A. NEWELL.

CHIMNEY JACKET.

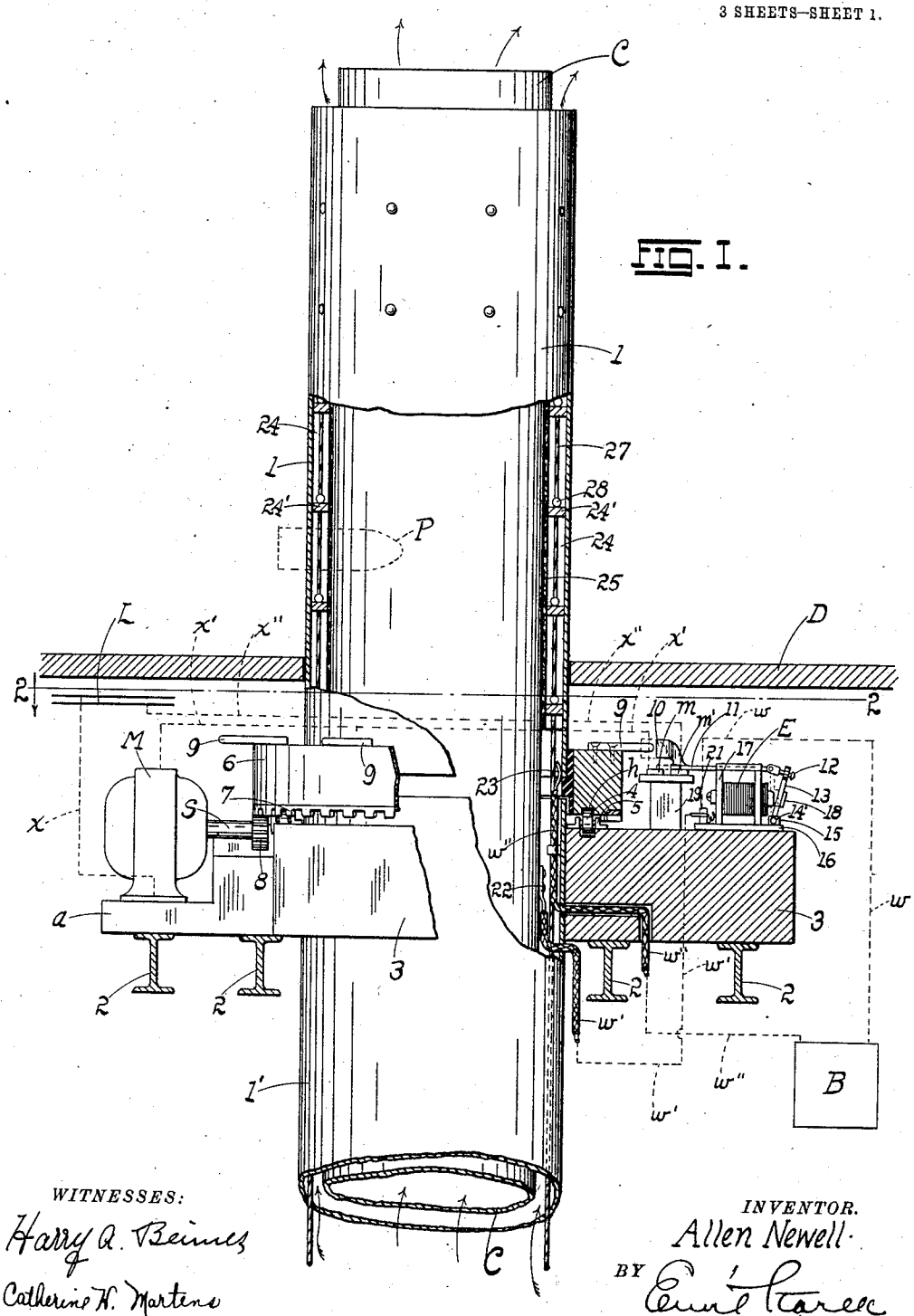
APPLICATION FILED MAR. 9, 1912.

1,047,553.

Patented Dec. 17, 1912.

3 SHEETS—SHEET 1.

FIG. 1.



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3 SHEETS—SHEET 2.

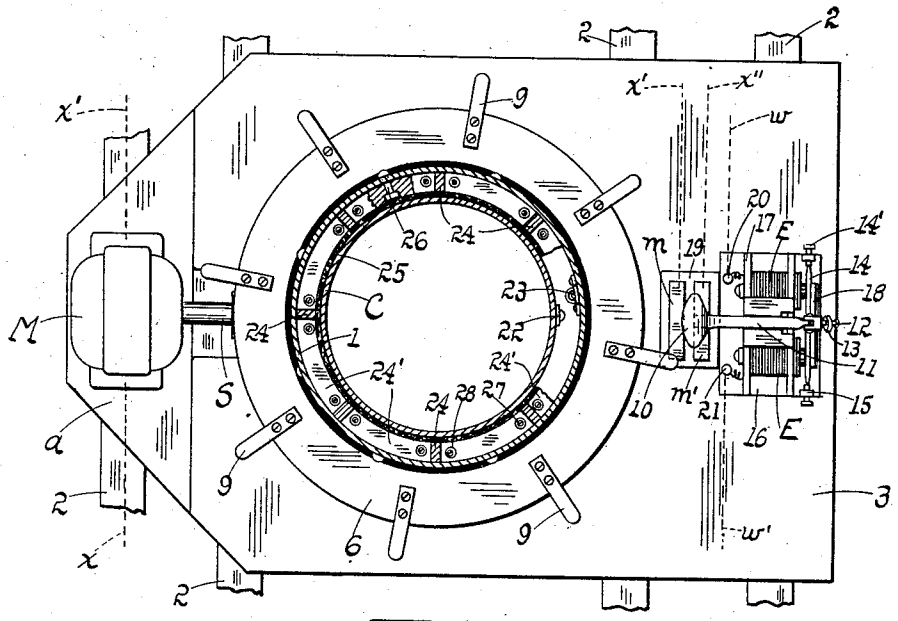

FIG. 2.

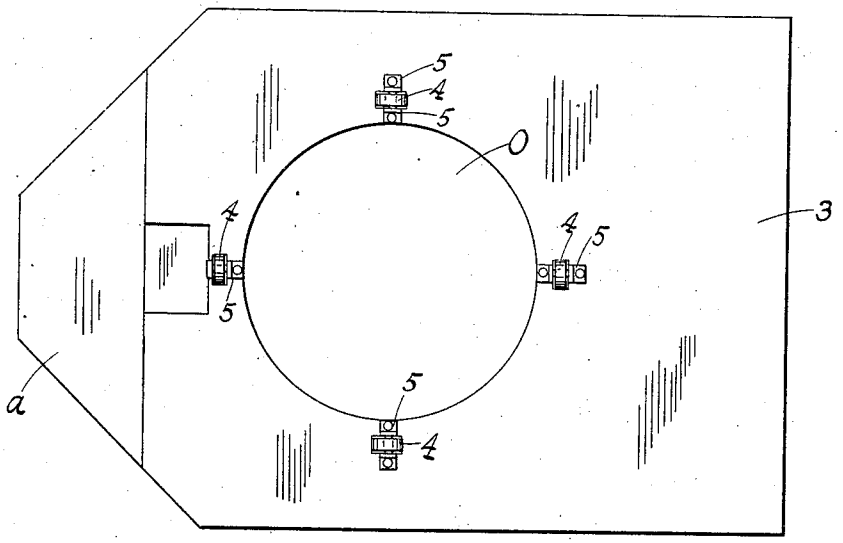

FIG. 3.

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3 SHEETS—SHEET 3.

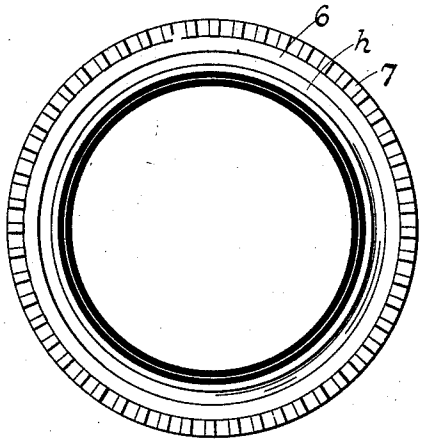

FIG. 4.

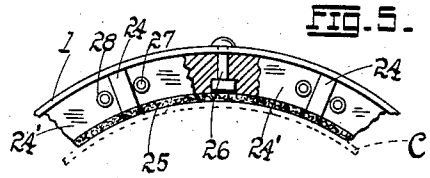

FIG. 5.

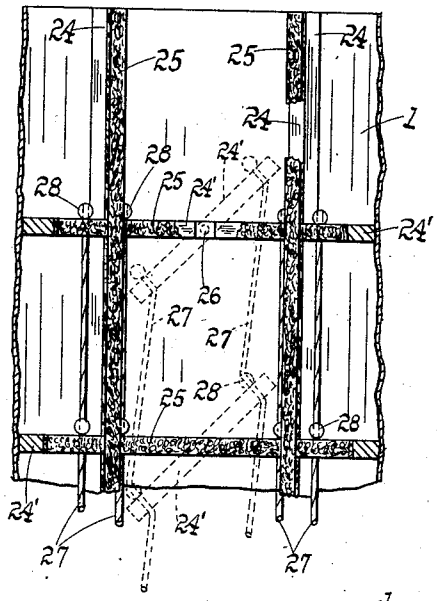

FIG. 6.

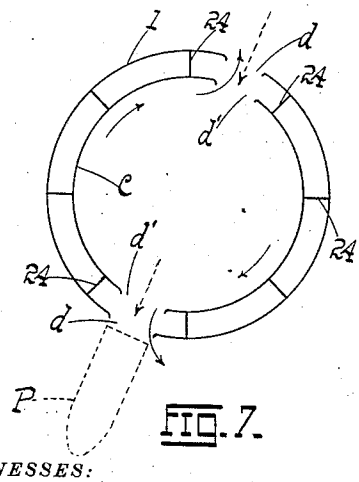

FIG. 7.

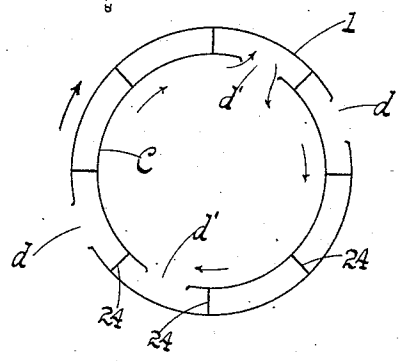

FIG. 8.

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CHIMNEY-JACKET.

1,047,553. Specification of Letters Patent. Patented Dec. 17, 1912.

Application filed March 9, 1912. Serial No. 682,683.

To all whom it may concern:

Be it known that I, ALLEN NEWELL, citizen of the United States, residing at Decatur, in the county of Wise and State of Texas, have invented certain new and useful Improvements in Chimney-Jackets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in chimney-jacket constructions for naval vessels; and it consists in the novel details more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is an elevation with parts in section, of my invention as applied to a vessel, the deck of the latter being shown in section; Fig. 2 is a horizontal section on the line 2—2 of Fig. 1 taken below the deck; Fig. 3 is a top plan of the platform supporting the rotatable ring secured to the jacket; Fig. 4 is a bottom plan view of the ring showing the marginal annular rack carried by the same; Fig. 5 is a top plan of a section of the jacket; Fig. 6 is an inside elevation of the portion of the jacket shown in Fig. 5; and Figs. 7 and 8 are diagrammatic views showing the positions of the jacket before and after a shot has been fired and the projectile has pierced the chimney and jacket.

The object of my invention is to provide a jacket for the furnace-stack or chimney of a naval vessel (or in fact any vessel) which will automatically close (to the atmosphere) the shot holes in the chimney, the jacket subserving the additional function of a ventilator for carrying off the heated air from the boiler room when under natural draft.

A further object is to provide a jacket which will suffer a minimum degree of destruction when pierced by a projectile; one in which the actuating mechanism therefor shall be instantly responsive the moment the projectile or shell strikes and pierces the chimney; one by which the closing of the chimney holes shall be certain; one providing means for regulating the currents of heated air from the boiler room; and one possessing further and other advantages better apparent from a detailed description of the invention which is as follows.

Referring to the drawings, D represents the deck of the vessel, C the chimney or stack, and 1 the rotatable section of the jacket, the stationary section 1′ of the latter extending through the vessel to the boiler room (not shown), and in the drawings shown broken at a point immediately beneath the deck. Supported below the deck in any convenient manner, and in the illustration shown preferably as resting on I-beams 2, is a platform or base 3, through an opening O of which the stack and jacket freely pass. Disposed around the opening on top of the platform are a series of rollers 4 mounted on brackets 5, the platform being preferably provided with an off-set *a* for the support of an electric motor M. Secured to, in any mechanical manner, and insulated from, the jacket 1 above the platform 3 is a ring or collar 6 the under surface of which is provided with an annular groove *h* for the travel of the rollers 4 by which the ring is supported, and over which it is free to rotate (the jacket 1 of course rotating with the ring). Disposed about the outer edge of the bottom face of the ring is a rack-ring 7 with which meshes a pinion 8 at the outer end of the shaft S of the motor M, a special off-set being made in the platform to accommodate the pinion (Fig. 1).

Distributed along the upper face of the ring 6 are a series of radially disposed wipers or tappets 9 which project beyond the periphery of the ring, the free ends of the wipers being adapted to engage a head or cam 10 carried at the adjacent end of a switch-slide, key or equivalent circuit closing member 11 whose opposite end is linked in any mechanical manner to an adjusting screw 12 at the upper end of the armature lever 13. The lower end of the lever 13 is secured to a rocker-bar 14 whose pointed ends are supported between the adjustment screws 14′ mounted in the brackets 15 on the wooden or equivalent base plate 16, a frame 17 being mounted on the base for guiding the slide 11. Disposed across the lever 13 is the armature 18 which coöperates with the electro-magnets E mounted on the base plate 16. There is nothing new about the magnets or armature conforming as they do, substantially to an ordinary telegraph relay, and *per se* not being claimed herein. The free end of the slide 11 operates across the contact plates *m*, *m′* of a switch mounted on a block 19 above the stationary platform 3.

Leading from one pole of a battery B (of

what for convenience may be termed the primary circuit) to the binding post 20 of the electro-magnet E is a wire *w*, and leading from the opposite binding post 21 to the stack C is a wire *w'*, the connection with the stack being made through a metallic strip or plate 22 (Fig. 1) riveted to the stack. Leading from the opposite pole of the battery is a wire *w''*, the wire being passed through the platform 3 (if desired, see Fig. 1) then along the stationary section 1' of the jacket in the space between the jacket and chimney and terminating in a smooth, flexed or convexed spring plate or brush 23 the convexed face of which bears against the inner face of the rotatable section 1 of the jacket, and makes proper electric contact therewith. Leading from one pole of the motor M to a line wire L is a wire *x;* from the opposite motor pole leads a wire *x'* said wire terminating at one of the switch plates *m*. From the opposite switch plate *m'* leads a wire *x''* the same connecting with the line wire L. The motor M may be referred to as an element in what for convenience may be termed as the motor circuit or secondary circuit in contradistinction to the primary or battery circuit above alluded to.

Disposed along the inner surface of the rotatable section 1 of the jacket are a series of longitudinal strips or partitions 24 the same converging toward, or radiating from the axis of the jacket (Fig. 5) said strips being faced with a brush or soft layer 25 of asbestos or equivalent material which contacts with the outer surface of the chimney C. The strips 24 thus divide the space between the chimney and jacket into a series of contiguous vertical air-flues the continuity of any one of which may at any time be broken, or the flow of air therethrough controlled and regulated by a series of curved or annular transverse partitions or strips 24' pivoted centrally to the wall of the jacket by pins or studs 26 about which they freely oscillate between the studs or strips 24, the ends of the strips 24' being beveled to conform to the radial disposition of the sides of the strips 24 which they engage when swung to a horizontal position. Like the studs 24 the transverse strips 24' are faced with an asbestos or equivalent brush 25. The strips 24' thus act as dampers or valves, and in practice the pivots of corresponding dampers of the several air flues are disposed in the same horizontal plane so that when the dampers are swung to a horizontal or closed position they form collectively an annular transverse strip around the inside of the jacket, such annular strip being intersected by the vertical studs 24 (Fig. 6). The adjacent ends of the several strips 24' are connected by wire or equivalent cables 27 provided with knots or knobs 28 (or in any mechanical manner), the cables passing down through the space between the stack and jacket to a point within reach of the engineer or attendant in the boiler room. By drawing on the proper cable the entire vertical series of strips 24' may be oscillated to an inclined position so as to open the passage of the flue between two adjacent studs 24 (see dotted position Fig. 6). In this way the ventilation or flow of hot air from the boiler room may be regulated. The distance across the space between the stack C and the jacket 1 is from six to eight inches though it is never so great as to be incapable of being spanned by the prevailing shell or projectile P from the guns of the enemy. It follows therefore that a projectile striking the jacket and penetrating the chimney will straddle the space between them, being momentarily in contact with both, and this fact is made use of with my improvement the operation of which will now be described.

Assuming that a projectile penetrates the jacket and stack (Fig. 1) and passes across the stack. For convenience we may refer to the diagrammatic views, Figs. 7 and 8 to supplement the present description. As the shell or projectile is passing through the jacket and stack it will connect them electrically thus momentarily closing the battery circuit which under normal conditions remains open or broken. During the interval that the shell is in contact with the jacket and stack, the battery circuit will be completed, the current from the battery B traversing the wire *w*, coils E, wire *w'*, stack C, shell P, jacket 1, brush 23, and wire *w''* to the battery. The primary circuit being thus closed results in an energizing of the electro-magnets E which instantly attract the armature 18, oscillating the lever 13 in proper direction to cause the slide 11 to pass over both switch plates *m*, *m'*, (Fig. 1) and thereby complete or close the normally open motor circuit. The motor-circuit being closed the current passes from the line wire L through the wire *x* to the motor M, from the motor through the wire *x'* to the plate *m*, across the slide 11 to the plate *m'*, and from the latter through the wire *x''* back to the line L. The closing of the motor circuit at once starts the motor which rotates the shaft S and pinion 8, the latter imparting rotation to the ring 6 and hence to the jacket 1 to which said ring is secured. The ring and its jacket continue to rotate until the proper wiper or tappet 9 strikes the cam 10 (which had previously been pushed in the path of the tappet by the inward movement of the slide 11 with the energizing of the magnet E) and forces back the slide to its original position, that is to say to a position where the free end of the slide clears the inner plate *m*, thereby opening the switch and breaking the motor circuit. Of course, the battery circuit is

broken the moment the shell P has passed out of the stack (and jacket); but unless the slide 11 is pushed back so as to open the switch plates m, m', the motor would continue running and hence continuously rotate the jacket. The wipers 9 therefore restore the slide to its original position where it remains until another shot hits the stack. The number of wipers 9 are governed by the number of strips or studs 24, and are so spaced that the jacket never rotates less than one-third farther than what would correspond to an arc defined by two consecutive studs and for an obvious reason. Assuming a shot to have struck the jacket within one of the blocks or squares into which the jacket is divided by the members 24, 24′ (Figs. 6, 7, 8) it will be seen that as the shot pierces the jacket and stack, it leaves four alining openings d, d', d, d', in the jacket and stack respectively. After the jacket has rotated or advanced through the proper arc (see heavy arrow Fig. 8), the openings or holes d, d', will be out of register or radial alinement, and intercommunication between the holes is cut off circumferentially by means of the partitions 24, 24′, forming the succeeding square; but assuming the shell to have struck the jacket at a point puncturing a strip 24, making a hole opening into two continuous squares. In that even a rotation of the jacket through an arc at least one-third more than what would correspond to an arc defined by two consecutive studs, is necessary to bring the hole in the stack within the second block or square succeeding the first block punctured. It follows therefore, that the rotation of the jacket after the stack has been pierced should not be less than through an arc one-third longer than that defined by two consecutive studs.

In practice the vertical distance between the transverse strips 24′ is substantially equal to the horizontal distance between the vertical strips 24 thus dividing the inner surface of the jacket into squares or blocks (Fig. 6), and when the jacket has been rotated or advanced as a result of impact by a shell, the hole d' in the chimney will be brought opposite one of these squares thus completely cutting off the hole from communication with the outer air and preventing interference with, or reduction in the draft, and preventing the escape of blinding smoke through the puncture. The rotation or advance of the jacket obviously can not interfere with the regulation of the flow of air through the air flues (between the studs 24 and chimney and jacket) and the attendant may at any time manipulate the cables 27 of any set of dampers 24′ not put out of commission by the shell or other projectile.

It may be stated in passing that the facing or brush of asbestos 25 makes close contact with the stack, the soft brush yielding to any burs made by the shell and forming an effective seal against escape of the smoke. The strips 24, 24′, are made non-fibrous and preferably of a composition of fuller's earth and asbestos, which not only serves as an electric insulator between the jacket and stack, is non-combustible, but when struck by a body of high velocity such as a shot, or a shell, or projectile, it crumbles or breaks short without a fiber, and at the point of impact only. It follows therefore that the passage of a shell through the stack will result in a minimum amount of damage to the jacket fittings. The covering of the shot holes in the stack by the rotation or advance of the jacket is thus an important matter as not only is the draft in no wise interfered with, but the air flues are maintained under perfect control by the dampers or oscillating strips or valves 24′. The use of the term jacket in the claims is to be understood as having reference to the rotatable section 1, the stationary section 1′ not being involved in the invention. By referring to Fig. 1 it will be seen that there is a slight space between the adjacent ends of the sections (1, 1′) so that the section 1 may be free to rotate without contact with the section 1′, the gap between the sections being spanned by the ring 6 secured to the rotatable section. The invention obviously need not be restricted to stacks on naval vessels, but may be used on land if located within range of the bullets of an enemy's vessels. The insulation and specific wiring here shown may of course be modified without departing from the spirit of my invention. After the slide 11 has been pushed back to open the switch m, m', the momentum of the jacket carries the wiper 9 a sufficient distance past the cam 10 to allow the member 11 to be drawn back again to its switch-closing position (over the contacts m, m') with any subsequent energization of the magnets E, E, (Fig. 2).

It is of course obvious that if the stack (and jacket) were hit as many times as there are strips 24, the jacket will have made a complete rotation and holes out of alinement after one shot might be brought into alinement later on as a result of other shots; but as to that the commander of the vessel must take chances. Besides it is quite unlikely that any one stack will be hit so often as to put the jacket entirely out of commission.

Having described my invention, what I claim is:—

1. In combination with a stack, a movable jacket surrounding the same, means for shifting the jacket relatively to the stack upon the conjoint puncture thereof by a shot whereby the shot-holes are brought out of alinement, and means between the stack and

jacket for cutting off inter-communication between said holes.

2. In combination with a stack, a movable jacket surrounding the same, and means for automatically shifting the jacket relatively to the stack upon the conjoint puncture thereof by a shot whereby the shot-holes are brought out of alinement.

3. In combination with a stack, a rotatable jacket surrounding the same, and means for automatically advancing the jacket relatively to the stack upon the conjoint puncture thereof by a shot, whereby the shot-holes are brought out of radial alinement.

4. In combination with a stack, a rotatable jacket surrounding the same, and means responsive to the impact of a shot puncturing the conjoint walls of the stack and jacket for automatically advancing the jacket relatively to the stack to bring the shot-holes out of alinement.

5. In combination with a stack, a rotatable jacket therefor insulated therefrom, an electric motor, and a suitable electric circuit adapted to be closed by the shot piercing the jacket and stack and forming an electric connection between them during its passage therethrough, whereby the motor is automatically set in motion, and intermediate connections between the motor and jacket for actuating the latter.

6. In combination with a stack, an enveloping rotatable jacket spaced and insulated therefrom, a primary electric circuit in the path of which the stack and jacket are disposed and which is closed by a shot with a conjoint piercing thereby of the stack and jacket walls, a normally open motor circuit, a motor in the path of said motor-circuit, means controlled by the closing of the primary circuit for completing the motor circuit and setting the motor into operation, and intermediate connections between the motor and jacket for rotating the latter.

7. In combination with a stack, an outer rotatable jacket spaced and electrically disconnected therefrom, a primary electric circuit having its current traversing the stack and jacket and adapted to be closed by a shot spanning the space between the stack and jacket walls, an electro-magnet in the path of said circuit, a circuit-closing member controlled by said magnet, a motor circuit provided with a switch controllable by said circuit-closing member, a motor in the path of the motor-circuit, intermediate gearing between the motor and jacket for rotating the latter, and devices operating in connection with the jacket for actuating the circuit-closing member and opening the switch whereby the motor circuit is broken and the rotation of the jacket is arrested when the holes made by the shot in the stack and jacket are sufficiently out of alinement.

8. In combination with a stack, a rotatable jacket surrounding the same, means responsive to the impact of a shot puncturing the conjoint walls of the stack and jacket for automatically advancing the jacket relatively to the stack to bring the shot holes out of radial alinement, and suitable formations between the stack and jacket to cut off circumferential intercommunication between the holes.

9. In combination with a stack, a rotatable jacket surrounding the same and spaced therefrom, means responsive to the impact of a shot puncturing the conjoint walls of the stack and jacket for automatically advancing the jacket relatively to the stack to bring the shot-holes out of radial alinement, suitable longitudinal strips disposed on the inside of the jacket and bearing against the stack for preventing circumferential intercommunication between the holes and likewise forming ventilating or air flues between the stack and jacket.

10. In combination with a stack, a rotatable jacket surrounding the same and spaced therefrom, suitable partitions or sealing strips on the inside of the jacket said strips being composed of non-fibrous material whereby they crumble when shot, only at the point of impact.

11. In combination with a stack, a rotatable jacket surrounding the same and spaced therefrom, suitable vertical partitions or sealing strips on the inside of the jacket and faced with a yielding brush bearing against the stack, for the purpose set forth.

12. In combination with a stack, a suitable jacket surrounding the same and spaced therefrom, vertical strips disposed along the inside of the jacket and bearing against the stack and forming air flues, and transverse strips disposed annularly along the jacket wall between the vertical strips and pivoted at their centers to oscillate freely between the vertical strips, whereby they serve as valves or dampers for controlling the flow of air through the flues.

13. In combination with a stack, a rotatable jacket surrounding the same and spaced therefrom, means responsive to the impact of a shot puncturing the conjoint walls of the stack and jacket for automatically advancing the jacket relatively to the stack to bring the shot-holes out of radial alinement, vertical strips on the inside of the jacket bearing against the stack and preventing circumferential intercommunication between the holes when brought out of radial alinement, and at the same time forming ventilating air flues, and oscillating annular transverse strips or dampers for regulating the currents through the air flues.

14. In combination with a stack, a jacket

surrounding the same and spaced therefrom, a ring secured to and insulated from the jacket, a support for the ring, a series of wipers on the ring, a primary electric circuit having the stack and jacket disposed in the path thereof and adapted to be closed by a projectile passing through the jacket and stack wall and momentarily spanning the gap between said walls, a motor circuit provided with switch contacts or plates, a switch-slide for closing the switch of the motor-circuit, an energizing coil or electro-magnet in the path of the primary circuit, an armature responsive to the coil, and connected to the switch-slide whereby upon the energizing of the coil, the armature is moved toward it and the slide caused to close the switch thereby completing the motor circuit, a motor in said motor-circuit, a circular rack on the ring, a shaft for the motor, a pinion on the shaft engaging the rack, and a member on the switch-slide adapted to be engaged by the wipers for breaking the motor circuit and restoring the armature to its normal position from the electro-magnet.

15. In combination with a stack, a movable jacket surrounding the same, and an electrically operated motor for automatically shifting the jacket relatively to the stack upon the conjoint puncture thereof by a shot whereby the shot-holes are moved out of alinement.

16. In combination with a stack, a rotatable jacket insulated therefrom, a primary electric circuit adapted to be closed by a shot piercing the stack and jacket, a motor circuit, a motor in said circuit coupled to the jacket, and devices actuated by the closing of the primary circuit for closing the motor circuit and actuating the motor and jacket to bring the shot-holes out of alinement.

17. In combination with a stack, a rotatable jacket surrounding the same, and means for automatically actuating the jacket sufficiently to bring the stack and jacket shot-holes out of alinement upon a piercing of the walls of the stack and jacket by a projectile.

In testimony whereof I affix my signature, in presence of two witnesses.

ALLEN NEWELL.

Witnesses:
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E. P. GIBSON.