

No. 704,465.

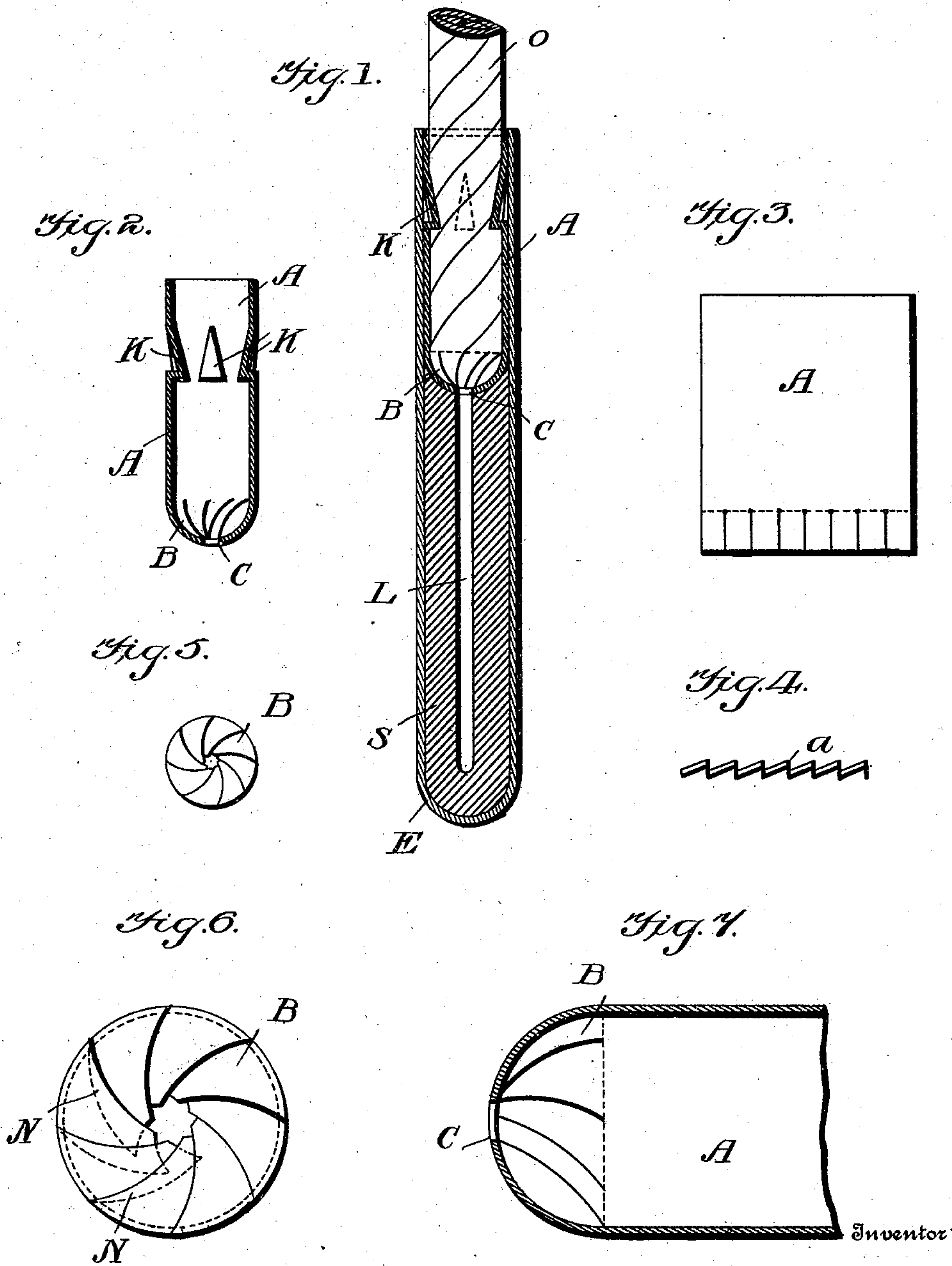
Patented July 8, 1902.

W. KIRSANOV.
BLASTING CARTRIDGE.

(Application filed Oct. 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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Fig. 9.

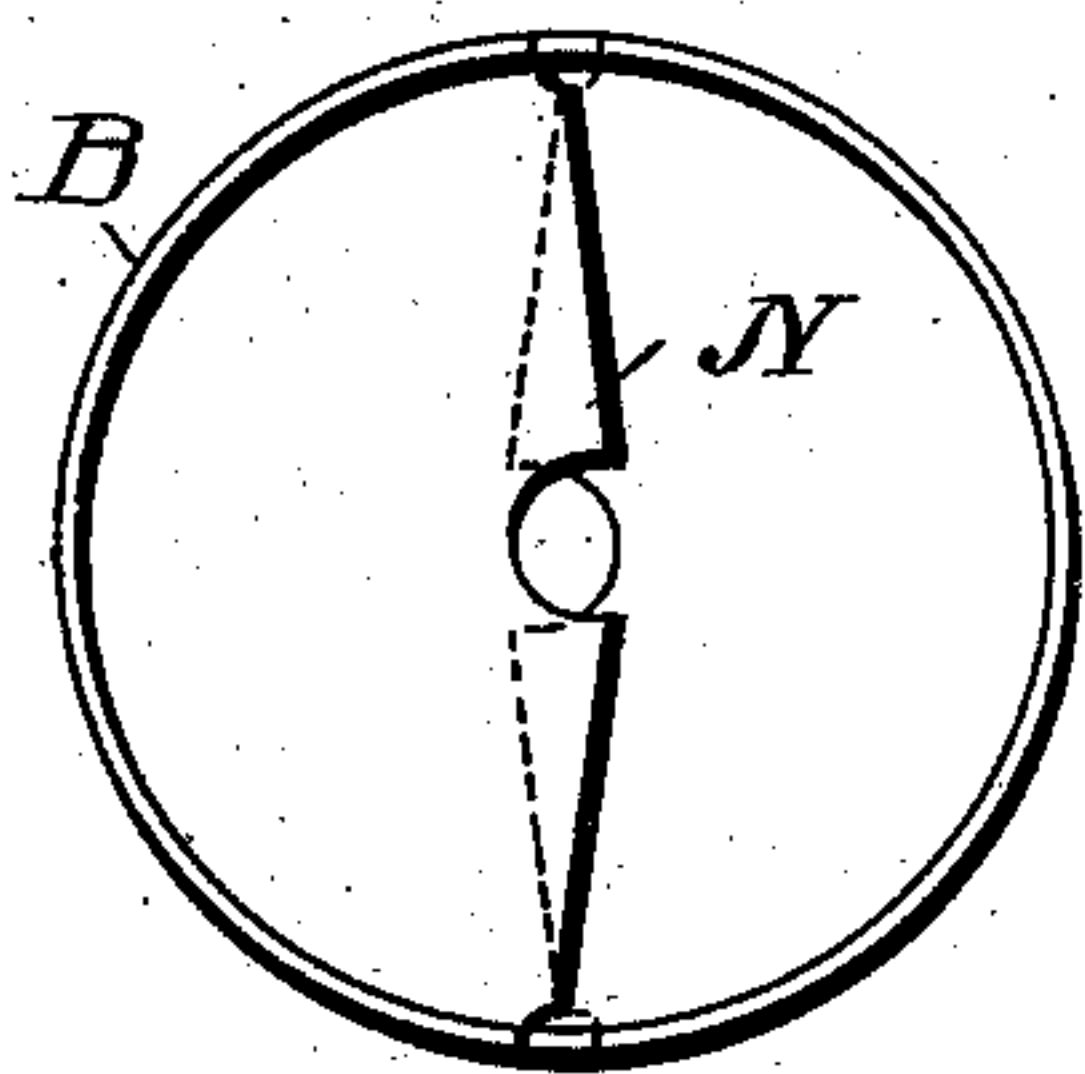


Fig. 8.

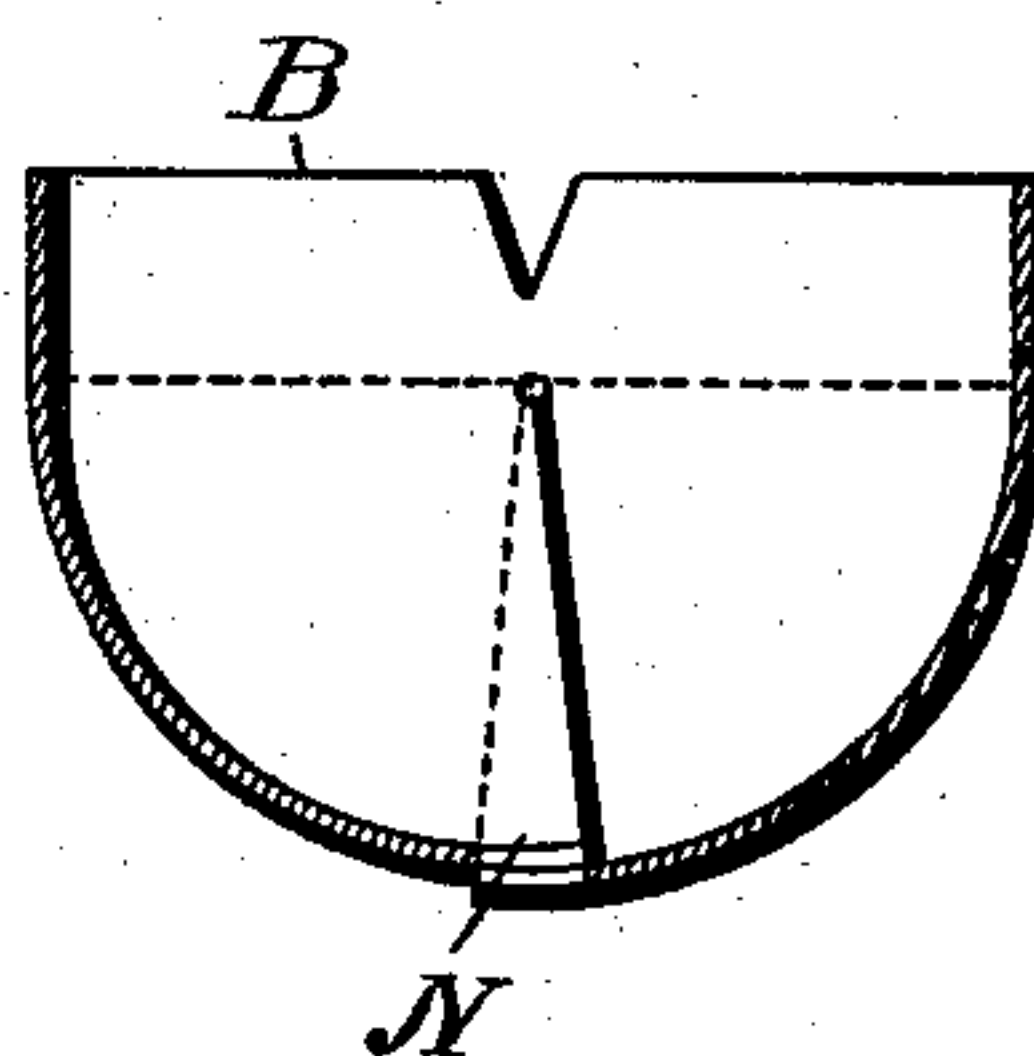


Fig. 12.

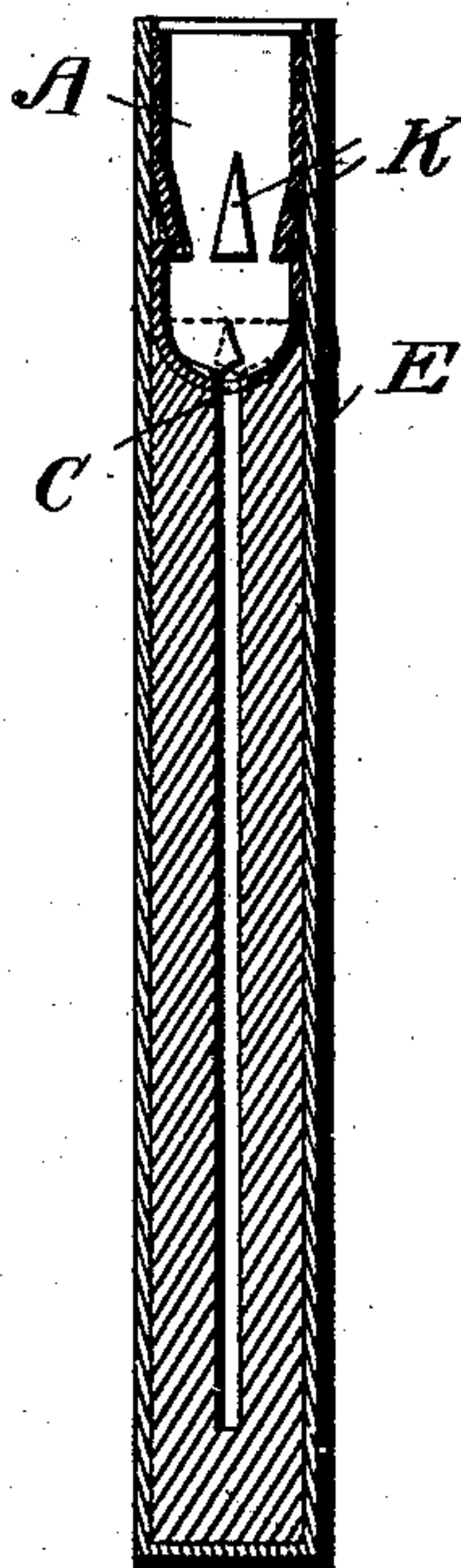


Fig. 10.

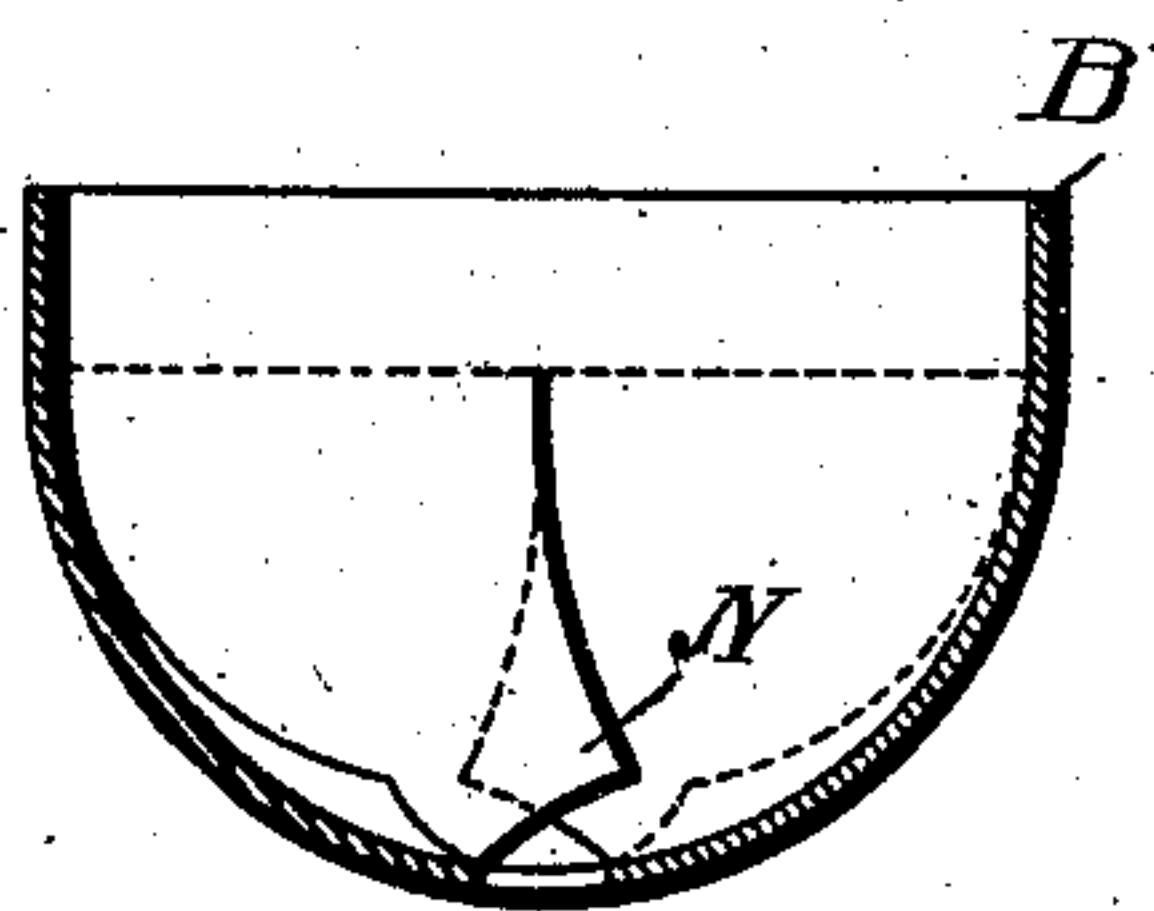
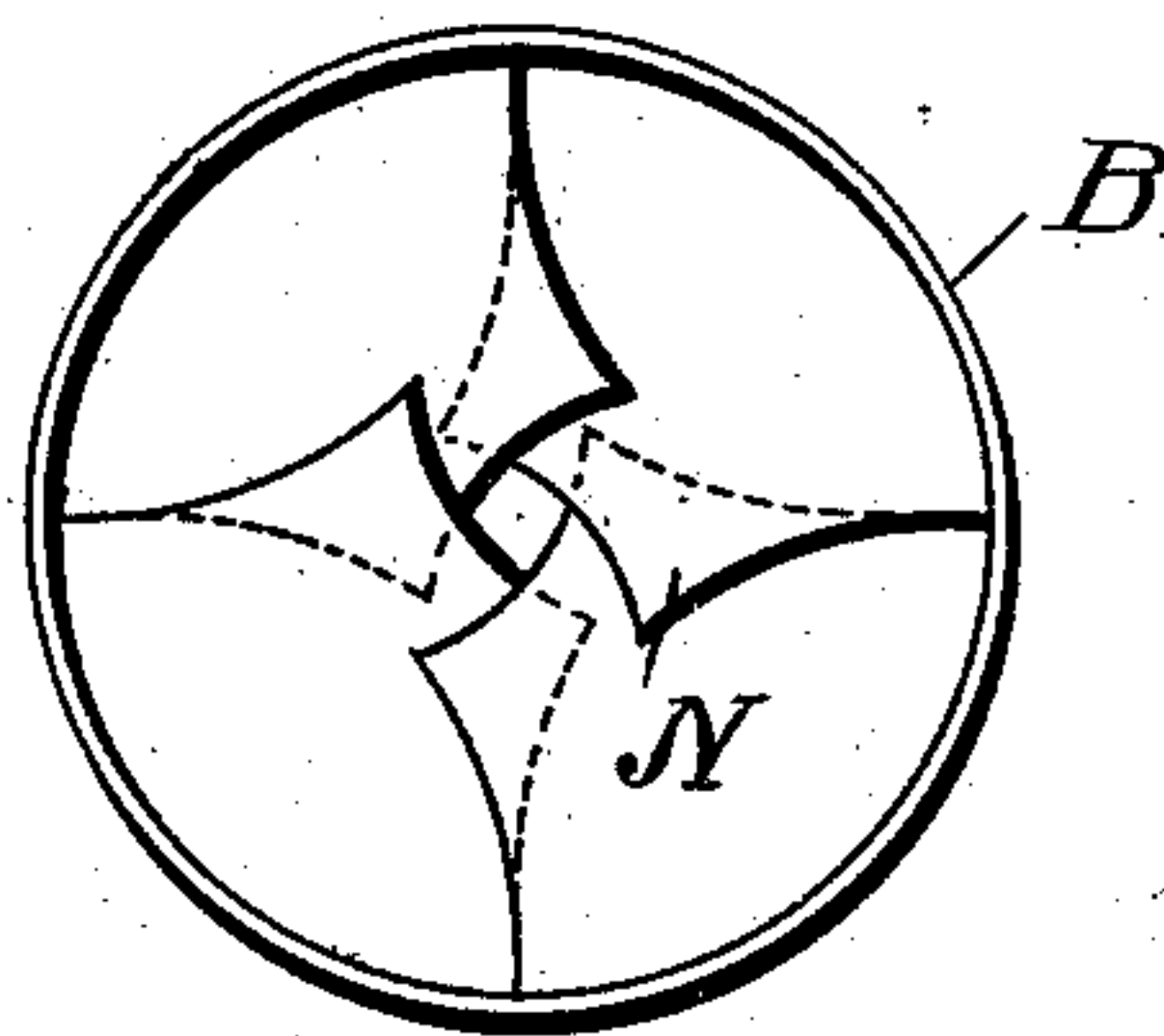


Fig. 11.



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UNITED STATES PATENT OFFICE.

WASSILY KIRSANOV, OF MOSCOW, RUSSIA.

BLASTING-CARTRIDGE.

SPECIFICATION forming part of Letters Patent No. 704,465, dated July 8, 1902.

Application filed October 22, 1901. Serial No. 79,590. (No model.)

To all whom it may concern:

Be it known that I, WASSILY KIRSANOV, a subject of the Emperor of Russia, residing at Moscow, Russia, have invented certain new and useful Improvements in Blasting-Cartridges, of which the following is a specification.

The blasting-cartridges which form the object of my invention are distinguished from others by the composition of the explosive and the method of closing them, by which flame is not prevented from communicating with the explosive, but the escape of the gases is prevented during the explosion.

On the accompanying drawings, Figure 1 represents a longitudinal section of a cartridge of my system. Fig. 2 is a longitudinal section of a closing-cylinder used in my cartridge. Figs. 3 and 4 are front and edge views of the closing-cylinder shown as unrolled, (plained.) Fig. 5 is an end view of the closing-cylinder. Figs. 6 and 7 are end view and longitudinal section of the same on a larger scale. Figs. 8 to 11 are sections and end views of two modifications of the closing-cylinder. Fig. 12 is a longitudinal section of a cartridge with closing-cylinder of a modified form.

Blasting - cartridges of my system are formed of a metal tube E, closed at one end by a hemispherical bottom. This tube or cartridge is charged with an explosive having the following composition: potassium chlorate, from forty per cent. to sixty per cent.; picrate of potassium, sodium, lead, ammonium, copper, iron, &c., from thirty per cent. to forty per cent.; celloidine, (a composition of nitrocellulose with camphor,) from five per cent. to twenty per cent.; elemi or sandarac resin, five per cent. The addition of celloidine (which is preferably dissolved in a mixture of sulfuric ether and alcohol or acetone) prevents the mass from becoming hygroscopic. The addition of the resin (which may be dispensed with) is for the purpose of introducing into the composition of the explosive a material rich in carbon. The resin may be replaced by potassium ferrocyanid; but in this case the cartridges will be more explosive and will thus require more care in use. In order to facilitate mixing the explosive so composed, a little water may be

added, which is afterward evaporated. There is no danger in ramming the semiliquid and pasty mass into the cartridges, as this mixture does not when wet explode or ignite by a flame or by percussion.

The cartridge is filled with the explosive above named in such quantity that there remains sufficient space for the introduction of the closing-cylinder A. This small cylinder is also a metal tube having a hemispherical bottom B, the construction of which is similar to that of the iris diaphragms used in the construction of optical instruments. For this purpose short nicks are made in the lower edge of a metal tube, Fig. 3, and the tongues of metal *a*, Fig. 4, comprised between these nicks then caused to take an oblique position, after which this edge of the cylinder is spun upon a suitable mandrel in order to form a hemispherical bottom in such a manner that the edges of the nicks cover each other, reciprocally forming at the center a star-shaped opening, Figs. 5 and 6. This opening contracts more or less when the bottom of the tube is compressed, and it is completely closed when sufficient pressure is applied. It is obvious that the number of tongues *a* may be varied. Thus Figs. 8 and 9 represent a cylinder-bottom with two tongues only, and Figs. 10 and 11 show a four-tongued hemispherical bottom. The cylinder thus formed is introduced into the cartridge in such a manner, Figs. 1 and 12, that its bottom rests upon the explosive with which the cartridge is charged. A metal rod is then introduced through the star-shaped opening *c* and forms in the explosive a central axial hole L. At the same time it forces the displaced explosive against the bottom of the closing-cylinder A and even causes it to penetrate into the interstices N of the tongues which constitute the bottom B of the cylinder. The cartridge charged in the manner indicated is then dried at a temperature of 100° centigrade by means of a thermostat. Drying is continued until complete evaporation of the sulfuric ether and alcohol or acetone and also of the water. Finally, in order to fix the cylinder A in the cartridge this latter is compressed with the cylinder by means of suitable tongues in such a manner as to form triangular or other indentations K. In order to explode the cartridge, a Bick-

ford fuse or other quick match is introduced into the small cylinder A and reaches to the bottom of the same. After lighting the free end O of the fuse the flame will pass through the star-shaped opening at the bottom B and will communicate with the whole mass of the explosive S, which will from the first moment of the explosion develop sufficient pressure upon the bottom B for the opening c in this latter to be completely closed and prevent the escape of the gasses. Complete combustion of the explosive thus takes place.

I claim as my invention—

1. A blasting-cartridge closed by a cylinder with hemispherical bottom formed by a number of tongues the adjacent edges of which cover each other reciprocally forming at the center a star-shaped opening which is automatically closed as soon as the pressure is applied.

2. A blasting-cartridge closed by a cylinder with hemispherical bottom formed by a number of tongues, the adjacent edges of which cover each other successively, forming at the

center a star-shaped opening adapted to be closed by the pressure in the cartridge, and means for retaining said cylinder in said cartridge, substantially as described.

3. A blasting-cartridge consisting of a tube closed at one end, explosive compound in said tube, a cylinder with a hemispherical bottom formed by a number of tongues, inserted in said tube upon the explosive compound, the said tongues being adapted to close the bottom of the cylinder when the explosion takes place, substantially as described.

4. A blasting-cartridge closed by a cylinder with a hemispherical bottom formed by a number of tongues adapted to be closed by the pressure in the cartridge, and a fuse in said cylinder, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

WASSILY KIRSANOV.

Witnesses:

GUSTAV HARTWIG,
NICHOLAS TSCHENALOFF.