

PATENT SPECIFICATION



147,522

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COMPLETE SPECIFICATION.

Improved Casing for "Sticks" of Fragile and Soft Materials for Drawing, Writing and the like purposes.

We, SOCIÉTÉ ANONYME DES ANCIENS ÉTABLISSEMENTS J. M. PAILLARD, of No. 17, Passage Saint Sebastien; Paris, France, Manufacturers, a French company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention consists in an improved material of the type comprising a fibrous vegetable substance such as powdered wood and an adhesive, such material being used for encasing "leads" of plumbago, and other substances such as chalk, pastels, and the like generally of all more or less soft or fragile materials, in sticks of any section intended for writing, drawing, sketching, colouring and like purposes.

Other features of the invention are hereinafter fully described and claimed.

The improved material is a pasty mass having properties such that the resulting casing is practically as light as the ordinary wooden casing which it is intended to replace. The improved casing has the same "feel" to the hand as wood, and it can be cut with a penknife or in a machine with the production of long fine shavings exactly as is the case with the ordinary wooden casing, while it can be polished and varnished in the same manner so as to resist completely the destructive action of moisture.

The pasty mass or agglomerate utilised for the improved casing according to the present invention, is composed of three constituents:

1) Vegetable organic materials, such as wood, cork, or rags, finely divided or pulverised;

2) Inert mineral substances, such as talc, clay, lime, gypsum or other substances of the same nature;

3) Agglomerating materials, such as casein, potassium silicates or sodium silicates, glues, resins or gums in general.

These constituents are employed preferably in the following proportions;

Vegetable materials -	-	30 per cent.
Mineral materials -	-	6 per cent.
Agglomerating materials	10 per cent.	
Water - - - -	-	54 per cent.

The mixing, stirring and kneading of these materials are done by hand or by machinery with the addition as indicated above of about their own weight of water.

The paste resulting from this operation is perfectly uniform and its constituents are intimately united, the vegetable material serving to render the mass less fragile, whilst the mineral material facilitates the cutting or carving of the same. Any desired pigment or dye may be incorporated with this paste.

This pasty agglomerate is used to form directly upon the leads, chalks, pastels, and like sticks, the casing that is intended to encase and protect the said leads, etc. This direct formation is effected by means of an apparatus of known construction *per se* comprising a die fed under pressure and constructed as hereinafter described by way of example with reference to the accompanying drawings in which:

Fig. 1 is a diagrammatic section of the

die fed by a press of any kind, the casing just beginning to be formed.

Figs. 2 and 3 illustrate an intermediate stage of the operation, with reference to 5 the lower part of the die.

Figs. 4 and 5 are cross sections respectively on the lines A—B and C—D of Fig. 1.

Fig. 6 is a longitudinal section of a 10 modification of the die arranged horizontally and fed by a filling machine comprising a helical plunger.

The die shown in Fig. 1 is formed substantially of two cylindrical tubes 1 and 15 2 arranged concentrically so as to leave them a space x . The inner tube 1 is designed to receive the leads, chalks or sticks which are to be encased, and which are slipped end to end into its 20 upper projecting end. The space x receives through a pipe 3 delivering into the outer tube 2, the pasty agglomerate under pressure coming from a press of 25 any kind, of mechanical, hydraulic or atmospheric pressure type. 4 is a sleeve for assuring the correct centering of the tubes 1 and 2; it serves as a plug for one of the ends of the tube 2.

The longitudinal adjustment of the 30 tube 1 relatively to the tube 2 is such that its lower end 1¹ of externally truncated conical form, is located opposite a truncated conical concentrated portion 2¹ of 35 the tube 2, which is prolonged at 5 for a certain length so as to constitute the delivery orifice or die. The internal section of the tube 1 is adapted to the section of the leads, or chalks to be encased. The 40 internal section of the die extension 5 is circular, elliptical or polygonal (Fig. 5) according as the casing to be produced has an outwardly cylindrical or prismatic shape.

Before admitting the pasty agglomerate 45 to the die, the tube 1 is first furnished with leads, or chalks placed one on top of the other therein in such a manner that the first stick will be flush or nearly flush with the exit orifice of the extension 50 5. The pasty agglomerate which is introduced under pressure through the pipe 3, is forced into the space x up to the moment when on reaching the truncated 55 conical contracted portion 2¹, it is forced towards the centre and downwards so as to come in contact in the extension 5 with the projecting portion of the lead, or 60 chalk y which it encases and upon the surface of which it exerts a pressure such that the stick y is drawn along by the agglomerate towards the exit orifice which gives it the desired shape externally.

The operation is continued (Fig. 2)

until the whole of the first stick has been 65 encased. At this moment the said encased stick breaks away from the die (Fig. 3), whereupon it is collected by any suitable means and conveyed to the 70 drying place. The next following stick is in its turn seized and encased by the agglomerate, and this operation is repeated as long as the tube 1 is fed with 75 sticks by hand or by means of an automatic feeding device, and as long as agglomerate is fed to the die.

It is to be noted that by the action of 80 its initial pressure and thrust towards the axis of the die, the pasty agglomerate will be powerfully pressed against the stick which it carries along with it and to 85 which it is as it were welded without any possible formation of cavities or gaps that would injuriously affect its strength.

The subsequent drying of the casing is 90 effected by any suitable known means.

In order to produce a uniform drying 95 throughout the thickness of the casing, and thereby prevent the possibility of the finished product being bent or deformed, the encasing operation may be effected in 100 successive layers, each layer being dried successively. For this purpose it would be sufficient to provide a series of stick tubes of different calibres of cross sections, and to change them successively until 105 the final thickness of the casing is produced. In such a case the successive encasing layers might be produced for example by means of a pasty agglomerate of a composition such that the outer 110 layers will be harder than those nearer the centre. By this means the hardness of the casing would increase from the centre towards the periphery, this being 115 extremely favourable as a means of withstanding shock and the strains of cutting. The successive layers might also be of 120 different colours. In all cases the pressure exerted by the press and by reason of the contracted portion 2¹, will assure 125 between the successive layers of the casing a welding action equal to that produced directly upon the stick.

The first layer applied and pressed 130 directly on the stick must be thin. Its thickness is about equal to a quarter of the total thickness of the casing. The density of the agglomerate used must be 135 small in order to facilitate the cutting, and the drying of this first layer must be as speedy as possible also. Prolonged 140 drying of a thick layer involves the risk of the subsequent drying being unequal and the resulting product being bent or 145 deformed. The essential function of this first, thin layer is to prevent the stick from

bending. An example of the composition of this first layer is approximately as follows:—

	Sawdust	-	-	-	31	<i>per cent.</i>
5	Caseine	-	-	-	13	" "
	Silicate of magnesia	-	-	-	3	" "
	Water	-	-	-	53	" "

The second layer, applied and pressed directly on to the first layer, when once the latter is quite dry, is of a thickness equal to three fourths of the total thickness. It completes this thickness, and the density of the agglomerate used is appreciably greater than that of the first layer, so that the hardness of the casing increases from the centre to the circumference.

The rigidity of the stick being secured by the application of the first layer, slow drying of the second layer can proceed without difficulty. An example of the composition of this second layer is approximately as follows:—

	Sawdust	-	-	-	32	<i>per cent.</i>
25	Caseine	-	-	-	18	" "
	Silicate of magnesia	-	-	-	3	" "
	Water	-	-	-	47	" "

The two layers which we are now considering are the two extremes, and it is to be understood that one can make use of intermediate layers of various numbers, and the thickness and composition of which would vary according to the number and also according to the particular results to be obtained.

In principle, the thickness and density of the successive layers increase from the centre to the circumference so as to effectively to protect the stick under treatment to prevent its bending; and to enable a casing to be obtained which is easy to cut.

The above described die combined with an apparatus for working up and supplying the material thereto having a helical or screw plunger, constitutes the horizontal apparatus illustrated in Figure 6, which is really a modification of the vertical apparatus above described, but with this difference that the feeding of the apparatus with plastic materials is continuous instead of being discontinuous.

The stick tube 1 fixed to a bracket 6 is surrounded by a rotary core 7 formed at its periphery with a helical groove. This core is mounted on a sleeve 8 journaled in a bearing bracket 9 forming part of the fixed casing 10 that plays the part of the tube 2 of the typical apparatus hereinbefore described. A toothed wheel 11 or any other transmission member fixed to

the sleeve 8, allows of imparting rotary motion to the core 7. The truncated conical end 1¹ of the tube 1 projects slightly beyond the free conical end of the core 7 around which there is arranged a head 12 of corresponding form fixed to the casing 10, so as to leave between it and the core a space *a*¹. Upon the head 12 there is fixed a tubular die 5¹ similar to the die extension 5 hereinbefore referred to. The casing 10 is provided at its upper part with a hopper 13 for the reception of the agglomerate.

By the action of the rotation of the core 7 this agglomerate is compressed and propelled towards the conical head 12 which guides it and pushes it towards the stick that is emerging from the tube 1 as hereinbefore described. The stick surrounded by the agglomerate is carried along by the latter into the tubular die 5¹ to produce the casing on the stick. The sticks as they are successively encased and pass out completely from the tubular die, break away automatically from the latter and are then collected and conveyed to the drying place.

The encasing by means of a die with the hereinbefore described agglomerate and by direct formation upon the lead, stick or chalk, has, in addition to having the same qualities as possessed by the best wooden casings as regards cutting, the further advantage of holding its contents very firmly and enabling it to withstand shock and pressure of all kinds, so that it can be sharpened with an infinitesimal risk of breakage. This last advantage is especially valuable in the case of chinks, pastels, and the like, which further can be handled without breaking and without soiling the hands of the user.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A pasty homogeneous mass for encasing leads, chinks, pastels and the like soft or fragile materials in sticks for writing, drawing, and like purposes, composed substantially of a mixture of about 30% of organic substances (such as wood, cork, or rag, finely divided or pulverised), 6% of inert mineral substances such as talc, clay, lime, gypsum, and 10% of agglomerating agents (such as casein, potassium silicate, soda silicate, glue, resin, gum), the whole being stirred and kneaded with about its own weight of water in such a manner as to form a

homogeneous paste which after being shaped and dried, will have the property of being readily cut with a knife or with a machine like wood without breaking.

5 2. A casing for leads, chalks, pastels and the like soft or fragile materials in sticks, consisting of a plurality of thin concentric layers of a pasty homogeneous mass, each layer being applied after the preceding layer has been dried.

10 3. A casing for leads, chalks, pastels and the like soft or fragile materials in sticks, consisting of a plurality of thin concentric layers of a pasty homogeneous mass, each layer being applied after the preceding layer has been dried, the materials constituting the several layers being so selected that each layer increases in hardness from the centre towards the periphery of the casing.

15 4. A casing as claimed in Claim 3 in

20 5. The improved homogeneous pasty mass for encasing leads, chalks, pastels and the like soft or fragile materials in sticks, substantially as hereinbefore described.

which the first layer is formed by a composition which comprises:—

Sawdust	-	-	31	<i>per cent.</i>	
Casein	-	-	13	"	25
Silicate of magnesia	-	-	3	"	
Water	-	-	53	"	

and the second layer is formed by a composition which comprises:—

Sawdust	-	-	32	<i>per cent.</i>	30
Casein	-	-	18	"	
Silicate of magnesia	-	-	3	"	
Water	-	-	47	"	

5. The improved homogeneous pasty mass for encasing leads, chalks, pastels and the like soft or fragile materials in sticks, substantially as hereinbefore described.

Dated this 3rd day of July, 1920.

MARKS & CLERK. 40

[This Drawing is a reproduction of the Original on a reduced scale.]

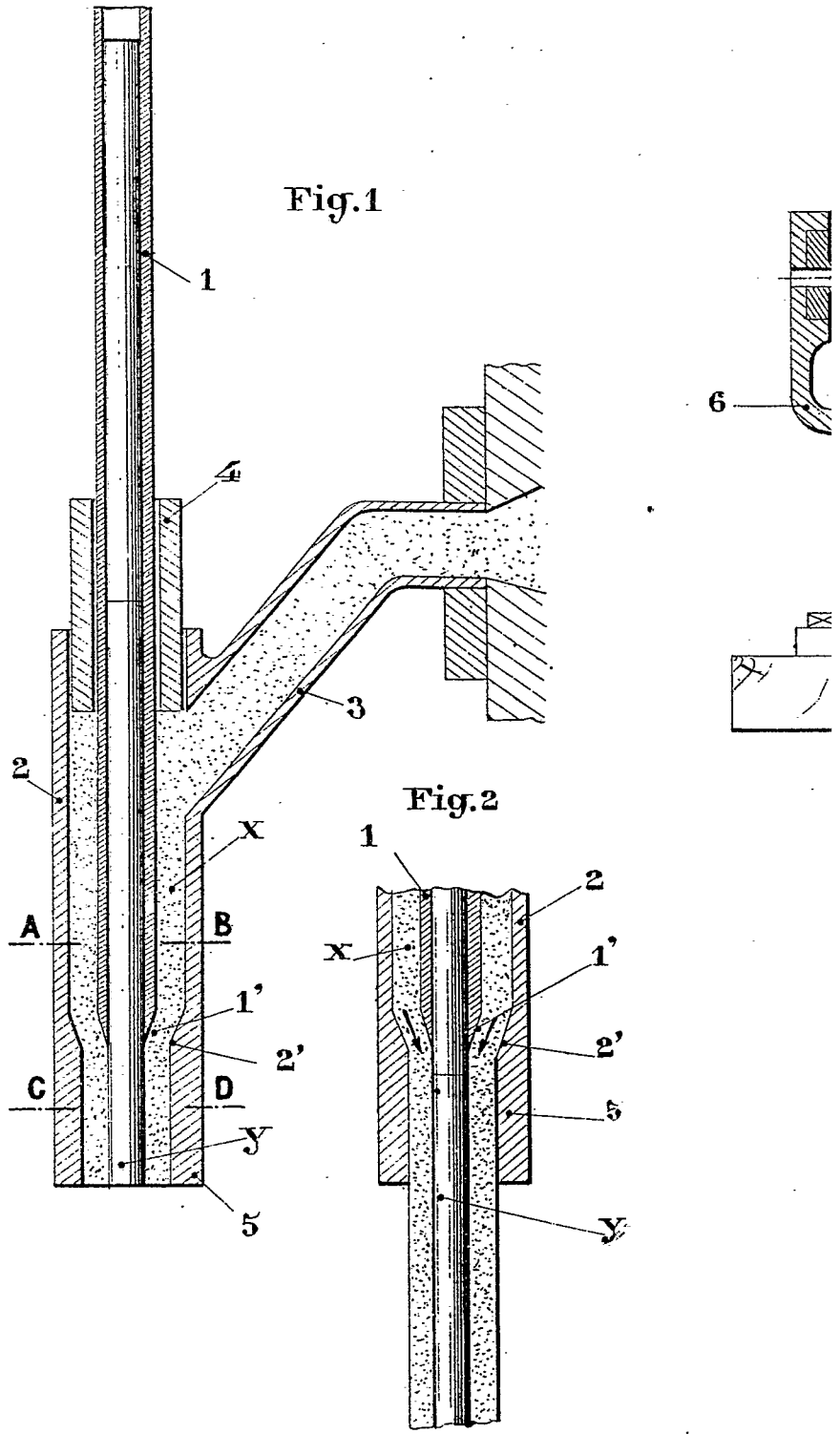


Fig. 6

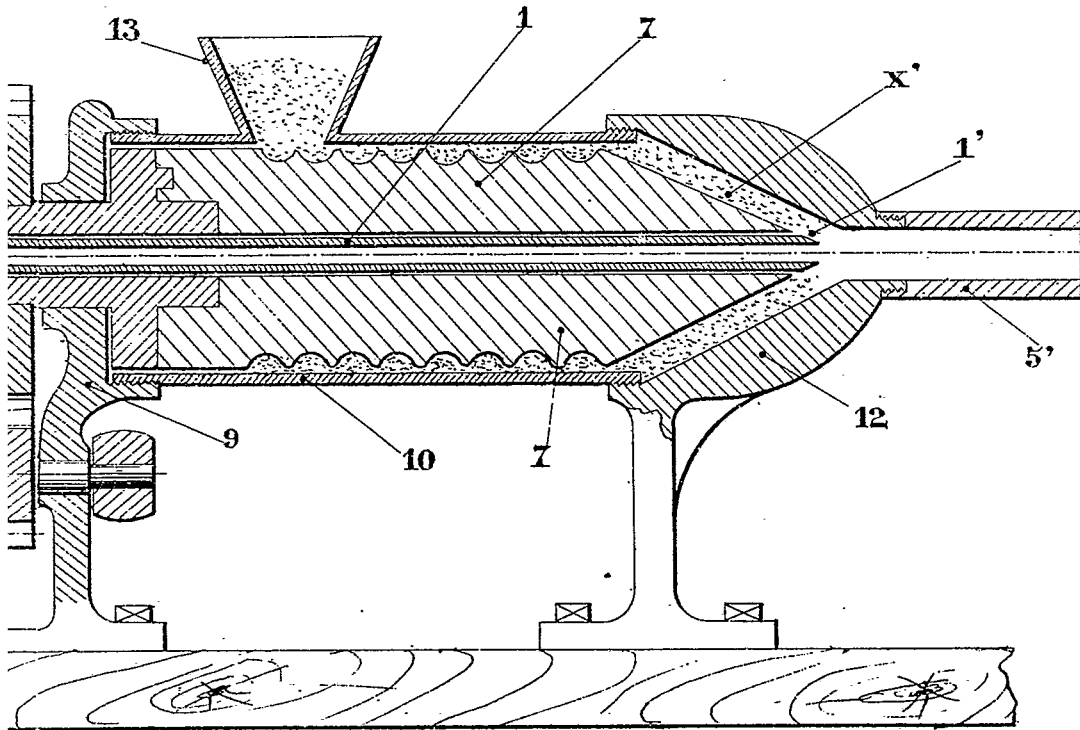


Fig. 3

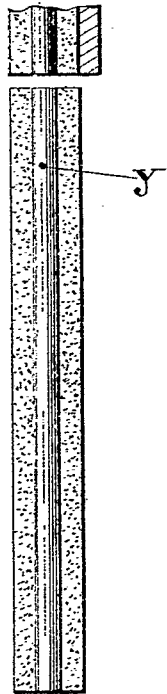


Fig. 4

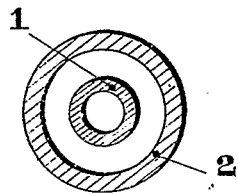
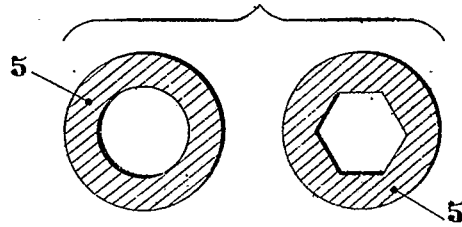


Fig. 5



[This Drawing is a reproduction of the Original on a reduced scale.]

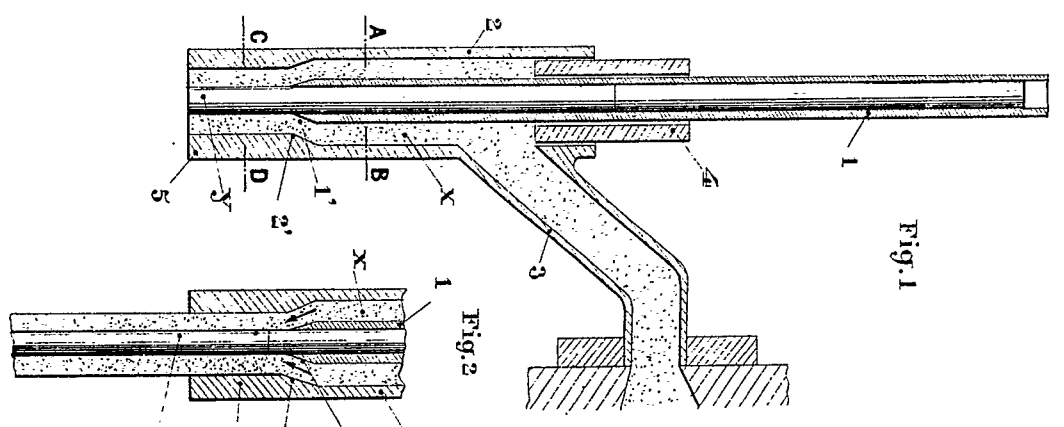


Fig. 1

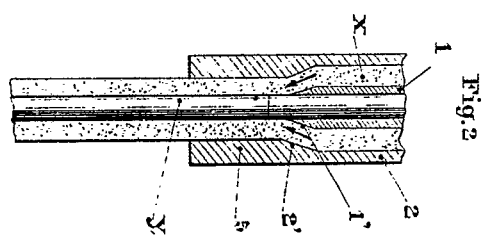


Fig. 2

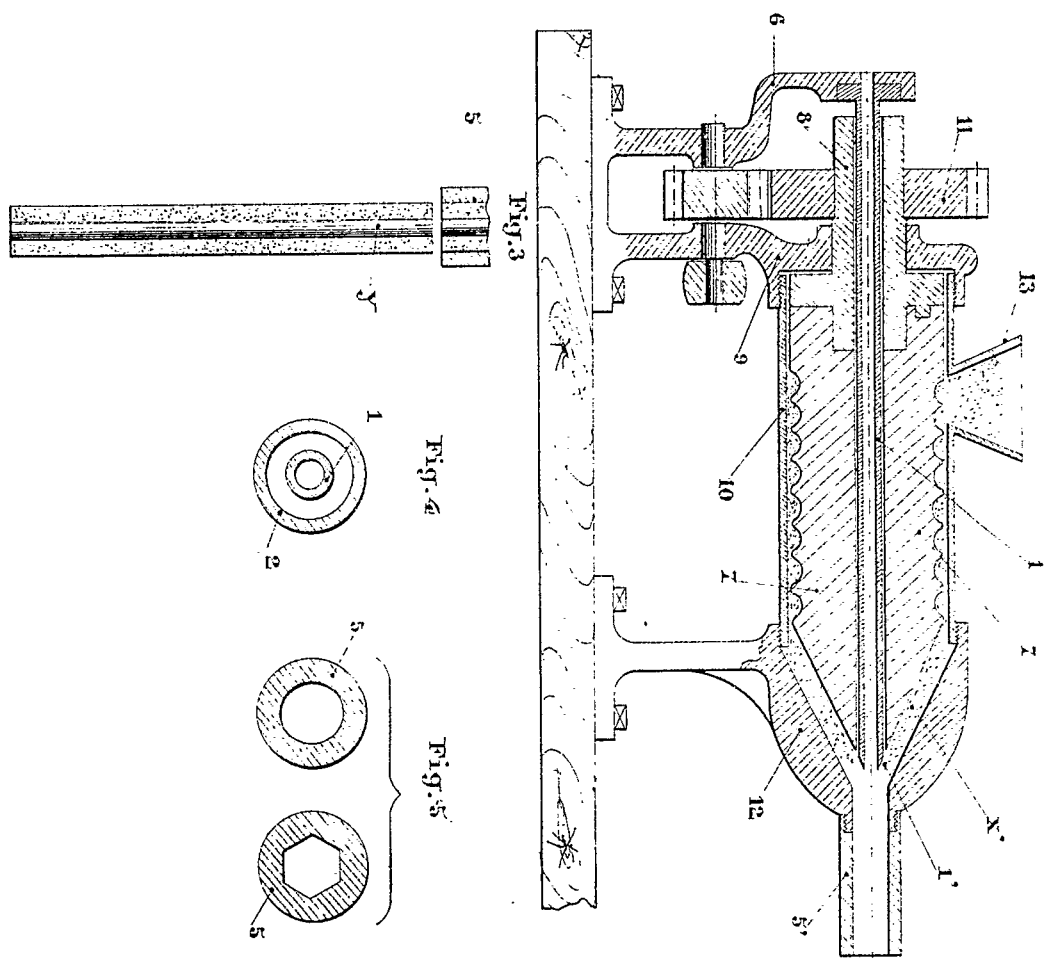


Fig. 6

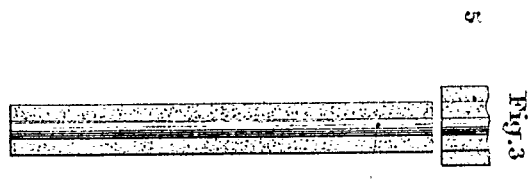


Fig. 3

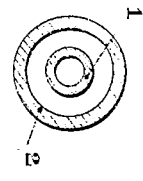


Fig. 4

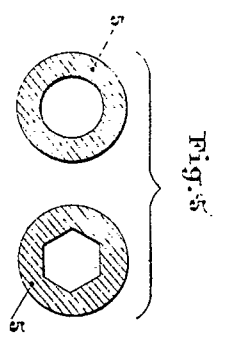


Fig. 5