May 23, 1967 P. ESCHWEILER 3,320,845

PIN FOR DRIVING INTO STONE OR METAL BUILDING ELEMENTS

Filed Aug. 24, 1965 2 Sheets-Sheet 1

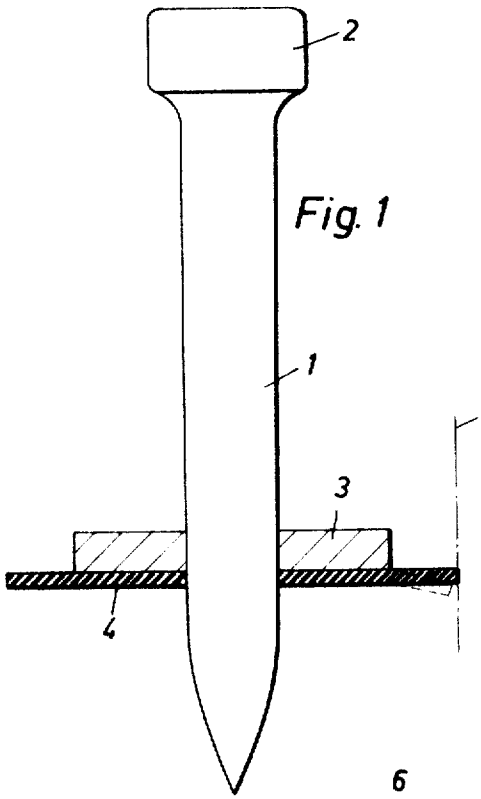

Fig. 1

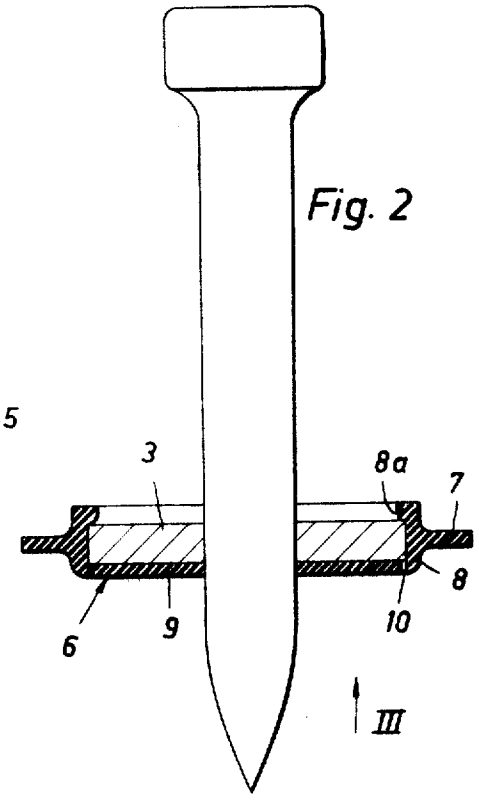

Fig. 2

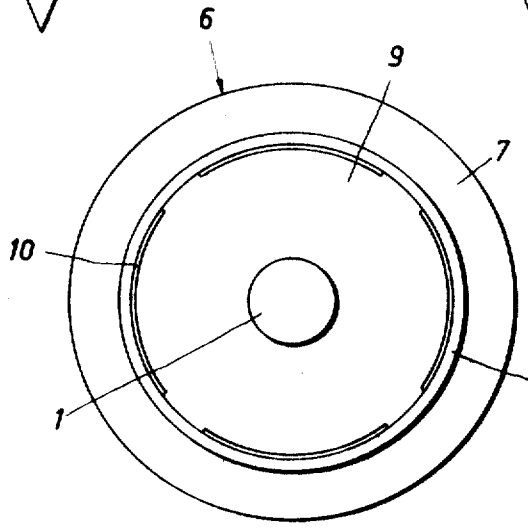

Fig. 3

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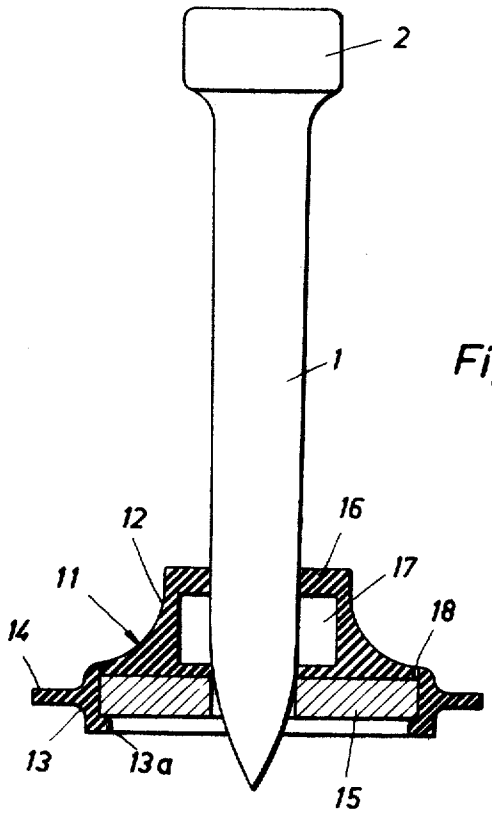

Fig. 4

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PIN FOR DRIVING INTO STONE OR METAL BUILDING ELEMENTS

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7 Claims. (Cl. 85—10)

The invention relates to a pin which is adapted to be driven by means of a gun into building elements of stone, concrete or metal. The pin carries, in known manner, a disc of resiliently yielding material the purpose of which it is to guide the pin in the barrel of the gun.

The diameter of such guide discs is, at least, slightly larger than the inner diameter of the barrel. Discs of this kind are known the periphery of which is formed with radial slots, so that the ends of the tongues disposed between such slots bear against the barrel.

Such guide discs, which are generally made of a plastics material or of an extremely thin sheet-metal, have the disadvantage that, when the pin is introduced into the gun barrel, they do not always take up their position exactly in the plane perpendicular to the pin axis, so that they do not bear uniformly against the barrel and do not effect the exact axial guiding of the pin.

On the other hand, it is known to fit a metal disc with a fractional grip on the stem of such pins intermediate of the ends which disc is at least 1 mm. thick, does not yield resiliently, has a smaller diameter than the barrel diameter and is positioned in a plane perpendicular to the pin axis. When the pin penetrates into the building element, the said metal disc is displaced on the pin stem as far as the thicker pin head, in this way limiting the penetration depth of the pin.

According to the invention, there are fitted on the stem of the pin both the resilient disc serving for guiding the pin in the gun barrel and the diameter of which is therefore somewhat larger than the barrel diameter (this disc being made of resiliently yielding plastics material and being called in the following text the "plastics disc"), and also the above-mentioned non-resilient metal disc, the two discs being fitted-on in such manner that the central portion of the plastics disc bears against the metal disc and the rim of the plastics disc projects beyond the rim of the metal disc.

For many purposes, it is advantageous to so arrange the metal disc that it is disposed on the end of the stem tapering towards the point of the pin, closely adjacent the point at which the tapering portion merges into the remaining cylindrical stem. Also the plastics disc can be secured with a frictional grip on the stem.

A plurality of embodiments of the invention is shown in the drawings, wherein:

FIG. 1 shows, in elevation and partly in section, a pin having a metal disc pressed on the stem and a plastics disc;

FIG. 2 shows, in elevation and partly in section, a pin with a pressed-out metal disc and a plastics disc engaging over the latter;

FIG. 3 is an end view of the arrangement according to FIG. 2, seen in the direction of the arrow direction III;

FIG. 4 shows, in elevation and partly in section, a pin having a plastics disc pushed on to the pin point and a metal disc pressed on the pin.

Pressed on the stem **1** of a pin which it is intended to shoot for example by means of a gun into concrete walls or steel building elements and which has a cylindrical head **2**, is a metal disc **3** the diameter of which is smaller than the diameter of the barrel (shown in dot-dash lines) **5** of the gun. A disc **4** of plastics material which is readily

resiliently deformed is pushed onto the pin **1** in front of the disc **3**. The bore in each is smaller than the diameter of the pin **1** so that when it is pushed on it is held in this position by friction. The metal disc **3** supports the plastics disc **4** and prevents it from tilting when engaged with the gun barrel. Since the diameter of the plastics disc **4** is a few tenths of a millimetre larger than the gun barrel, its rim bends on contact with the barrel **5** when the pin is introduced into the gun barrel, the disc **4** being slightly deformed in "umbrella-like" manner to the position shown in broken lines in FIG. **1**, but remains, due to the support afforded by the metal disc **2**, apart from this, exactly at right angles to the axis of the pin **1**. It thus centres the pin in the barrel and prevents it from carrying out any undesirable axial movement in the barrel.

With the arrangement according to FIG. 2, the plastics disc **6** is, in order that it may be supported more satisfactorily against the metal disc, so shaped that the plastics disc **6** has a skirt portion **8** which surrounds the outer periphery of the metal disc **3** and has a radial flange **7** projecting beyond it.

The plastics disc **6** is formed at the point at which its plane portion **9** joins the skirt portion **8** with a line of perforations **10**. When the pin is propelled, the generated surface portion is torn off at this perforation line and the plane part **9** remains as a resilient protective disc between the surface of the building element and the metal disc. It acts in sealing manner and as a protection against corrosion and, under some circumstances, it reduces any danger of breaking-out of the surface at the edge of the firing-in point. The skirt portion **8** on the outer flange **7**, torn off when the gun is fired, drops of its own accord or can be lifted over the pin head **2**.

According to FIG. 4, a plastics disc **11** is manually pushed on to the stem of the pin **1** where it is frictionally held, its aperture being widened. The plastics disc **11** comprises a hub **12** and a peripheral portion **13** which extends around and embraces a metal disc **15** and holds it by means of an inwardly projecting edge **13***a*. The portion **13** has an outwardly projecting flange **14**, the diameter of which is somewhat larger than the internal diameter of the barrel of the firing apparatus by which the pin is to be driven. The aperture in the metal disc **15** is somewhat smaller than the diameter of the stem of the pin **1**, so that it cannot be pushed by hand onto the stem of the pin **1** but when the plastics disc is engaged with the stem of the pin **1** the metal disc **15** will be held mounted on the tip of the pin **1** as shown. Only when the pin **1** is driven in is it pushed along the stem until it comes up against the pin head **2**. The arrangement according to FIG. 4 therefore renders it unnecessary for the metal disc **15** to be pressed on to the pin stem.

The hub **12** has a cavity **17**, the shape of which corresponds to the shape of the pin head **2**. When the pin is driven home, the projecting portion **16** snaps over the pin head **2**, so that the latter takes up a position in the cavity **17**. The pin head **2** is thus fitted with a plastic cap which remains thereon. The peripheral portion **13** may remain on the disc portion **11** or be broken off.

The flange **14** may also be disposed at the lower end of the peripheral portion **13**, so that, when the pin has been driven in, it can adapt itself to the surface of the building part so as to bear tightly against it.

I claim:

1. A pin adapted to be driven into a structural part by means of a firing tool, said pin including an elongated stem portion having a penetrating point at one end thereof and a radially enlarged head portion at its opposite end, the said pin being connected to a plastic disc of resiliently yieldable plastic material, which is intended

to guide the pin in the barrel of the firing apparatus, characterised in that the disc of resilient material is associated with a relatively non-yieldable metallic disc so that a portion of the resiliently yieldable disc bears against the non-yieldable disc, and the edge of the yieldable disc projects radially beyond the outer edge of the non-yieldable disc, both of said discs being friction fit on said stem portion by central apertures and being positioned thereon adjacent said penetrating point with said resiliently yieldable plastic disc being located axially closer to said point than is said non-yieldable metallic disc, whereby said resiliently yieldable plastic disc is adapted to provide a sealing means and said non-yieldable metallic disc is adapted to limit penetration of the pin by engaging said enlarged head portion when the pin is driven into said structural part.

2. A pin according to claim **1**, characterised in that the relatively non-yieldable metallic disc is mounted on the stem portion of the pin with such great friction that it cannot readily be shifted thereon by hand, but can be moved thereon when the pin is driven into the structural part.

3. A pin according to claim **2**, characterised in that the plastic disc is also friction fit on the stem portion of the pin.

4. A pin according to claim **1**, characterised in that the plastic disc consisting of resiliently yieldable plastic material comprises a hub for frictional mounting on the stem portion of the pin, and its periphery embraces the relatively non resilient metallic disc, which is adapted to

be positioned on the tip of the pin by its central aperture, which aperture is somewhat smaller than the cross-section of the stem portion of the pin.

5. A pin according to claim **1**, characterised in that the plastic disc of resiliently yieldable material comprises a peripheral portion, which embraces the external periphery of the relatively non-yieldable metallic disc and comprises a radial flange which projects somewhat beyond the latter.

6. A pin according to claim **5**, characterised in that the embracing peripheral portion comprises an edge which projects inwardly over the edge of the relatively non-yieldable metallic disc.

7. A pin according to claim **1**, characterised in that the plastic disc of resiliently yieldable plastic material is formed with perforations along a periphery corresponding to the external periphery of the relatively non-yieldable metallic disc.

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