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Patented Dec. 30, 1902.

N. S. TAYLOR.

METAL SHEET PILING AND WALL STRUCTURE.

(Application filed May 1, 1902.)

(No Model.)

2 Sheets—Sheet 1.

Fig 1

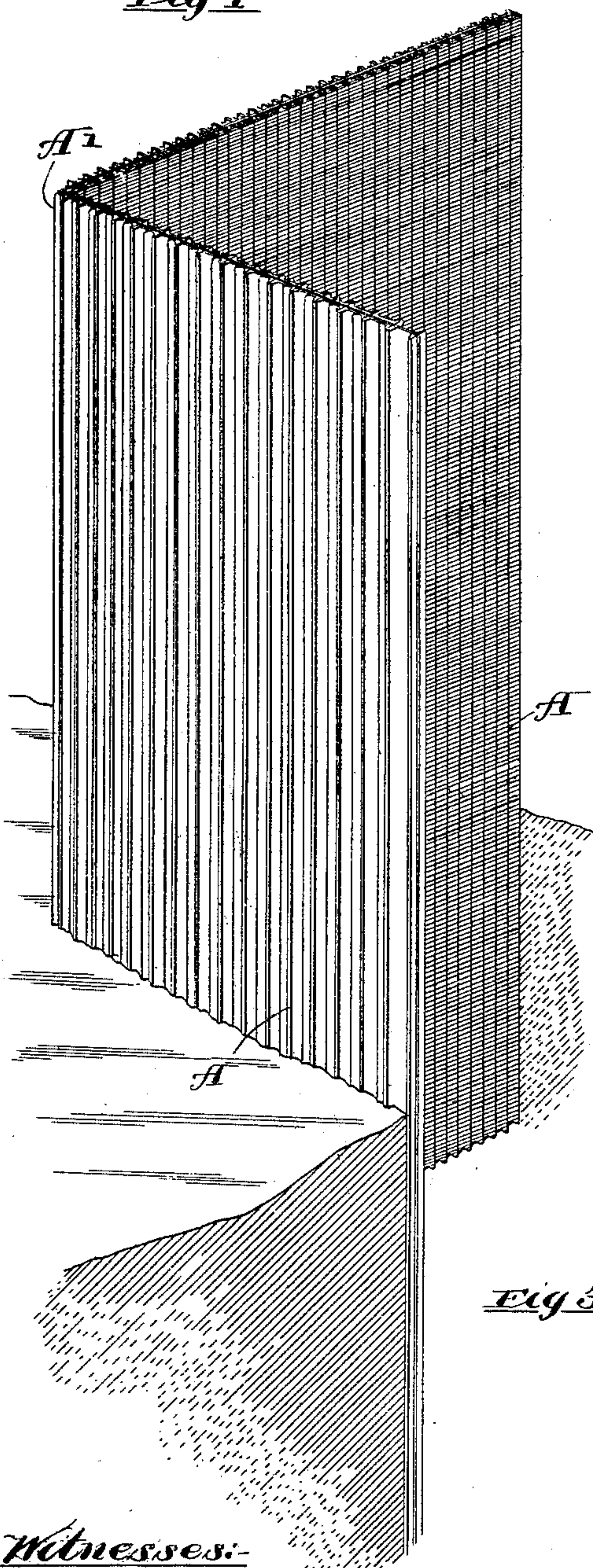


Fig 2

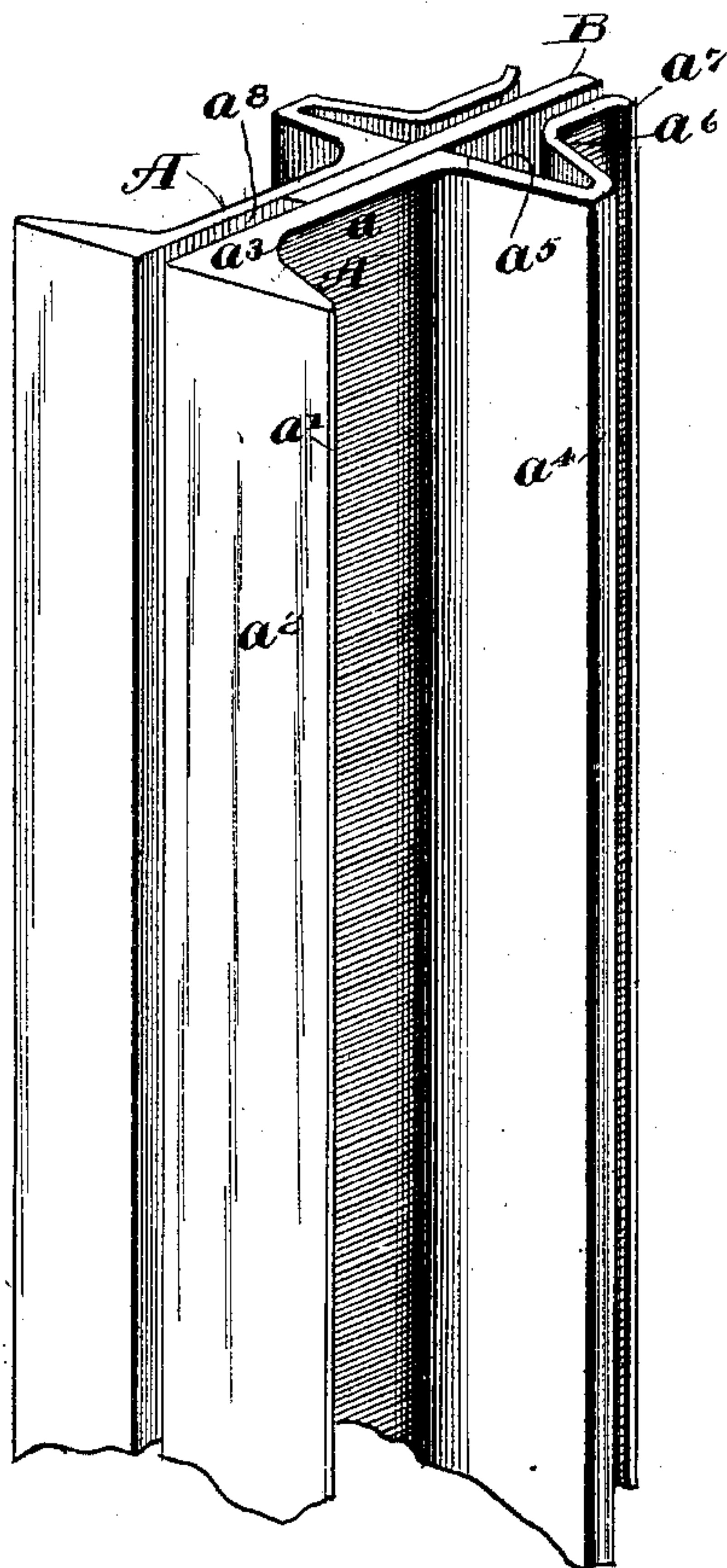
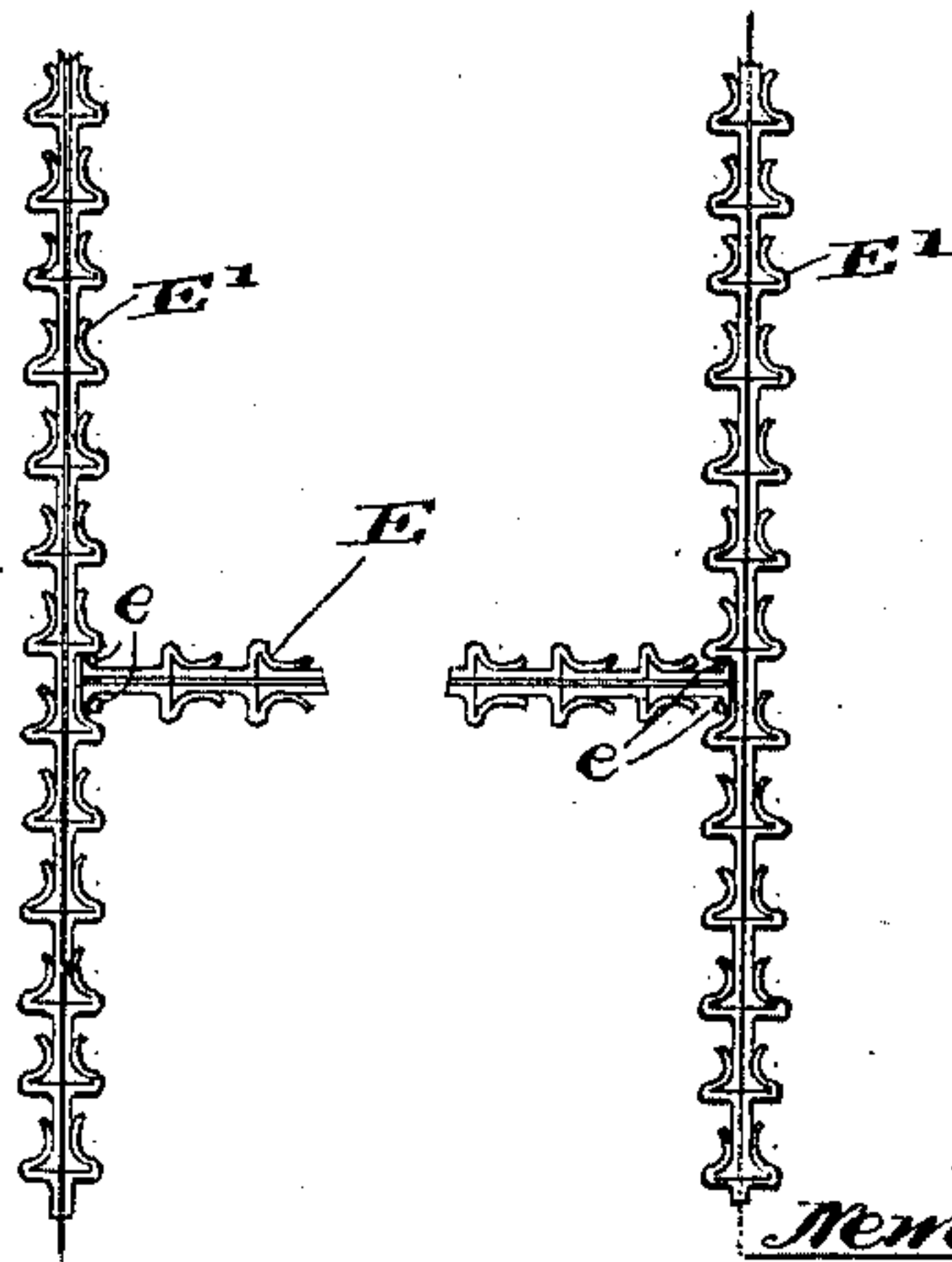


Fig 3



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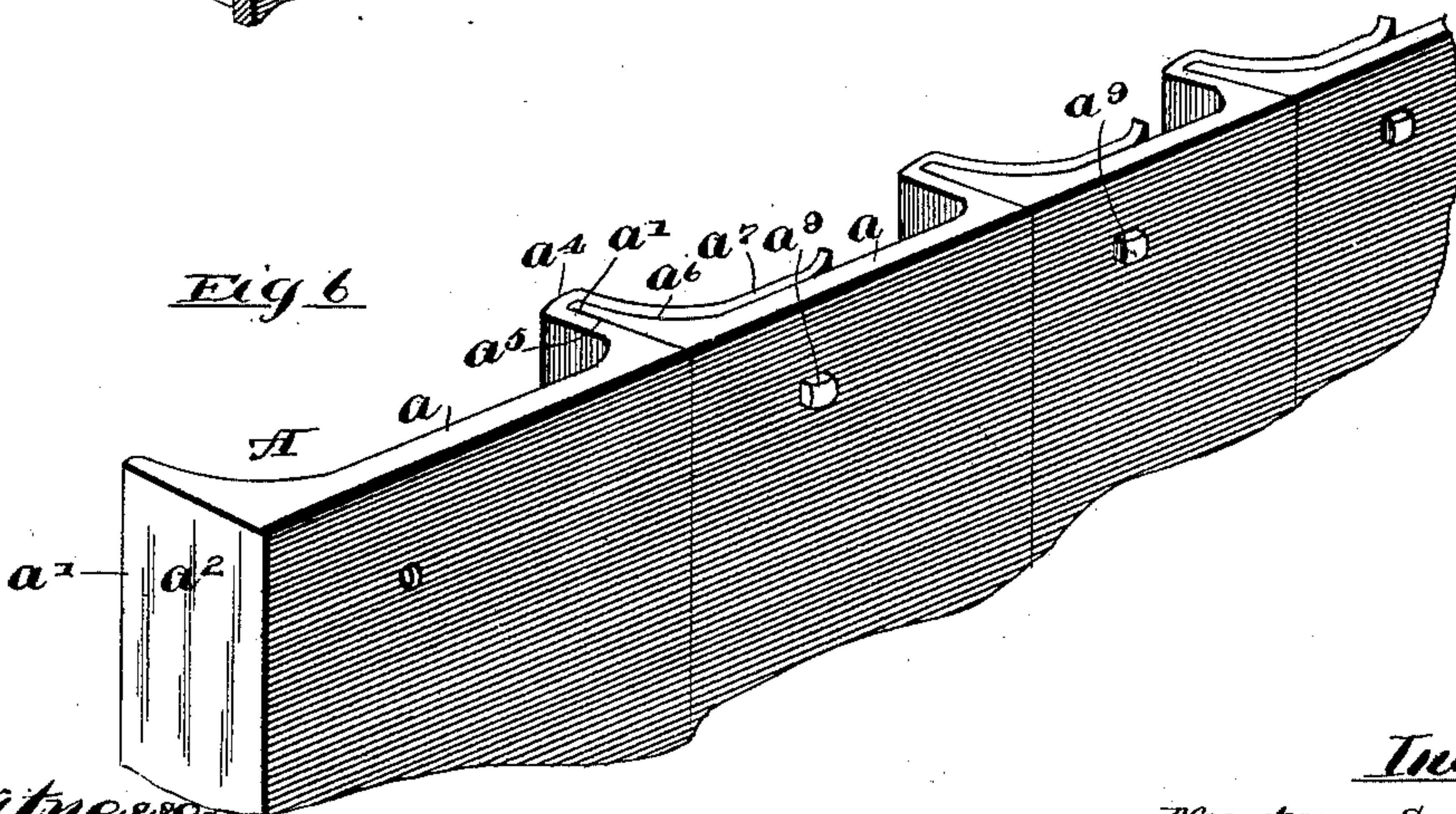
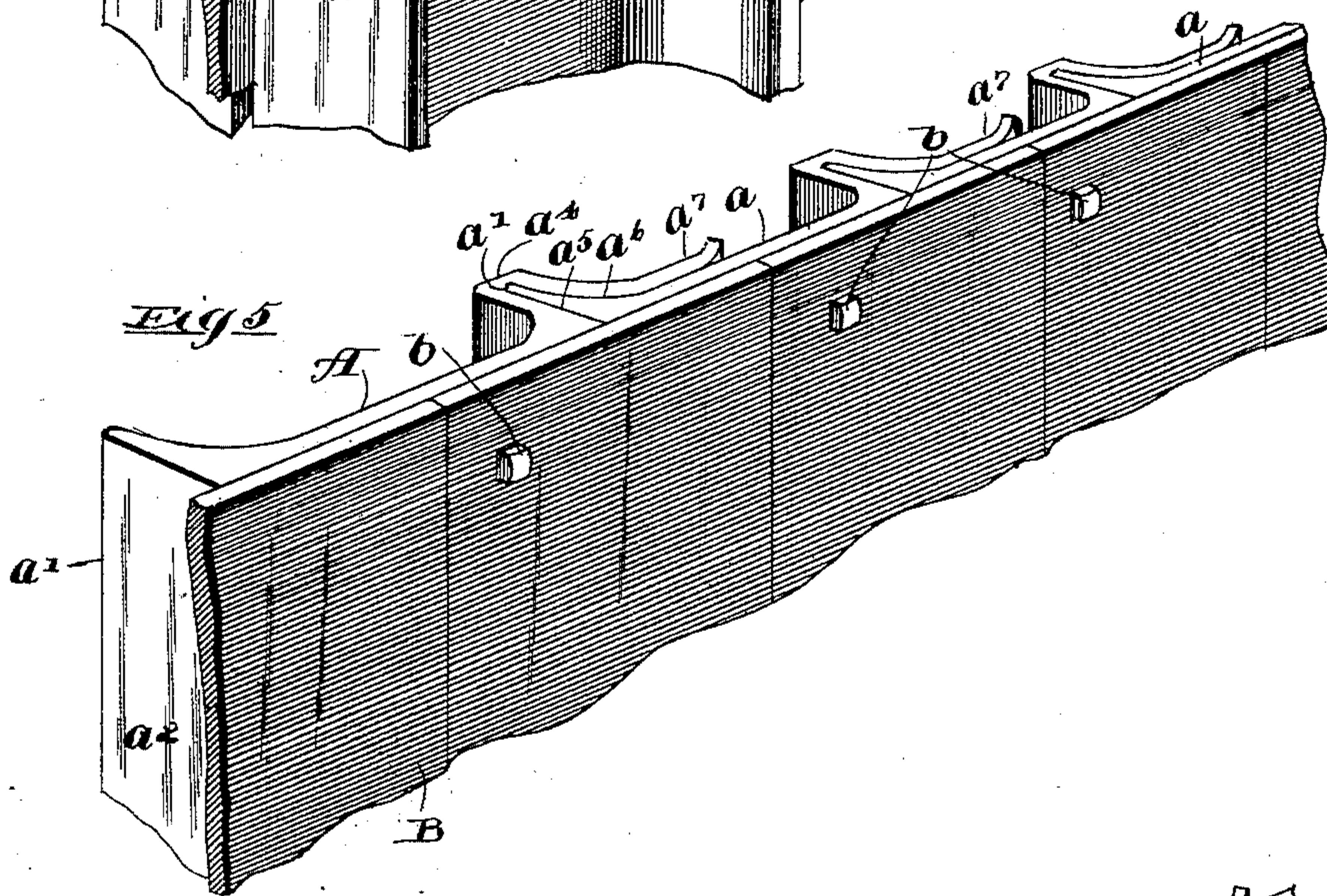
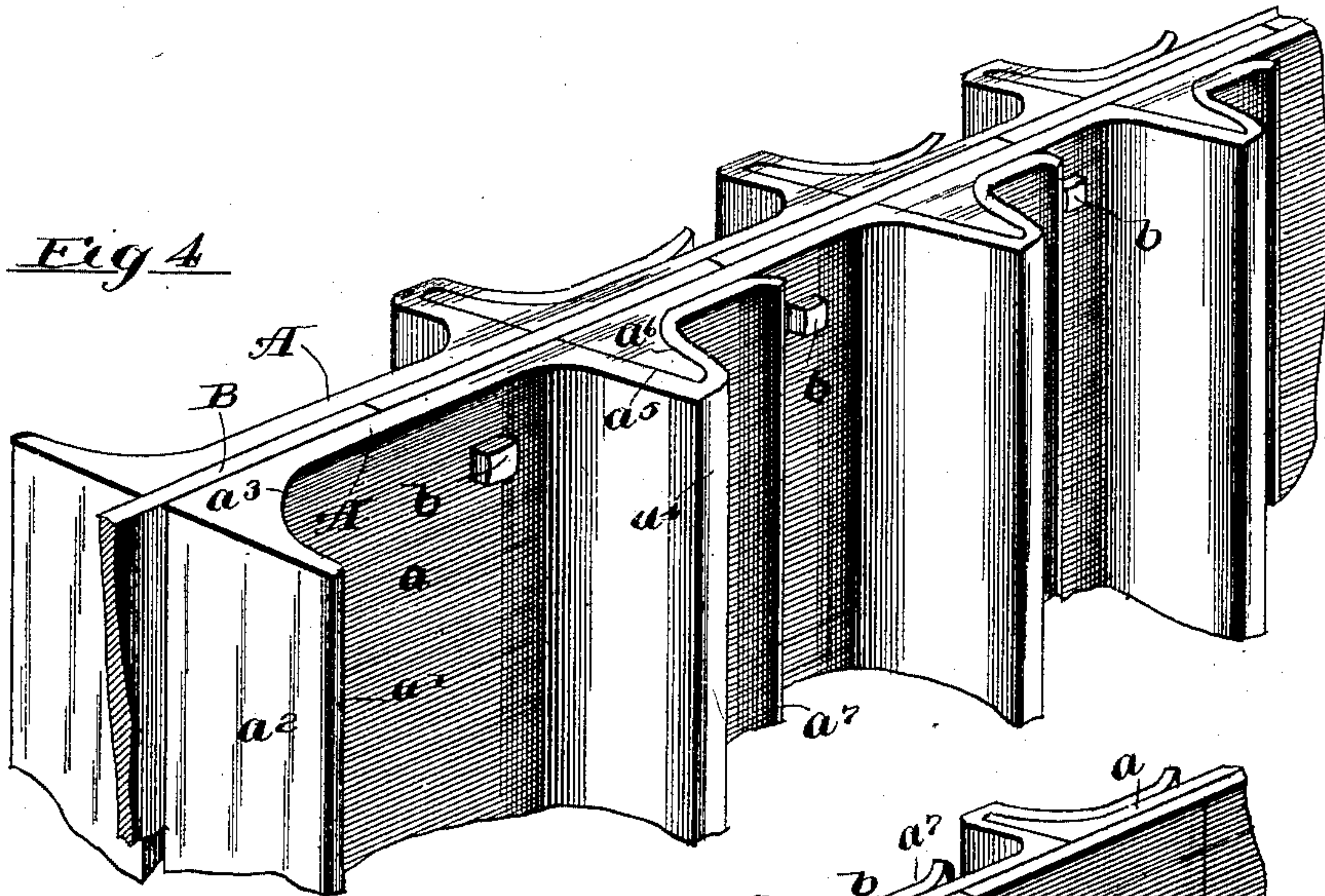
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(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

NEWTON S. TAYLOR, OF CHICAGO, ILLINOIS.

METAL-SHEET PILING AND WALL STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 717,135, dated December 30, 1902.

Application filed May 1, 1902. Serial No. 105,421. (No model.)

To all whom it may concern:

Be it known that I, NEWTON S. TAYLOR, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Metal-Sheet Piling and Wall Structures; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in sheet-metal walls constructed of a plurality of sheet-metal parts or sections which have interlocking connection at their margins and designed for use in pile construction used for protecting earth excavations, for the walls of coffer-dams, for retaining the walls of wharves and piers, and also for walls of buildings, smoke-stacks, oil and water tanks, and the like.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of one corner of a structure made of a series of piles constructed in accordance with my invention. Fig. 2 is a perspective view, on an enlarged scale, of one of the sections of which the wall shown in Fig. 1 is composed. Fig. 3 is a plan view of two walls made of my improved metal piling, showing a means of bracing said walls. Fig. 4 is an enlarged perspective view of the upper ends of a plurality of connected sections. Fig. 5 is a perspective view of a series of connected sections embracing certain parts of the construction shown in Fig. 1 and adapted more particularly for the walls of oil and water tanks and the like. Fig. 6 is a similar view of a connected series of certain portions of said sections adapted for forming the wall of a building, grain-bin, smoke-stack, or the like.

First referring to the construction shown in Figs. 1 to 4, inclusive, which is adapted more particularly for coffer-dams and like constructions, it will be observed that each pile-section is made up of three parts—to wit, two similar side members A A and an intermediate member or bar B. The sections A consist of long bars of metal which are formed

between opposing rolls or dies to give the desired cross-sectional shape thereto, while the bars B are flat and fit against the flat opposing sides of the members A. Each of said members A is composed of a central flat web a , provided on one side margin with a laterally-directed flange a' , and the outer face a^2 of said flange a' is made flat and is disposed generally at right angles to the web a , while the inner face a^3 of the flange a' is curved toward said web, whereby said flange is thinnest at its outer margin and thickest at its junction with said web. The opposite margin of each member A is rolled to provide a laterally-directed corrugation a^4 , the inner part of which constitutes a longitudinal groove having a flat wall a^5 and a curved wall a^6 , and the extreme margin a^7 of said member beyond said groove is generally parallel with the web and is located out of line with said web. The parts A A of each pile structure are duplicates and are adapted to be assembled face to face and with the flanges and corrugations a^4 a' , respectively, thereof in line with each other, the flanges a' forming on the section oppositely-directed flanges which are adapted to enter and interlock with the grooves formed by the corrugations a^4 , the cross-sections of the assembled flanges and grooves being alike. The intermediate members or bars B fit closely against the adjacent faces of the members A when the parts are assembled in the manner shown in Fig. 2. The margins a^7 of the members A of each section are deflected out of the planes of the webs a thereof a distance to receive the double thickness of the webs of an adjacent section, together with the interposed member or bar B, and the webs of one section fit closely against the opposed margins a^7 of the interlocking section. The intermediate members or bars B of each section extend from about the longitudinal centers of the webs a to the outer extreme parts of the margins a^7 , thereby providing between the webs a at the flanged margins thereof a groove a^8 , adapted to receive the projecting part of the intermediate bar or member B of the adjacent section when said sections are interlocked or assembled. Said intermediate bars or members B are preferably made of such width that the

intermediate bars of adjacent sections when the sections are assembled meet edge to edge, as clearly shown in Fig. 4. The meeting edges of the members B are therefore in the assembled structures located out of line with the line of junctions of adjacent interlocking sections. Said intermediate members B may be made of either wood or metal. When made of wood and employed in the construction of coffer-dams and like structures where they are brought into contact with water, said pieces expand or enlarge and form efficient packing to prevent the escape of water between the joints of interlocked sections of the piling. If the intermediate members be made of metal, they will desirably be made thin, so as to be sufficiently flexible to conform to the adjacent contacting faces of the members A of the piling-sections, and thereby afford means to prevent water passing between the joints of the interlocked sections of the pile structure. The several members of each pile-section are when assembled fastened together by means of bolts C, extending through the parts, as shown in Fig. 2.

When the piles are to be driven into the ground, a single pile is first sunk to the proper depth and thereafter the adjacent piles are driven, the flange of each pile-section before being driven being fitted or entered into the groove of an adjacent pile-section, said flanges and grooves constituting guiding means which properly guide the piles while being driven with respect to the driven piles and thereafter holding the several pile-sections interlocked. Said piles are usually made of considerable length, so that only a single pile-section is ordinarily required to provide the necessary height of the pile structure. If a deeper pile structure is required, however, one or more lengths or sections may be driven on the piles first driven, and in this case the end-to-end joints of the different pile-sections will be located out of line with respect to each other.

In joining two walls of an inclosure at an angle the corner pile-section A', as shown in Fig. 1, may be made wider than the other pile-sections and bent at right angles or any other necessary angle along its longitudinal center. The said intersecting walls of an inclosure may, however, be connected together in a different manner than that shown in Fig. 1. The inner faces of the margins a' of the members of the pile-sections may be cut away or curved outwardly, as shown in Fig. 4, to provide a groove adapted to receive a calked packing, such as lead.

An important advantage of the construction shown, wherein the members of the pile-sections are provided with corrugations a' to provide grooves to receive the flanges a' of adjacent members or sections, is that said construction affords great strength and rigidity to the pile-sections, thereby enabling a wall composed of said sections to withstand

great lateral pressure, and this construction is of especial importance when said sections are used in the construction of a coffer-dam wall or like places, where the wall at one side is subjected to the pressure of a body of water.

A further important advantage of the construction described is that it provides against leakage of water between the joints of adjacent sections and insures a dry inclosure when employed in the walls of a coffer-dam or like structure.

It may be necessary in some instances where the walls are of considerable length to interpose braces between parallel walls, and I have shown in Fig. 3 means for effecting such bracing of the walls. The brace, as therein shown, consists of a transverse wall E, constructed of the pile-sections herein described, extending between two parallel walls and secured at its margins to said walls. As herein shown, the transverse brace-wall is attached to the parallel walls by means of bolts e, extending through flanges at the opposite margins of the brace-walls and the webs of the adjacent parallel walls. Said brace-wall may, however, be otherwise made.

In Fig. 5 I have shown a construction wherein but one of the members A of each section is employed, said member being employed in connection with the member or bar B, disposed with respect to the member A substantially as in the construction hereinbefore described—that is to say, with said member B overlapping the junctions of two adjoining sections. The members B are attached to the members A by bolts b, as in the construction previously described. The sections are adapted to be interlocked by engaging the flanges a' of each member A with the groove formed in the corrugations of an adjacent member A. This form of the construction may be used for lighter coffer-dam and pier work and is also especially useful in making the walls of water and oil tanks and the like. When this construction is employed, the member B may be made either of metal or wood. When the sections consisting of the members A and B are employed for the construction of water and oil tanks, which tanks are usually made cylindric, the webs of said parts A and the plates B are transversely curved to correspond to the radius of said tanks.

In Fig. 6 I have shown a construction wherein each section consists of but one of the members A, the flanges at each margin of each member interlocking with the groove in the margin of an adjacent member. Said sections are joined by means of bolts a', extending through the overlapping webs a and margin a' of adjacent sections. This form of the construction is adapted for use in making the walls of buildings, grain-bins, smokestacks, and other like structures where the structure is not required to be of such great strength as in the uses hereinbefore men-

tioned and where the contents of the structure are not so likely to leak through the joints between the interlocking sections.

Many other uses will suggest themselves to users of the structures of the characters hereinbefore mentioned, and I do not wish to be limited to the applications mentioned, nor do I wish to be limited to the specific structural details shown except as hereinafter made the subject of specific claims.

I claim as my invention—

1. A wall or pile structure comprising a plurality of rolled metal bars each of which is corrugated near one margin to provide a lateral groove and provided at its other margin with a lateral flange adapted to interlock with the groove of an adjacent bar, the margin of each bar beyond its groove overlapping the web of an adjacent bar.

2. A wall or pile structure comprising a plurality of rolled metal bars each of which is corrugated near one margin to provide a lateral groove and provided at its other margin with a flange adapted to interlock with the groove of an adjacent bar, and means for fastening said sections rigidly together.

3. A wall or pile structure comprising a plurality of rolled metal bars each of which is corrugated near one margin to provide a lateral groove and provided at its other margin with a flange adapted to interlock with the groove of an adjacent bar, and flat bars fitted upon and secured to the flat faces of the flanged and grooved bars and overlapping the joints between adjacent bars.

4. A wall or pile structure comprising a plurality of sections, each consisting of two rolled metal bars, each bar being provided on one margin with a lateral flange which is directed oppositely to the complementary flange of the other bar and said bars being provided at their margins remote from said flanges with oppositely-located lateral grooves adapted to receive the flanges of an adjacent section.

5. A wall or pile structure comprising a plurality of sections, each consisting of two rolled metal bars, each bar being provided on one margin with a lateral flange which is directed oppositely to the complementary flange of the other bar, said bars being provided at their margins remote from said flanges with oppositely-located lateral grooves adapted to receive the flanges of an adjacent section,

and bolts or like fastening means extending through the webs of the assembled bars of each section.

6. A wall or pile structure comprising a plurality of sections, each consisting of two rolled metal bars, each bar being provided on one margin with a lateral flange which is directed oppositely to the complementary flange of the other bar, said bars being provided at their margins remote from said flanges with oppositely-located lateral grooves adapted to receive the flanges of an adjacent section, and a flat bar interposed between the flat faces of said flanged and grooved bars and extending beyond the grooves of said bars.

7. A pile-section consisting of three parts, namely, two similar side bars and an intermediate flat bar, said side bars being flanged at one margin of the section in opposite directions and formed to provide near the other margin of the section a groove adapted to receive the flanges of an adjacent section and the intermediate bar extending beyond the groove in the section of which it forms a part.

8. A pile-section consisting of three parts, to wit, two similar, side, rolled metal bars, and an intermediate bar, said side bars being rolled to provide at one margin of the section, oppositely-disposed flanges, and near the other margin of the section a groove adapted to receive the flanges of an adjacent section, the margins of said bars beyond said groove being located laterally out of line with the webs of the bars to permit the webs of the bars of another section to pass between the same, and the intermediate bar extending beyond said groove.

9. A wall or pile structure consisting of a plurality of sections each consisting of two similar side bars formed at one margin of the section to provide laterally-directed flanges and at the other margin of the section with a groove to receive the flanges of an adjacent section, and a flat bar interposed between the side bars of each section and overlapping the joints between the adjacent sections.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 28th day of April, A. D. 1902.

NEWTON S. TAYLOR.

Witnesses:

WILLIAM L. HALL,
GERTRUDE BRYCE.