June 19, 1956 R. E. McCLELLAN 2,750,902

SAFE CONSTRUCTION

Filed Aug. 16, 1954

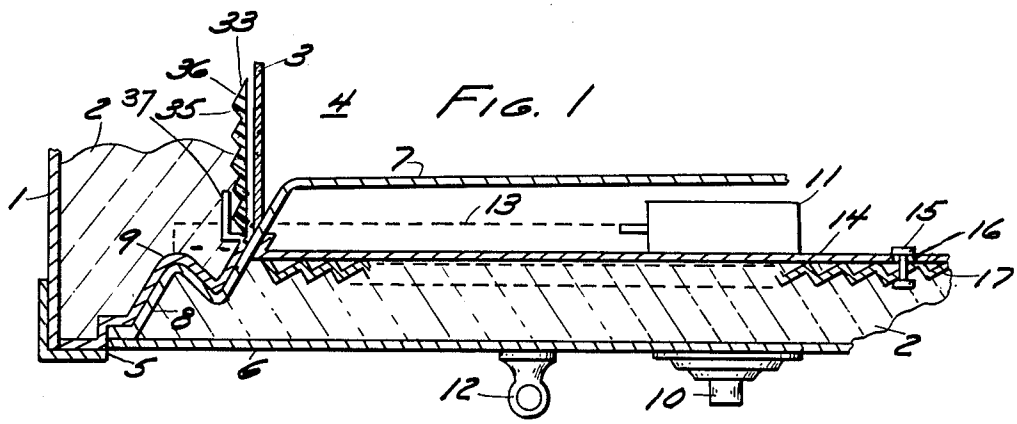

FIG. 1

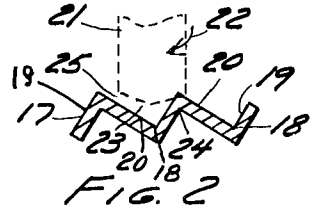

FIG. 2

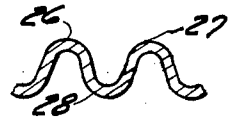

FIG. 3

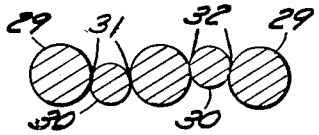

FIG. 4

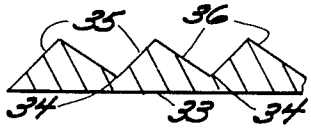

FIG. 5

FIG. 6

FIG. 7

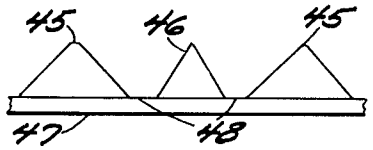

FIG. 8

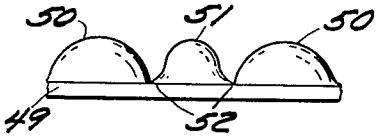

FIG. 9

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SAFE CONSTRUCTION

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1 Claim. (Cl. 109—81)

This invention relates to wall and safe features resistant to attack, especially in the guarding of contents against unwarranted attack.

This invention has utility when incorporated in an inter wall of drill resistant properties, say of hard metal and alloys with the outer face of such wall configured not to have symmetrical cutting arc, thereby detracting from hard steel drill heating or fusion action. This results in discontinuous grabbing at wall different regions as spaced, with torque strains of such effectiveness as to break the tool.

Referring to the drawings:

Fig. 1 is a fragmentary horizontal section at the left hand corner of a one door safe, having features of the invention incorporated therein;

Fig. 2 is a sectional showing of a couple of ribs of the special face providing wall, with dotted line showing of unsymmetrical drill approach thereto;

Fig. 3 is a sectional showing of such wall face of general sinuous contour, with adjacent ribs of different arc radii;

Fig. 4 is a section thru adjacently dissimilar diameter cylindrical rods in abutting weld assembly, wherein the adjacent faces as rising from the root do not have the same arc;

Fig. 5 is a section of the protective face wall, enlarged from its showing in the safe wall as extending inward from the door opening in Fig. 1;

Fig. 6 is a fragmentary showing of the protective wall face with the adjacent pointed ribs, one more blunt than the other, instead of lop-sided as is the showing in Fig. 5;

Fig. 7 is a protective wall face showing of straight faced cones and concave faced cones spacing the straight faced cones;

Fig. 8 is a showing of a wall face of rectangular pyramids which alternately differing in side wall pitch; and

Fig. 9 is a fragmentary wall section of successive domes, the intermediate domes of lesser diameter having ogee arc sections toward their bases.

A safe body outer wall **1** encloses a filler or insulation **2**. An inner wall **3** provides therein a safe interior **4**. At a front opening **5** is a door having an outside front wall **6**, an inner wall **7** and a stepped connecting frame **8** registering with a door jamb **9** connecting the wall **1** with the wall **3**. Combination lock spindle **10** is on the door front for operating a lock **11** so that a handle **12** may throw lock-released bolt mechanism **13**, thus to clear the structure for outswinging of the door. Insulation filler **2** inside the safe door front wall **6** is clear of the lock **11** and the bolt mechanism due to a pan or interwall diaphragm **14**.

Rivets **15** have clearance at openings **16** to mount a zigzag protective face structure **17**. This face **17** on its side outward toward the wall **6** has depressed regions, herein shown as V-bottomed grooves or valleys **18** forming root portions from opposite sides of which rise projecting region limits as the termini of diverging face portions **19**, **20**, at different angles or pitches. In practice

this means that a rotary drill **21**, having operative direction as shown by an arrow **22**, has its tapered active cutting end **23** effective at a region **24** which is local in arc extent, thereby in its rotation having clearance **25**. There is herein achieved disturbance of cutting action balance, developing dissimilar disturbances.

While there is adequate range to carry-thru these details of protective value, it is believed in point to direct attention to the fact that ⅝" diameter drill is normally maximum for the tool for which the point **23** may be an obtuse angle of about 116° or have a cutting edge less than about 35° with the plane of the plate or protective face structure **17**. Considering the drill to be of hard steel, driven at two hundred even up to five hundred revolutions per minute, and pressure exerted for the tool to enter the work, there is heat developed from the frictional contact to heat the metal for films therefrom to be annealed and scraped off in drill progress. This is on the basis that the work to be drilled is hard.

Should the material to be drilled be soft, this type of hard steel drill will act upon the relatively soft metal for producing chips which adhere by weld action on the drill tip and cutting edges, thus nullifying its cutting action. However, here the protective wall selection is that such wall, at least as to its face as outward from the safe interior, be heat treated, or the body be of hard stock. Accordingly, there is a hardness wall in a range to require efficient operation thereupon of carbide and such range of hard steel type of material in drills. Such may range of Rockwell hardness "A" 82 to 94 and higher and extend into the not so hard Rockwell scale "C" 61 to 64. This means that the protective wall face, as spaced inward from the safe outer wall, does not afford a continuous contact area or closed figure face distributed as endless about the drill tip. The high speed rotation, together with the applied pressure, cause the drill tip to develop, from such unbalanced resistance, lateral pushings or wedge actions. The fact that the rivets **15** allow the protective plate **17** to shift or float, thus nullify lateral holding of the work to center with the drill. Supplementing this disturbance of cutting action are the interruptions or successive grabbings of such unbalanced resistances for taking on bites at the stock. As the drill comes against a bite region from a clearway or gap, there is impedance acting as a torque hammer reverse tending to twist the tool in its body, counter to its direction of rotation. These poundings or hammerings not only tend to introduce internal crystallization, but actually rapidly develop drill rupture. The drill is thus soon disabled. Unauthorized access to the lock or boltwork is not achieved when there is concealed in the safe structure discontinuous dissimilar face regions defeating drill entrance for peripheral cutting action endless orbits.

Various embodiments have to do with rendering effective nullification of drill operation. Economy in manufacture of the special face may be taken into account by differing angle adjacent rib faces in an embedded irregular corrugation body **17** (Fig. 2). In lieu of apex providing or linear ribs, there may be sinuous contour of major rib **26** as to adjacent minor radius rib **27** (Fig. 3) from a common root or re-entrant region or groove **28**.

Weld connected rods **29**, **30** (Fig. 4), are shown as even having plural depth root regions **31**, **32**. As with the flat faces (Fig. 2) and the arc faces (Fig. 3), there is dissimilar divergence of the faces as outward from the re-entrant limit.

Stock having flat side **33** (Fig. 5) has such not outward, but on the face toward the outer wall **1** (Fig. 1) has groove depth lines or roots **34**, with dissimilar rise angle flat faces **35**, **36**, therefrom. Inner wall **3** is shown with a tongue **37** pushed out therefrom and overlapping an edge of the wall **33**, **34**, **35**, **36** (Fig. 1) thereby provid-

ing a fastening loose in lieu of the rivet feature for locating the wall **17**.

As a departure from the dissimilar slant divergent faces **35**, **36** (Fig. 5), embodiment as wider base ribs spaced by ribs more narrow (Fig. 6) are here shown as from a planar back **37'**, a root **38**, steeper flat faces **39** and less slant faces **40**.

Departure from the rib and groove embodiments is in rows of cones **41**, **42**, alternating with each other in the two directions and rising from flat base **43**. From roots **44** straight face cone **41** sides take different ascent from the dissimilar concave face side cones **42** (Fig. 7).

Interrupted or discontinuous peaks or points are provided by rectangular base pyramids **45**, **46**, from a base **47**, providing roots **48**. The straight sides of the cones **46** are more steep than the sides of the cones **45** (Fig. 8).

A base **49** (Fig. 9) has domes **50** spaced by less diameter domes **51** having ogee mergings to spacing regions, valleys or roots **52**.

The protective wall or safe structure as herein disclosed is an embedded ply with the outward face portion of greater area than like dimension section of the enclosing wall as directly outward therefrom. The area surplusage of this face is development achieved by root depth regions and dissimilar diverging faces rising therefrom linear or point projecting regions spaced by the irregular depth connecting regions. In practice this means that a rotary drill theretoward, when thrust to engage a pair of diametrical regions for tangency with two faces and gap or clearance spacings between said tangency regions, defines a plane. As there be drill pressure to act on the protective wall face, should there be attack at each tangency, the dissimilar characteristic insures that such attacks are of cutting arc departure, with differing peripheral resistance to the functioning of the drill. The drill torque is unsymmetrical twistings overcoming the physical

or hold-together properties of the tool, with resultant tool rupture almost at once there is drilling attack on the ribbed or pimpled face.

Stock as superficially hardened, may have the interior thereof of toughness to resist fracture or brittle traits as more prevalent in the tool, especially carbides and some alloys. Impact attack on the wall, even to the extent of developing fracture, has such wall protective.

What is claimed and it is desired to secure by Letters Patent is:

A drill resistant wall comprising a pair of relatively thin hard spaced shells with a relatively thicker and softer filler therebetween, the improvement comprising: a hardened metal plate between said shells with said filler, at least one surface of said plate being irregular and having a plurality of alternate sharp projections and depressions connected by sloping surfaces having an angle of more than about 35° with the plane of said plate, said sloping surfaces between two adjacent sharp projections having different slopes to their intermediate depression, and means for fastening said plate in said wall to permit limited movement thereof in the plane of said plate.

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