

No. 804,159.

PATENTED NOV. 7, 1905.

C. NEUMANN.  
AIR COMPRESSOR.

APPLICATION FILED NOV. 2, 1903.

4 SHEETS—SHEET 1.

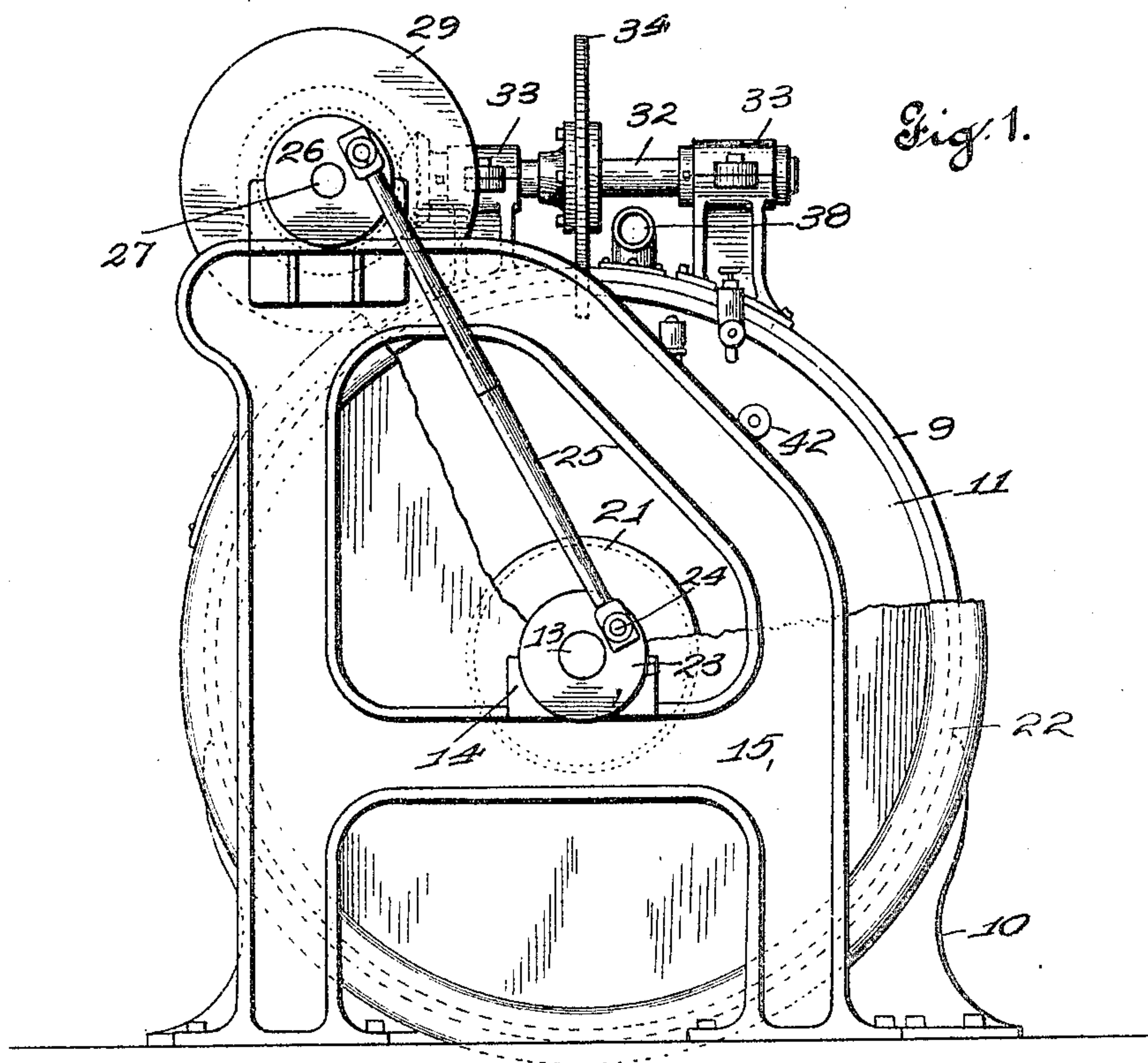


Fig. 1.

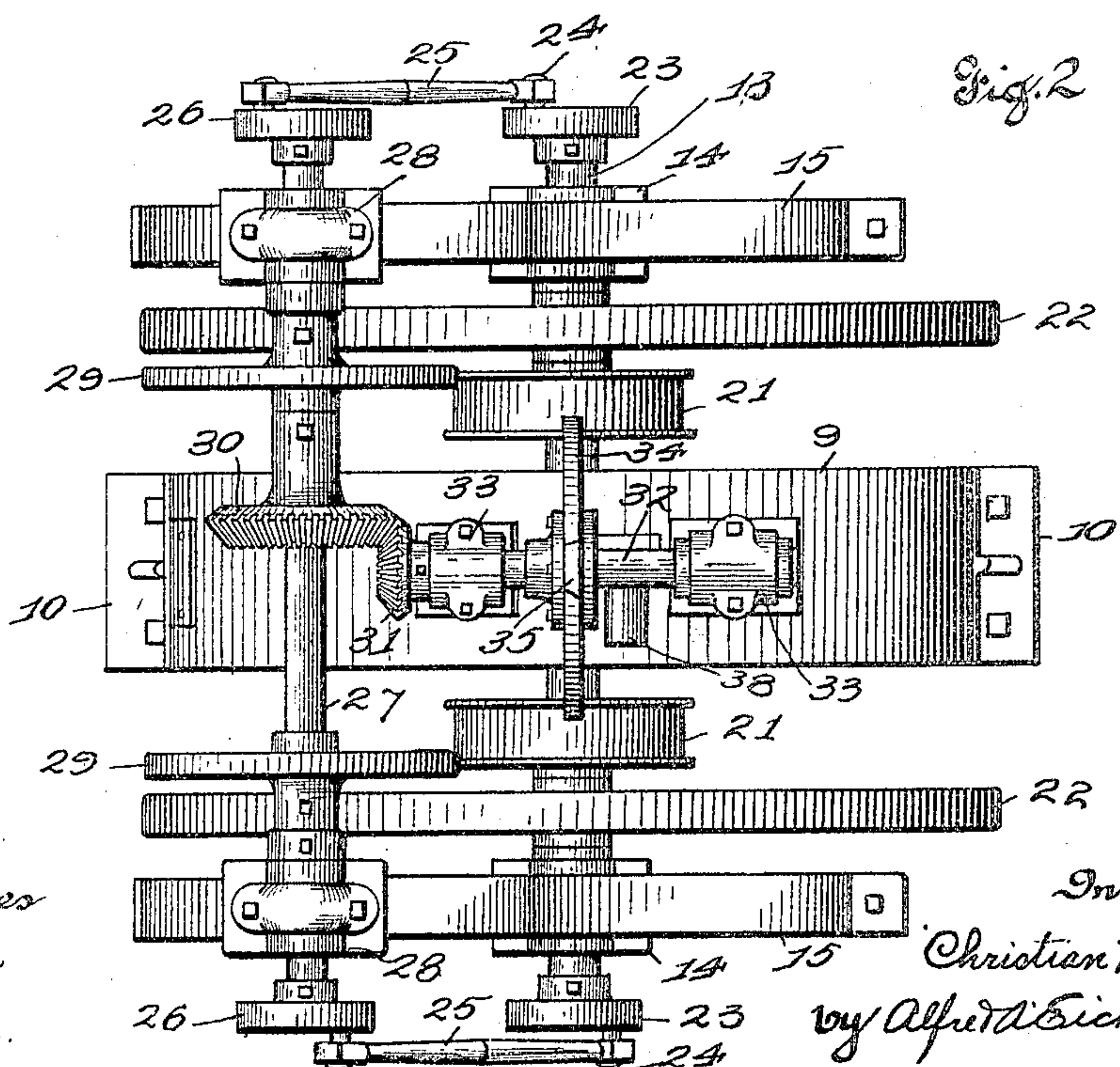


Fig. 2.

Witnesses  
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Inventor  
Christian Neumann  
by Alfred Eicks Atty.

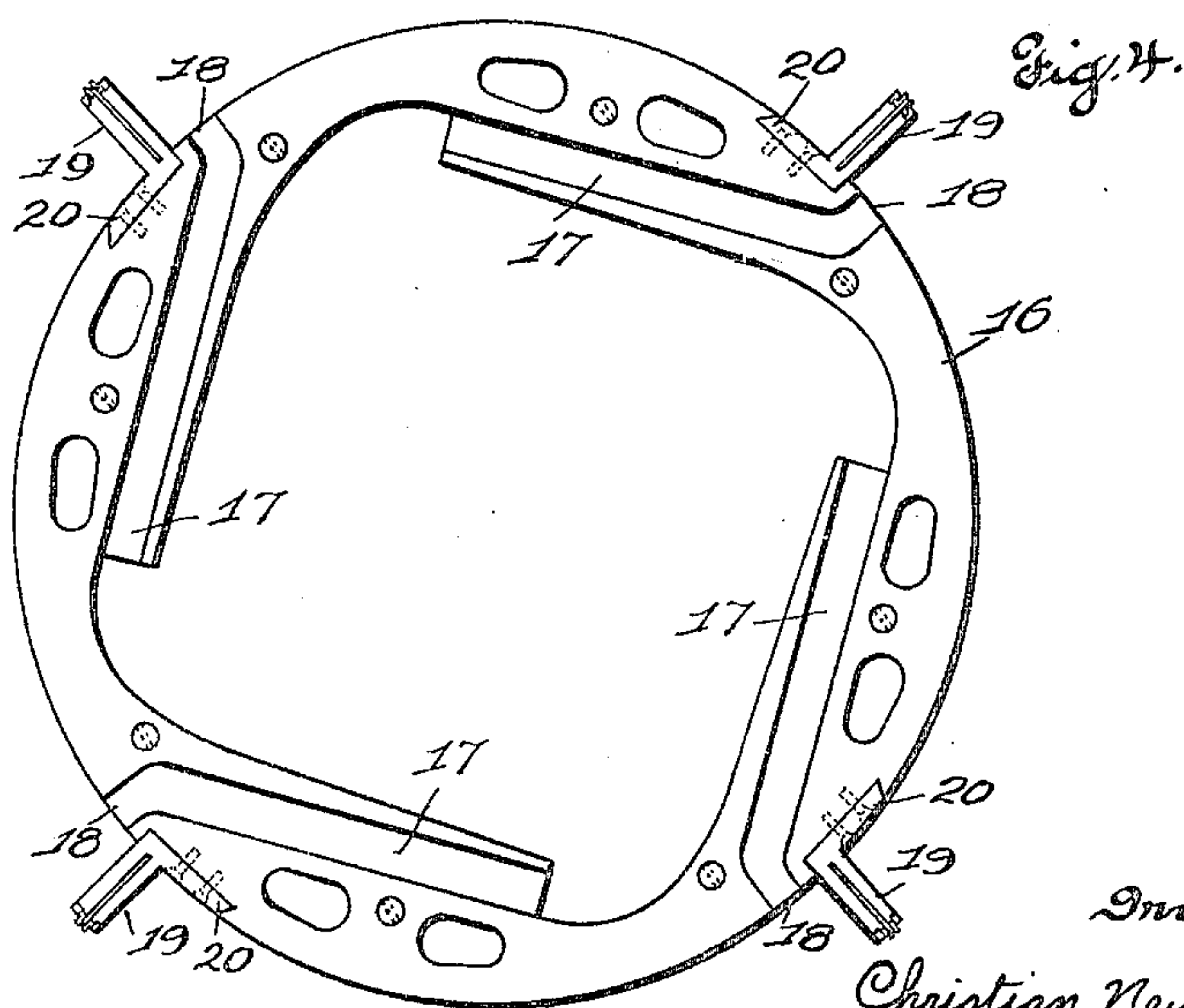
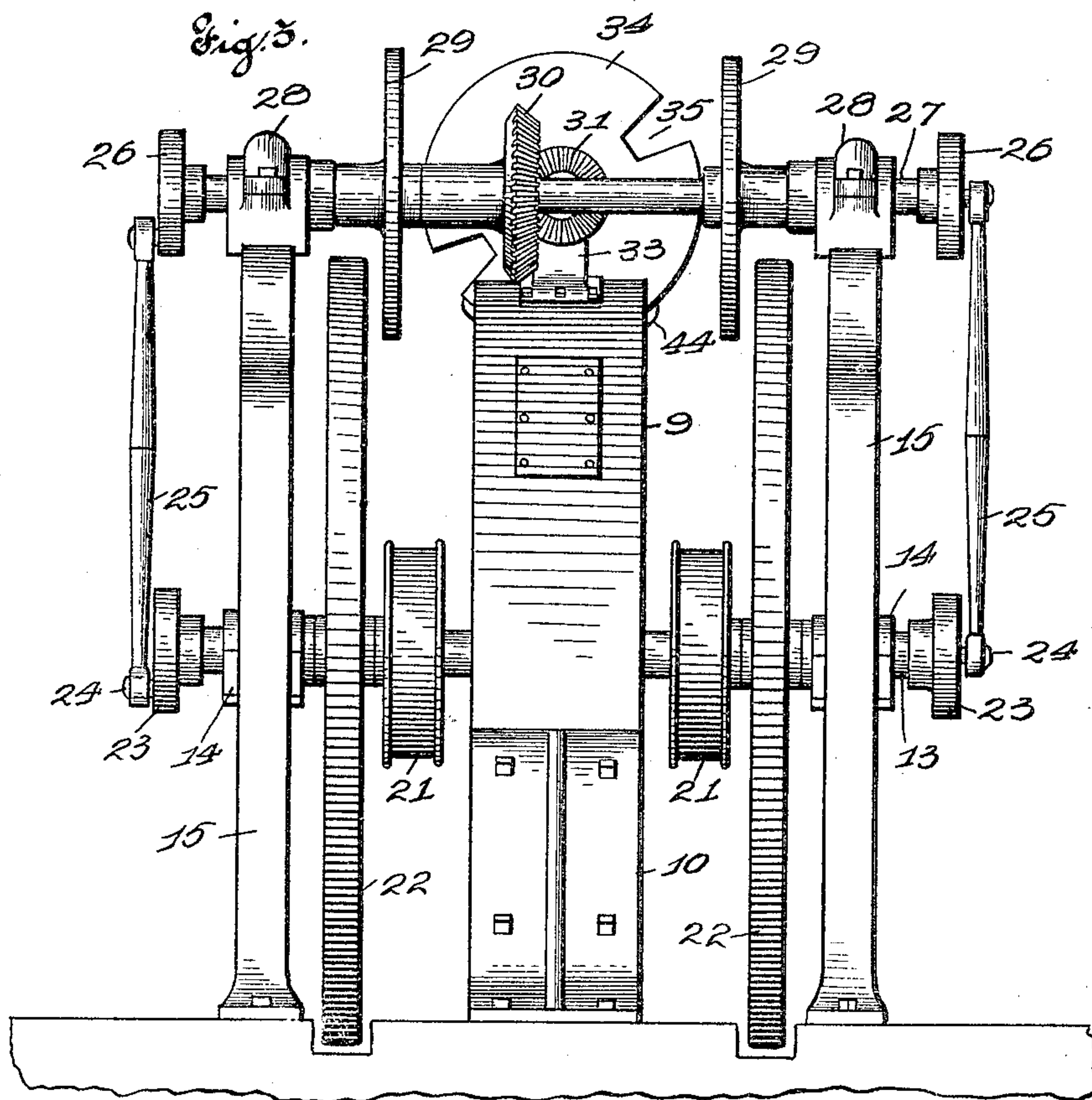
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4 SHEETS—SHEET 2.



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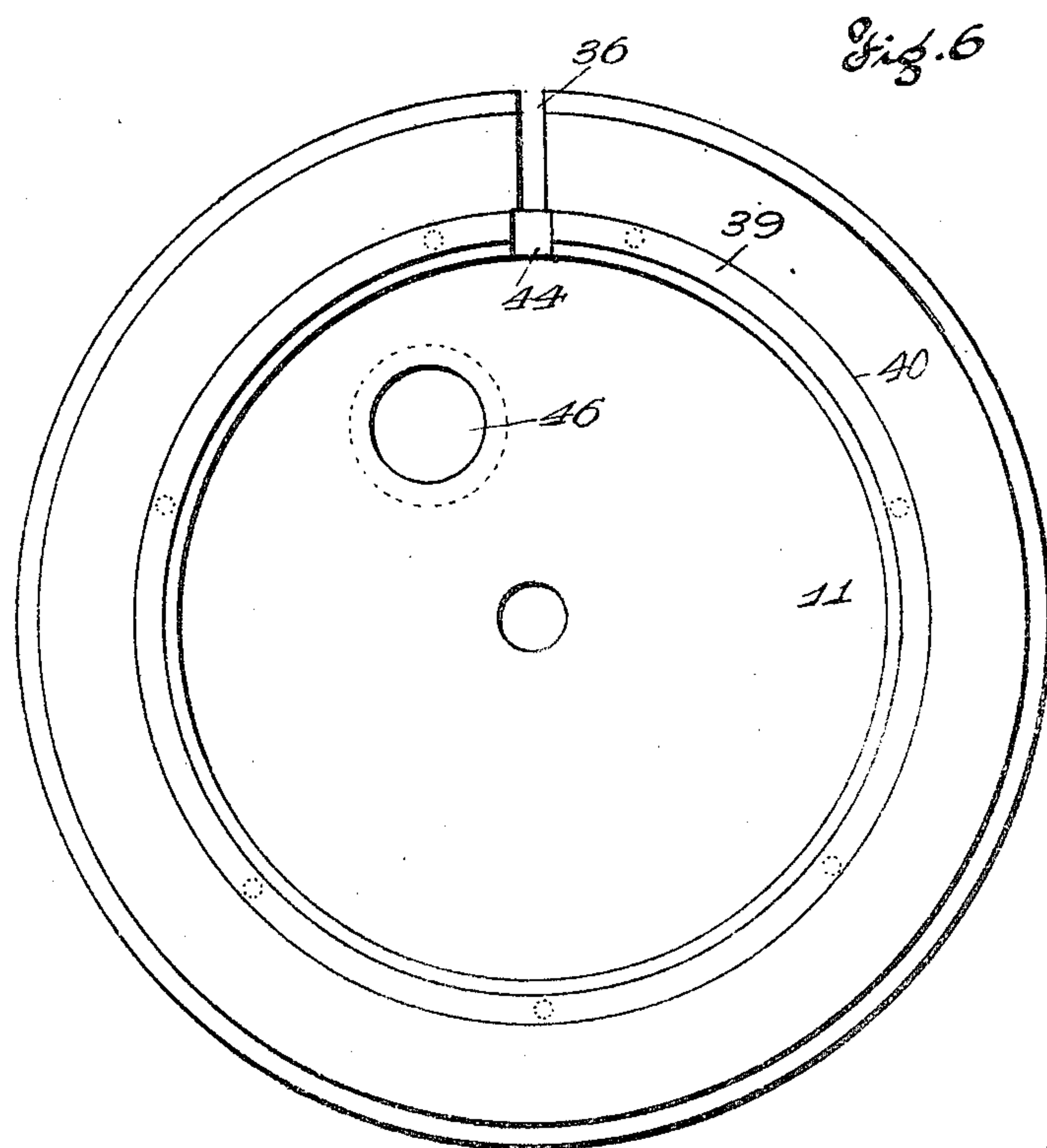
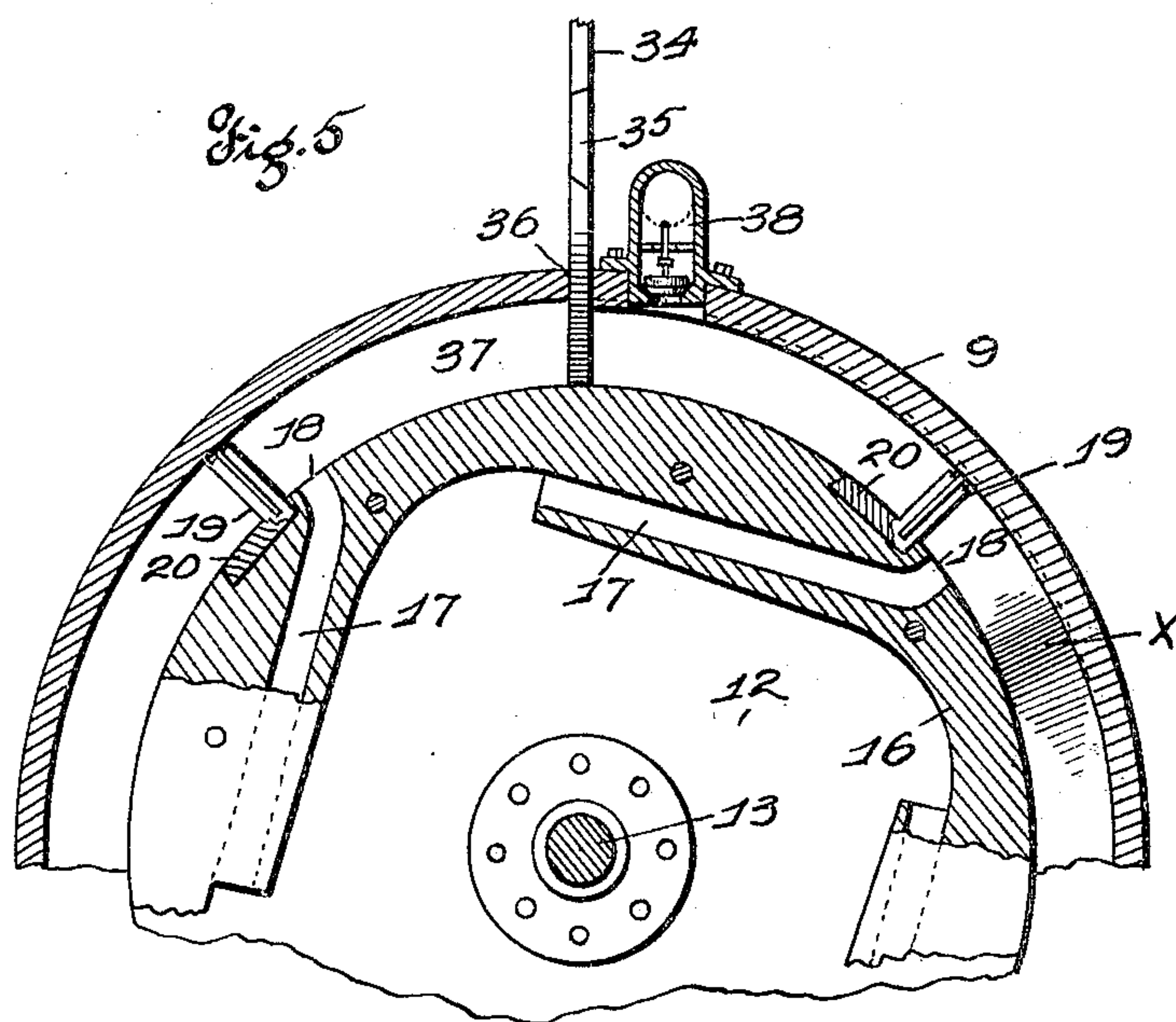
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4 SHEETS—SHEET 3.



*Witnesses*  
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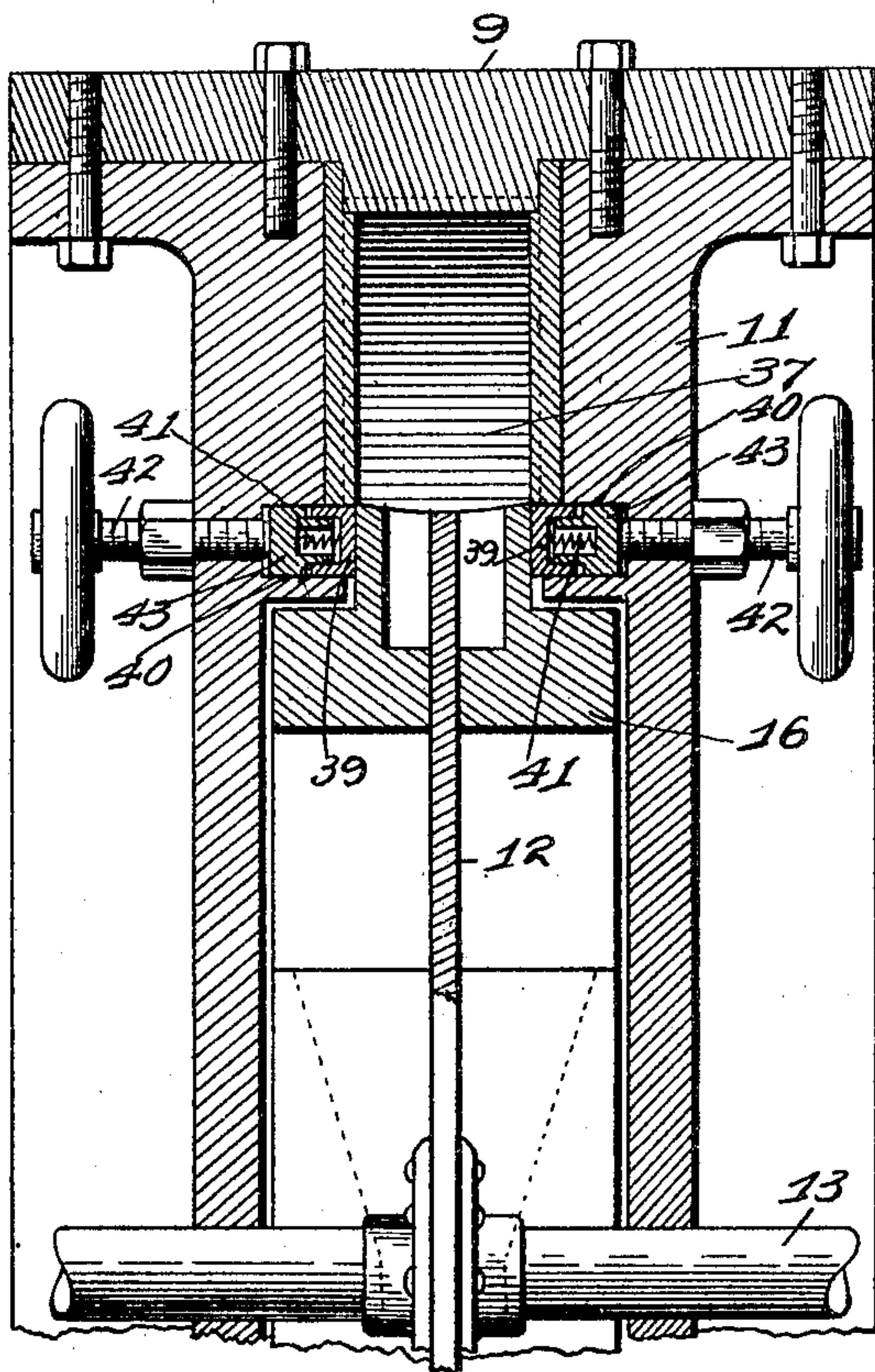
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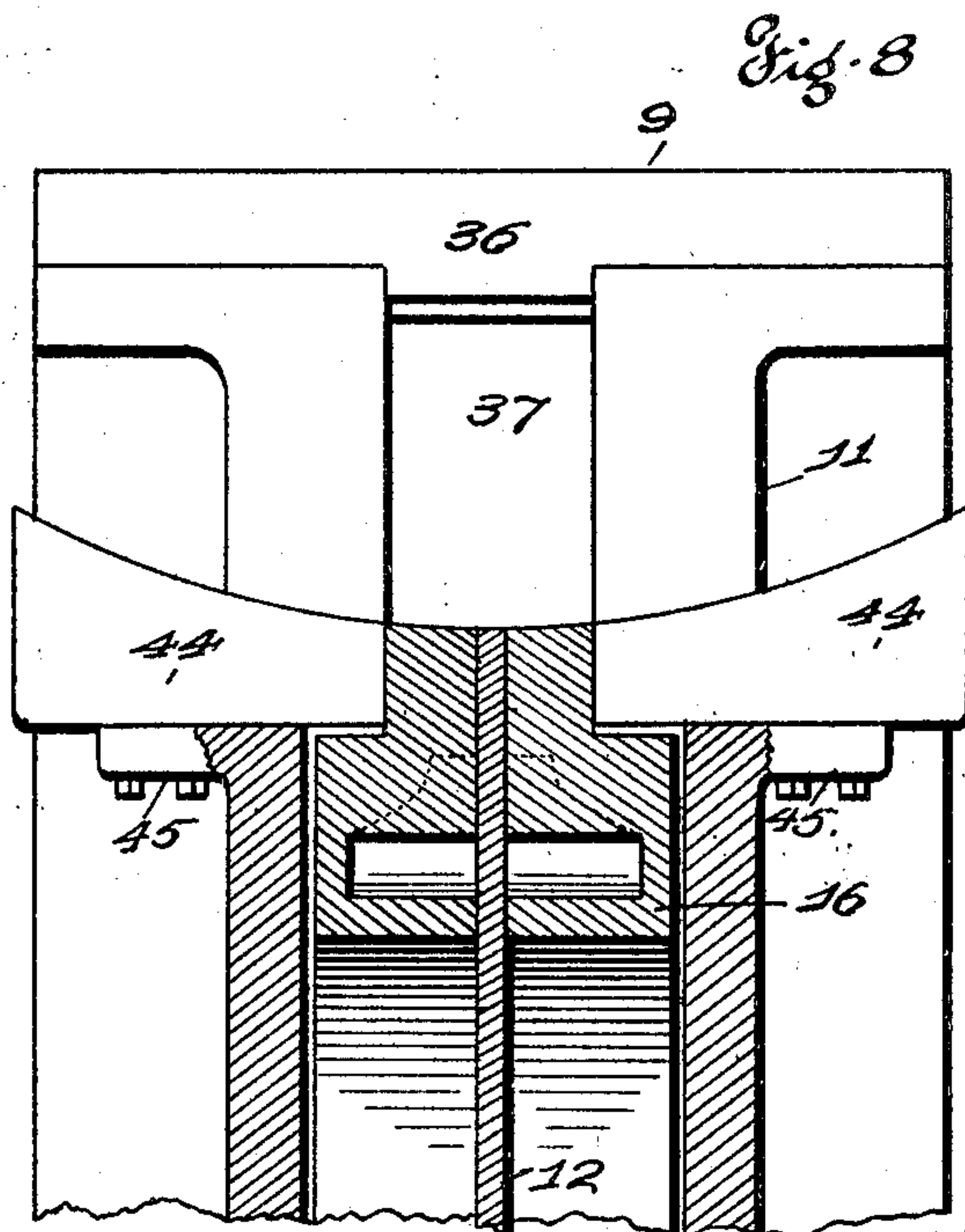
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4 SHEETS—SHEET 4.



*Fig. 7*



*Fig. 8*

*Witnesses*  
*P. J. Eicks*  
*Fred Michels*

*Inventor*  
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*by Alfred Eicks atty.*



# UNITED STATES PATENT OFFICE.

CHRISTIAN NEUMANN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE  
NATURAL POWER CO., OF ST. LOUIS, MISSOURI, A CORPORATION.

## AIR-COMPRESSOR.

No. 804,159.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed November 2, 1903. Serial No. 179,467.

*To all whom it may concern:*

Be it known that I, CHRISTIAN NEUMANN, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Air-Compressors, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in air-compressors; and it consists in the novel arrangement, construction, and combination of parts, as will be fully hereinafter described, and set forth in the claims.

The object of this invention is to construct a device for collecting air, conveying it through passages, delivering it into the compression-chamber, and compressing it therein by means of pistons carried by a revolving disk.

A further object of this invention is to construct a machine wherein air is compressed to a high degree of pressure by a rapidly-revolving disk carrying pistons or plungers passing on their travel through a curvilinear compression-chamber.

Figure 1 is a side view of my complete invention, a portion of the fly-wheel broken away for clearness. Fig. 2 is a top plan view of the same. Fig. 3 is an end view of the compressor viewing it from the left-hand side of Fig. 1. Fig. 4 is a detail side elevation of one of the rings containing the air-passages detached from the revolving disk. Fig. 5 is a vertical longitudinal sectional view of the casing with parts broken away, showing the internal arrangement. Fig. 6 is a detail view of the inner side of the vertical walls forming the sides of the machine. Fig. 7 is an enlarged vertical cross-sectional view of a portion of the machine. Fig. 8 is a similar view to Fig. 7, slightly shifted, showing the arrangement of the machine at the point occupied by the cut-off or rotating abutment.

I will now describe in detail the construction of my invention wherein the circular frame or rim 9 is suitably mounted and rigidly supported upon legs or brackets 10. Within the circular frame 9 and securely bolted to its inner periphery are flanged side castings 11, which form, with rim 9, a casing having a peripheral passage 37, through which pistons 19, carried by the rotating disk 12, travel. The said disk 12 is rigidly mounted

upon a shaft 13, which is supported in bearings 14, located upon the A-frames 15 at each side of the machine.

To each side of the revolving disk 12 is secured a ring-casting 16, in which are formed air-passages 17, preferably arranged at right angles to each other, as shown, and terminating in an outlet 18 in the periphery of the casting. The open inner ends of these passages act as air-catchers.

Upon the periphery of the revolving disk and castings 16 are mounted a plurality of pistons or plungers 19, preferably four in number, and each provided with a right-angular base 20, arranged to be dovetailed in the castings, as indicated in Fig. 4. Said pistons are provided with suitable packing on the sides and top for completing an air-tight joint.

Upon the shaft 13 adjacent to each side of the frame are pulley-wheels 21, and adjacent said pulleys are fly-wheels 22, constructed of a larger diameter than the revolving disk and of solid material.

Each end of the shaft 13 is provided with a crank-disk 23, on each of which is a wrist-pin 24, whereto one end of the connecting-rods 25 is connected, their other ends connected to like pins set on disks 26, located on each end of the shaft 27. Said shaft is arranged above the machine in suitable bearings 28, formed on the top of the A-frames, and carries smaller fly-wheels 29. Said shaft is also provided with a beveled gear-wheel 30, meshing with a beveled pinion 31, carried by the short shaft 32, which is supported upon the frame by the bearings 33. To this shaft is rigidly secured the revolving cut-off disk 34, which is provided with slots 35, which are for the purpose of allowing the pistons 19 to pass while in their travel.

The disk 34 operates through the casing by means of the opening 36 and occupies the entire depth of the passage 37, through which the piston travels. The passage 37 is formed by the walls 11, circular frame 9, and the revolving disk 12 and ring-castings 16. This passage is arranged for retaining the collected air and supplying the compression-chamber.

The compression-chamber referred to is that portion of the passage 37 extending from the rotary cut-off disk 34 at the right to the point indicated by the letter X.



The inner surfaces of the frame 9 and walls 11 in the compression-chamber project slightly inwardly, tapering gradually, beginning at the point indicated by the letter X, decreasing the size of the passage, causing the packing of the pistons to engage therewith and prevent leakage.

A check-valve 38 is located upon the machine, through which the compressed air is allowed to escape into a pipe leading to a suitable receiving-tank.

To prevent the backing up of the air between the walls of the stationary portion and revolving mechanism, I provide a packing-ring 39, set in grooves 40 and upon springs 41. Said rings are regulated by the set-bolts 42, arranged at intervals around the machine-walls, coming in contact with the rings 43, thereby regulating the pressure of the ring 39 upon the sides of the ring-castings 16.

To provide a perfect joint at the base of the slot or passage 36, I provide blocks 44, arranged to fit snugly against the periphery of the cut-off disk and mounted upon lugs 45, formed integral with the side castings.

Air is admitted into the interior of my device through the openings 46, formed in the side castings 11 at a point immediately to the rear of the compression-chamber. (See Fig. 6.)

This invention is an improvement over Letters Patent No. 704,360, issued to me July 9, 1902, and a pending application filed May 16, 1902, Serial No. 107,697.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An air-compressor comprising a casing; a shaft; a disk mounted upon said shaft; pistons located upon the periphery of said disk; A-frames located on each side of the casing supporting the shaft; a shaft located on the top of said casing; a cut-off disk supported by said shaft; a shaft located on top of the A-frames; beveled gears located upon said shafts meshing together for operating the cut-off disk, fly-wheels located upon the driving-shaft

and the shaft supported upon the A-frames, substantially as specified.

2. An air-compressor comprising a revolving piston-carrying disk located within a casing; ring-castings located upon said disk; air-passages in said castings; a revolving cut-off disk slotted for the passage of the pistons; a compression-chamber formed within the casing, and a mechanism for operating the disk; substantially as specified.

3. A device of the class described comprising a casing; a revolving member operating in said casing, pistons and air-catchers located on said revolving member, a slotted cut-off disk located on the top of said casing and operating through an opening formed in the casing; said cut-off disk extending through the casing to the periphery of the revolving member; said cut-off disk acting as an abutment, and a mechanism for operating said compressor, substantially as specified.

4. A device of the class described comprising a casing mounted upon a base, a shaft; a revolving disk located upon said shaft, and having air-passages; pistons formed on the revolving disk; said shaft supported in A-frames located at each side of the casing; fly-wheels and pulleys located upon said shaft; crank-disks located upon the ends of the shaft; connecting-rods connecting the crank-disks of the upper shaft with those of the lower shaft; a gear-wheel located on the upper shaft, a short shaft located upon the top of the casing, operated by the aforesaid shaft, a slotted cut-off disk carried by the said short shaft and arranged to allow the pistons of the revolving disk to pass therethrough during the operation of the machine; and a means for discharging the compressed air from the machine, substantially as specified.

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

CHRISTIAN NEUMANN.

Witnesses:

T. J. EICKS,  
FRED MICHELS.