(No Model.)

W. P. BETTENDORF.

METALLIC FRAME FOR WAGONS.

No. 479,618. Patented July 26, 1892.

Fig. 1.

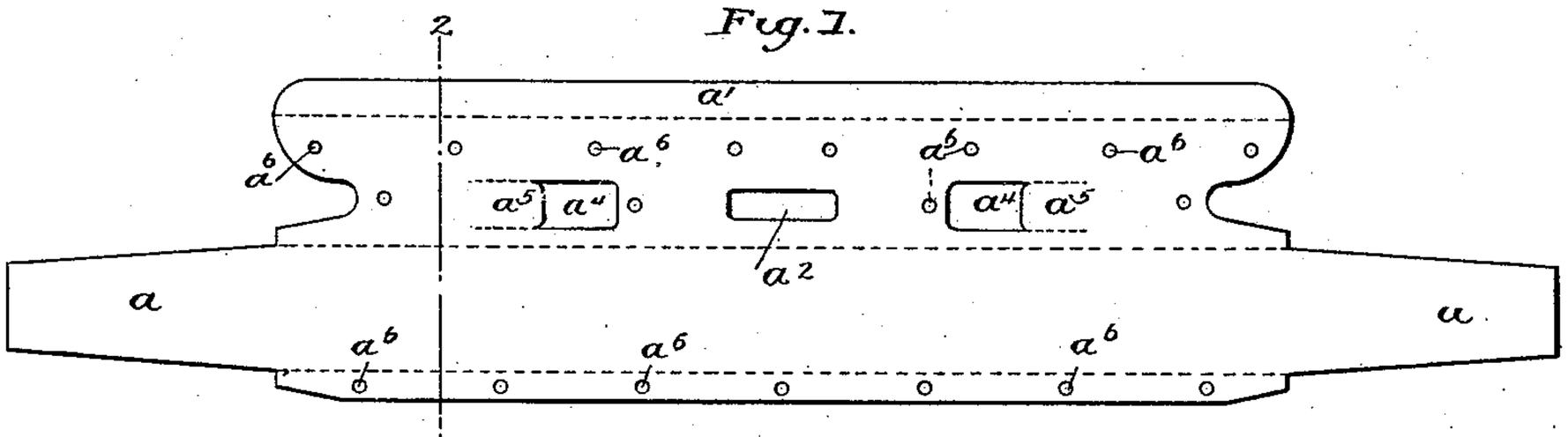

Fig. 3.

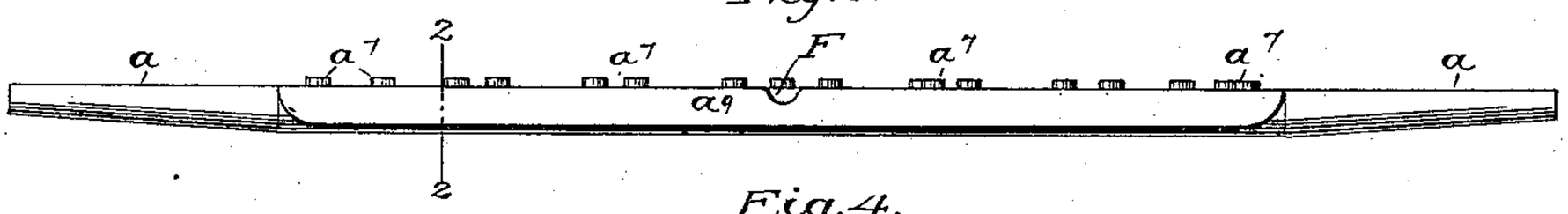

Fig. 4.

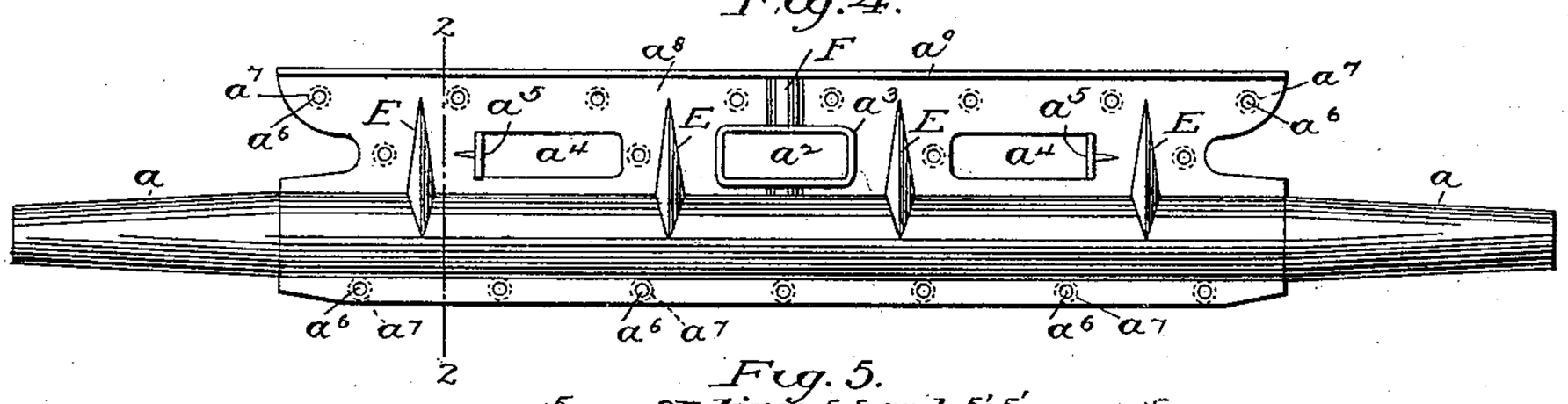

Fig. 5.
on lines 5-5 and 5'-5'

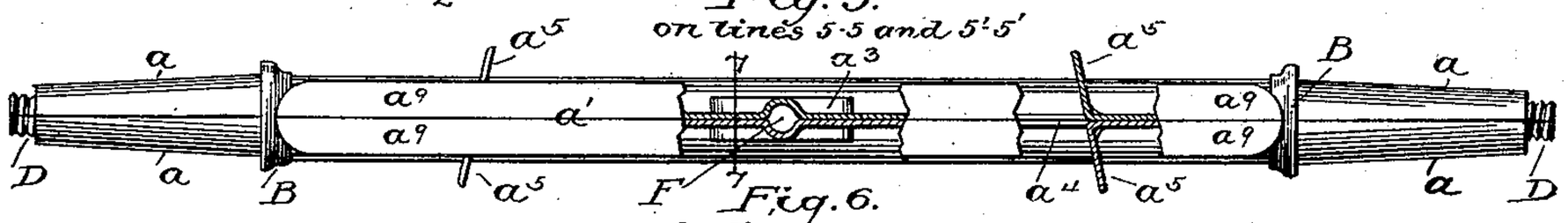

Fig. 6.

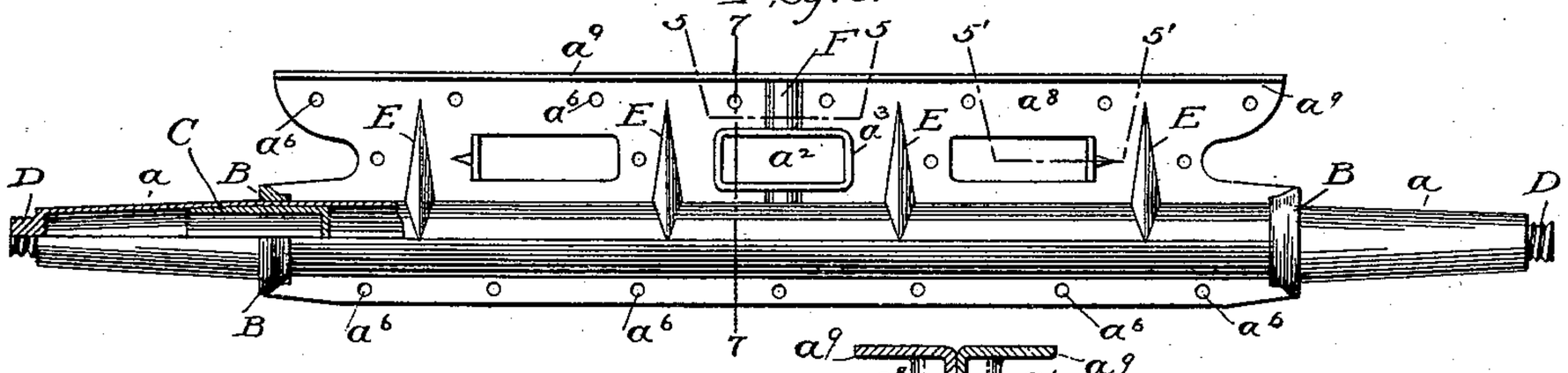

Fig. 7.
on line 7-7

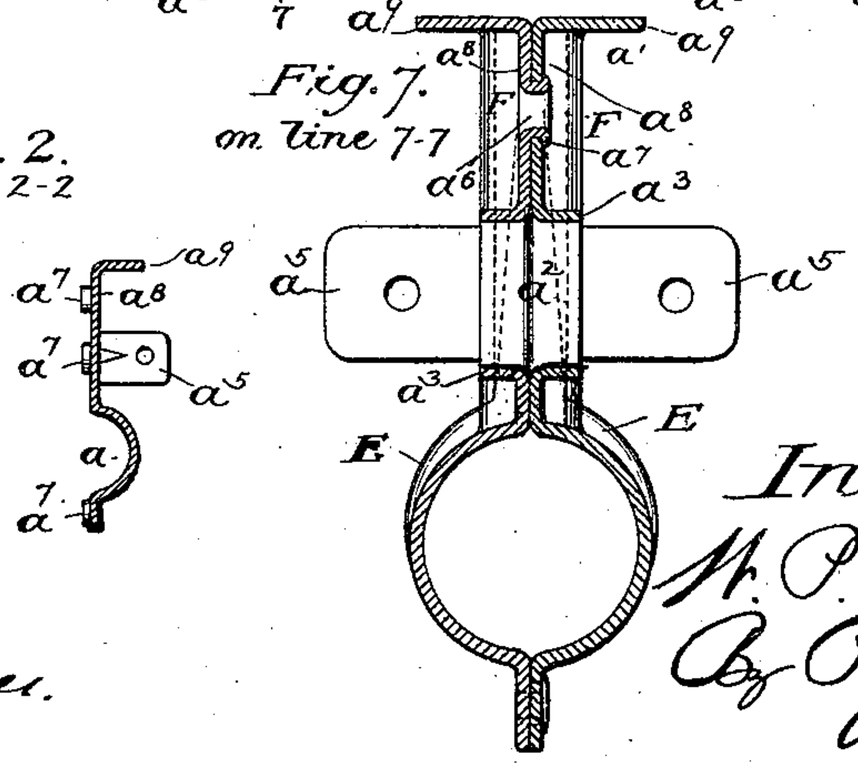

Fig. 2.
on line 2-2

Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM P. BETTENDORF, OF DAVENPORT, IOWA.

METALLIC FRAME FOR WAGONS.

SPECIFICATION forming part of Letters Patent No. 479,618, dated July 26, 1892.

Application filed December 24, 1891. Serial No. 416,021. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. BETTENDORF, of Davenport, county of Scott, and State of Iowa, have invented a new and useful Improvement in Metallic Frames for Wagons, &c., of which the following is a specification.

The aim of my invention is to produce from sheet metal a wagon-axle and sand-board which shall be light, strong, and cheap. To this end I construct the axle and sand-board of two complementary parts, the vertical faces of which are joined and fastened together. Each part or half consists of a blank of suitable shape cut from a single piece of sheet metal and afterward bent at one edge, so that it presents a semi-tubular half of the axle and that the other edge presents a half of the sand-board.

It is manifest that the details of form and size may be modified according to the pattern of the axle demanded, the essential characteristic of the structure being that it consists of two sheet-metal halves joined face to face through the middle.

In the accompanying drawings, Figure 1 represents a face view of one of the blanks, which may be constructed in duplicate. Fig. 2 is a cross-section of the same on the line 2 2 of Figs. 1, 3, and 4 as it appears after being bent into shape. Fig. 3 is a top plan view of one of the parts or halves completed and in condition to be joined to its companion. Fig. 4 is a side elevation of the same shown in section. Fig. 5 is a top plan view of the completed axle on the lines 5 5 and 5′ 5′ of Fig. 6. Fig. 6 is a front elevation of the axle and sand-board complete, one end being shown partly in section. Fig. 7 is a vertical cross-section on the line 7 7 of Figs. 5 and 6.

As the first step in the construction of my axle I shear, punch, or otherwise form from a flat sheet or plate of steel or other suitable metal a blank—such as represented in Fig. 1—of a length corresponding to that of the required axle and of a width proportioned to the diameter of the axle and the width of the sand-board. At each end this blank is provided with a tapering extension a, designed to form one-half of the spindle for the wheel. Along the upper edge, beyond the portion which is to form the axle proper, the blank comprises a portion a', somewhat shorter than the remainder of the blank and designed to form one side of the sand-board. Midway of its length the blank has an opening a^2 punched therethrough, preferably with the metal around the margin of the opening turned outward to form an encircling flange a^3, as shown in cross-section in Figs. 5 and 7. On opposite sides of this central opening two openings a^4 are punched through the blank, the metal being cut loose at one end and along the upper and lower sides only, thus leaving a tongue or lip a^5, which is bent outward beyond the face of the blank, forming a lip or ear for connection with the reach. The three openings mentioned may be formed and the metal pressed outward at any suitable stage during the manufacture of the axle.

Through each of the blanks at numerous points therein I punch small holes a^6. I form these holes in like positions in the two blanks, so that they will register. The holes in the one blank are made of larger diameter than those in the other. The blank having the smaller holes has the metal turned or flanged upward around the hole, as shown at a^7, Figs. 2, 3, 4, and 7, so that it constitutes in effect a hollow stud or rivet adapted to project through the holes of the other member, as hereinafter referred to.

Having produced a blank such as above described, I proceed to bend the same throughout its length into a sectional form, such as shown in Figs. 2 and 7, the lower portion being bent into a semicircular shape and adapted to form one-half of the axle, while the upper portion, rising vertically from the axle to form part of the sand-board a^8, is finally turned over in the shape of a horizontal flange a^9 to serve as a part of the top surface of the sand-board. The two blanks, being thus bent in reverse directions, are brought together face to face and the studs of the one passed through the openings of the other and flanged or burred down on the outside, as clearly shown in cross-section in Fig. 7, thereby binding the two parts firmly together, so that they present jointly the form of a tubular axle having integral therewith an overlying sand-board with a wide top surface. The lower edges of the blanks are projected downward below the axle proper and joined to each other in the manner above described.

These connected lower edges serve not only to hold the two parts together and to prevent the opening of the axle, but also to stiffen and strengthen the axle and adapt the same the better to resist the strains encountered in practice. Before the blanks are united the projecting ends *a* are drawn down into tapering form, as shown in Figs. 3 and 4, so that when the two parts are united the ends of the axle present tapering spindles to receive the wheels. After the parts are united I apply around each end of the axle at the inner end of the spindle a metallic encircling collar B, which is shrunk or welded in place, the latter mode of attachment being preferred.

In order to strengthen the axle at the points subjected to the greatest strains, I introduce between the two parts at each end before they are united an internal tube or bushing C, which is preferably welded in place. This bushing should extend on both sides of the collars—that is to say, into the spindle at one end and into the body of the axle at the other end. In the outer end of each spindle I weld a projecting block D, the outer end of which is threaded to receive the nut for holding the wheel in place. It is to be understood that this block may be replaced by any other suitable means for retaining the wheel and that the internal sleeve C may be omitted or varied in form at will.

For the purpose of giving additional rigidity to the sand-board I propose to raise vertical flutes or corrugations E in the two parts, as shown in the several figures; but these may of course be omitted or modified in form.

In order to provide a hole or opening for the king-bolt, I propose to press the two parts or halves of the sand-board outward from each other, as shown at F, Figs. 2, 5, and 6, and this so as to leave within or between them a vertical hole, so that the king-bolt may be inserted through this hole and through the reach projected into the opening a^2.

On reference to Figs. 5 and 7 it will be seen that the lips a^5, before referred to, are projected on opposite sides of the sand-board, whereby they are adapted for firm connection with the front hounds of the sway-bar.

While I prefer to connect the two parts of the axle by means of the tubular necks formed integral with one part, as above described, it is to be understood that the parts may be connected by ordinary rivets, screws, or other fastenings.

In practice it will be found advantageous to weld together the edges of the portions forming the spindles, so as to produce spindles with seamless wearing-surfaces.

The various steps in the manufacture above referred to may be carried out in any convenient order; but I commonly proceed as follows: I first shear the blank to shape and punch therein the openings for the reach and hounds and the rivet-holes. I next flange the sand-board, shape the axle, flange the reach and rivet-holes, and form the corrugations. I then unite the plates and rivet them together. As the next step the bushing previously inserted and the collars, the spindles, and the plug for the screw-thread are welded. The ends of the axle are then threaded. Finally the axle is set to the templet to control the "gather" of the wheels. Obviously the portion forming the sand-board may be omitted and the remaining portion of the structure or axle proper constructed alone in the manner herein described.

Having thus described my invention, what I claim is—

1. A combined wagon-axle and sand-board consisting of two complementary parts, each formed from a single sheet of metal and the two united, substantially as described.

2. A sheet-metal axle consisting of two semi-tubular sections having their ends welded together in the form of conical spindles and the intermediate portions riveted together.

3. A combined axle and sand-board consisting of two complementary parts, each formed from a single sheet of metal, one edge bent into semi-tubular form and the opposite edge bent to form one side of the sand-board.

4. In a sheet-metal axle, the two longitudinal complementary parts, in combination with the internal strengthening-sleeves C, extending from the spindle into the main body.

5. The combined axle and sand-board consisting of the two longitudinal complementary parts united face to face, vertical depressions being formed in their proximate faces to provide a king-bolt opening F.

6. The sheet-metal axle consisting of longitudinal members, one having tubular necks or rivets raised therefrom and projected through and fastened to the other member.

7. The combined axle and sand-board consisting of the two complementary sheet-metal parts, substantially as described, united face to face and provided with corrugations E.

8. In a combined axle and sand-board, the complementary sheet-metal parts united face to face and provided with openings a^4, having the lips a^5 turned outward therefrom in opposite directions to receive the sway-bar.

9. The blank for an axle and sand-board, consisting of a sheet-metal plate having substantially the outline shown in Fig. 1, with end projections *a a* to form complementary parts of the spindles and the side extension a' to form a complementary part of the sand-board.

In testimony whereof I hereunto set my hand this 5th day of December, 1891, in the presence of two attesting witnesses.

WM. P. BETTENDORF.

Witnesses:

CHR. LAMP,

H. G. SCHARFENBERG.