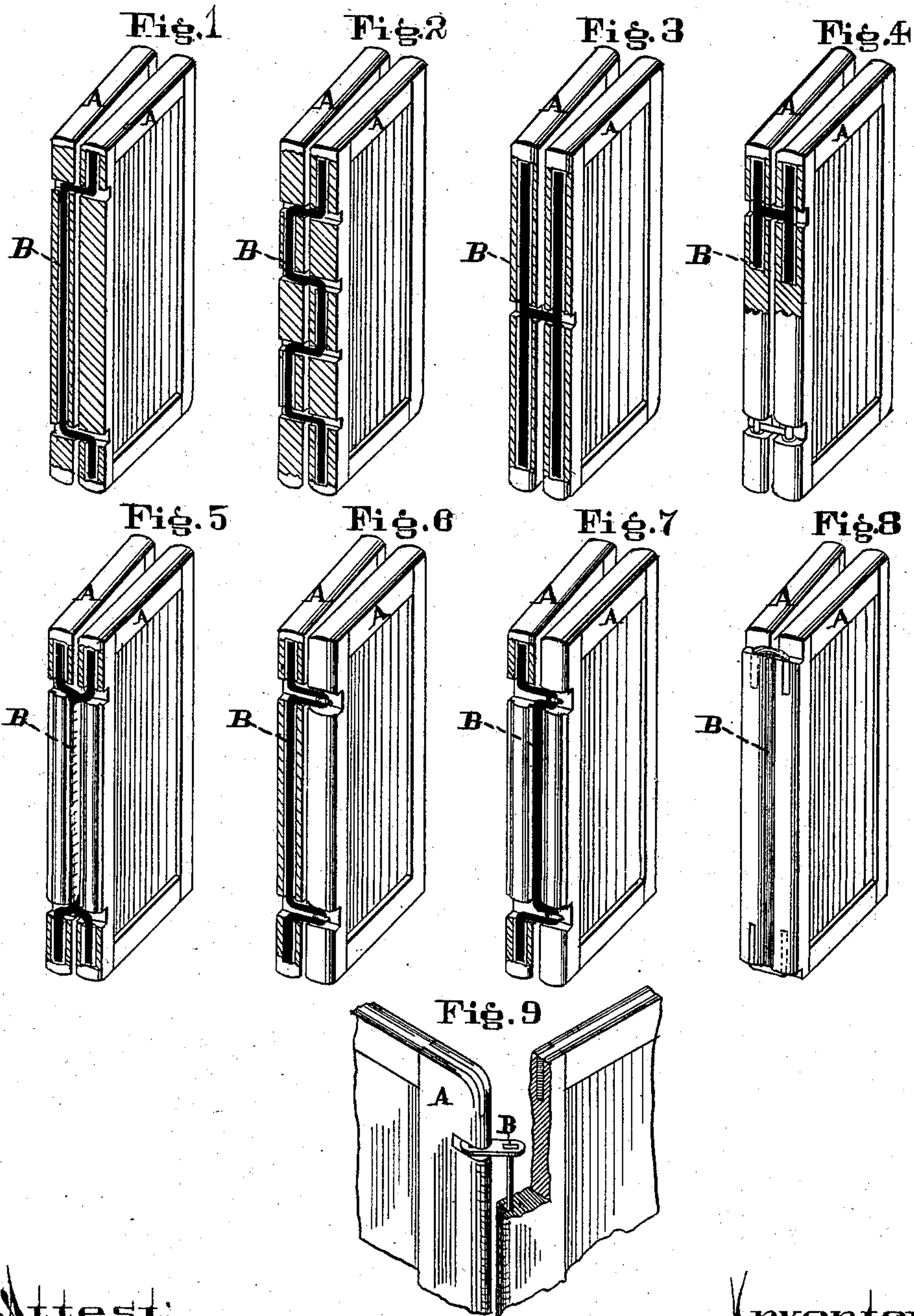


(No Model.)

C. F. RAPP.  
School Slate.

No. 232,416.

Patented Sept. 21, 1880.



Attest:  
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# UNITED STATES PATENT OFFICE.

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## SCHOOL-SLATE.

SPECIFICATION forming part of Letters Patent No. 232,416, dated September 21, 1880.

Application filed May 19, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN F. RAPP, of the city of Cincinnati, county of Hamilton, State of Ohio, have invented a new and useful Improvement in School-Slates, of which the following is a specification.

This invention relates to that class of reversible slates in which a slender cylindrical wire or rod is bent or looped from one member to the other, the opposite bends or loops being embedded in or united to the opposite folding members to permit them to fold upon each other in either direction. This class of slates is represented in Letters Patent Nos. 186,443 and 186,621 granted to me, dated January 23, 1877, and my Patent No. 203,293, dated May 7, 1878.

The various figures of the drawings hereto annexed are perspective views of slate-frames united in pairs by various forms of my bent-wire connecting device. In Figure 1 the frame-connecting device has but two transverse bends. In Fig. 2 the wire has a greater number of bends. In Fig. 3 the opposite pintle portions of the wire are rigidly united in the center by the cross-link. In Fig. 4 are shown two coupling devices, similar to the one shown in Fig. 3, the upper one in section and exposed, while the lower is embedded in the edge of the frame. Fig. 5 shows the frames united by two wires, similar to the form shown in Fig. 1. These are twisted together between the bends, and the central twisted part is between the frames. In Fig. 6 the central part of the wire, between the transverse links and the parts outside of the links, are embedded in one of the folding members. Two transverse loops extend across to the opposite member, and are secured by staples, thus uniting the frames together. In Fig. 7 the ends of the wire only are embedded. The central longitudinal part is between the frames. Fig. 8 shows a form similar to Fig. 5, except that the ends are bent back in the direction of the central part, which is also between the frames. In Fig. 9 the connecting-link is similar to Figs. 3 and 4; but in this case the ends of the wire are flattened to enter corresponding perforations in a flat metal cross-link to rigidly unite the longitudinal parts and prevent either turning independently of the other.

In the forms of coupling device in which the connecting-link has its longitudinal portions all embedded in the edges of the respective frames A, the edges of these frames are a plain half-round; but in the forms shown in Figs. 5, 7, and 8, in which the central connecting-pieces between the cross-links are between the edges of the frame, the edges are beaded, as shown. The object of this is to provide a bed for the exposed longitudinal part of the wire B, so that when the slates are closed the flat surfaces of the frames may fold closely together.

The edges of the slate-frames are grooved where they are to receive the pivotal parts of the coupling device B, and notched transversely where the pivotal portions are united by the cross-bends, as in my former patents above referred to, so that the transverse bends may assume a position perpendicular to the faces of the frames when folded.

The wire B is secured in place in the edges of the frames by the insertion of glued wooden strips or cleats, or by staples, or both staples and cleats, if desired. The staples may be driven over the wire and the cleats omitted. In this case it would make no difference were the wood upon each side of the groove cut away. Or the staples may be driven over the cleats to hold them firmly in place in case the glue should be dissolved by washing the slate.

It is evident that the grooving of the edges may be entirely omitted. Take the form, for instance, represented by Fig. 7. By removing the bayonet-shaped ends in front of the fastening-staples, turning the end of the wire into an eye around the staple, and making a central loop, similar to the ones shown, to enter a transverse notch in the middle of the opposite frame, and securing it in the same way by a staple, and a pair of reversible slates are produced without grooving either frame. Two or more of these loops may be made to enter and be secured in each of the opposite members of the slate.

In Fig. 8 I have shown a form which requires but one extraneous fastening device in each frame. The opposite members are grooved at the diagonally-opposite corners. The corners opposite the grooves are bored in from the end. The bent end of the wire is slipped into the hole in one frame, the opposite frame slipped

over the diagonally-opposite pintle; the other pintles can now be turned into their respective grooves and secured by cleats or staples, in the usual way.

5 The form of hinge-wire shown in Figs. 3 and 4 may have the transverse portions either brazed to the longitudinal portions, or made of two wires and the cross portions twisted, as in Fig. 5.

10 The coupling-wire may be bent in various ways, (not shown,) or divisions and variations of the shown forms used, without varying the principle of the invention, which consists, essentially, in bending or looping the wire and  
15 connecting the opposite bends to the opposite folding members.

I claim—

1. A pair of slate-frames, A A, in combination with the bent-wire coupling device B, the opposite bends of which are embedded in or 20 connected to the opposite folding members A A, substantially as shown, and for the purpose set forth.

2. The double reversible slate consisting of a pair of round-edged and longitudinally- 25 grooved and transversely-notched leaves, A A, and the rod or wire B, bent or formed at the extremities into the bayonet-like form shown, the whole being arranged, secured, and adapted to operate substantially as set forth.

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Witnesses:

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