G. B. THAYER.
Paper-Fasteners.

No. 217,831. Patented July 22, 1879.

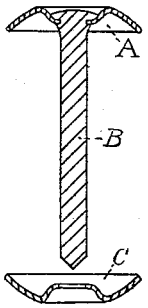

FIG. 1.

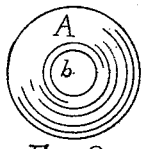

FIG. 2.

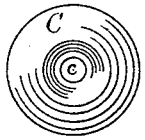

FIG. 3.

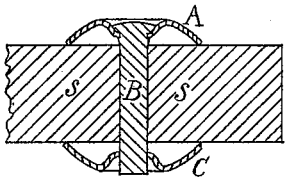

FIG. 4.

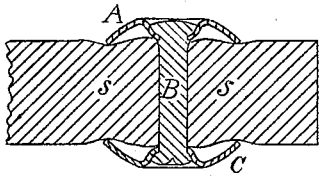

FIG. 5.

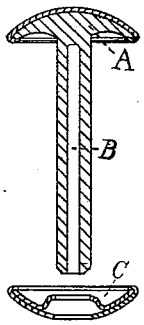

FIG. 6.

FIG. 7.

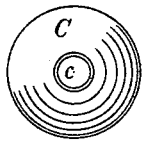

FIG. 8.

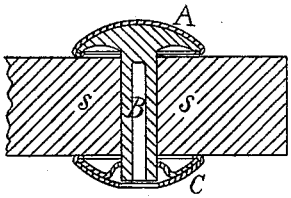

FIG. 9.

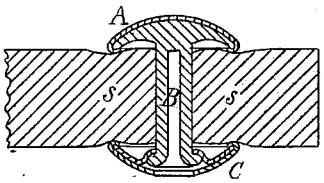

FIG. 10.

WITNESSES;
H. L. Whitcomb.
N. S. Daniels.

INVENTOR;
Geo. B. Thayer

UNITED STATES PATENT OFFICE.

GEORGE B. THAYER, OF CONCORD, ASSIGNOR TO RUFUS A. THAYER, OF RANDOLPH, MASSACHUSETTS.

IMPROVEMENT IN PAPER-FASTENERS.

Specification forming part of Letters Patent No. **217,831**, dated July 22, 1879; application filed October 28, 1878.

To all whom it may concern:

Be it known that I, GEORGE B. THAYER, of Concord, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Paper-Fasteners; and do declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference thereon marked.

The paper-fastener which forms the subject of my invention, and which is designed to be used in binding or fastening together separate leaves or sheets of paper, cloth, leather, and similar materials, may be manufactured at comparatively small expense, may be easily and expeditiously applied without special expensive apparatus, will hold with equal certainty and firmness the ever-varying thicknesses of sheets constantly occurring in practice, and when applied will present a neat and finished appearance on both sides of the bound sheets, without exposing on the reverse side of the sheets any loose and troublesome projecting points or strips of metal, as is the case with many of the fasteners now in use.

My paper-fastener consists, essentially, of a shank, B, of any metal sufficiently soft to be easily manipulated, as hereinafter described, firmly united to a head or washer, A, of the same or of a harder metal than that of the shank B, and a detached head or washer, C, having a recess formed within it, around a central hole, *c*, made for the passage of the shank B, the object of the recess being to receive portions of the shank B, bent or forced into it, in the operation of applying the fastener, in such a manner that the main body of the washer C will be above all parts of the shank B, so that when the fastener is applied no part of the shank B can come in contact with, to soil or scratch, any object upon which the bound sheets may be laid.

The shape of the cross-section of B is immaterial. It may be round, square, or rectangular, &c., either solid or tubular, either single, double, or multiple, or partly single and partly double or multiple, to facilitate the operation of heading down within the recess of C.

The general outline of A and C is immaterial. It may be round, as shown in Figs. 2, 3, 7, and 8, or of any other convenient form. The cross-sections of A and C, however, should be substantially as shown in the drawings, for the following reasons: first, to economize the material; second, to leave a space under the washers A and C to cover the holes formed in perforating the sheets; and, third, to form the recess around the central hole, *c*, of C. The shape of the recess should, of course, be made to correspond with that of the cross-section of B.

The materials of which the fastener is constructed may be described as follows: For the washers A and C any thin hard sheet metal, such as brass, will be the best.

For the shank B a hard metal or alloy, such as copper or brass, might be used; but as the cutting off of the shank of B to the requisite length, which is necessary in applying this fastener, and the subsequent operation of fixing C in place, would require a specially-constructed implement in case so hard a metal as copper or brass are used, I propose for ordinary purposes to make the shank B of some soft, easily-worked metal or alloy, such as lead or an alloy of lead, which offers the following advantages for this purpose: First, the tenacity of a shank whose area is equal to, or even somewhat less than, that of a circle one-sixteenth of an inch in diameter will be sufficient for the purpose; second, a shank of this area of cross-section, even when in the shape of a round wire, can easily be severed to the proper length with a common pocket-knife, and still more easily if in the shape of a double ribbon or tube; third, the metal of the end of the severed shank can easily be forced into the recess around the central hole of C with a blunt awl used in perforating the paper, or with an inexpensive punch, by simple pressure or a slight blow; fourth, no especial care need be taken in cutting off the superfluous part of the shank B; fifth, after the metal of the shank B is headed into the recess of C, should the sheets not be sufficiently compressed between the washers A and C, a slight blow upon the awl or punch while A is laid flat upon the table or other unyielding object will, by upsetting the metal of the shank B be-

tween A and C, bring A and C nearer together and compress the sheets between them; sixth, the use of so easily tarnished a metal as lead and most of its alloys in a paper-fastener is rendered entirely unobjectionable by the devices shown by the drawings and the form given to the washers A and C, as therein shown.

The manufactured article should, moreover, be treated with lacquer, whatever form is given to it. The exposed portion of the shank in the washer A of Figs. 1 and 2 will thus preserve the luster of freshly-worked metal, and if the form of A shown in Figs. 6 and 7 is used, none of the soft metal is exposed.

In the form of the washer C shown in Figs. 3 and 5, although a portion of the soft metal is exposed to view, it does not project beyond the body of the washer C, so as to be liable to soil or scratch any object on which it may be placed. In the form of the washer C shown in Figs. 8 and 10, the soft metal is still more masked.

The operation of applying this fastener is as follows: The paper being perforated with any convenient instrument, such as a common brad-awl or knife-blade, the shank B is passed through the hole thus formed until the fixed washer A comes against the sheets. The washer C, which is perforated with a hole corresponding to the shape of the shank B, is passed over the part of the shank B which projects from the reverse side of the sheets, and brought down upon the sheets. The sheets being lightly pressed together with the fingers on opposite sides of C, the shank B is cut off close to the washer C, so as to leave sufficient material of the shank outside the central hole of the inner shell of C to form the head, which may be done by pressing the awl used in perforating upon the center of the projecting part of the shank B, so as to spread out or bend the metal of the shank into the recess about the central hole of C. A further slight pressure or blow upon the awl or punch completes the operation, as before explained.

To bind the sheets temporarily, the shank B is bent down over the outside of the washer C without being cut off. To unbind sheets permanently fastened together, remove a portion of the metal in the recess of C, and the washer C can be pulled off; or simply insert the blade of a knife between the sheets and cut off the shank B between the washers.

The simplest form of this paper-fastener is shown in Figs. 1 to 5, inclusive, in which A and C are of the same form, made of a single shell.

Fig. 1 shows a central longitudinal section. Fig. 2 shows an outside view of A, with the head of the shank B at *b*. Fig. 3 shows a similar view of C, with a central hole for the passage of the shank B. Fig. 4, which is a central longitudinal section, shows the position of the parts of the fastener with reference to the sheets *s s* after the shank B is cut off to the requisite length, and before it is riveted upon the recess of C. Fig. 5 shows the same parts as Fig. 4 after the shank is riveted, and that part of the shank between the washers A and C is upset, so as to compress the sheets, as before explained. Figs. 6 to 10, inclusive, which correspond, respectively, to Figs. 1 to 5, inclusive, show the fastener with an outer shell formed over the washers A and C, to conceal as far as possible the heads of the shank B. The head of the shank of washer A is entirely concealed. In the outer shell of the washer C a hole must be formed corresponding to that of the inner shell, to allow the passage of the shank B and the introduction of the awl or other instrument used in forcing the metal into the recess about the central hole of the inner shell and the upsetting of the shank between the washers, as before explained.

It is obvious that the washer A and the shank B may be formed of a single piece of metal, and, when a soft metal is used, lacquered or otherwise treated to obviate the liability to soil or tarnish.

It is obvious that the washer C, whether of the form of Figs. 3 or 8, may be made out of a single solid piece of metal.

I claim as my invention the following:

1. A paper-fastener having a single solid penetrating-shank, attached to a suitable head, and a washer perforated to receive the shank, and provided with a recess to allow the projecting end of the shank to be headed down even with or below its outer surface, all substantially as shown and described.

2. A paper-fastener having a penetrating-shank attached to a suitable head, and a recessed perforated washer, all constructed and applied substantially as shown and described.

3. In a paper-fastener, a perforated washer for the reverse side of the sheets, having a recess formed therein, substantially as shown, and for the purposes set forth.

In witness whereof I hereunto set my hand.

GEO. B. THAYER.

Witnesses:
ALFRED W. HOSMER,
N. S. DANIELS.