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D. O. Paige,
Burglar Proof Safe.

No. 100,184.

Patented Feb. 22. 1870.

Fig. 1.

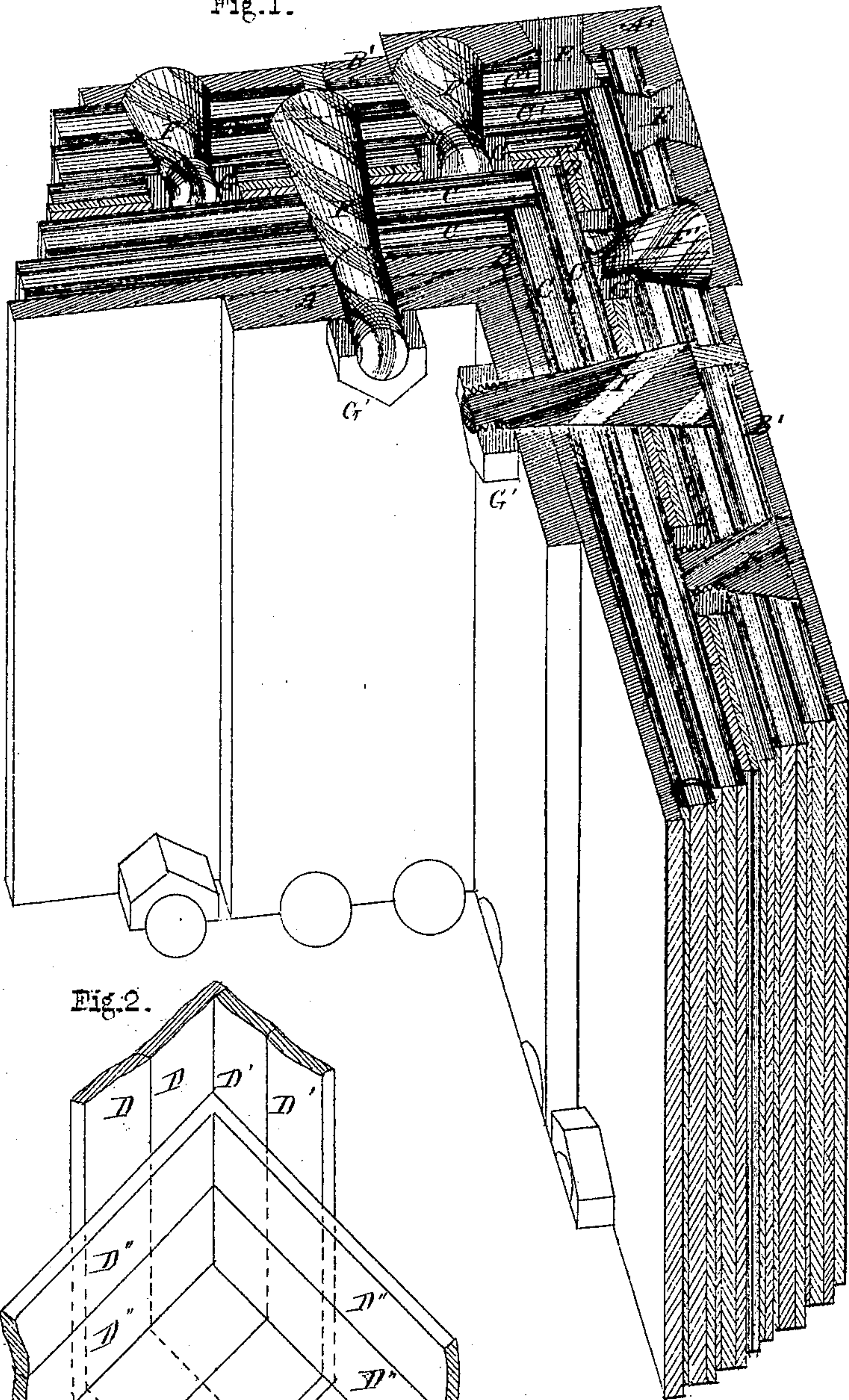
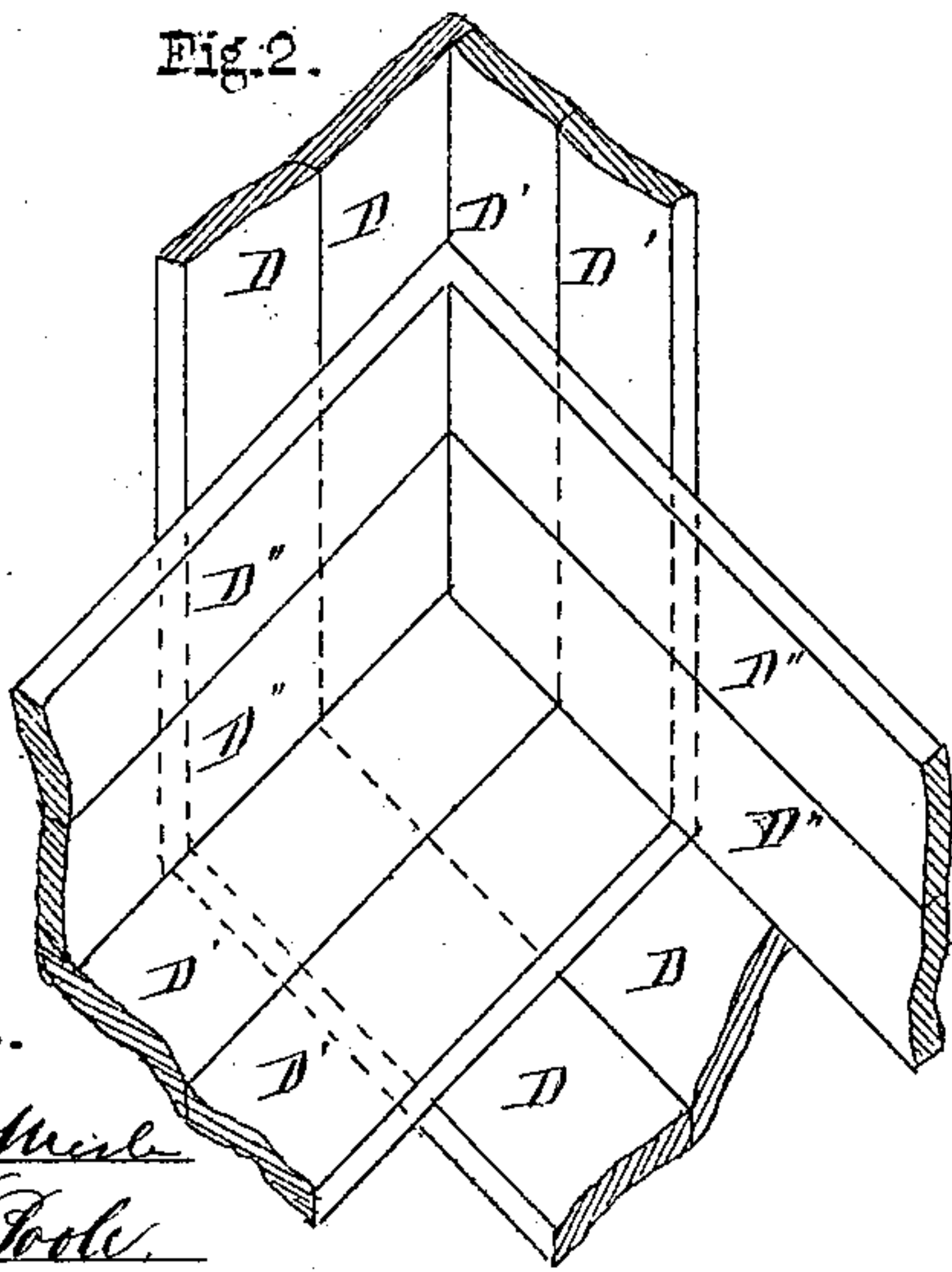


Fig. 2.



Witnesses.

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Letters Patent No. 100,184, dated February 22, 1870.

IMPROVEMENT IN SAFES

The Schedule referred to in these Letters Patent and making part of the same.

To whom it may concern:

Be it known that I, DAVID O. PAIGE, of Detroit, in the county of Wayne, and State of Michigan, have invented a new and useful Improvement in Safes; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, and being a part of this specification.

In the drawings—

Figure 1 represents a vertical and horizontal section of one corner of my safe; and

Figure 2 represents, also, a corner of the same, exhibiting the mode of construction, so far as relates to certain steel bars hereinafter described.

Like letters denote like parts in each figure.

The object of my invention is the construction of a safe composed of hard and soft steel and iron, so combined, arranged, and connected together as to offer the greatest possible resistance to attempts of burglars to pry or force an entrance to its interior, or to blow it open with gunpowder, or to make an opening into it with drills or like tools.

In making this safe I use sheets, bars, and bolts of steel, manufactured by a process discovered by J. Parks, Jr., of Pittsburg, Pennsylvania, in which the outsides of the metal are very fine, hard, and highly-carbonized steel, while the interior is a layer of fibrous steel of great tensile strength, thus adding to the hard outsides of each piece, which can scarcely be penetrated with a drill, an interior fibrous core of great strength and toughness. Iron sheets may be used for the outer and inner walls of this safe, for convenience of finish.

The nature of my invention consists—

First, in the novel method of constructing the corners of the safe by means of angle bars arranged in a peculiar manner, so as to offer a longitudinal resistance to strain or force in every direction.

Second, in the construction of safes, the employment of layers of sheets of the steel described running at right angles to each other and secured by bolts made of the same material.

Third, in the method by which the various layers composing the safe and the outer and inner angle plates are secured together by bolts and rivets.

Fourth, in the construction of the bolts of steel described, by twisting the metal while hot, so as to leave the hard and soft steel in alternate spiral layers, or by making them with alternate diagonal layers.

In the drawings—

A and A' represent the outer and inner angle plates, of suitable size and thickness, which I use preferably of iron, but which may be of the steel described or of ordinary steel.

B and B' denote the inner lining and outer covering, of suitable thickness, for which I use iron preferably, but any other suitable metal may be employed.

C and C' are sheets of suitable thickness, made of the hard and soft steel described.

D D' and D'' are the angle bars, of the same material as the sheets C and C'.

E are conical double-headed iron rivets.

F and F' are bolts of the hard and soft steel described.

G and G' are nuts into which the ends of the bolts F and F' severally enter.

This safe is constructed in a way not usual with manufacturers, by being built up from the outside.

First, the angle plate A' is set up, which is followed next in order by the covering plate B', which is not as thick as the angle plate. The insides of the angle and covering plates coincide, and the edges of the latter rest against the edges of the former, making a tight joint between them. The outer plate C' is then put on, with the conical bolts F' protruding through it from outside to inside, being flush with the outsides of said plates. The rivets E, conical and double headed in form, are then put hot through the holes provided for them in the angle plate A' and in the outer plate C', which holes are larger upon the outside and inside than in the center, and riveted until they entirely fill said holes in all parts. Likewise, similar smaller rivets are used, to secure in a similar manner the covering plate A' to the plate C'. The inner plate C, provided with the bolts F protruding through it from outside to inside, and flush with the outside of said plate, is then put on, the sheets of which run at right angles to those of the outer plate C', which sheets are provided with proper holes, so as to pass over and fit closely to the bolts F.

Next in order the bars D are put on. These bars are preferably four or five inches wide, and from one-fourth to three-fourths of an inch thick, according to the size of safe, and long enough to go around one corner and reach a portion of the distance across the wall of the safe. Supposing the safe to stand as it would completed and ready for use, the bar D is fitted closely to the interior vertical corner of the inner plate C', upon one side of the safe, and passing vertically down that corner to the bottom, bends at right angles across said bottom, with its edge against the inner back of the safe, to the opposite side, where it turns up at right angles, and follows vertically up said side to the top of the safe, where it bends again at right angles, and passes over to the place of beginning, being at all times in the same vertical plane.

When this bar D or the bars D' or D'' are spoken of, it is intended to embrace the several bars used in

combination and in the same plane, which, in connection, go entirely around the safe, except at the points where the opening for the door interposes.

A similar bar, D, is then put up next to that described, and touching its edges, and so on until the two sides, the top, and the bottom of the safe are covered with one layer of bars. Next the bar D' is set up in the same manner with the bar D, except that it is upon the back wall of the safe, with its edge touching vertically against the outer part of the bar D, which bar D' covers vertically the front and rear walls and the top and bottom of the safe, in which last-mentioned parts it crosses the bars D at right angles and covers them. Next the bar D'', and touching it on the edges, a similar bar is set up, which passes in like manner entirely over the top and bottom and back wall of the safe, and so much of the front wall as has no opening for the door; and in that manner bar after bar is added, until the back wall and top and bottom, and so much of the front wall as has not the opening for the door, is covered with a layer of the bars D'. Next the bars D'' are added, which pass around the interior of the safe longitudinally, and cover the four sides of it with a layer of the bars D'', except that part of the front which has the opening for the door.

These bars D D' and D'' are provided with proper holes for the bolts F and F' to pass through and fit tightly. On the series of bars D D' and D'' the nuts G are countersunk flush with the outside of the bar D, which nuts are provided with proper threads to receive and secure the threaded ends of the bolts F'. These bars may be riveted together at points of intersection, and should be so arranged that their several ends shall break joints.

It will thus be seen that these three series of bars, D D' and D'', cover the entire safe with two layers. The bars D' and D'' cover the front and rear walls with two layers, the bars D and D'' cover the side walls with two layers, and the bars D and D' cover the top and bottom with two layers. The order above named for placing the bars is used for convenience and certainty in description, but in practice the order may be changed, taking care to preserve the relative arrangement of each series with both of the others.

Next within these bars D D' and D'' are placed the plates C, crossing each other and fitted and secured like the plates C'. Inside of this again is placed the lining plate B, and within that the inner angle plates A, within which, in turn, are placed the nuts G', provided with threads to engage with and secure the threaded ends of the bolts F.

I secure the various layers of this safe in the following manner: Bolts F pass through the inner plates C', the bars D D' and D'', the plates C, the inner lining B, the inner angle plate A, and into the nut G', which secures it. The bolt F' passes through the outer plate C', the inner plate C, and the bars D D' and D'', into the nut G, which is countersunk into the bars D D' and D'', which nut secures said bolt F'. The double-headed conical rivets E pass through the outer angle plates A' and the outer plate C'.

Proper rivets of like kind secure the covering plate

B' to the plate C'. The heads of the bolts F and F' are in all instances flush with the outsides of the respective plates which they first pass through. The bolts F and F' are made of the hard and soft steel described, being first roughly shaped and then twisted when hot, so as to leave them in alternate spiral layers of hard and soft metal, and then finished as described, and provided with suitable screw-threads at one of their ends. I also make these bolts out of blanks of the steel described, in such a manner as when finished the bolt is composed of alternate layers of hard and soft steel, diagonally arranged across the body of the bolt. In practice I make these bolts conical in form, but I do not wish to confine myself to any particular shape, but wish to adopt any equally effective.

By the mode of fastening employed it will be seen that every layer composing my safe is securely fastened, so that the removal of any one of them does not secure the removal of the rest, nor does the removal of any bolt or any series of outer bolts enable a burglar to separate the inner layers.

By the employment of the bars described I get an enormous strength for resisting strains in any and all directions. By the use of the steel plates described I get a combination of hard and soft steel, alternately, which is found in practice most difficult to perforate with drills or to break with hammers, and strongest to resist explosions. By the use of the spiral or diagonal layers of hard and soft steel in the bolts F and F', I am enabled successfully to resist the drill at the weakest point in any safe, for the spiral or diagonal layers divert the drill from a direct line, and cause it to impinge at an angle which will result in its fracture.

Having thus fully set forth the nature and merits of my device,

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The bars D D' and D'', of any suitable metal, when combined in layers and arranged relatively to each other, substantially as described, shown, and set forth, and for the purpose specified.
2. In the construction of safes, the employment of the plates C and C', of the hard and soft steel described, when said plates are constructed and secured together, substantially as described, shown, and set forth.
3. The combination of the angle plates A and A', the lining and covering plates B and B', the bars D D' and D'', and the plates C and C', with the bolts F and F', the rivets E, and the nuts G and G', constructed and arranged substantially as and for the purpose set forth.
4. The bolts F and F', made of the hard and soft steel described, with the hard and soft steel in alternate diagonal layers, substantially as and for the purpose set forth.

DAVID O. PAIGE.

Witnesses:

A. W. RICE,
H. F. EBERTS.