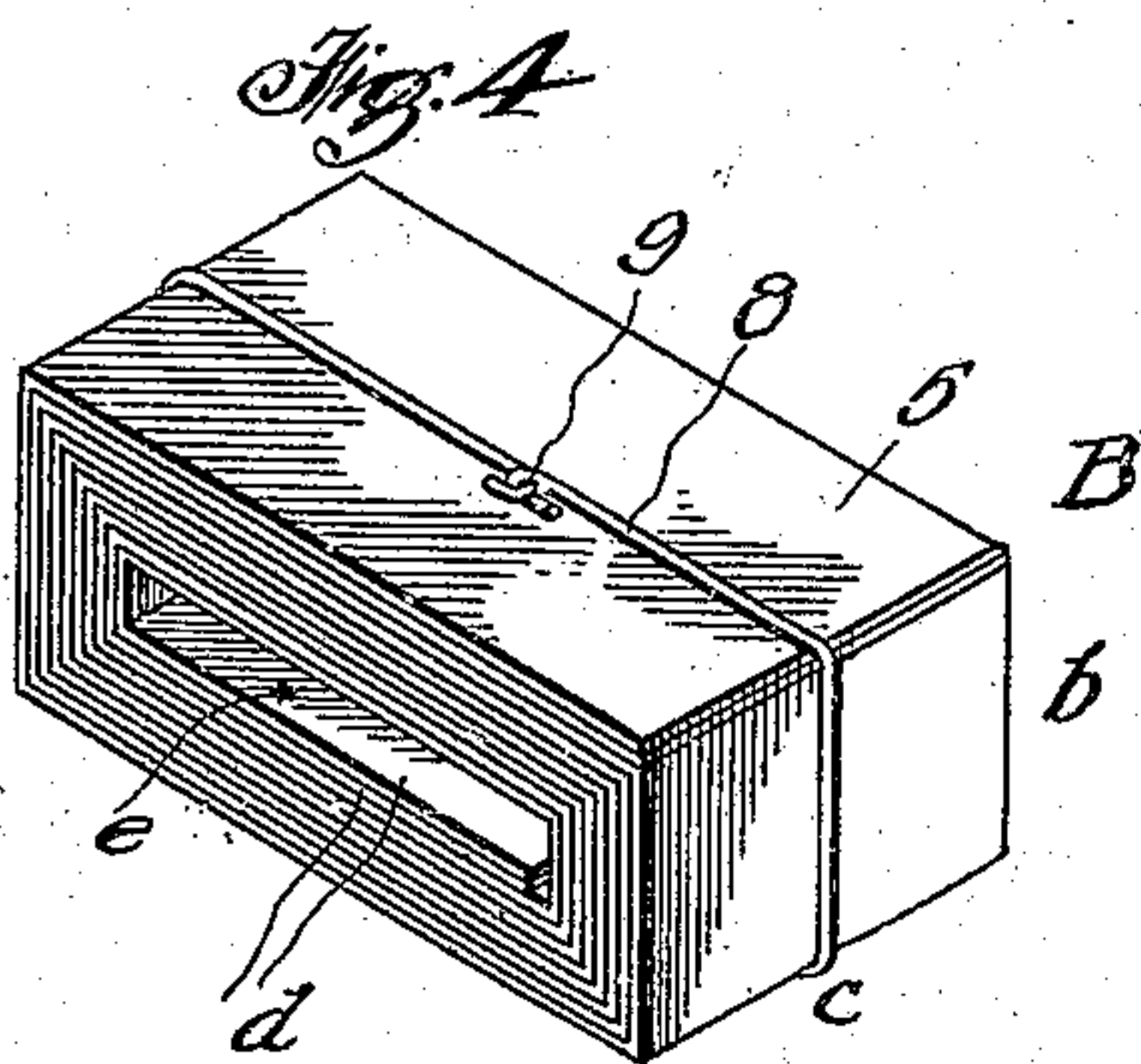
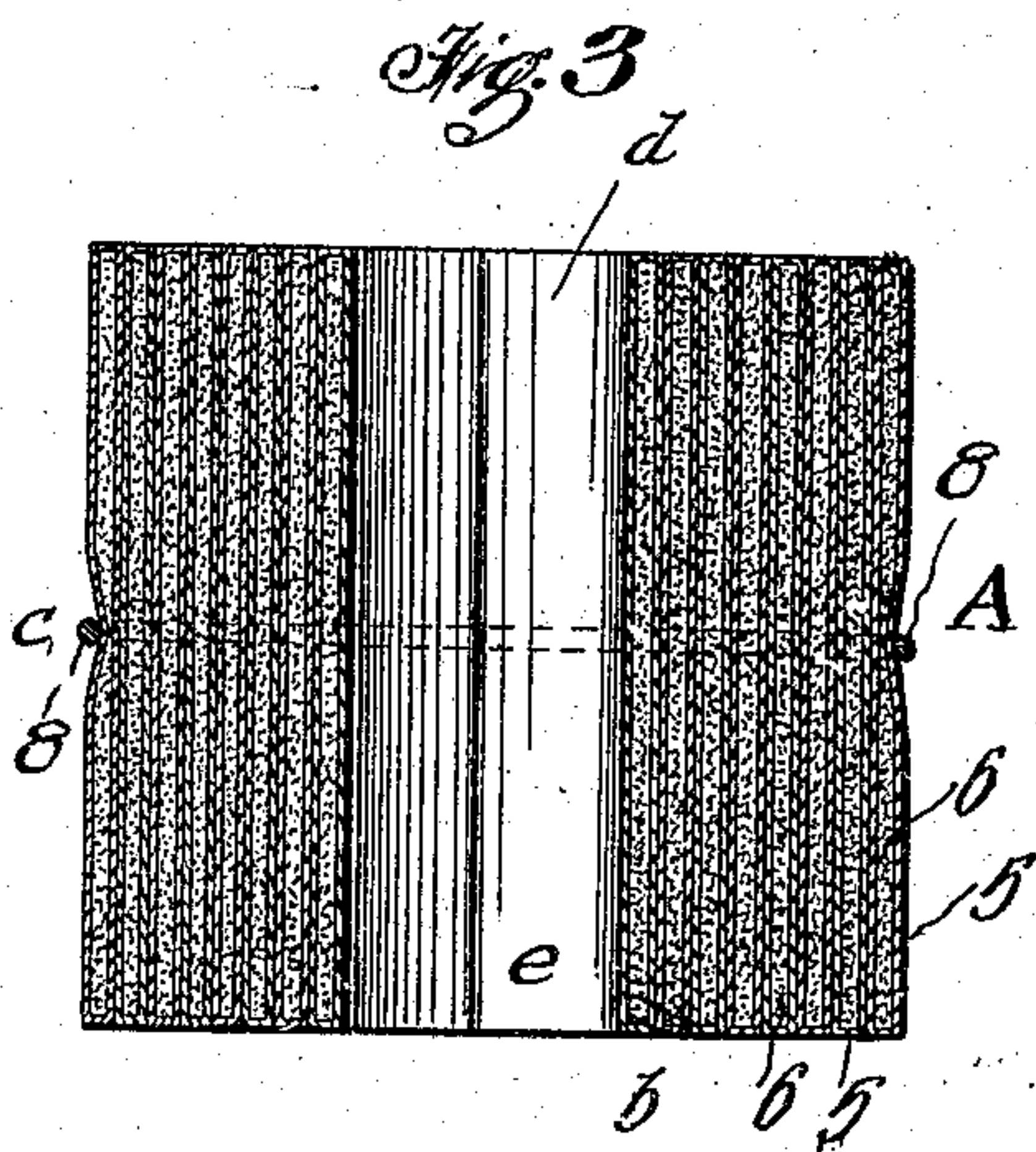
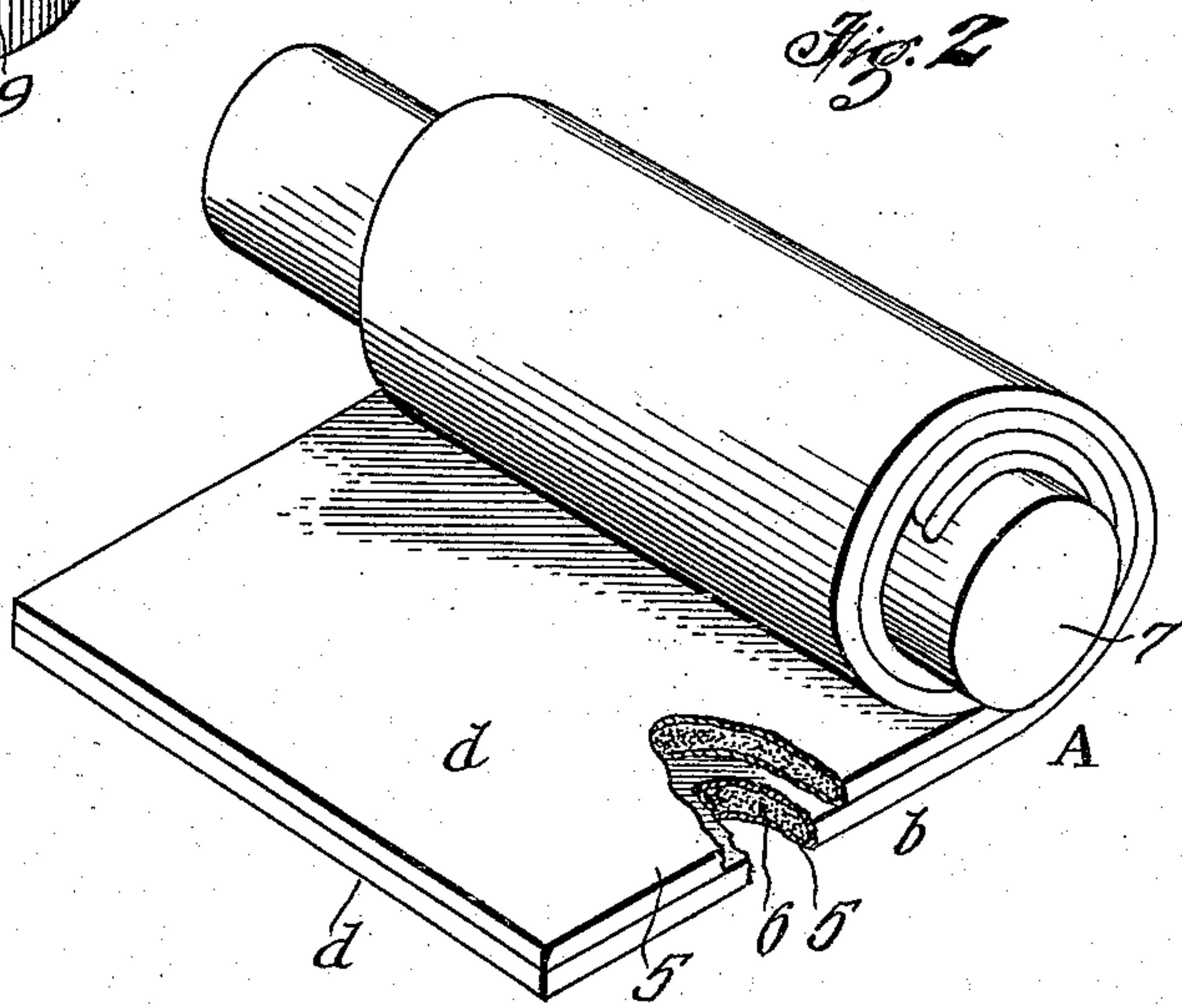
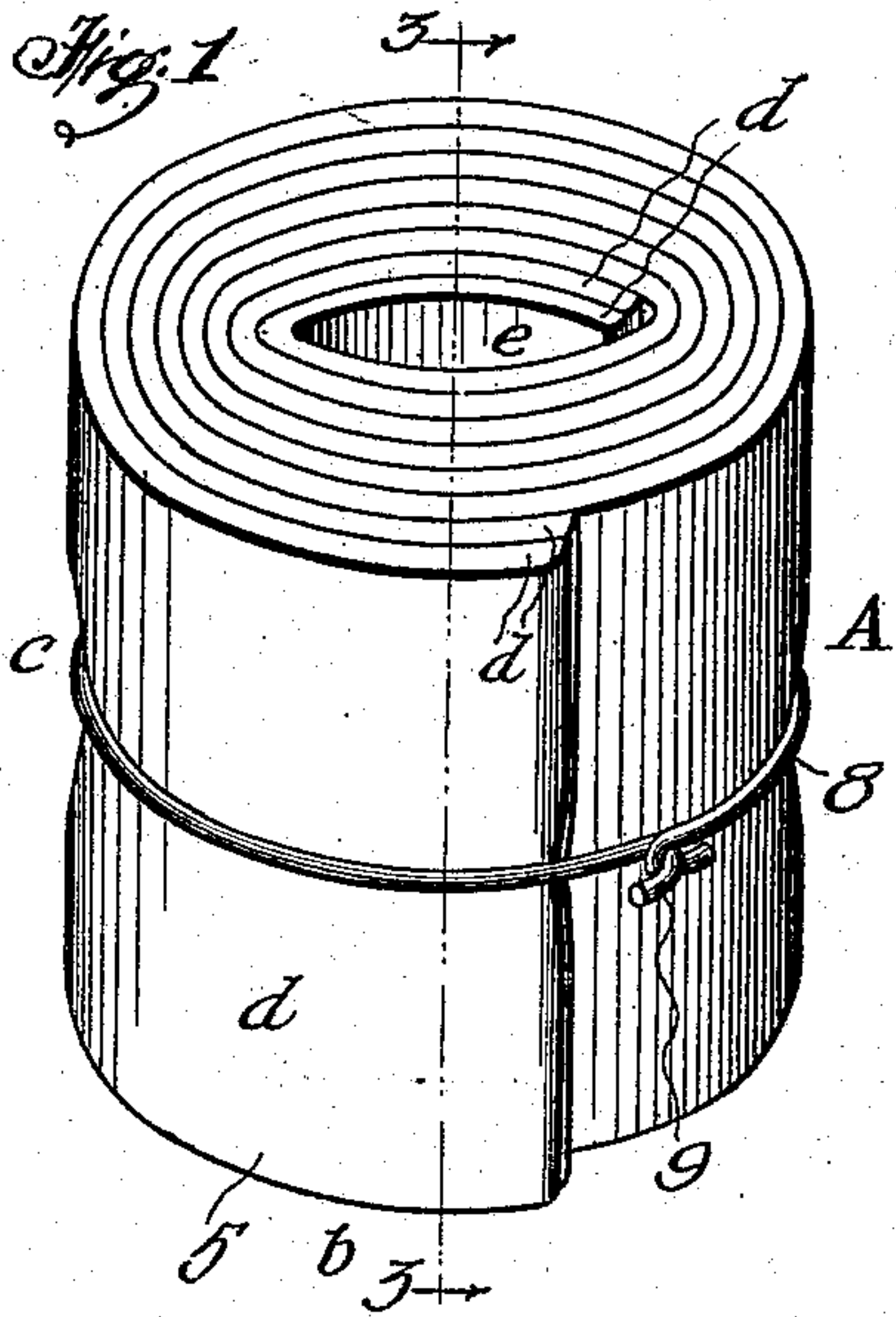


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FUEL.

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# UNITED STATES PATENT OFFICE.

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## FUEL.

No. 930,526.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed October 2, 1907. Serial No. 395,653.

*To all whom it may concern:*

Be it known that I, WILLIAM G. BLOSS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Fuel, of which the following is a specification.

This invention relates to fuel, and it has for its object to provide an improved article of manufacture constituting a fuel which shall be inexpensive and comparatively simple in production, economical, cleanly, convenient, and highly efficient in use; and which may utilize in its organization a wide range of waste and other low-value materials and substances; the product being highly superior in point of serviceability and adaptability to a wide range of heat-generating uses.

The invention consists in the novel provision, association, and combination of parts, members, portions and features hereinafter described, illustrated in the drawing, and finally pointed out in the claims.

In the drawing:—Figure 1 is a perspective view of a fuel element produced according to the invention; Fig. 2 is a perspective view of the same in the process of formation; Fig. 3 is an axial sectional view of the completed fuel element, taken upon the line 3—3 Fig. 1, and looking in the direction of the appended arrows; and, Fig. 4 is a perspective view of a modified form of construction of the fuel element.

Corresponding parts in all the figures are designated by the same reference characters.

Referring with particularity to the drawing, and to Figs. 1 to 3 inclusive of the same, A designates a preferred form of construction of a fuel element produced according to the invention. In Fig. 4, B designates a modified form of construction of such fuel element; the organization of both forms of construction varying relatively only in shape or conformation.

Referring now to all the figures, *b* designates the body of the fuel element, and *c* designates a binder applied to the same and whereby the entirety is maintained in form for shipment, storage and general use. The body *b* is a strip which comprises a plurality of body-portions *d*, preferably of similar constitution in any one fuel element, but variable in this respect in accordance with the prevailing conditions of use and heat-generation utilization. Each of the body-portions *d*

comprises a wrapper or envelop 5 of sheet material and a contained combustible 6 of granular material. The wrapper or envelop 5 is preferably inflammable in nature; but the combustible 6 is essentially so to a degree commensurate with its constituent material or substance. The wrapper or envelop 5 may consist of paper or textile material, paste-board, or other suitable inexpensive sheet material, waste newspaper being particularly satisfactory in material nature and from a standpoint of inexpensiveness. The combustible 6 may consist of, and in its composition or provision be selected from, a wide range of waste and other low-value granular materials and substances, such as husks, nutshells, saw-dust, sea-weed, shavings, chips, excelsior, hair, waste-paper, dried grass and leaves, chaff, straw, corn-cobs, garbage, and scraps of various kinds. These materials or substances, or such of same as may be chosen for any one body-portion, are mixed together or reduced in unitary size and finely-divided or granular form, by crushing, grinding, chopping, tearing, or other method, or are utilized in natural form and condition; and the same are massed into the formed wrapper or envelop 5, to the desired degree of compression; or the wrapper or envelop is formed or folded around the materials or substances constituting the combustible. The resultant body-portion *d* may, by pre-determination, be of any preferred and suitable form; but is preferably a strip elongated and rectangular, as illustrated in the drawing.

The body-portion *d* is preferably impregnated or saturated with an inflammable filler consisting of crude oil, kerosene, gasoline, fat, or other oily and volatile material or substance; this treatment being given to the wrapper or envelop and to the combustible, or both, either before or after their association as described.

A plurality of the body-portions *d*, constituted as above, are now jointly associated to form the body *b*; and in the form of construction shown in Figs. 1 to 3 inclusive this result is accomplished by laying such body-portions together in flat serial relation, and winding them spirally into a roll around a removable core, former or roller 7. The bodyportions *d* are now tightly compressed and secured together in compact form by the binder *c*, which may consist of a length 8 of wire, cord, tape, metal ribbon, or other suitable material; the ends of the same being twisted to-



gether or detachably engaged as at 9, to fasten and secure the binder in place, preferably about the central portion of the body. When the core, former, or roller 7 is removed, a flue or vent *e* is produced, centrally of the body *b*, the walls of the same comprising the innermost portions of the body-portion *d*.

In producing the form of construction illustrated in Fig. 4, the body-portions are also wound spirally and compressed about a core, former or roller, (not shown), of angular preferably rectangular, conformation; and the resultant shape or conformation of the body *b* is a rectangular spiral, as illustrated.

A flue or vent *e* is likewise produced in this form of construction; and the binder *c* is similarly applied. The innermost convolution of the body-portion of the body *b* is preferably moistened with water, to a certain extent, which causes more even and gradual combustion of the entire body. The whole fuel element A or B may be immersed in a seal consisting of slaked lime or a solution of clay, or plaster, or other suitable material or substance, forming a fixed or non-volatile coating, killing or preventing any dissemination of any odor arising from the body, and retaining the gaseous substances in the latter until combustion takes place.

The method of use and advantages of the improved fuel constituting the invention will be readily understood. One or more of the fuel elements A and B is placed in the stove, on the grate, or in the fire-place, the same being disposed with the flue or vent *e* of each extending vertically, and fire is applied to same at the top of each fuel element, or within the flue or vent of the same. Combustion extends downwardly and outwardly of the body. The binder *c* of each fuel element is preferably allowed to remain in operative position to secure an extended or slow and even combustion of the body *b*. To this end a binder of wire is preferable, as it resists combustion. To produce a quick combustion the binder *c* is taken off, and the body *b* allowed to uncoil and open up to the air. Such uncoiling tendency will be stronger where the body is composed of a plurality of body-portions arranged in serial relation, because a weaker convolution in either portion would probably be strengthened by the adjacent convolutions in the other. If the innermost convolution or either or both the body-portions have been moistened as above described, the swelling of the granular combustible will tend to expand the same and assist it to uncoil. The fixed seal gradually burns away or is penetrated, liberating the combustible and volatile gases and exposing the saturated wrapper, and when this is burned through the fire has access directly to the granular combustible 6 which constitutes practically the base of this fuel element. By the time the flame has reached

this base the seal will have practically disappeared, and if the binder had been first removed and the coils have opened up the wrappers will be afire or will have been consumed and the base and its highly inflammable filler are left to burn with great intensity and efficiency—the duration depending upon the materials employed.

In conclusion, I do not desire to be understood as limiting myself to the specific provision, combination, association, and construction of parts, members, portions and features herein described and shown in the drawing; but reserve the right to vary the same, in adapting the improvements to varying conditions of use, without departing from the spirit of the invention or the terms of the following claims.

Having thus described my invention, I claim and desire to secure by Letters Patent:—

1. A fuel element comprising a body strip wound into a spiral having an axial flue, and a binder secured tightly around the spiral.
2. A fuel element comprising an inflammable body strip wound into a spiral, and a non-inflammable binder drawn tightly around said element with the extremities of the binder detachably engaging each other.
3. A fuel element comprising a body consisting of a plurality of body-portions in strip form superimposed on each other and wound into a spiral having an axial flue, the innermost convolution being moistened for the purpose set forth.
4. A fuel element comprising a body consisting of a plurality of body-portions in strip form superimposed on each other and wound into a spiral having an axial flue, the innermost convolution being moistened for the purpose set forth, and a binder detachably surrounding the spiral.
5. A fuel element having a body portion made in strip form and wound into a spiral, said portion comprising throughout its length an envelop of sheet material and an inflammable combustible therein of granular material, and a wire binder surrounding the spiral.
6. A fuel element comprising a body strip wound into a spiral having an axial flue, the innermost convolution being moistened for the purpose set forth.
7. A fuel element comprising a body strip wound into a spiral having an axial flue, the innermost convolution being moistened for the purpose set forth, and a binder detachably surrounding the spiral.
8. A fuel element having a body portion made in strip form and wound into a spiral, said portion comprising throughout its length an envelop of sheet material and an inflammable combustible therein of granular material, and a wire binder surrounding the spiral with its ends detachably engaged.



9. A fuel element comprising a base wound into a spiral and consisting of an envelop of sheet material and a granular combustible therein, an inflammable and volatile filler with which the base is saturated, and a fixed or non-volatile seal or coating enclosing the whole; combined with a binder detachably surrounding said element.

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

WILLIAM G. BLOSS.

Witnesses:

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AUBIN G. LOCKE.