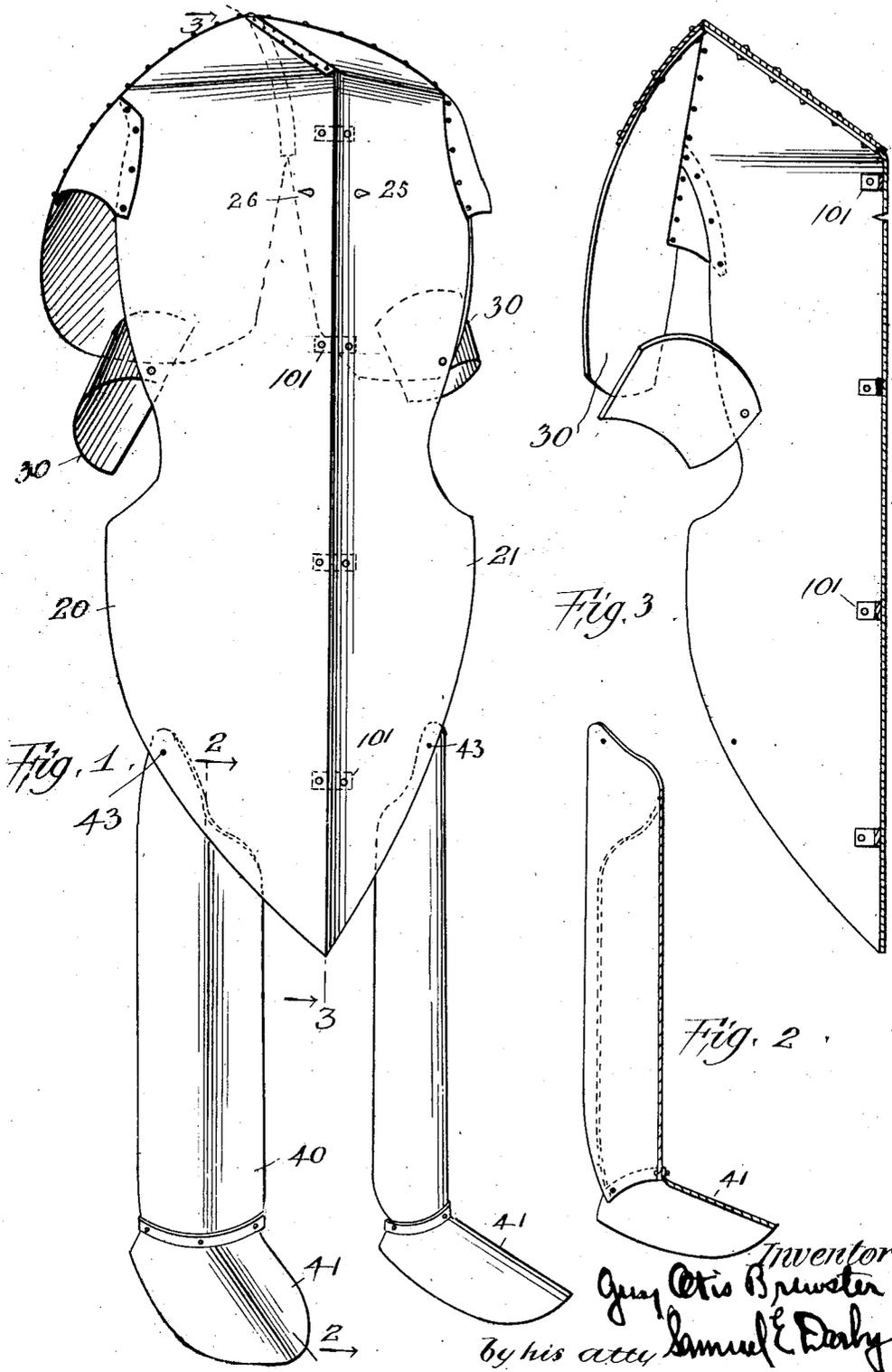


G. O. BREWSTER.  
BULLET PROOF ARMOR.  
APPLICATION FILED AUG. 13, 1917.

1,348,204.

Patented Aug. 3, 1920.

3 SHEETS—SHEET 1.

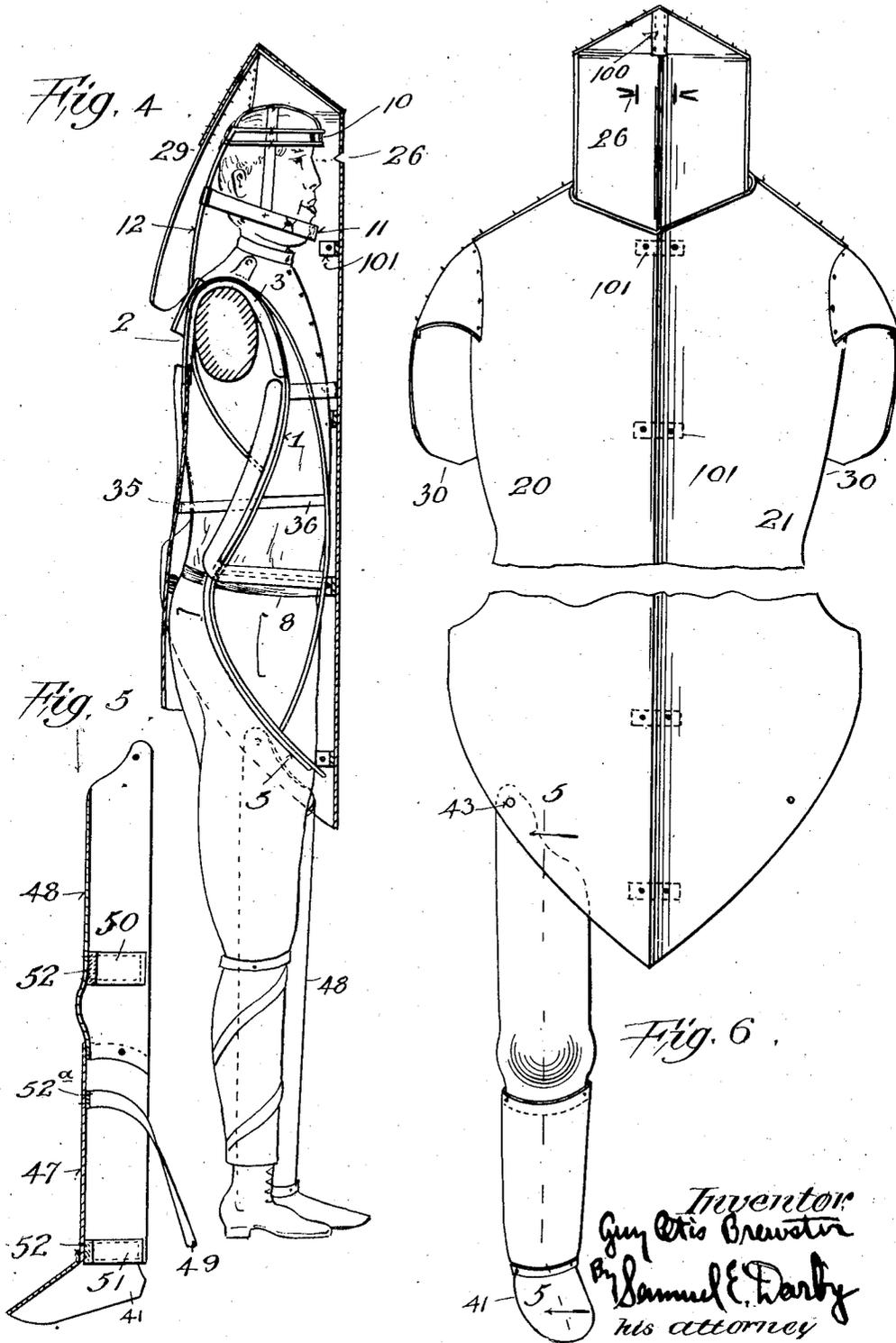


Inventor  
Guy Otis Brewster  
by his atty Samuel E. Darby

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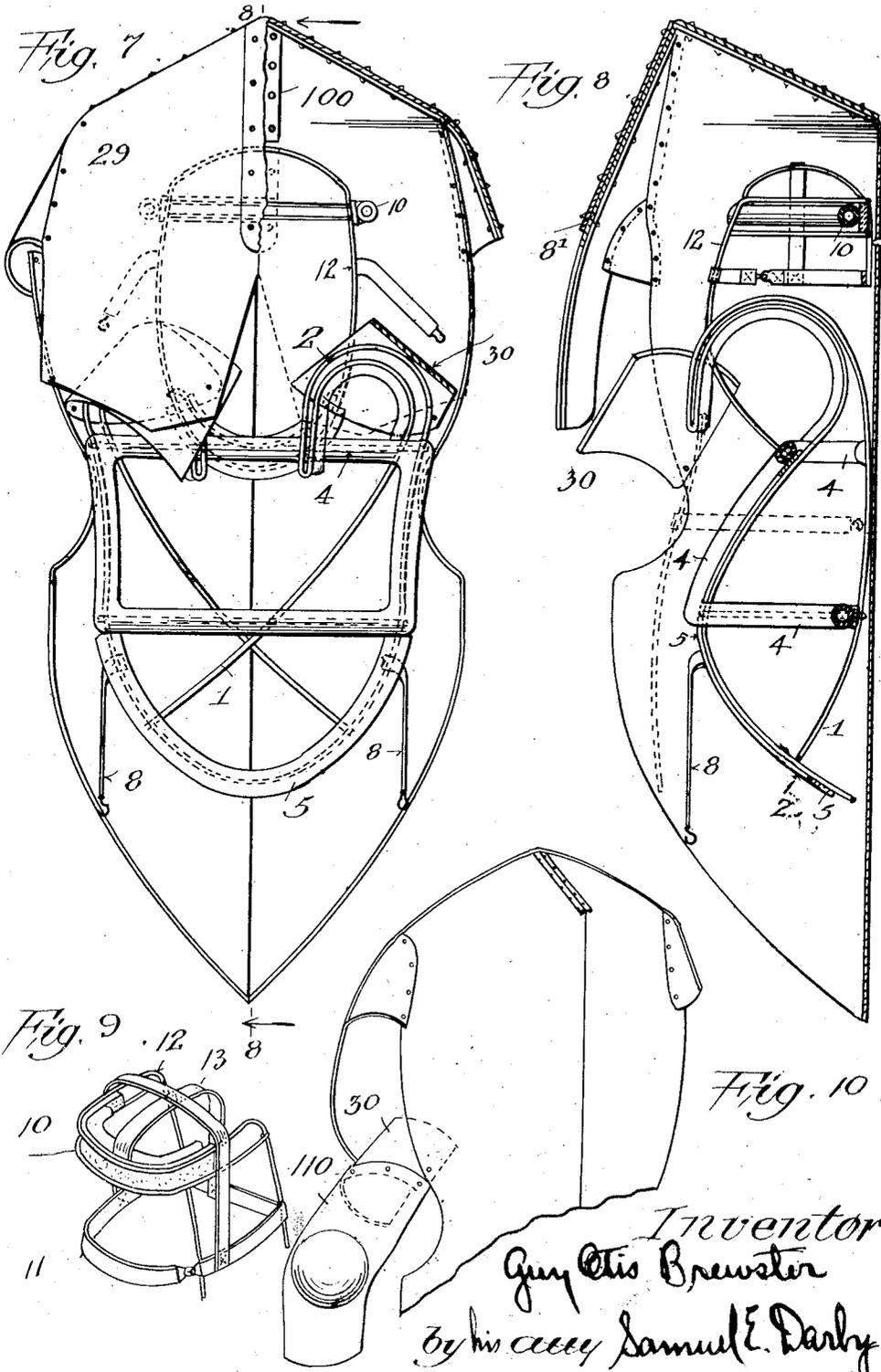


Inventor:  
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# UNITED STATES PATENT OFFICE.

GUY OTIS BREWSTER, OF DOVER, NEW JERSEY.

## BULLET-PROOF ARMOR.

1,348,204.

Specification of Letters Patent.

Patented Aug. 3, 1920.

Application filed August 13, 1917. Serial No. 186,034.

*To all whom it may concern:*

Be it known that I, GUY OTIS BREWSTER, a citizen of the United States, residing at Dover, in the county of Morris, State of New Jersey, have made a certain new and useful Invention in Bullet-Proof Armor, of which the following is a specification.

This invention relates to bullet proof armor.

The object of the invention is to provide an armor for use in warfare which is bullet proof, and which affords free movement of the arms, legs and neck of the wearer.

A further object of the invention is to provide an armor of the class described which is light and can be conveniently carried.

A further object of the invention is to provide an armor of the class described which is provided with shock absorbing pads scientifically located over non-sensitive and non-vital spots or portions of the human frame.

A further object of the invention is to provide a bullet proof armor which may be assembled and dis-assembled readily, thereby allowing same to be a part of a soldier's pack or equipment, and easily transported in numbers from place to place, and which can be put on and taken off by an individual without other assistance in a small amount of time.

Further objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location, and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown by the accompanying drawings, and finally pointed out in the appended claims.

Referring to the drawings:—

Figure 1 is a view in front perspective of an armor embodying my invention.

Fig. 2 is a sectional view taken on the line 2, 2, Fig. 1, and looking in the direction of the arrows.

Fig. 3 is a sectional view taken on the line 3, 3, Fig. 1, and looking in the direction of the arrows.

Fig. 4 is a view similar to Fig. 3 showing the armor supporting means employed.

Fig. 5 is a view similar to Fig. 2 showing a modified construction of leg and foot armor.

Fig. 6 is a view in front elevation of a

modified construction of body and head armor.

Fig. 7 is a rear view of the body and head armor.

Fig. 8 is a sectional view taken on the line 8, 8, Fig. 7, and looking in the direction of the arrows.

Fig. 9 is a perspective view of the helmet support.

Fig. 10 is a broken detail view.

The same part is designated by the same reference numeral wherever it occurs throughout the several views.

In my co-pending application, No. 69,009, I show and describe a bullet proof armor made of angular metal adapted to be worn by a soldier to afford protection to the front of his body from toe to crown. My present invention is directed to armor of this type, namely, angle metal made angularly to afford the deflecting surface for the impact of bullets; the armor itself being of bullet proof steel, or armor steel.

In my present invention I provide a frame made of wire or other suitable similar material which is readily slipped on by the soldier and to which is secured the cushions or pads or other shock absorbing elements, which elements are located on the wire frame at scientifically located spots which will, when the frame is adjusted to the form of the user, fall over non-sensitive and non-vital portions of the body of the wearer. I provide means for readily securing the armor plate, which is formed in two parts, to this wire frame. I also provide attaching means for securing the frame to the body so that the weight of the armor suspended from the frame is evenly distributed over the body and the total weight thereof falls on what is known in the medical profession as the acromion process of scapula and clavicle, at which portions of the anatomy there is no nerve, and is used particularly in climates and countries where heavy burdens are carried by men to support heavy loads without pain, injury, or discomfort.

Referring to the drawing, I indicate at 1 the wire frame above referred to. This wire frame is provided with a curved portion adapted to pass over the shoulders of the wearer. The curved portion 2 is provided with a pad which fits snugly across the acromion process of scapula and clavicle.

There is also provided a pad extending across the wire frame 1 which fits against the sternum or chest. The frame is also provided with a pad 5 which I will call the pelvic pad, which rests on the hip bones and the front surface of the osinnominata. These respective pads may be of any desired form or material. I prefer, however, to use a felt pad to which is attached an inflatable pad which may be inflated by the user prior to putting on the armor.

When the wire frame 1 has been put on and held in place around the body of the user in any desirable manner, for example, by straps 8, the armor is then secured to the frame as will be hereinafter described. The armor as above outlined consists of metal sheets placed at an angle relative to each other, the sheets providing means for protecting various exposed portions of the user as will be hereinafter set forth. The head or helmet portions may be of one piece with the body armor or may be separate and independent therefrom. Where the helmet is of one piece with the body armor a head support shown in Figs. 4, 8, and 9, is employed, which head support is also carried by frame 1. This head support consists of straps shown in detail in Fig. 9 provided with the pads 10 and chin rest 11, also padded, and cross pads 12 and 13 as shown for assisting and supporting the helmet and body portion of the armor. Each sheet of armor is secured to the frame in any suitable manner, for example, by bolt and nut, at any number of desired places. In practice I find that it is sufficient to bolt each portion of the armor 20, 21, to the frame 1 at two places, namely, near the chest or sternum pad, and near the pelvic pad. When the helmet is made in one piece integral with the body portion of the armor I provide suitable means for allowing sight from within the armor. This may be of any desired form. For example, the holes 25 as shown in Fig. 1, or it may be the French racing slots 26 as shown in Fig. 6. The steel or armor plate of the helmet is bent over the top of the user and substantially over the back of his head as indicated at 29, Figs. 7 and 8, to protect as far as the back of the neck of the wearer. If desired, and as shown, the body portions of the armor may be provided with a curved shield 30 at each side to cover in front and from the rear the coracoid process of scapula and humerus as will be apparent from the drawing. If desired a back protector indicated at 35 may be suspended from the free ends of the curved portion 2 of the frame 1 and held in place by strap 36 strapped around the front of the body of the soldier. When this back protector is employed I prefer to associate therewith a pad which would strike a sacrum of the soldier and absorb the shock

of impact of a projectile thereagainst by that portion of the body, which, of course, would not be liable to be injurious to the spine. Where the armor is to be used in trench warfare, that is, where the occupant or wearer of the same, stands a short portion above the top of the trench it is obvious that there are no requirements to protect the pedal extremity of the soldier. Where the armor is used to advance in the face of fire, however, it is obvious that some means must be taken to protect both the legs and feet of the wearer as well as the arms of the wearer. Various forms of leg protector may be employed, but after considerable experimentation I have arrived at two practical forms, one shown in Figs. 1 and 2, wherein the leg portion 40 is formed with a curved foot portion 41 secured thereto, the leg portion 40 being secured to the armor plates 20 and 21 in any suitable manner, for example, by bolts 43. The leg armor is curved as indicated to afford a deflecting surface for an impacting bullet. Due to the angle of the plates 20 and 21 of the body protector relative to the front of the wearer the leg portions 40 can swing on their bolt connection a sufficient distance to allow the wearer of the armor to walk in a manner quite similar to the German goose step while at the same time affording protection to both his legs and feet, due particularly in the latter instance, to the foot covering 41 as will be clearly understood. It might be advisable, however, to provide a hinged foot section which would allow the wearer to bend his knee and for this reason I have successfully tested the form of leg protector shown in Figs. 5 and 6 wherein the shin protector 47 is hinged to the thigh protector 48 as indicated. In both instances however to prevent too free a play between the leg of the soldier and the shield, the shield may be secured to the leg which is below and above the knee as indicated at 49 and 50, and above the ankle as indicated at 51 by means of straps or the like, pads being provided however as indicated at 52 at all of these places.

As above explained, a separate helmet may be employed as shown in Fig. 6, and as described in detail in my co-pending application, Serial No. 69,009, filed December 28, 1915, in which instance, of course, the helmet supporting frame secured to the frame 1 would be dispensed with. I have found in practice that it is advisable to allow the arms of the wearer of the armor to be free, and for this reason to protect the same in advancing in the face of fire the arms can easily be held in back of the body allowing little or no exposure of any portion of his body, the only possible exposure being the fleshy part of the arm, and then under circumstances which would not normally be encountered as will be hereinafter described.

If desired, however, even the arm may be protected as described and set forth in my co-pending application above identified.

When all of the armor has been assembled on the wearer it will be seen that I have provided a protection which is bullet proof to the entire front of the wearer leaving exposed only the back surface of the legs below the sacrum. This is particularly desirable in modern warfare in use, for example, by surgeons who in bending forward over the ground to aid a wounded soldier for protection for their vital parts from shrapnel shells and any shells exploding in the air above them. The foregoing as shown in Fig. 4 form the entire equipment of my armor, but it is obvious that any portions of it may be dispensed with as occasion may arise. For example, in trench warfare, all portions except the body and helmet portions may be dispensed with, and for advancing on trenches only the body portion and the leg portions may be employed, but my broad invention consists in providing an armor which is bullet proof and which may be readily assembled and dis-assembled in use and which will effectively receive and absorb the shock of impact of high velocity bullets to thereby prevent the shock of impact from incapacitating the soldier, which is accomplished as above set forth by absorbing the shock of impact at non-sensitive and non-vital parts of the human frame. When the armor is dis-assembled it can be packed compactly and forwarded to first line trenches in desired quantities. The men in their trenches can then adjust the frame to their body, strap it in place, and then proceed to secure the armor plates to the frame as above outlined. Thus it will be seen that I have provided a simple bullet proof armor which does not impede the free use of the legs, arms or neck of the occupant, and which has been thoroughly tested, and has proven to be bullet proof and shock proof, and which allows the free movement of the occupant for either defensive or offensive warfare.

The helmet portion, to secure the desired angular effect, I construct of a plurality of pieces of metal or armor plate secured together in any desirable manner, for example, by means of the strips 100 by rivets, bolts, or the like, and likewise I secure front edge of the two sheets 20 and 21, together, by any suitable means, for example, clips 101, which are angularly shaped to conform with the angle between the two plates 20 and 21. The plates are bolted to these respective clips. I find in practice it is preferable to have all bolt heads or rivet heads made of the same material as the armor plate itself or especially treated to harden the same to eliminate the possibility of having the heads thereof shot off. If

desired, as is shown in Fig. 10, an arm protector indicated at 110 may be secured to the shoulder protector 30 for a portion of the length of the arm. I do not, however, prefer the use of this arm protector in ordinary trench warfare as it does to a certain extent interfere with the free use of the arm. If desired the method of joining the two portions of the body armor may be similar to that shown for joining the portions of the head armor, and vice versa, and I have merely shown the two different forms in connection with the two different portions of the armor to show the two forms which I have tried and have found to be satisfactory for the purpose.

It is obvious that many changes in detail will occur to those skilled in the art without departing from the spirit or scope of my invention, as defined in the claims, and therefore what I claim as new and useful and of my own invention and desire to secure by Letters Patent, is,—

1. In an armor, the combination with a rigid frame adapted to be carried by the body, said frame extending from the shoulders to a point below the hips and completely across the body, of an armor, and means for securing said armor to said frame so that the frame is interposed between the armor and the trunk portion of the body.

2. In an armor, the combination with a wire frame adapted to be carried by the body, said frame extending from the shoulders to a point below the hips and completely across the body, of an armor, and means for securing said armor to said frame so that the frame is interposed between the armor and the trunk portion of the body.

3. In an armor, the combination with a rigid frame adapted to be carried by the body, said frame extending from the shoulders to a point below the hips and completely across the body, of an armor formed in two parts, and means for securing said armor to said frame so that the frame is interposed between the armor and the trunk portion of the body, whereby said armor parts are disposed at an angle to each other, said frame being interposed between the armor parts and the trunk portion of the body.

4. In an armor, the combination with a rigid frame adapted to be carried by the body, of an armor, and means for detachably securing said armor to said frame.

5. In an armor, the combination with a rigid frame adapted to be carried by the body, said frame extending from the shoulders to a point below the hips and completely across the body, of an armor formed in two parts, and means for detachably securing said armor to said frame whereby said armor parts are disposed at an angle to each other, said frame being interposed

between the armor parts and the trunk portion of the body.

6. A bullet proof armor comprising a rigid frame adapted to be readily put on or taken off, and a head and body protecting bullet proof armor carried by the front of said frame, and a leg protecting bullet proof armor carried by said body protecting armor.

7. A bullet proof armor comprising a rigid frame adapted to be readily put on or taken off, and a head and body protecting bullet proof armor carried by the front of said frame, and a back protecting bullet proof armor carried by the rear of said frame.

8. A bullet proof armor comprising a frame adapted to be readily put on or taken off, and a head and body protecting bullet proof armor carried by the front of said frame, and a back protecting bullet proof armor carried by the rear of said frame, and a leg protecting bullet proof armor carried by said body protecting armor.

9. A bullet proof armor comprising a rigid frame adapted to be readily put on or taken off, said frame extending from the shoulders to a point below the hips and completely across the body, of an armor made in vertical sections, each section adapted to cover an approximate half of the front of the body and the side thereof, the top of the body and a shoulder, and means for securing the armor to said frame, whereby the sections are disposed at an angle relative to each other, said frame being interposed between the armor parts and the trunk portion of the body.

10. A bullet proof armor comprising a frame adapted to be readily put on or taken off, said frame extending from the shoulders to a point below the hips and completely across the body, of an armor made in vertical sections, each section adapted to cover an approximate half of the front of the body, and the side thereof, the top of the body and a shoulder, and means for securing the armor to said frame, whereby the sections are disposed at an angle relative to each other, and means for securing said sections in their angularly disposed positions to each other, said frame being interposed between the armor parts and the trunk portion of the body.

11. In an armor, the combination with a frame adapted to be carried by the body, of an armor, and means for securing said armor to said frame and pads carried by said frame and interposed between said frame and the body and so positioned as to absorb and distribute the shock of impact of a projectile against said armor to non-sensitive, non-vital parts of the body.

12. In an armor, the combination with a frame, means for securing said frame to the

body, of an armor, and means for securing said armor to said frame, and pads carried by said frame and interposed between said frame and the body, and so positioned as to absorb and distribute the shock of impact of a projectile against said armor to non-sensitive, non-vital parts of the body.

13. In an armor, the combination with a frame provided with a portion to rest over the shoulder, means for securing said frame to the body, bullet proof armor, and means for securing said armor to said frame, and pads carried by said frame and interposed between said frame and the body, and so positioned as to absorb and distribute the shock of impact of a projectile against said armor to non-sensitive, non-vital parts of the body.

14. In an armor, the combination with a frame adapted to be carried by the body, of an armor formed in two parts, and means for securing said armor to said frame whereby said armor parts are disposed at an angle to each other, and pads carried by said frame and interposed between said frame and the body, and so positioned as to absorb and distribute the shock of impact of a projectile against said armor to non-sensitive, non-vital parts of the body.

15. In an armor, the combination with a frame adapted to be carried by the body, of an armor, and means for detachably securing said armor to said frame, and pads carried by said frame and interposed between said frame and the body, and so positioned as to absorb and distribute the shock of impact of a projectile against said armor to nonsensitive, non-vital parts of the body.

16. In an armor, the combination with a frame adapted to be carried by the body, of an armor formed in two parts, and means for detachably securing said armor to said frame whereby said armor parts are disposed at an angle to each other, and pads carried by said frame and interposed between said frame and the body, and so positioned as to absorb and distribute the shock of impact of a projectile against said armor to non-sensitive, non-vital parts of the body.

17. A bullet proof armor comprising a frame adapted to be readily put on or taken off, and a head and body protecting bullet proof armor carried by the front of said frame, and pads carried by said frame and interposed between said frame and the body, and so positioned as to absorb and distribute the shock of impact of a projectile against said armor to non-sensitive, non-vital parts of the body.

18. A bullet proof armor comprising a frame adapted to be readily put on or taken off, and a head and body protecting bullet proof armor carried by the front of said frame, and a leg protecting bullet proof armor carried by said body protecting ar-

mor, pads carried by said frame and interposed between said frame and the body, similar pads carried by said leg protecting armor, said pads being positioned to absorb and distribute the shock of impact of a projectile against said armor to non-sensitive and non-vital parts of the body.

19. A bullet proof armor comprising a frame adapted to be readily put on or taken off, and a head and body protecting bullet proof armor carried by the front of said frame, and a back protecting bullet proof armor carried by the rear of said frame, and pads interposed between the back protecting armor and the body.

20. A bullet proof armor comprising a frame adapted to be readily put on or taken off, of an armor made in vertical sections, each section adapted to cover an approximate half of the front of the body and the side thereof, the top of the body and a shoulder, and means for securing the armor to said frame, whereby the sections are disposed at an angle relative to each other, and pads carried by said frame and interposed between said frame and the body, and so

positioned as to absorb and distribute the shock of impact of a projectile against said armor to non-sensitive, non-vital parts of the body.

21. A bullet proof armor comprising a frame adapted to be readily put on or taken off, of an armor made in vertical sections, each section adapted to cover an approximate half of the front of the body, and the side thereof, the top of the body and a shoulder, and means for securing the armor to said frame, whereby the sections are disposed at an angle relative to each other, and means for securing said sections in their angularly disposed positions to each other, and pads carried by said frame and interposed between said frame and the body, and so positioned as to absorb and distribute the shock of impact of a projectile against said armor to non-sensitive, non-vital parts of the body.

In testimony whereof I have hereunto set my hand on this 31st day of July A. D., 1917.

GUY OTIS BREWSTER.