My invention relates to improvements in combustible mixtures for generating heat, compressed gas or choke gas, and to a process for preparing the same. My improved combustible mixture consists substantially of animal charcoal and ammonium nitrate in suitable proportion. In a preferred process 15 parts by weight of animal charcoal are mixed with 55 parts by weight of ammonium nitrate and pressed into solid bodies or cartridges to facilitate handling and application of the product. Since ammonium nitrate is hygroscopic it is necessary to exclude the air by an envelope and to prevent the admission of dampness. The envelope or wrapping may be combustible, but it may equally well consist of a refractory material and then form a combustion chamber, whereby the heat may more easily be concentrated on a certain point.

The mixture has various advantages. Above all it burns without any air being admitted, so that it is perfectly utilized in closed chambers and leaves no appreciable residue behind. In comparison with other mixtures, primarily gunpowder, it burns very slowly and produces a uniformly rising pressure. This may be accounted for by the fact, that the combustion is not substantially accelerated even when the pressure rises. The comparatively low combustion temperature probably has an influence in this direction. The containers for the compressed gas may consequently be accurately calculated and the danger of an explosion be avoided. To these must be added the further advantage, that the mixture may easily be ignited, for instance by a small priming set, the open flame, an incandescent wire or an electric spark.

When using the mixture as fuel for generating heat closed heating chambers may be used and since the combustion takes place without a flame and under development of small quantities of smoke, steam and vapor, my improved compound may also be used in a partly closed receptacle even in storage rooms for inflammable substances. For the development of choke gas or nitrogen for suppressing fires in the holds of ships or other closed rooms or for killing vermin the fact that the mixture burns without a flame is likewise of great advantage, while its low combustion temperature does not let the mixture appear as easily inflammable substance.

Ammonium nitrate has already been suggested or used as addition to blasting substances and black gunpowder. The remaining constituents increased, however, the velocity of combustion of the mixture up to an explosion, so that such mixtures were unsuitable for generating compressed gas in closed containers. I have found by extensive experiments, that animal charcoal mixed with ammonium nitrate results in a compound, which has special qualities for many purposes, and in particular valuable for the use by the public, inasmuch as its speed of combustion does not increase substantially when the pressure rises. The two constituents of the mixture, animal charcoal and ammonium nitrate, are essential for the favorable qualities of the mixture. The speed of combustion may, however, be varied in a different degree by adding other kinds of carbon, such as ordinary charcoal, whereby the combustion is retarded.

The compressed gas may be employed for various purposes, for instance for forcing liquids out of closed containers, as in the case of fire extinguishers, paint or cement guns, siphons, atomizers, as well as driving medium for pneumatic tools, air brakes, ejectors and for starting gas motors.

I claim as my invention:
1. The process of preparing a combustible compound for generating compressed gas, choke gas or heat, which consists in mixing
about 15 parts by weight of animal charcoal and 85 parts by weight of ammonium nitrate in a state of fine division.

2. The process of preparing a combustible compound for generating compressed gas, choke gas or heat, which consists in mixing about 15 parts by weight of animal charcoal and 85 parts by weight of ammonium nitrate in a state of fine distribution, pressing the compound, into solid bodies, and enclosing them in an airtight envelope.

I affix my signature.

JULIUS THIECKE.