

No. 683,911.

Patented Oct. 8, 1901.

O. H. CASTLE.  
DRIVING CONNECTION FOR COMPRESSORS.

(Application filed Jan. 2, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

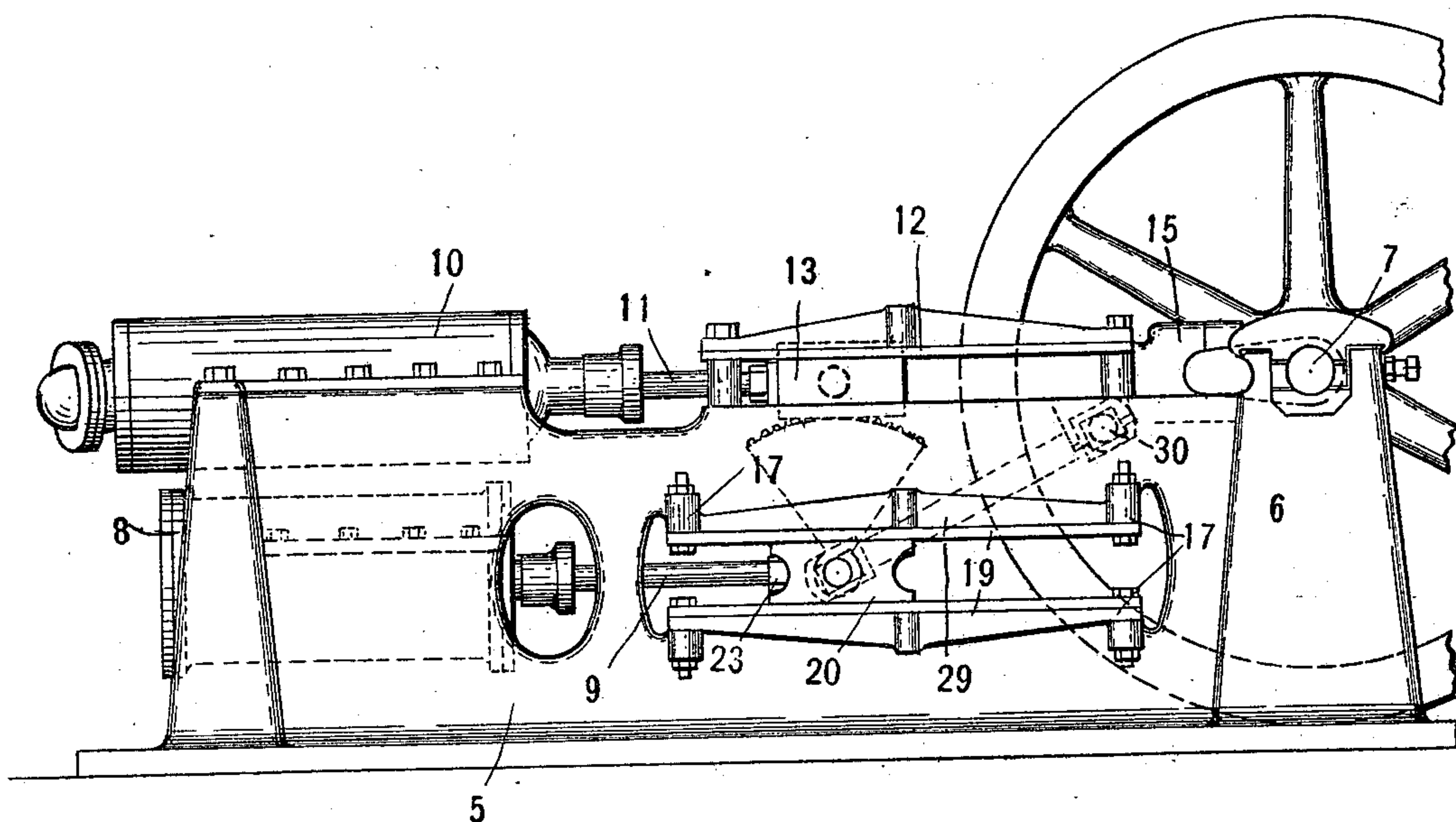
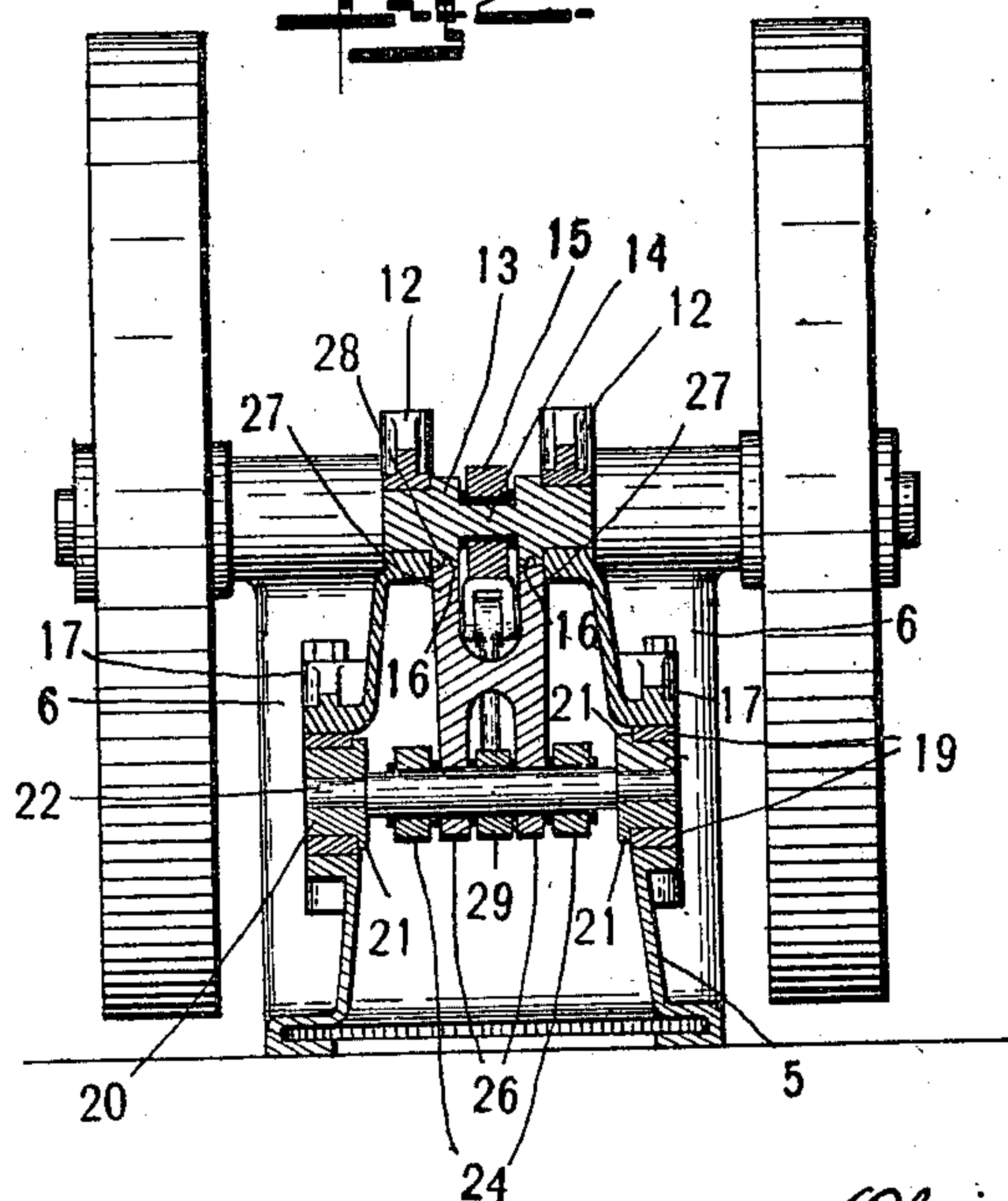


Fig. 2.



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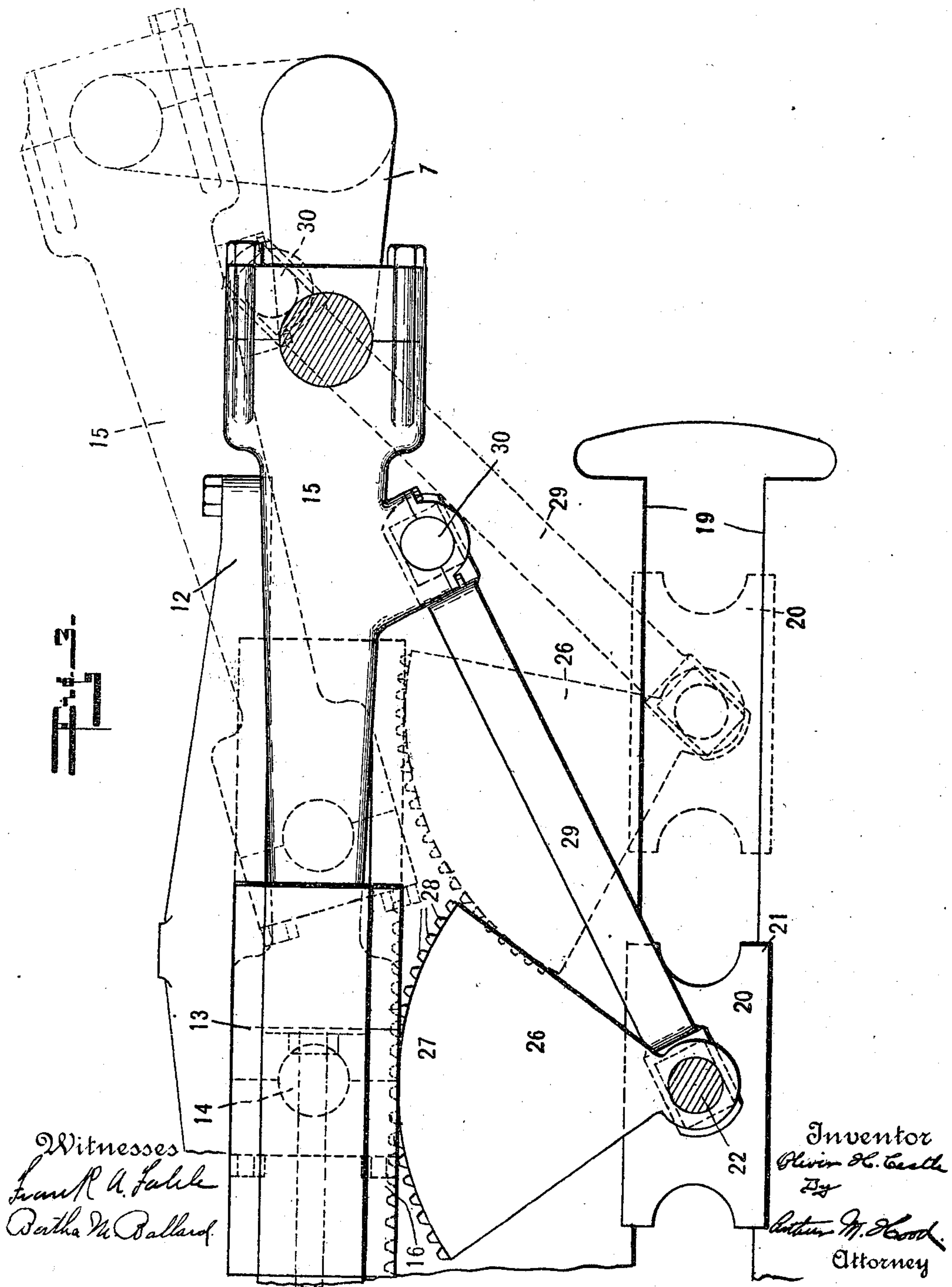
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# UNITED STATES PATENT OFFICE.

OLIVER H. CASTLE, OF INDIANAPOLIS, INDIANA.

## DRIVING CONNECTION FOR COMPRESSORS.

SPECIFICATION forming part of Letters Patent No. 683,911, dated October 8, 1901.

Application filed January 2, 1901. Serial No. 41,821. (No model.)

*To all whom it may concern:*

Be it known that I, OLIVER H. CASTLE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Driving Connection for Compressors, of which the following is a specification.

My invention relates to an improvement in compressors, particularly of that type used in ice-machines for the compression of ammonia.

The objects of my invention are to produce a machine in which the power-cylinder and compressor-cylinder are not in the same axial line, to provide an improved form of driving connection between the power-cylinder and compressor-cylinder, and to so arrange the several wearing parts that they may be readily accessible, easily adjusted, and easily disassembled.

The accompanying drawings illustrate my invention.

Figure 1 is a side elevation. Fig. 2 is a section through the cross-head centers of Fig. 1. Fig. 3 is a detail of the driving connections.

In the drawings, 5 indicates a supporting-frame, preferably formed of a single casting, provided at one end with standards 6, which support suitable bearings for a crank-shaft 7. The frame 5 consists, essentially, of two parallel sides, and between these sides is supported a power-cylinder 8, provided with a reciprocating piston-rod 9. Supported upon frame 5, immediately above cylinder 8, is a compressor-cylinder 10, provided with a piston-rod 11. Mounted in front of cylinder 10 are two sets of cross-head guides 12 12, one member of each pair being adjustable toward and from the other in the usual well-known manner. Mounted so as to reciprocate within and between guides 12 12 is a cross-head 13, which is secured to the projecting end of the piston-rod 11. Cross-head 13 is provided with a pin 14, to which is pivoted one end of the pitman 15, the opposite end being pivoted to the crank 7. Cross-head 13 is provided on its under side with a pair of surfaces 16, which are parallel to the axes of the two cylinders. Each side of the supporting-frame 5 below guides 12 12 is provided with projecting lugs 17, between which are supported cross-head guides 18, said guides being parallel to guides

12 and the axis of the power-cylinder. Mounted between each pair of guides 19 is a cross-head shoe 20, provided upon its inner end with flanges 21, which engage the side of guides 19. Each of the shoes 20 is provided with a transverse bore adapted to receive the reduced ends of a shaft 22, which extends between the two shoes. Secured to piston-rod 9 is a yoke 23, each member of which carries a bearing 24, through which the shaft 22 passes. Either pivoted upon or clamped to shaft 22 is one end of a second pitman 29, the other end of which is pivoted to the connecting-rod 15 at a point 30, which lies between the ends of said connecting-rod.

In the construction described there is a slight angular movement of pitman 29 with relation to rod 15, and there would be a tendency to cramp the cross-heads within their guides. In order to prevent this tendency, I pivot upon shaft 22, between the members of yoke 23, the lower arms of a sector 26, one upon each side of pitman 29. The upper end of sector 26 is bifurcated, so as to form a pair of arms 27, each of which is formed upon an arc of a circle struck from the center of shaft 22 and with a radius equal to the distance between said center and the surfaces 16 of cross-head 13. In order to prevent the displacement of sectors 26, I provide each arm 27 thereof with a number of projecting teeth 28, which are adapted to cooperate with recesses formed in surfaces 16.

In operation power is transmitted through piston-rod 9 to the shaft 22 and by it through pitman 29 and pitman 15 to the crank-shaft, this movement resulting in a reciprocation of cross-head 13 and piston-rod 11. As the crank advances around its center there is a gradual change of angle between pitman 15 and pitman 29, the stroke of the power-piston being considerably in excess of the resultant stroke of the compressor-piston. The relative movement between the two cross-heads results in a swing or movement of sector 26, said sector being, however, always in contact with surfaces 16, and thus preventing any tendency of the cross-heads to cramp in their guides.

It will be readily understood that instead of the sector shown a strut may be substi-



tuted, said strut being provided either with a roller or a shoe upon its upper end in position to contact with the surfaces 16.

To dismount the parts, guides 19 are first 5 detached, so as to allow the removal of shoes 21, when shaft 20 may be easily withdrawn. The lower cross-head guides are outside of the bed-frame and are thus easily watched and attended.

10 I claim as my invention—

1. The combination with a pair of reciprocating heads movable along different lines, of a crank, a pitman connecting one of said heads to said crank, a second pitman connecting the second head and the first pitman, 15 and a sector carried by said second head and arranged to roll upon the first head.

2. The combination with a pair of reciprocating heads movable along different lines, 20 of a crank, a pitman connecting one of said heads to said crank, a second pitman connecting the second head to the first pitman,

and a sector carried by one of said heads in position to have rolling contact with the other head. 25

3. The combination with a pair of reciprocating heads movable along different lines, of a crank, a pitman connecting one of said heads to said crank, a second pitman connecting the second head to the first pitman, 30 and a connecting-strut carried by one of said heads and having a movable contact with the other.

4. In an engine, the combination with a pair of parallel cross-head guides, of a pair 35 of shoes each provided on its inner side with a flange to engage its guide, a shaft extending between said shoes, and a connection between said shaft and the piston-rod of the engine.

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