

(Model.)

E. G. KNOEPFEL & H. MILLER.
BULLION SAMPLER.

No. 464,252.

Patented Dec. 1, 1891.

Fig. 1.

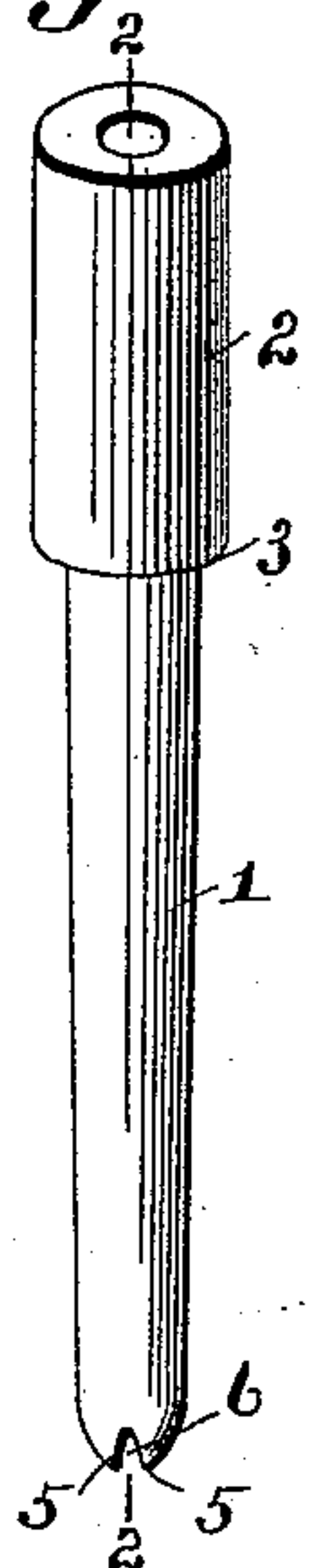


Fig. 2.

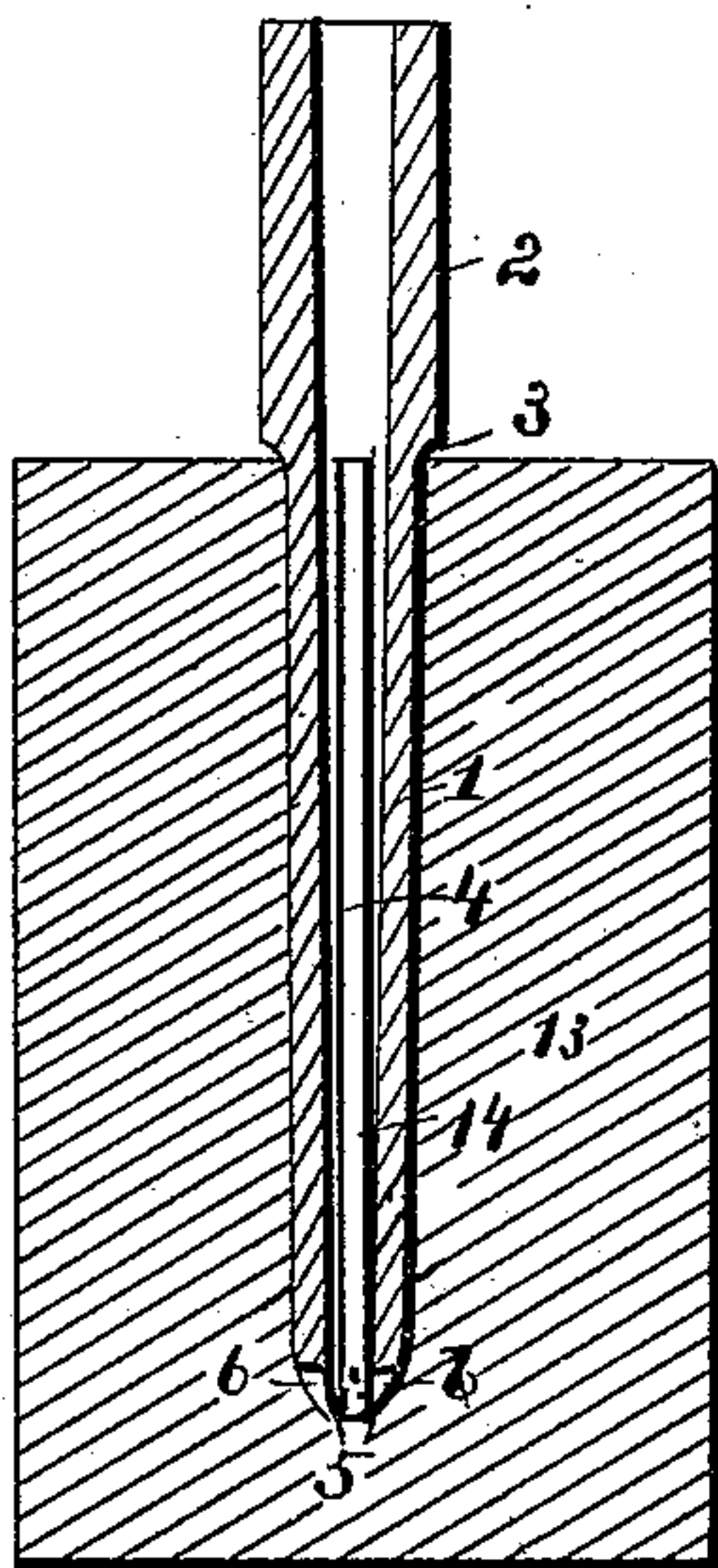


Fig. 3.

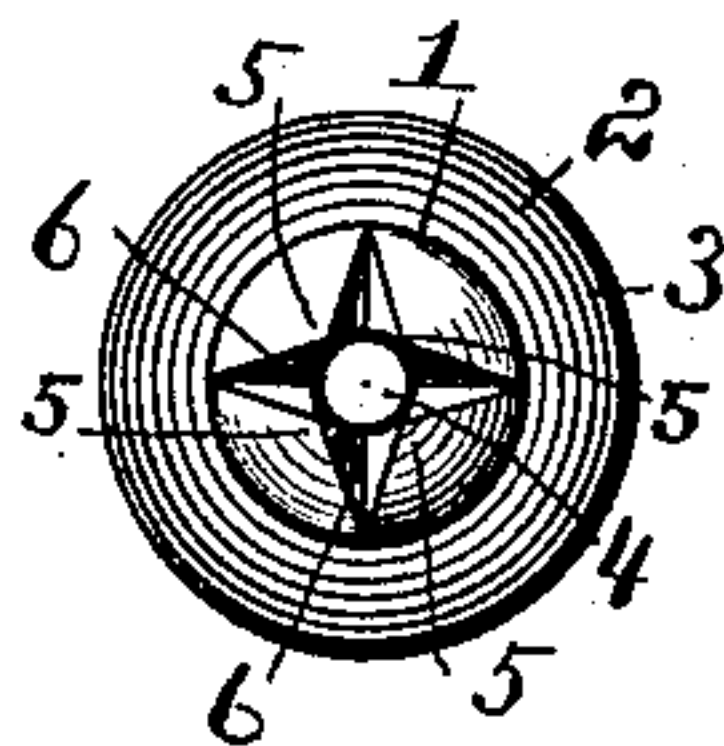


Fig. 4.

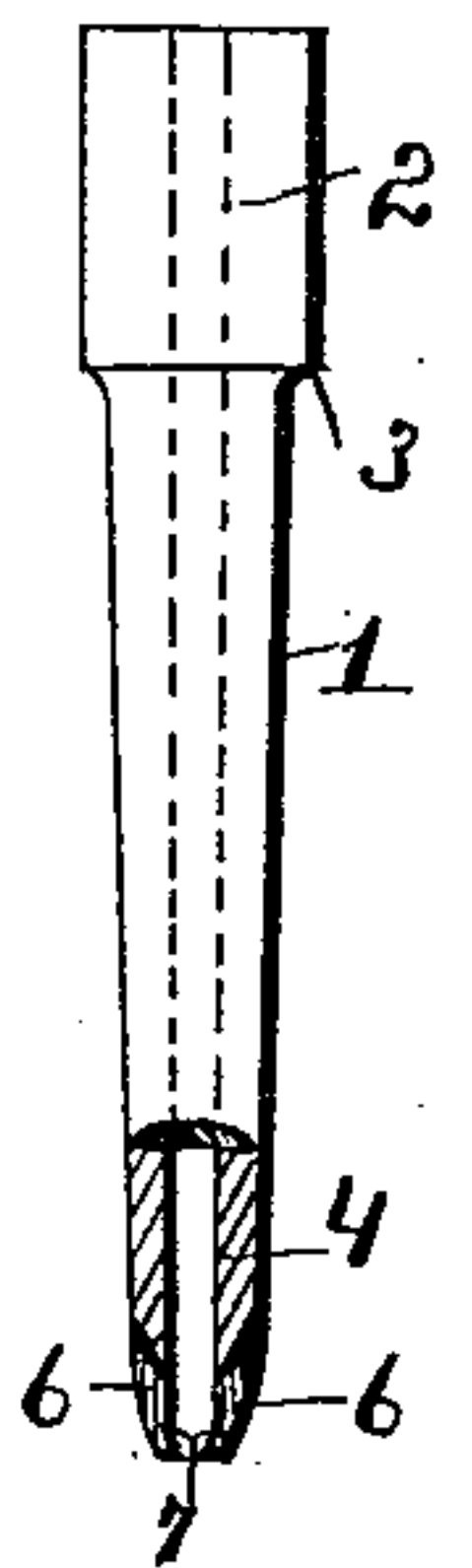


Fig. 5.

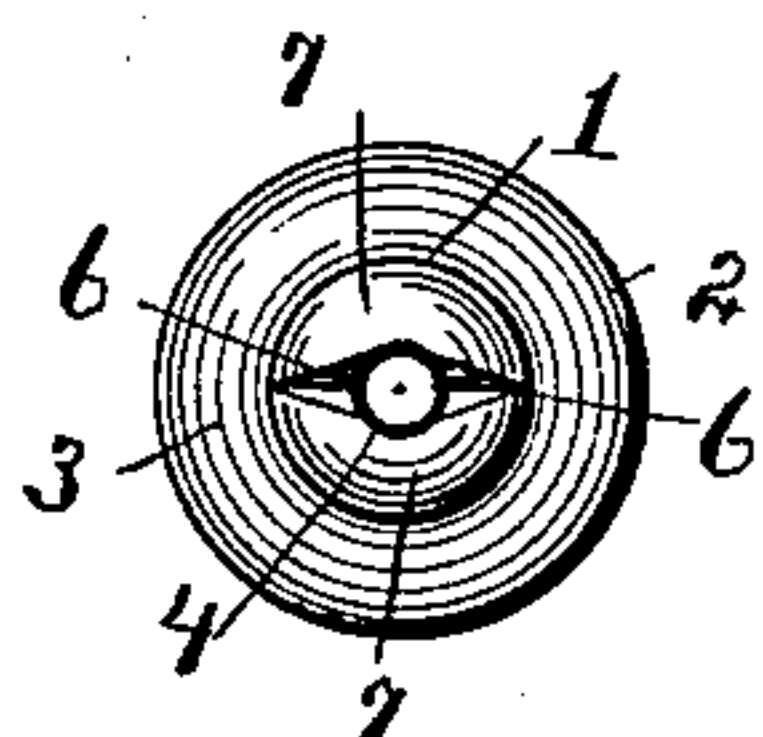


Fig. 6.

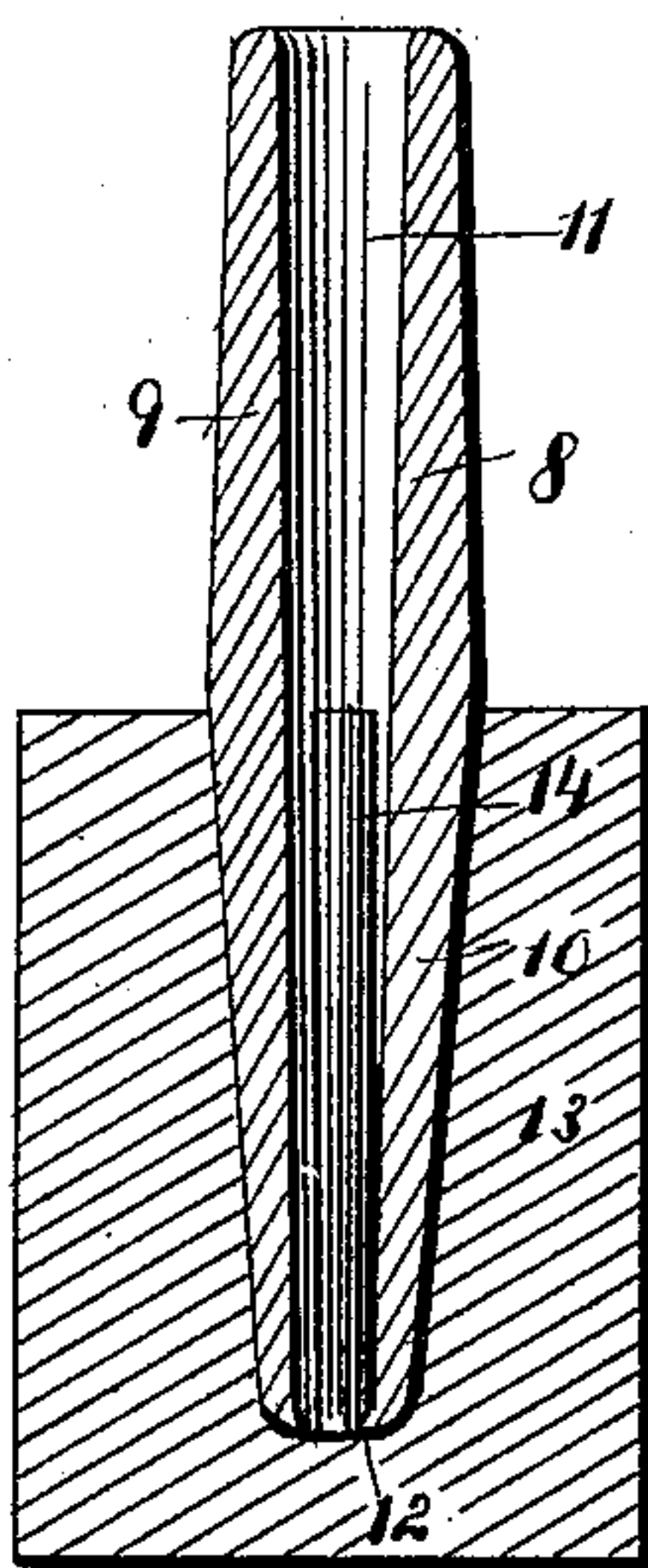
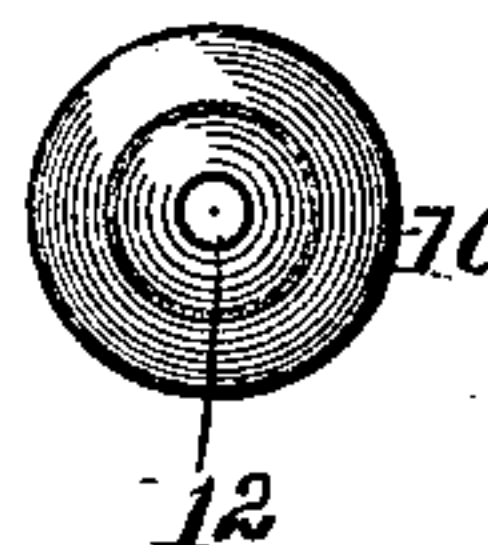


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

ERNEST G. KNOEPFEL AND HARRY MILLER, OF ARGENTINE, KANSAS.

BULLION-SAMPLER.

SPECIFICATION forming part of Letters Patent No. 464,252, dated December 1, 1891.

Application filed August 15, 1891. Serial No. 402,747. (Model.)

To all whom it may concern:

Be it known that we, ERNEST G. KNOEPFEL and HARRY MILLER, of Argentine, Wyandotte county, Kansas, have invented certain new and useful Improvements in Bullion-Samplers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to appliances for obtaining samples of gold, silver, and other precious metals or alloys from bars or bricks, the purpose of such samples being to show whether such bars, bricks, or other bulky quantities of such metals or alloys are or are not of uniform grade or quality throughout.

The objects of our invention are to produce appliances which shall be simple, durable, and inexpensive in construction and easy to manipulate, and by means of which reliable samples of the metals or alloys can be quickly obtained without involving any waste of such metals or alloys.

To the above purposes our invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that our invention may be fully understood, we will proceed to describe it, with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a sampling-drill constructed in accordance with our invention. Fig. 2 is a central longitudinal section of the same on the line 2 2 of Fig. 1. Fig. 3 is an end elevation of the same, looking at the cutting end of the drill. Fig. 4 is a side elevation of a modified form of our improved sampling-drill, the cutting end of the drill being in longitudinal section. Fig. 5 is an end elevation of the same, looking at the cutting end of the drill. Fig. 6 is a perspective view of the cutting end of the drill shown in Figs. 4 and 5. Fig. 7 is a central longitudinal section of a sampling-punch constructed in accordance with our invention. Fig. 8 is an end elevation of the same, looking at the cutting end of the punch.

Referring first to the device shown in Figs. 1, 2, and 3, 1 designates the stem, and 2 the shank, of the sampling-drill. The stem 1 is of any preferred or suitable length and is ex-

ternally perfectly smooth, and is, furthermore, of gradually-increasing external diameter from its cutting end to its point of juncture with the shank 2. The shank 2 is preferably formed integrally with the stem 1, and is of sufficiently greater external diameter than the stem to form a circular shoulder 3 at the point of juncture of the two. Through the drill thus constructed extends longitudinally a bore or channel 4, which is circular in cross-section, and which gradually increases in diameter from the cutting end to the shank end of the drill, as shown, and for a purpose to be hereinafter explained.

5 designates the cutting-points of the drill, there being in this instance four of such cutting-points separated from each other by four triangular recesses 6, the said recesses thus assuming a star form, and each of the cutting-points also assuming a triangular form with the apices of said triangles toward the center of the end of the drill, as shown in Fig. 3. By reference to Fig. 2 it will be seen that the cutting-points 5 also converge downwardly and inwardly toward the axial center of the bore of the drill, and the purpose of this peculiar construction of the cutting-points will be hereinafter fully explained.

In Figs. 4, 5, and 6 we have shown a modified form of the drill, but one which embodies the essential features of our invention. This drill is composed of a stem 1 and shank 2, forming a circular shoulder 3 at their point of juncture, as before, and through the stem and shank extends the bore or channel 4, said channel being circular in cross-section and gradually increasing in diameter from the cutting end to the shank end of the drill, as before described. In this instance, however, the cutting end of this drill is formed with only two cutting-points 7, which are semi-circular in form, and which are separated by two recesses 6 of the same triangular form as the recesses 6, before described, and extending oppositely from each other. In this instance the two cutting-points 7, although differing in form from the cutting-points 6, extend obliquely inward and downward toward the axial center of the bore or channel 4, as before described, and as clearly shown in Figs. 4 and 6.

In Figs. 7 and 8 we have shown a sampling-

punch embodying the essential features of our invention, and in these figures 8 designates the said punch, which is of any suitable or preferred length. The upper part or shank 5 9 of this punch is preferably of cylindrical form, and is united integrally with the lower part or stem 10 of the punch, the said portion 10 increasing gradually in external diameter from its cutting end to its point of juncture 10 with the upper portion or shank 9. Through these two portions of the punch extends a bore or channel 11, which gradually increases in diameter from the cutting end to the shank end of the punch, similarly to the bore or 15 channel of the drill above described. The cutting-edge 12 of this punch is circular in form, in which respect it differs from the cutting-points 5 and 7 above described; but said cutting-edge is similar to said cutting-points, 20 in that it extends downwardly and inwardly toward the axial center of the bore or channel of the punch.

The drills and punch above described are to be made of any suitable metal or composition of metals possessing sufficient hardness and temper for the requirements of their work. The drills are designed to have their shanks inserted into the socket of a suitable brace or stock or into a suitable chuck, and are turned 30 under pressure so as to enter the mass of a brick or bar 13 of bullion until the shoulder 3 comes into contact with the outer surface of the bar or brick. Owing to the described external taper of the shanks of the drills they 35 readily compress or condense the soft metal or alloy which comes into contact with their sides as they are driven inward, and owing to the described taper of the bore of the drills the stick 14 or sample of the metal clears the 40 interior walls of the bore, so that the sample cannot choke the said bore, and at the same time all waste of the metal is avoided. When the drill has been sunk into the bar or brick to the desired depth, a few reversed turns of the 45 drill are made without pressure, and as the result of the described inward and downward inclination of the cutting-points and the softness of the metal or alloy being operated upon these last few turns completely sever 50 the inner end of the sample from the mass of the bar or brick, the teeth of the drills biting into the core or sample sufficiently to twist the core, and thus assist in severing its inner end from the mass of the brick or bar. Ow- 55 ing to the described external taper of the drill, the drill can be readily withdrawn from the mass of bullion without causing waste from the walls of the cavity made by the drill, and after being so withdrawn the sample can 60 be readily removed from the shank end of the drill.

The principles of operation of the punch are substantially the same with regard to the compression or condensing of the metal external to the punch and the clearance of the 65 core or sample from the walls of the bore as those of the drills; but of course the punch

is not designed to be rotated as it enters the bar or brick. After the punch has been sunk to the required depth into the bar or brick 70 its outer end is struck several times laterally, by which action the inner end of the sample is severed from the mass of metal, the lateral movements of the punch driving the cutting-edges across the inner end of the core or sam- 75 ple, and thus severing it from the mass of the brick or bar. Thus the punch is loosened in the cavity which it has formed, and can thus be readily withdrawn from said cavity. It is to be particularly observed that owing to the 80 inward extension of the cutting-teeth of both the drills and the punch when the drills or punch are withdrawn from the brick or bar the cutting-teeth, being embedded in the lower end of the sample or core, exert an end- 85 wise strain upon the core or sample, which insures its severance from the mass of the brick or bar.

From the above description it will be seen that the sampler in either of the drill forms 90 or in the punch form above described is simple, durable, and inexpensive in construction, is easily operated, and is economical and effective in its action.

Having thus described our invention, what 95 we claim as new therein, and desire to secure by Letters Patent, is—

1. An improved bullion-sampler comprising a stem of gradually-increasing external diameter from its cutting end to its opposite end 100 and provided with a bore or channel also gradually increasing in diameter from its cutting to its opposite end, substantially as set forth.

2. An improved bullion-sampler comprising 105 a stem gradually increasing in diameter from its cutting end to its opposite end, and a shank, and a bore extending from the cutting end to the shank end of the sampler and being of gradually-increasing diameter from the cut- 110 ting end of the stem, said cutters extending obliquely downward and inward toward the axial center of the bore or channel, substantially as set forth.

3. An improved sampling-drill for bullion, 115 comprising a stem gradually increasing in external diameter from its cutting end to its shank, and a longitudinal channel or bore extending from the cutting end to the shank end of the drill and gradually increasing in diam- 120 eter from the said cutting end to the said shank end and provided also with a number of triangular cutting-teeth extending obliquely downward and inward toward the axial center of the said bore or channel, substan- 125 tially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ERNEST G. KNOEPFEL.
HARRY MILLER.

Witnesses:

JNO. L. CONDRON,
H. E. PRICE.