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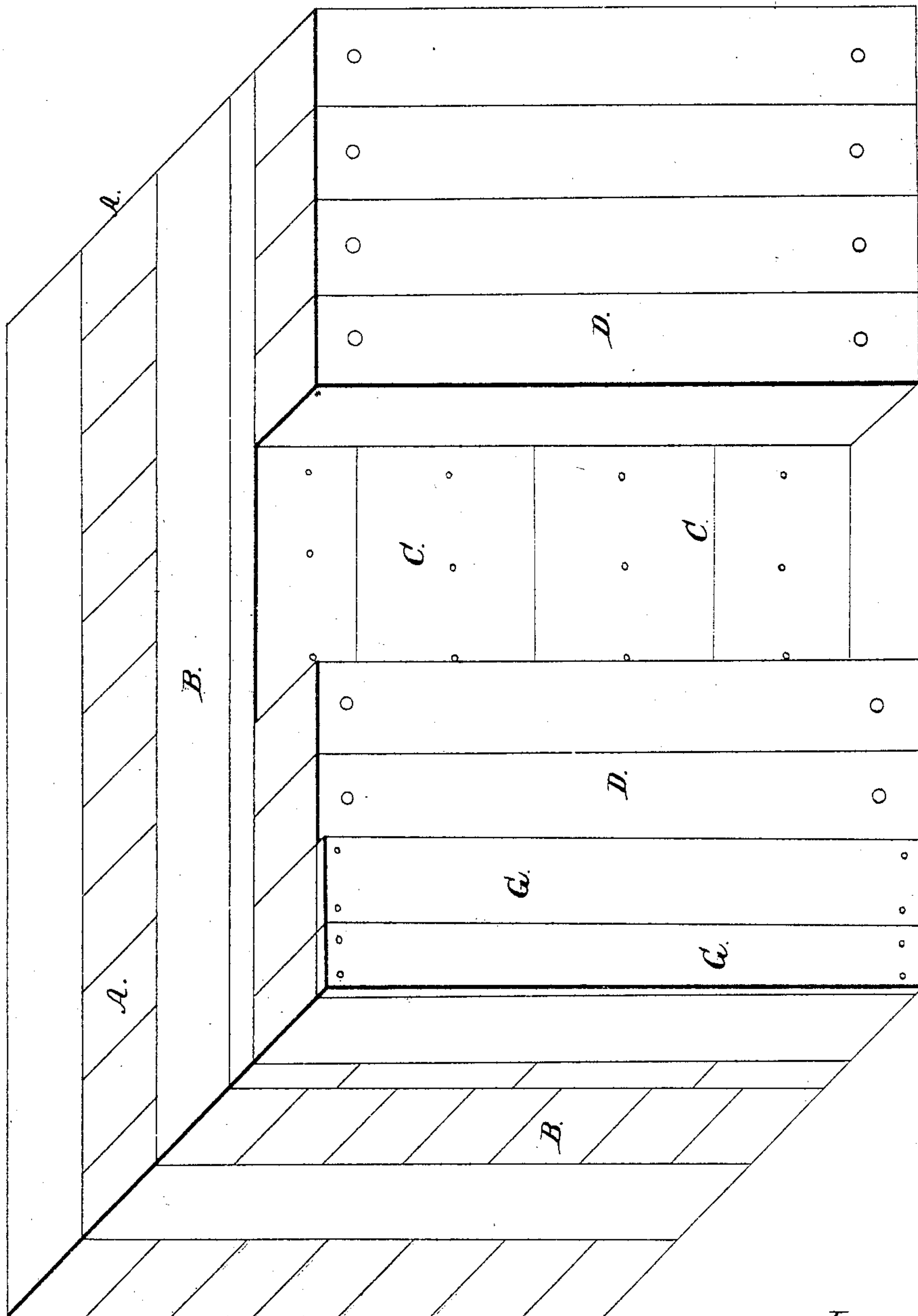
C. W. S. Heaton.

Armor Clad.

N^o 38,206.

Patented Apr 14, 1863.

Fig. 1.



Witnesses.

R. T. Campbell
D. C. Hawcener

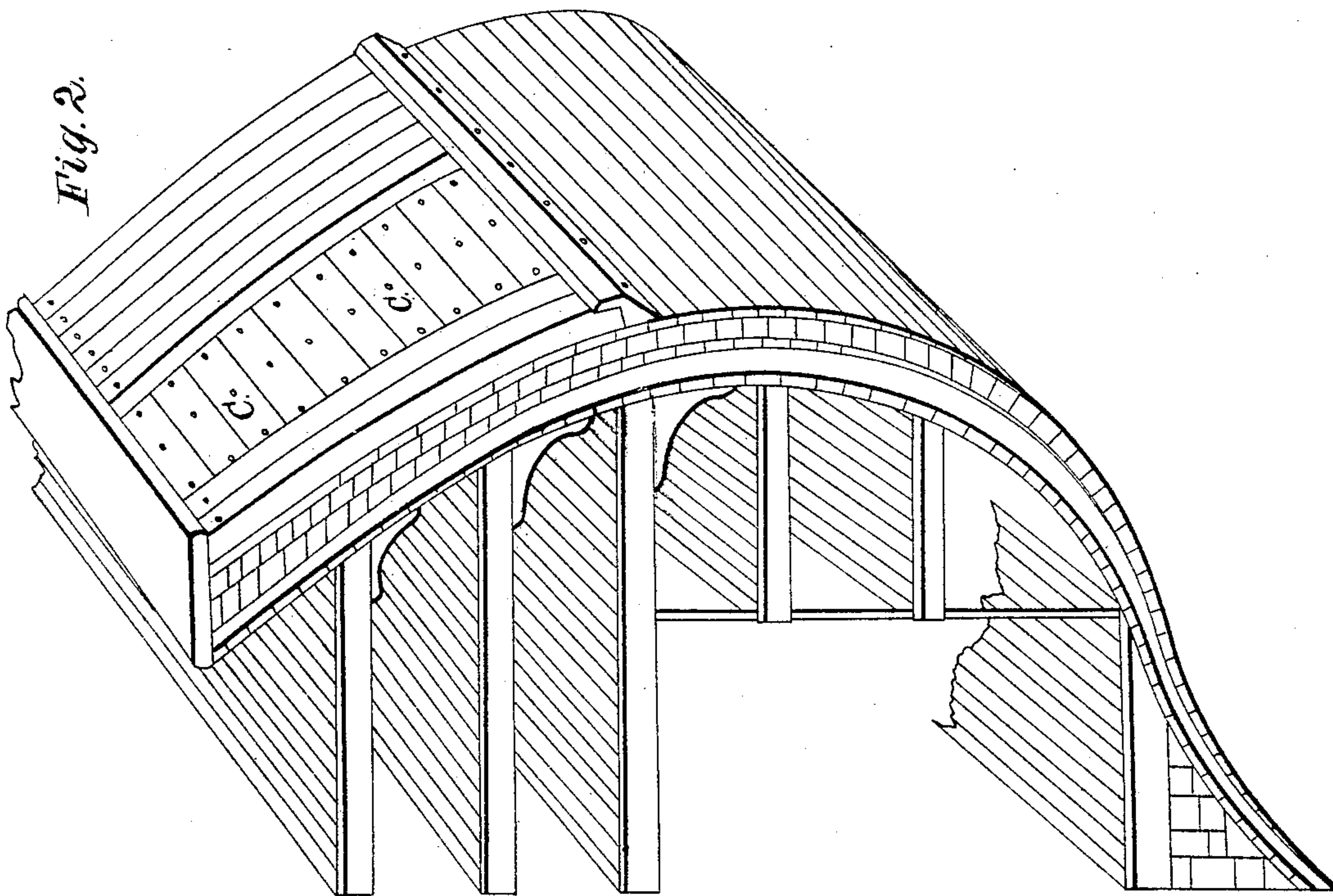
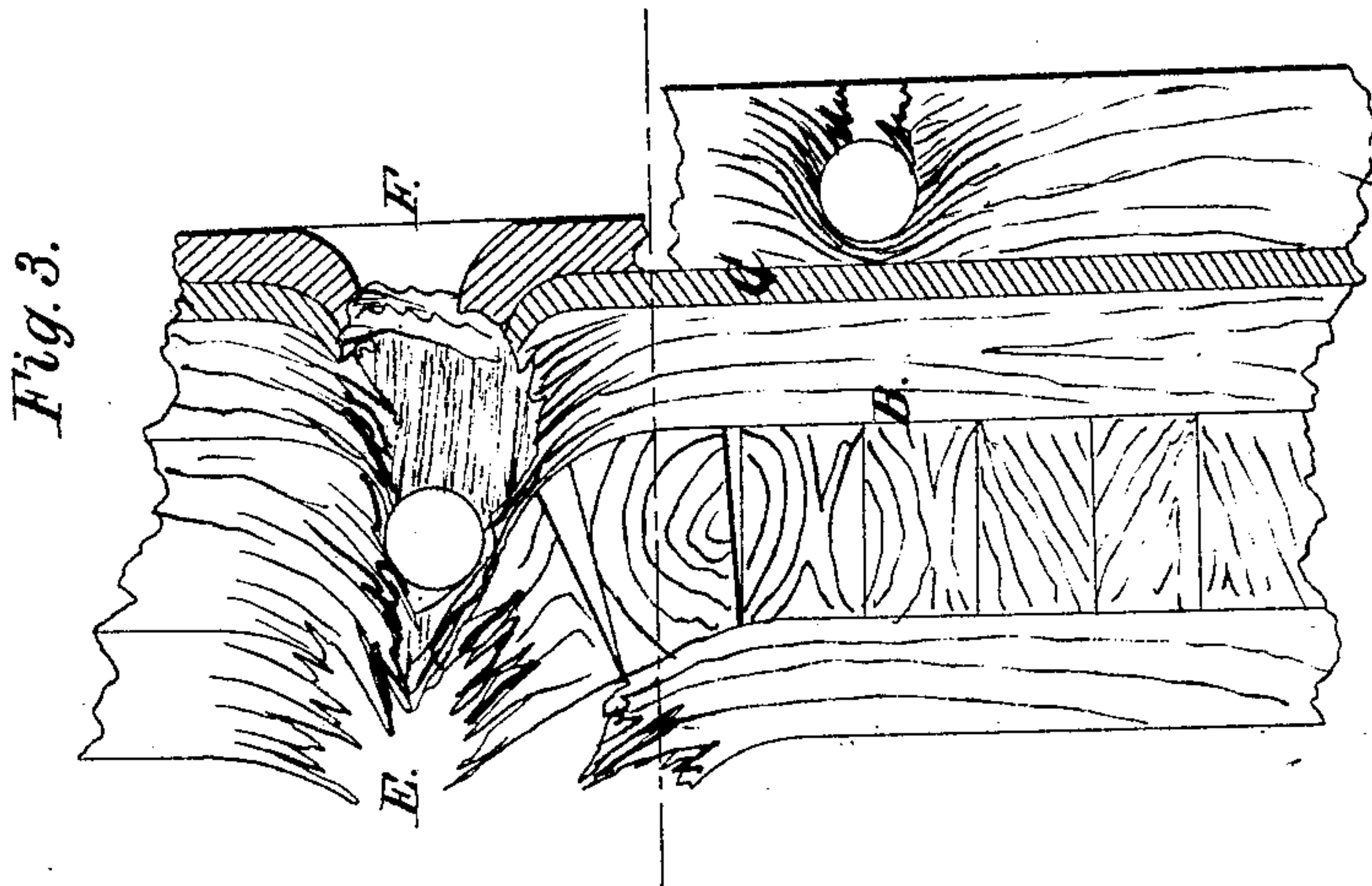
Inventor.

Chas. W. S. Heaton

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N^o 38,206.

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Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES W. S. HEATON, OF BELLEVILLE, ILLINOIS.

IMPROVED DEFENSIVE ARMOR FOR SHIPS' AND OTHER BATTERIES.

Specification forming part of Letters Patent No. **38,206**, dated April 14, 1863.

To all whom it may concern :

Be it known that I, CHARLES W. S. HEATON, of Belleville, in the county of St. Clair and State of Illinois, have invented a new and useful System of Defensive Armor for Marine and Land Batteries ; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of my system of defensive armor. Fig. 2 is a perspective view showing my invention in its application to the side of a vessel which has ordinary metal armor on its surface. Fig. 3 illustrates the effect of a ball where my invention is the resisting agent, in contrast with the effect of a ball where the ordinary system of armor is adopted.

Similar letters of reference in the three figures indicate corresponding parts.

a a, Fig. 1, are the vertical timbers of a vessel; *B B*, the longitudinal or outer timbers thereof, forming the backing to the armor. *C C* are the armor-plates laid against the backing in the usual way. *D D* is an outer layer of timbers covering the armor-plates *C C*, in a manner as will be hereinafter shown, to deaden and to gradually resist the penetrating force in its passage to the plating *C C*. In this heavy buoyant surface lies the gist of my invention or discovery.

My invention consists, not in the introduction of wood, rubber, or any other like yielding substance behind the metal armor, but in the discovery that a timber or other yielding surface will deaden and resist the power of a cannon-ball when such wood or other surface is backed by the metal armor which usually is on the surface, and when such metal armor is backed by sufficient wood or other backing to hold it rigidly in its normal position.

My system of armor for vessels or forts does not contemplate stopping the ball at the immediate surface; but the metal or armor proper is placed at an intermediate point, so that by the time the shot has reached its momentum is so greatly reduced that it is arrested without serious injury, either from starting the bolts or fracturing the metal armor.

The object of my system of armor is to render a war-vessel or other structure "shot-proof" with a less amount of iron armor than

is now used with that end in view. By using less metal and more timber I increase, instead of decrease, the buoyancy of a ship, and at the same time greatly increase the resisting effect of the armor-plating.

Another object which I have in view is to obviate the tendency to break the bolts or fastenings of the plating when it is struck by a ball.

The operation of my invention I will illustrate as follows, in connection with the drawings:

First. With regard to the fracturing of the bolts or fastenings, it will be seen that when the ordinary plating is used, and is of sufficient thickness to possess in itself strength and stiffness to break a bolt under the shock of a ball, the fracture results from this cause—to wit, the plate, being struck directly by a ball of sufficient weight to bend it, is depressed or bent inward in one direction and outward in the other. In other words, it is "cupped," and this recoil or reaction of the plate so strains the bolts or fastenings, and at the same time acts as a blow or shock, that the bolts are torn asunder, and the result is that the heads or nuts (these being the weakest points) give way and fly off and leave the plating insecure. By my system this is avoided, as the ball, coming in contact with the wood, which is outside, is received with a less shock than when it strikes an unyielding or hard substance, and the wood, being "backed up" by the iron, offers a gradual resistance, which increases as the force of the ball diminishes, and as the force of the ball is thus diffused over a larger surface the shock is in a great measure deadened or diffused, the plates less liable to be bent or sprung, and the bolts or fastenings much less liable to be broken.

Second. With regard to penetration, the advantage of wood outside of the iron or armor proper is, that the blow of the shot is received first by the wood, and by the time it arrives at the iron it is so much diminished in force that it is stopped at the iron with an impacted cushion of wood ahead of it. The reason of this is, when the iron is all laid on the outside in the ordinary manner, the presumption is that the shot is to be stopped suddenly and by main force at the immediate point of contact. The trouble is, that when shot is fired against iron plating at sufficient velocity (for it is simply a question of force as now used) the plat-

ing is shattered by the "first intension," and the remaining force of the ball is sufficient to pass through the backing and to shatter it worse than if no plating had at first checked it, and as wood can be made to displace or pass through wood, the ball goes through the backing, driving the wood ahead of it and making a worse and larger hole than if no iron had retarded its momentum, (see E, Fig. 3.) By my system the ball is not contemplated to be stopped by main force, but by gradual resistance, which increases, owing to its rigid iron backing, as the force of the ball diminishes. The action of my system of armor is this: When a ball comes in contact with the outer layer of wood, which does not yield simultaneously, it is met and resisted by a yielding substance through which it has to cut its way under increasing resistance, for the wood, being backed by iron C, Fig. 3, and that iron being again backed by wood, or its equivalent, B, Fig. 3, offers much more resistance than wood alone would do, as a ball will pass through wood, driving and bursting the wood out ahead of it, and gradually increasing the size of the hole, as shown at E, Fig. 3, and this very fact I take advantage of, for when iron is placed between or interposed, the wood cannot be made to displace the iron by any sudden shock or force, like that of a ball, and as it will be readily seen that it has nowhere else to go to, C, Fig. 3, it forms an impacted cushion, which is interposed between the ball and the iron plating, and the ball is stopped

without serious damage or shock. Whereas, even if the shot should not penetrate an iron surface—such as illustrated at F, Fig. 3—it will so indent or fracture it and "start the backing" that it will be very hard to repair, while my system can be readily repaired by the simple insertion of a plug of wood or a new piece of timber. In practice I simply overlay the iron armor of an ordinarily-constructed vessel (which iron armor is backed up by sufficient backing to rigidly support the plates) with an outer layer of timber, D D, which timber is only bolted on sufficiently strong to hold it to its place, as illustrated at Fig. 2.

My invention also consists in the following, to wit: I also plate or thinly sheath this timber D D on its outer or exposed surface, not, however, to stop shot, but to prevent a "raking shot" from tearing the timber, and also to prevent the wood from being too readily set on fire, as such sheathing would exclude the air, and so retard combustion, (see G, Fig. 1.)

Having thus described my improved system of defensive armor for ships and forts of every known description, what I claim, and desire to secure by Letters Patent, is—

The employment of wood, or its equivalent, when used in the manner and for the purpose substantially as described.

CHAS. W. S. HEATON.

Witnesses:

R. T. CAMPBELL,
D. C. LAURENCE.