 14' of which the latter is preferably formed in the rear head 4 of the casing and the other exteriorly of the casing and adjacent to the front head 3. An air inlet-opening 15 is provided centrally of the front head and in line with  
40 the openings 16 and 17 of the said partitions, while an outlet opening 18 is provided in the peripheral wall of the casing at the rearmost compartment 8''. This wall is advantageously formed of a spiral shape to provide a  
45 regularly enlarging conduit, about the outer circumference 11' of the blower 11, and terminating at said outlet opening. Each of the blowers is comprised of an annular plate 19 at its inlet end, a disk 20 at its other end which is reliably secured to a fixed hub 21 upon the shaft, and buckets 22 placed intermediate of and rigidly secured to the plate and disk. The buckets are  
50 severally formed of a curved configuration and terminate, desirably, at their outer ends in concentric extensions 22' for the purpose of partially obstructing, within the various blowers, the outward flow of the fluid  
55 to create greater pressures than would otherwise prevail. To prevent a retrograde movement of the air between

the various said compartments, the inner peripheries 7' and 19' of both said partitions and the adjacent plates of the blowers are flanged forwardly as shown to direct the inflow of air towards the blower to be acted upon  
60 by the buckets. This feature of the invention is one of considerable moment and permits of the assembling of a plurality of blowers in a single casing. In practice the blowers may advantageously be made of equal diameters and of successively diminishing widths from  
65 the intake to the delivery end of the apparatus; and, to reduce the friction of the centripetal currents of air passing from one blower to another, a stationary disk-plate 25 may desirably be placed in close proximity of the rear ends of all but the last blower. These plates  
70 are of the same diameters as the blower disks 20, or approximately so, and are reliably secured to the casing by radially arranged angle-attachments 25'. The blowers are rotated in unison, in the direction indicated by  
75 arrow  $y$  in Fig. 2, and, by the centrifugal force, air is successively drawn axially into each blower through the central opening in the adjacent inlet head or partition, as the case may be, and delivered into the spaces surrounding the several blowers which communicate  
80 with the next following compartment by the aforesaid central openings of the partitions, excepting in the rearmost compartment where the compressed air is discharged through the opening 18, wherefrom it is conducted through a suitable pipe, such as 24, to a reservoir or elsewhere.

85 The advantages of an air-compressor constructed in accordance with my invention, reside in its compactness, the compounding of the blower elements whereby the pressure is gradually built up from the inception of the air to its ultimate delivery, and finally to the peculiar construction of the blower elements.

I do not wish to be understood as confining myself to the specific illustrated manner of carrying out my invention, for changes may obviously be made therein without departing from its spirit or sacrificing its advantages. For example, the blower buckets may be  
95 varied in shape, arrangement and number to meet special conditions in different apparatus as well as in the different compartments of a single one. Furthermore, the number of blowers used in an apparatus may be  
100 two or more according to the desired quantity and density of the compressed air.

Having thus described my invention, what I claim as new and desire to secure by Letters-Patent, is—

1. An air compressor comprising a casing having an air inlet and discharge, a shaft in the casing, a plurality of  
105 blowers, each consisting of an end disk on the shaft, an annular plate secured on said shaft and spaced from said disk and formed with a central opening having its inner periphery flanged outwardly, buckets formed of curved  
110 members secured to said disk and plate, a disk plate disposed adjacent said end disk, means for stationarily supporting said disk plate at a distance from the casing, par-



partitions to separate said blowers, each partition being formed with a central opening having its inner periphery flanged outwardly and being disposed to surround said flanged portions of the blower plates.

- 5 2. An air compressor composed of a casing, a pair of partitions in said casing dividing the same into three compartments of decreasing size, an air inlet and discharge, each partition being formed with a central opening having its inner periphery flanged outwardly, blowers of decreasing size in said compartments, each blower having an annular plate formed with a central opening having its inner periphery flanged outwardly, two of said plates having their flanged portions disposed adjacent the flanged portions of the partitions, a disk plate for the rear of two 10 of said blowers, said disk plates being of the same diameters as the blowers, and an angle attachment secured to the casing for stationarily supporting said disk plates.
- 15 3. An air compressor comprising a casing having an air inlet and discharge, a shaft in the casing, a plurality of

blowers of decreasing size, each blower being composed of 20 an end disk secured on the shaft, a plate also secured on the shaft spaced from said disk and formed with a central opening having its inner periphery flanged outwardly, buckets formed of members secured to said disk and plate, a disk plate to the rear of the largest and intermediate 25 blowers of approximately the same size as said end disks thereof, partitions located adjacent the plate of all but the largest blower, each partition being formed with a central opening having its inner periphery flanged outwardly and surrounding said flanged portions of said plate, the 30 flanged portion of the plate of the largest blower extending in said inlet.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN F. DAVIDSON.

Witnesses:

S. H. YERKES,  
O. W. KROOK.