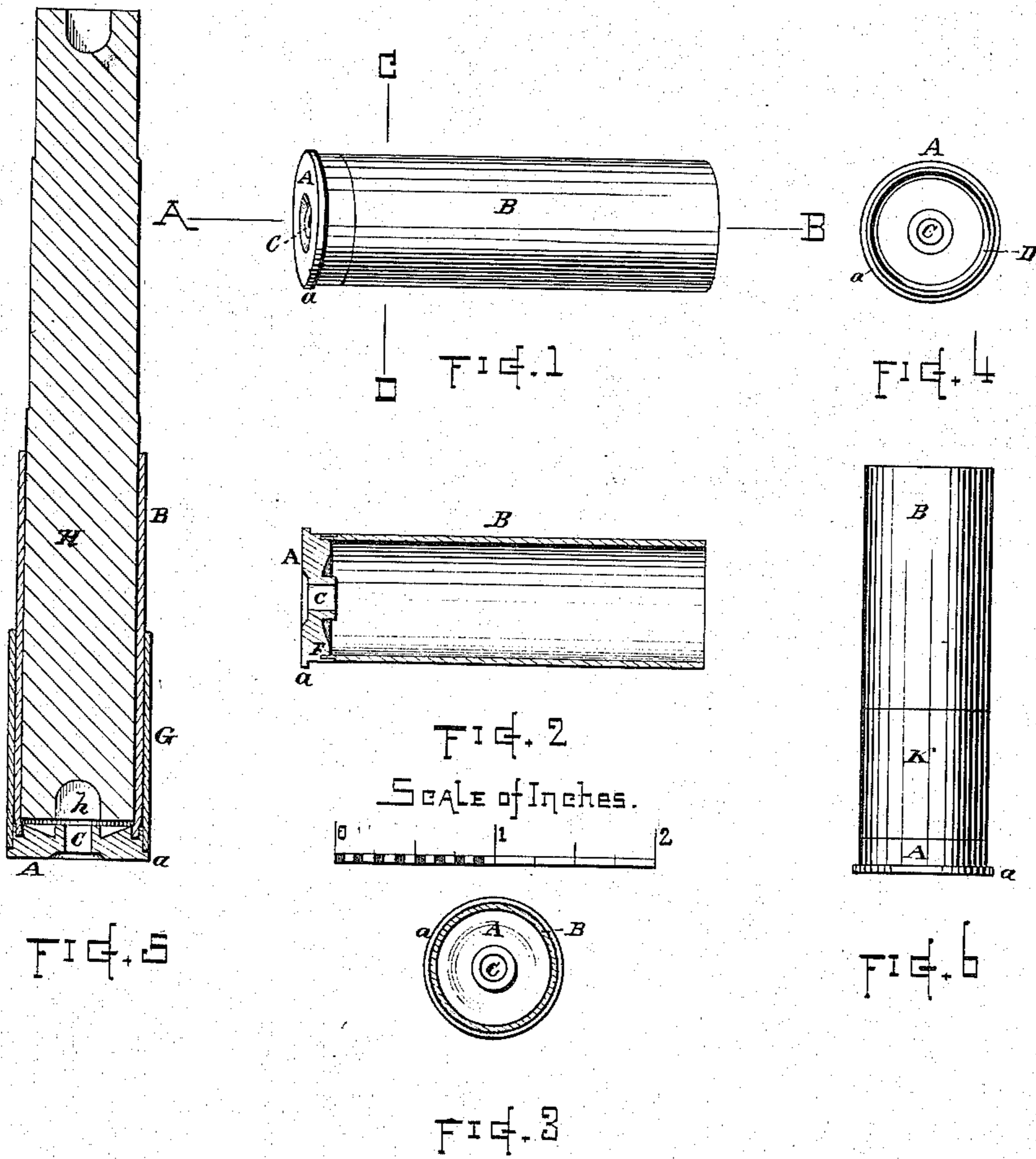


SULLIVAN FOREHAND & HENRY C. WADSWORTH.
 Improvement in Metallic Cartridges.

No. 121,606.

Patented Dec. 5, 1871.



Witnesses

Thos. H. Dodge
Chas. W. Burlingame

Inventors

Sullivan Forehand
Henry C. Wadsworth

UNITED STATES PATENT OFFICE.

SULLIVAN FOREHAND AND HENRY C. WADSWORTH, OF WORCESTER, MASS.

IMPROVEMENT IN METALLIC CARTRIDGES.

Specification forming part of Letters Patent No. 121,606, dated December 5, 1871.

To all whom it may concern:

Be it known that we, SULLIVAN FOREHAND and HENRY C. WADSWORTH, both of the city and county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Cartridge-Shells; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, in which the various figures represent the parts as follows, viz.:

Figure 1, a perspective view of the finished shell; Fig. 2, a central longitudinal section of the finished shell at line A B, Fig. 1; Fig. 3, a transverse section of the same at line C D, Fig. 1; Fig. 4, a front view of the head-piece; Fig. 5, a central longitudinal section illustrating one stage in the process of formation; Fig. 6, a side view of the shell when made in a somewhat modified form.

Our invention relates to combined paper-and-metal cartridge-shells. Great difficulty has hitherto been experienced in providing for the union of the paper and the metal. Either the manufacture had been too expensive and complicated to adapt it for practical use, or the union of the paper and metal has been so defectively and slightly made as to render the cartridge-shell worthless. The object of our invention is to make this union expeditiously, simply, and effectively, thereby producing a shell which shall be cheap, light, convenient of use, and at the same time shall possess great strength and durability, and be simple in construction and easy of manufacture.

To enable others skilled in the art to which our invention belongs to make and use the same, we will describe it in detail.

Our improved cartridge-shell is composed of a head-piece, A, and a charge-holding tube or cylinder, B. The head-piece A is formed from a single piece of metal, and consists of a circular disk perforated through its center with an opening, C, of the proper size and form to receive the discharging-cap or priming, and provided with an annular groove, D, formed in its front side near its circumference, and of a depth equal to about one-half the thickness of the disk or less, to receive the end of the tube or cylinder B, which latter is, in the present instance, formed of rolled paper, and of sufficient length to contain the re-

quired charge. A flange, *a*, is formed around the periphery of the head-piece A at its rear corner to prevent the shell from entering too far into the barrel of the fire-arm when used, and also to facilitate its removal therefrom. The front side of the head-piece or disk A is hollowed out with the exception of a small flange around the priming-opening C. This hollow may be of conical form, as shown in Fig. 5, or of any other desired shape or depth. The disks or head-pieces A may be readily and conveniently made by turning them from the end of a bar of metal, or by any other method if preferred. After the disks or head-pieces A and paper cylinders B have been prepared, the parts are secured to each other in the following manner: The end of the cylinder B is inserted within the groove D, and a metallic cylinder, G, of proper caliber placed over the shell so as to inclose the disk A and cylinder B at their junction. The shell is then placed upon some suitable anvil or supporting-block, and a cylindrical mandrel, H, turned of the proper size to fit the interior of the shell, and provided with a suitable cavity, *h*, to clear the flange of the priming-opening C, is forced down by a hammer or press into the interior of the shell, as indicated in Fig. 5. (The view shows the parts just previous to the moment of contact between the mandrel and the head-piece.) The mandrel H strikes upon the metal of the disk A and swages down the corner so as to force the metal thereof outward to close the groove D, causing it to embrace the end of the cylinder B with a firm hold, as indicated at F, Fig. 2. The mandrel H and inclosing-cylinder G are then removed, and the shell is completed ready to be charged. The mandrel H, when forced into the interior of the tube or cylinder B, presses the material thereof outward against the inclosing-cylinder G so as to extend over the flange around the groove D, whereby the outside of the shell is made smooth and perfect throughout its entire length. It will be observed that by this process of construction a firm and reliable connection is produced between the paper cylinder B and the head-piece or disk A, thus rendering the shell strong and durable, as it is not liable to become separated at said joint. The paper cylinders may, if desired, be surrounded or re-enforced, for a portion of their length, by a thin metallic casing, as shown at K, Fig. 6, said casing to be arranged upon the cylinder previous

to putting the parts of the shell together, so that its end will be retained within the groove D. The priming-openings in the head-pieces may be fitted to receive the various kinds and sizes of primers in use.

Those skilled in the art to which our invention belongs will readily perceive the great utility of our improvement, inasmuch as the head-piece being of solid metal gives the same resistance and assistance at the discharge of the arm as though the entire shell was of metal, while the tube or cylinder, being of paper or similar material, greatly reduces the weight, labor of manufacture, and cost of the shells.

In conclusion, we would state that we are aware cartridge-shells have heretofore been made consisting of a solid metal head in combination with a metal charge-tube set into an annular groove or channel in the head; but in such cartridges it is indispensable that the charge-tube should be formed before insertion into the head with a con-

tracted or drawn-in end and a shoulder resting upon a corresponding shoulder of the head-piece, whereas in our cartridge such construction is not requisite. The charge-tube may be a plain cylinder, and, after insertion into the metal-head, can be pressed and formed so as to rest upon the shoulder of the head and to form with the head a smooth unbroken exterior surface throughout the length of the shell.

What we claim, therefore, and desire to secure by Letters Patent, is—

A cartridge-shell composed of the metal head A and paper charge-tube B when said parts are constructed and united together to form a smooth and continuous exterior, in the manner herein shown and set forth.

SULLIVAN FOREHAND.
HENRY C. WADSWORTH.

Witnesses:

THOS. H. DODGE,
CHAS. H. BURLEIGH.

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