J. B. & A. LUKOMSKI.

COMPRESSOR.

APPLICATION FILED MAY 10, 1915.

1,176,843.

Patented Mar. 28, 1916.

2 SHEETS—SHEET 1.

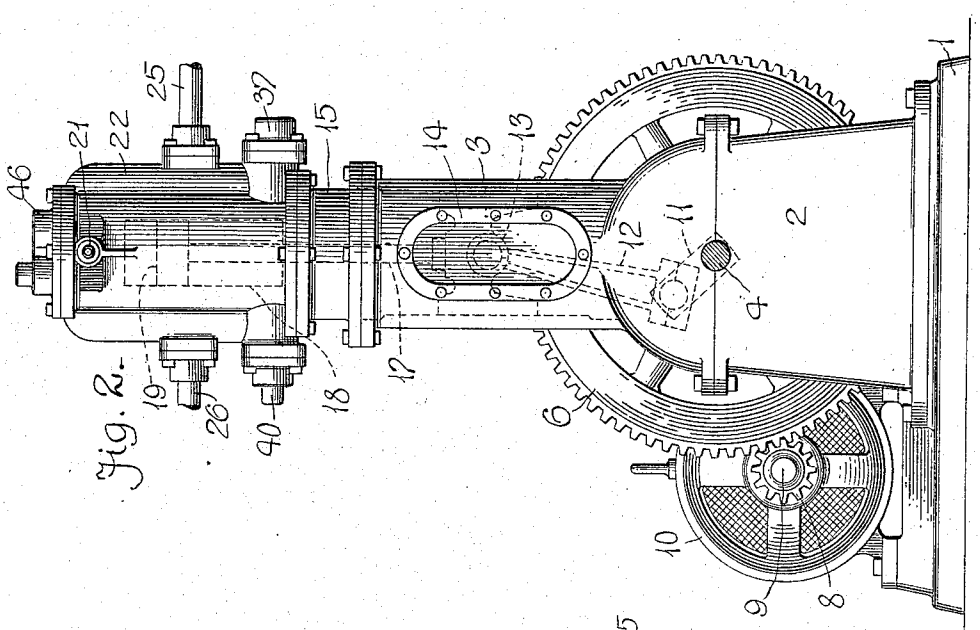


Fig. 2.

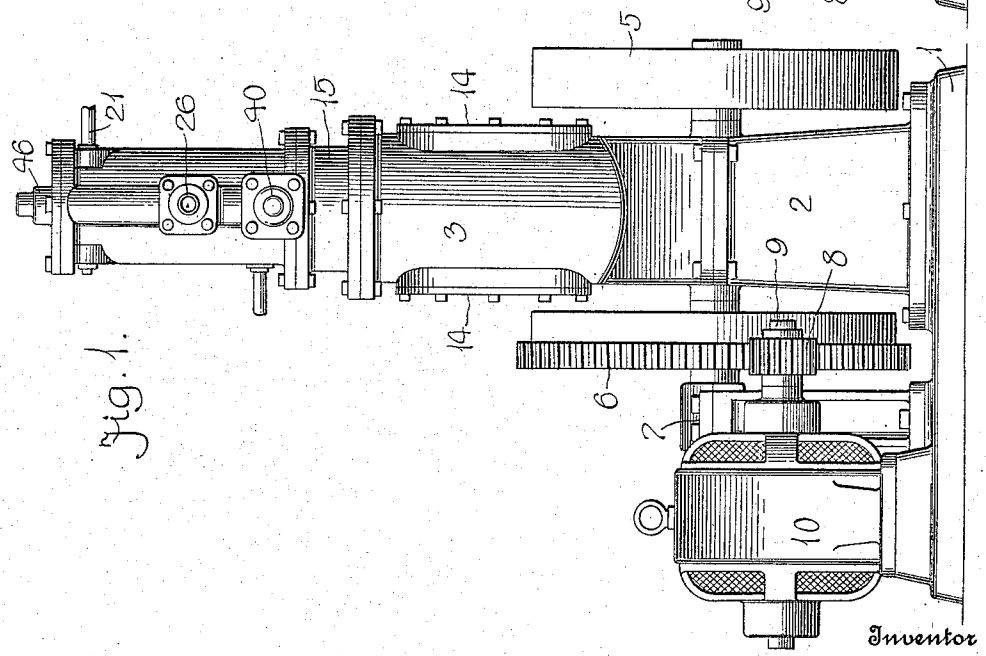


Fig. 1.

Witnesses

Chas. W. Stauffiger
Anna M. Dorr

Inventor

Anthony Lukomski,
John B. Lukomski.

By Barbett & Bechtel

Attorneys

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

J. B. & A. LUKOMSKI.

COMPRESSOR.

APPLICATION FILED MAY 10, 1915.

1,176,843.

Patented Mar. 28, 1916.

2 SHEETS—SHEET 2.

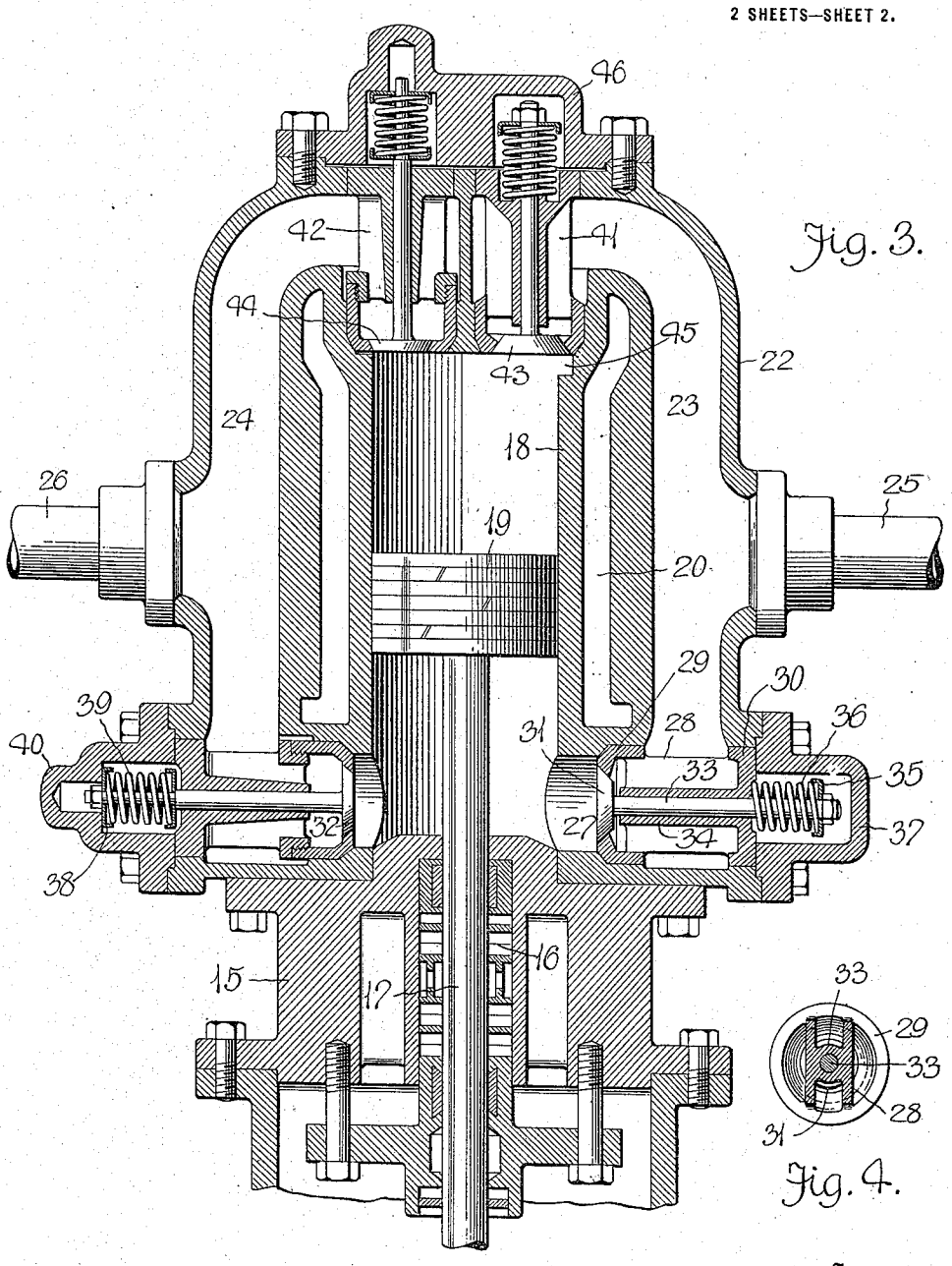


Fig. 3.

Fig. 4.

Witnesses
Anna M. Dorr.
Chas. W. Stauffiger

Inventor
Anthony Lukomski
John B. Lukomski

By Cartwright & Cartwright
Attorneys

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN B. LUKOMSKI AND ANTHONY LUKOMSKI, OF DETROIT, MICHIGAN.

COMPRESSOR.

1,176,843. Specification of Letters Patent. Patented Mar. 28, 1916.

Application filed May 10, 1915. Serial No. 27,090.

To all whom it may concern:

Be it known that we, JOHN B. LUKOMSKI and ANTHONY LUKOMSKI, citizens of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Compressors, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to compressors designed for refrigerating systems and ice making machines, and the primary object of our invention is to provide a compressor of the above type which has an exceedingly long stroke and is operated at such a speed that ammonia gas can be expeditiously and economically compressed and delivered to a condenser.

A further object of our invention is to provide a compressor wherein the parts are constructed with a view of reducing the cost of manufacture and at the same time retain the features by which safety, durability, simplicity and ease of assembling are secured, and our invention resides in the novel construction, combination and arrangement of parts to be hereinafter specifically described and then claimed.

Reference will now be had to the drawings, wherein—

Figure 1 is a side elevation of the compressor; Fig. 2 is an end view of the same; Fig. 3 is an enlarged vertical sectional view of a portion of the compressor; Fig. 4 is a cross sectional view of a valve housing adapted to form part of the compressor.

In the drawings, the reference numeral 1 denotes a base or a suitable foundation and secured thereto is a crank casing 2 supporting a guide housing 3. Journaled in the crank casing 2 is a crank shaft 4 having one end thereof provided with a fly wheel 5 and the opposite end thereof with a large gear wheel 6, the end of the shaft supporting the large gear wheel 6 being journaled in an additional bearing 7 on the base 1. The large gear wheel 6 meshes with a small gear wheel or pinion 8 on the armature shaft 9 of an electric motor 10. The electric motor is of a conventional form adapted to be operated from a suitable source of electrical energy.

The shaft 4, within the crank casing 2, has a crank portion 11 provided with a connecting rod 12 which extends into the guide housing 3 and is connected to a cross head 13 slidable in said housing. Diametrically opposed sides of the housing 3 have detachable plates 14 and man-holes whereby easy access can be had to the interior of the housing 3 for assembling parts of the cross head 13.

Mounted on the top of the guide housing 3 is a large stuffing box 15 containing packing 16 which insures a non-leakable connection between the stuffing box and a piston rod 17 connected to the cross head 13 and extending through the stuffing box. Suitably secured to the top of the stuffing box 15 is the lower end of a compressor cylinder 18 in which reciprocates the piston head 19 of the rod 17. The cylinder 18 has a water jacket 20 provided with end connections 21 whereby water or a suitable cooling agent can be circulated through the jacket to maintain the walls or bore of the cylinder 18 cool during the operation of the compressor.

At diametrically opposed sides of the cylinder 18 are longitudinal enlargements 22 providing an intake passage 23 and an outlet passage 24, the intake passage 23 having a suitable connection 25 with the coils of a refrigerating or ice making machine (not shown). The outlet passage 24 has a suitable connection 26 to a condenser (not shown). The lower ends of the passages 23 and 24 are in communication with lateral ports 27 communicating with the cylinder 18. In these lateral ports are placed valve housings which are substantially alike, with the exception, that one housing is provided with an intake valve opening toward the cylinder 18 and the other housing with an outlet valve opening away from said cylinder. Each housing comprises a spider or web 28 having a valve seat head 29 at one end thereof and a closure head 30 at the opposite end thereof. The valve seat heads 29 afford seats for valves 31 and 32 having stems 33 extending through guides 34, carried by the spiders or webs 28 of the housings. The outer end of the stem 33 of the valve 31 has a cup 35 and encircling said stem, between the cup 35 and the closure head 30 of this particular valve housing, is a coiled retractile spring 36 which holds the intake valve 31 normally seated; the outer end of the valve stem 33, the cup 35 and the spring 36 being closed by a cap 37 suitably secured to the lower end of the enlargement.

The outer end of the stem of the valve 32 has cups 38 and interposed between said

cups is a coiled compression spring 39 adapted to hold the outlet valve 32 normally seated; the cups 38 and the spring 39 being inclosed by a cap 40 suitably secured to the other enlargement of the compressor cylinder. All of this construction is best shown in Fig. 3, wherein it will be observed that an upstroke of the piston head 19 will unseat the intake valve 31 and allow the lower end of the cylinder to be charged with ammonia gas, while the downstroke of the piston produces a compression in the lower end of the cylinder which unseats the outlet valve 32 and allows the compressed ammonia gas to enter the passage 24 and the condenser connection 26 thereof. Of course the valves are spring seated, but are susceptible to an increase or decrease of pressure in the lower end of the cylinder 18, whereby the intake and outlet valve will be alternately actuated during a reciprocatory movement of the piston within the cylinder.

The upper ends of the passages 23 and 24 are in communication with separate vertical valve housings 41 and 42 respectively, said valve housings having spring seated valves 43 and 44, the latter opening away from the upper end of the cylinder and the former opening into the cylinder, which necessitates cutting away the upper end of the cylinder, as at 45, in order to provide clearance for the intake valve. Instead of a separate cap for each housing, said valve housings have a single cap 46 suitably secured to the upper ends of the enlargement 22, also the upper end of the cylinder 18, as best shown in Figs. 1 and 2. The valve housings 41 and 42 are very similar to the valve housings at the lower end of the compressor cylinder and the valves 32 and 43 are adapted to be actuated in synchronism while the valves 31 and 44 simultaneously operate, thus permitting of the piston head 19 taking in ammonia gas on one side thereof and compressing and discharging upon the opposite side thereof.

From the foregoing it will be observed that with the compressor in operation, the long stroke of the piston and the rapidity at which the same is reciprocated will cause a large volume of ammonia gas to be drawn into the compressor cylinder, compressed and discharged to the condenser, consequently a compressor constructed in accordance with our invention is capable of handling the ammonia gas of a refrigerating system or ice making machine which under ordinary circumstances would require a plurality of compressors. To obtain this increase in the capacity of a single compressor has necessitated the novel construction herein disclosed, and while in the drawings there is illustrated a preferred embodiment of our invention, it is to be understood that the structural elements are susceptible to such variations and modifications as fall within the scope of the appended claim.

What we claim is:—

A compressor of the type described comprising an upright cylinder, a reciprocable piston therein, enlargements integral with diametrically opposed sides of said cylinder providing intake and outlet passages having the upper ends thereof terminating at the upper end of said cylinder and the lower ends in lateral ports communicating with the lower end of said cylinder, a valve housing in each port, valves in said housings adapted to be alternately actuated by a movement of said piston in said cylinder, caps at the outer ends of said lateral ports, means inclosed by said caps maintaining said valves normally closed, a set of valve housings establishing communication between the upper ends of said passages and the upper end of said cylinder, valves in said housings adapted to be alternately operated by a movement of said piston within said cylinder, said cylinder being cut away to provide clearance for an opening movement of one of said valves, caps on the last mentioned valve housings, and means inclosed by said caps to maintain said valves normally closed.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN B. LUKOMSKI.
ANTHONY LUKOMSKI.

Witnesses:
KARL H. BUTLER,
ANNA M. DORR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."