

(No Model.)

A. E. RHOADES.  
WARPER COMB.

No. 602,771.

Patented Apr. 19, 1898.

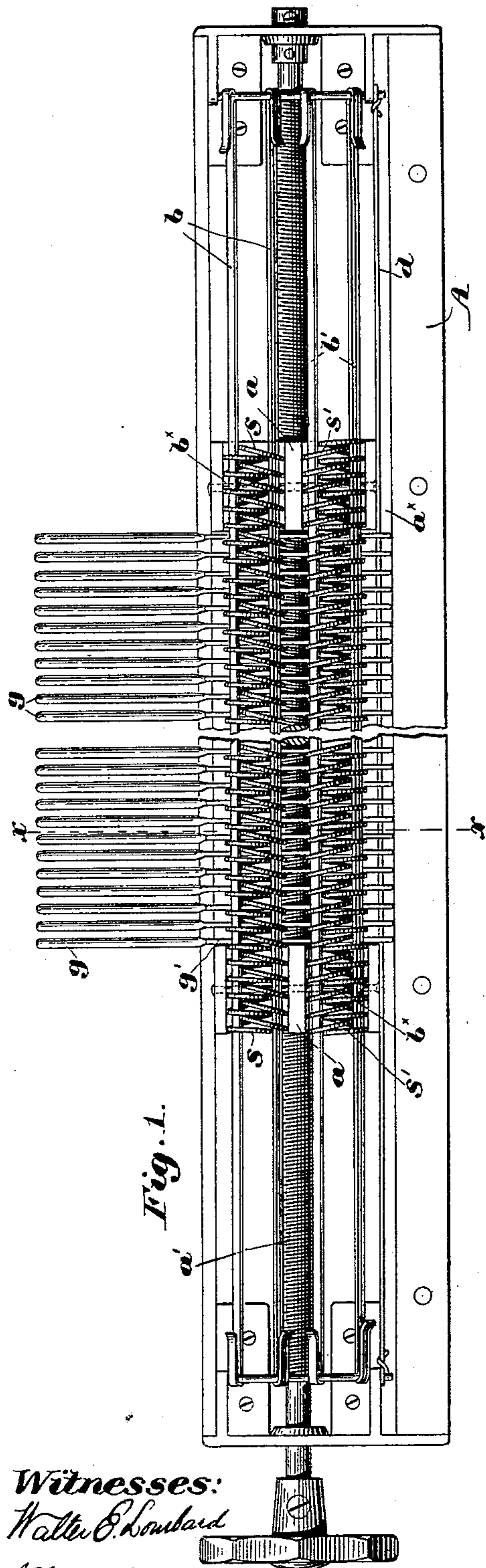


Fig. 1.

Witnesses:

Walter E. Lombard

Thomas J. Drummond

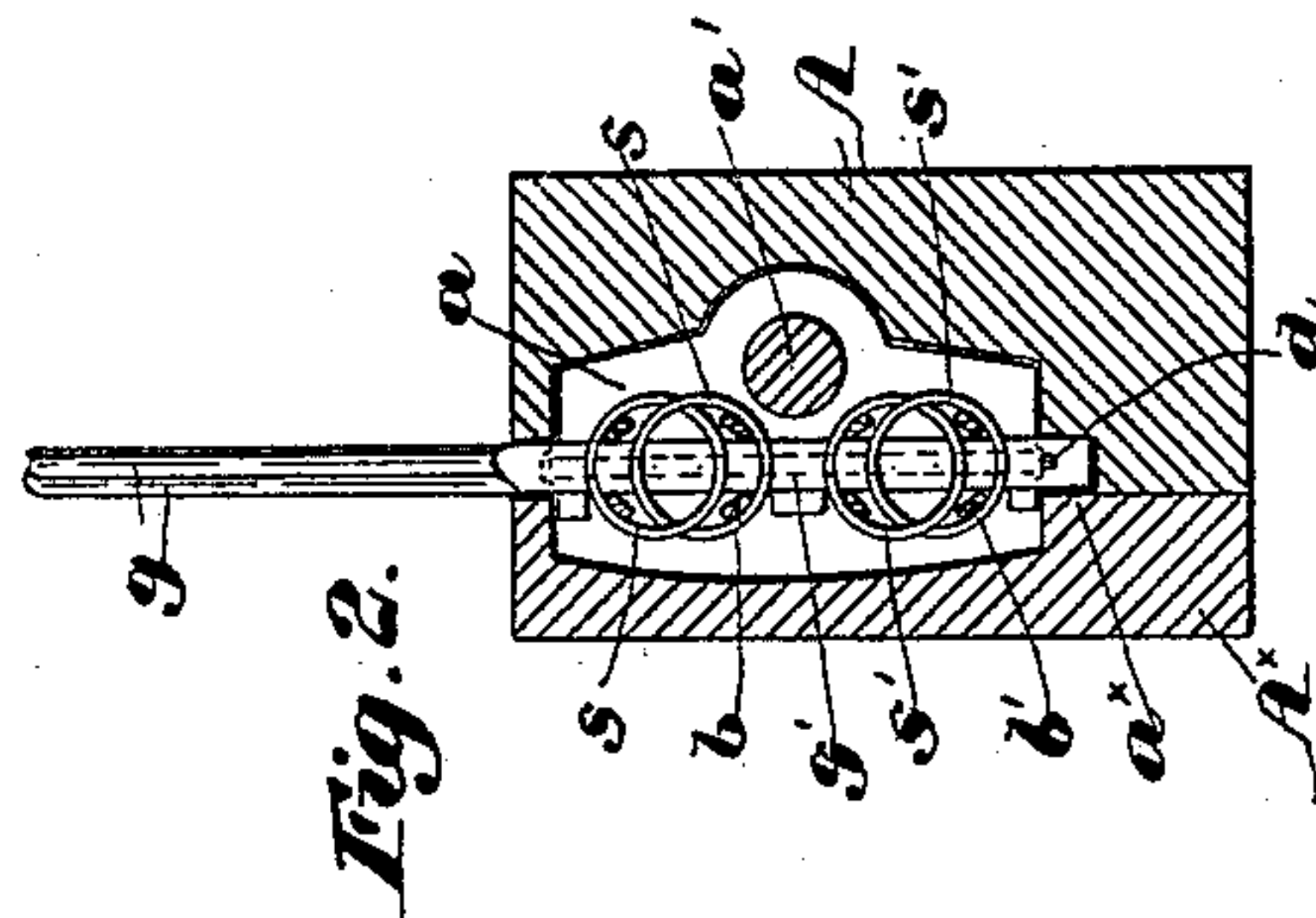


Fig. 2.

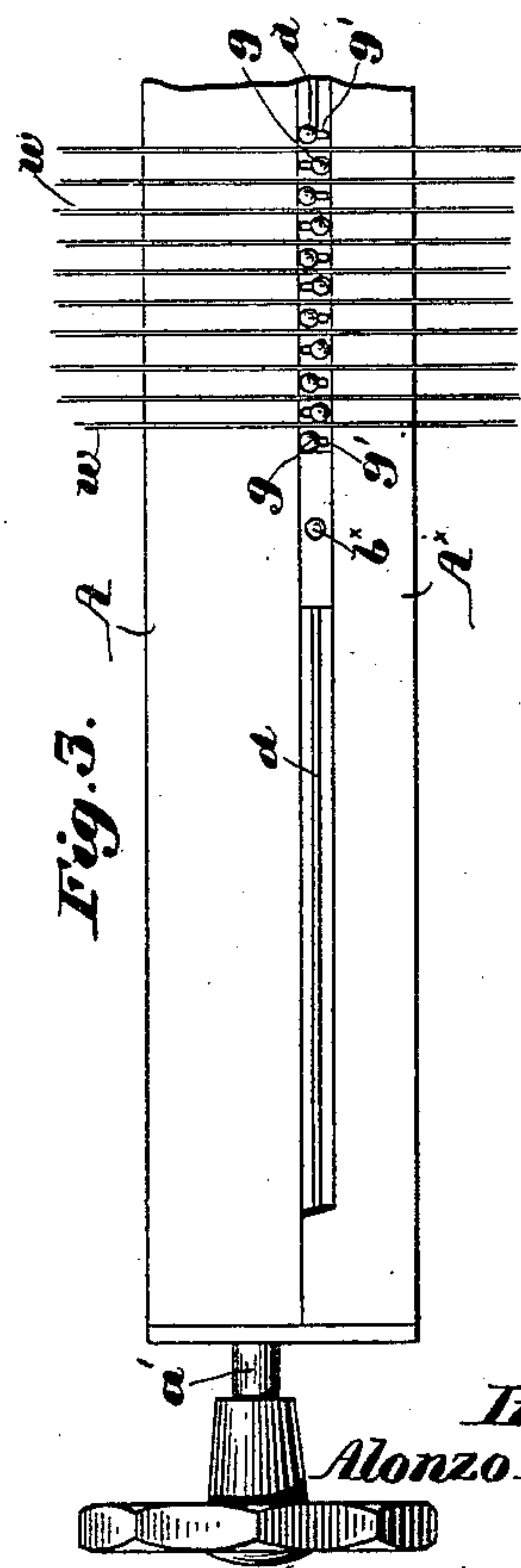


Fig. 3.

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# UNITED STATES PATENT OFFICE.

ALONZO E. RHOADES, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE  
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## WARPER-COMB.

SPECIFICATION forming part of Letters Patent No. 602,771, dated April 19, 1898.

Application filed July 23, 1897. Serial No. 645,663. (No model.)

*To all whom it may concern:*

Be it known that I, ALONZO E. RHOADES, of Hopedale, in the county of Worcester and State of Massachusetts, have invented an Improvement in Warper-Combs, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates to warper-combs used on warpers to separate the threads leading to the beam.

It is necessary in these devices to separate or bring nearer together the upright wires or guides which serve to divide the warp-threads, and this is usually accomplished by means of a coiled spring, the guides being inserted between the coils, and by suitable mechanism the spring is expanded or allowed to contract. Heretofore the guides have been flat and they could thus be crowded together very closely when necessary. In my present invention I use upright guides rounded in cross-section in order to avoid catching of the warps and to present a smoother surface for the passage of the threads, and by using the round guides I have found it necessary to arrange them in a certain order, so that when moved close together they will still permit the warp-threads to readily pass by.

Figure 1 is a front elevation, centrally broken out, of a sufficient portion of a warper-comb to be understood with my invention embodied therein, the front or cover plate being removed. Fig. 2 is a transverse sectional view taken on the line  $xx$ , Fig. 1, with the cap in place; and Fig. 3 is a partial top or plan view of the apparatus shown in Fig. 1 with the cap in place.

40 The transverse stand or support A, recessed in its front face to receive the adjusting collars or sleeves  $a$ , mounted upon a right and left screw-threaded adjusting shaft or rod  $a'$ , mounted in suitable bearings upon the support A, the coiled springs  $s$   $s'$ , arranged in pairs, the longitudinally-extended guides  $b$   $b'$ , extended through the springs and secured to the stand at their ends, and the pins  $b^x$ , securing the springs to the adjustable sleeves  $a$ , are and may be all as common in warper-combs, it being understood that by rotation

of the adjusting-shaft  $a'$  the sleeves  $a$  will be moved toward or from each other to permit the coils of the springs to contract or expand to thereby vary the distance between the warp-guides in usual manner. 55

I have herein shown the warp-guides as upright wires  $g$ , rounded in cross-section at their upper ends and having flattened shanks  $g'$  to pass between the coils of the springs, the lower ends of the shanks entering a longitudinal recess  $a^x$ , formed in the stand A, a retaining-wire  $d$  being extended loosely through holes in the feet of the guides. 60

In order to permit the rounded guides to be brought into close proximity and to still allow the warp-threads to pass freely between them, I have so constructed the guides that the upper rounded ends of the alternate guides will be staggered, as clearly shown in Fig. 3. This is conveniently effected by making the shank somewhat wider than the diameter of the upper end of the guide, as best shown in Fig. 2, and offset from the latter along one edge, adjacent guides having their shanks oppositely turned. By staggering the alternate guides, as described, they may be moved very closely together when necessary without interfering with the free passage of the warp-threads  $w$ . 65 70 75 80

A cap  $A^x$ , of usual construction, (shown in Figs. 2 and 3,) protects the springs and adjacent mechanism from dust and dirt, the top edges of the cap and stand leaving a clearance-space through which the upright guides pass. 85

The round guides being greater in diameter than the width of the flat wires formerly used act to deliver the yarn more evenly onto the beam. 90

With the thin flat guides, when separated to leave considerable space between any two of them, the threads had room to assume different positions, while the round guides limit the threads to a more definite position. 95

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a warper-comb, a series of warp-guides having flattened shanks offset therefrom alternately in opposite directions, whereby the shanks are in alinement and the upper ends 100

of the guides are staggered, substantially as described.

2. In a warper-comb, a series of warp-guides rounded in cross-sections at their upper ends, 5 and having flattened shanks offset therefrom alternately in opposite directions, whereby the shanks are in alinement and the upper ends of the guides are staggered, substantially as described.

10 3. In a warper-comb, a supporting-stand having a longitudinal recess therein, a series of warp-guides having flattened shanks to enter said recess, and means to vary the distance between the guides, the flattened shanks

of said guides being offset therefrom alternately in opposite directions, whereby while the shanks are in alinement in the longitudinal recess of the stand the upper ends of the guides are staggered, substantially as described. 15 20

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALONZO E. RHOADES.

Witnesses:

GEO. OTIS DRAPER,  
HERBERT S. MANLEY.