

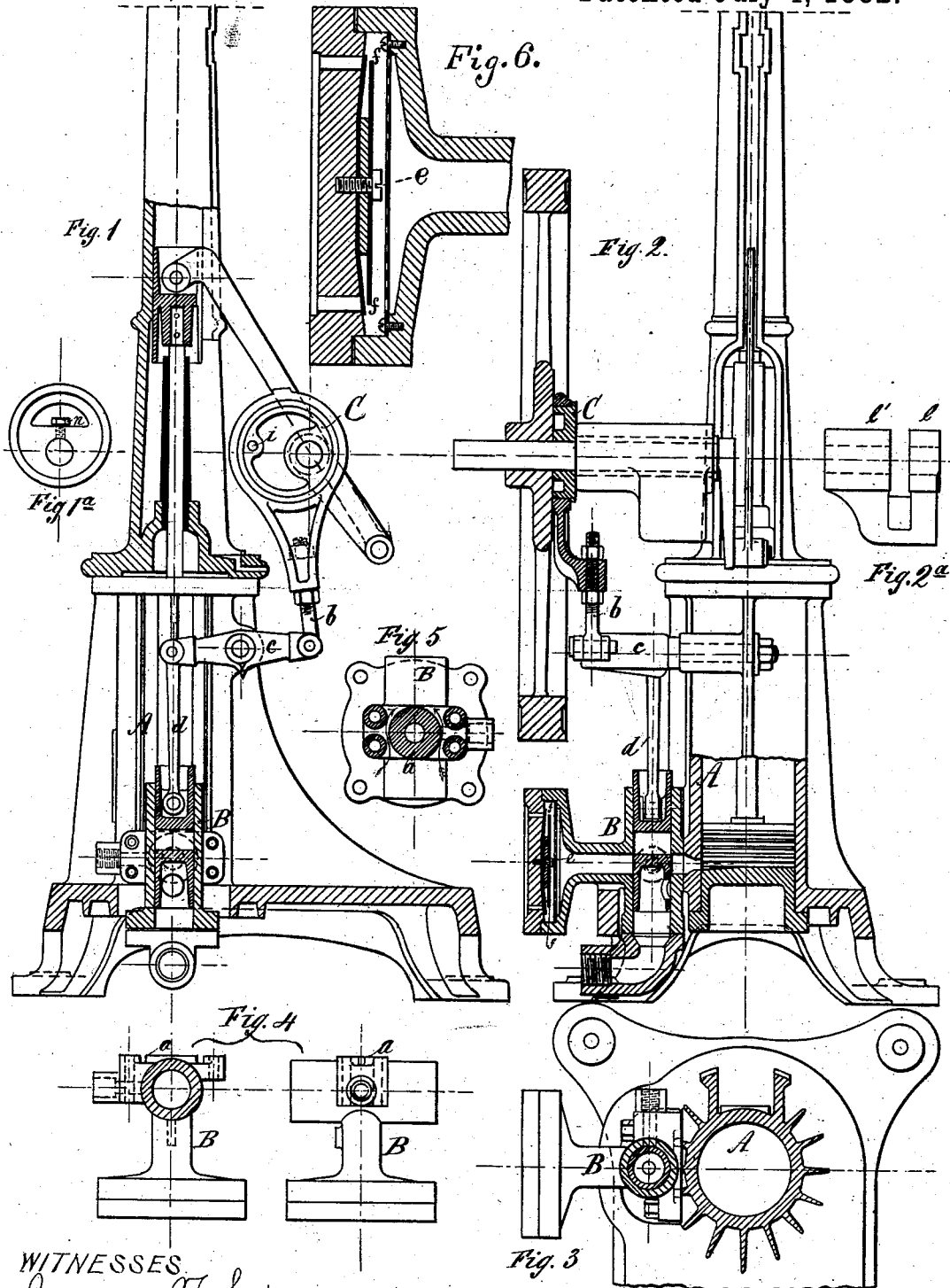
(No Model.)

C. M. SOMBART.

GAS ENGINE.

No. 260,620.

Patented July 4, 1882.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

CHARLES MAX SOMBART, OF MAGDEBURG, GERMANY.

## GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 260,620, dated July 4, 1882.

Application filed June 13, 1881. (No model.) Patented in Germany October 26, 1881, No. 14,080, and in England January 25, 1882, No. 320.

*To all whom it may concern:*

Be it known that I, CHARLES MAX SOMBART, a subject of the King of Prussia, and residing in Magdeburg, Germany, have invented certain Improvements in Gas-Engines, of which the following is a specification.

My invention relates to certain improvements in the details of construction of what is known as the "Bisschop gas-engine;" and my invention consists, firstly, in casting the entire slide-valve casing separate from the working-cylinder and forming thereon annular projections to allow of a circulation of air between the two; and, secondly, in combining a sieve-like perforated disk with the air-valve chamber of the engine to prevent the destruction of the valve-disk.

In the accompanying drawings, Figures 1, 2, and 3 are sectional views of a Bisschop gas-engine containing my improvements; Figs. 4 and 5, views of the piston-valve casing B detached; and Fig. 6 an enlarged sectional view of the air-inlet chamber and valve.

The main cylinder A, piston, piston-rod, connecting-rod, and crank-shaft are the same as in the ordinary form of the Bisschop gas-engine.

The piston-valve casing B, instead of being formed as a boss cast on the cylinder of the engine, is cast separately, and is screwed to a faced surface on the cylinder A, as shown in the drawings. The object of this is to permit the removal of this valve-casing for re boring, repairs, or replacing without disturbing the main working parts of the engine, as would be the case where the valve-casing forms part of the main cylinder.

In order to prevent as much as possible the transmission of heat from the working-cylinder to the piston-valve casing B, the faced surface *a* of the latter is formed of annular projections which leave between them and the corresponding face of the cylinder A sufficient space, Figs. 2, 4, and 5, to admit of the air passing through, thus keeping the valve casing cool.

In order to prevent the india-rubber disk in the air-valve chamber, Fig. 6, from being so easily burned or destroyed by the flame from

the explosion, I make use of a finely-perforated iron disk, as illustrated in Fig. 6 of the annexed drawings. The iron disk *e* contains fine holes, and is placed just behind the plate *f*, which limits the lift of the india-rubber disk. This perforated disk *e* affords the requisite passage for the entrance of the air, but deadens the force or effect of the back flame at the moment of the explosion, so that the caoutchouc, of which the air-valve is composed, is not softened and destroyed to such an extent as would otherwise be the case.

In order to afford a strong and continuous bearing-surface for the crank-shaft, I prefer to apply the eccentric C, Fig. 1<sup>a</sup>, to the shaft at the end of the bearing, as indicated in Fig. 2, instead of in a slot in the bracket, as in one of the ordinary forms of the Bisschop engine and as indicated in Fig. 2<sup>a</sup>. In this case the connection of the eccentric C with the fly-wheel is effected by means of a pin, *i*, Fig. 1, adapted to a hole in the nave of the fly-wheel and serving as a driver, so that the eccentric maintains an invariable position in respect to the crank. Its motion is transmitted to the piston-valve through the medium of the eccentric-rod *b*, the double-armed lever *c*, and valve-rod *d*, Figs. 1 and 2. By securing the eccentric-rod *b* to the strap of the eccentric C by two nuts, means are provided for altering or exactly adjusting the relative position of the piston-valve to the eccentric.

I claim as my invention—

1. The combination of the cylinder of a Bisschop gas-engine with a slide-valve casing, B, cast separately therefrom, and having projecting annular faced surfaces, as and for the purpose described.

2. The combination of the air-inlet of a gas-engine and rubber valve with a protecting perforated disk, *e*, in the air-chamber, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES MAX SOMBART.

Witnesses:

PAUL MÖLLER,  
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