

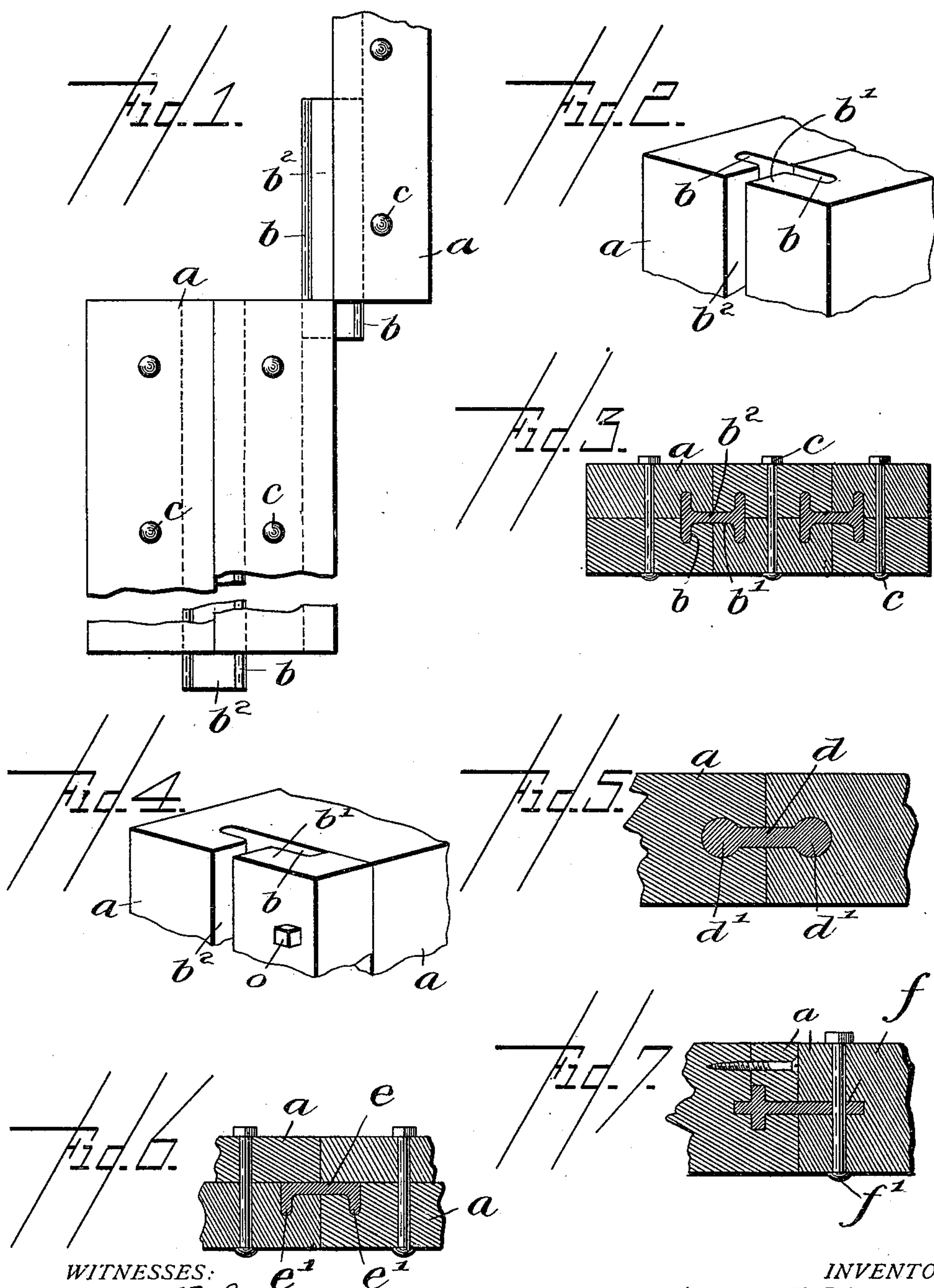
**No. 641,838.**

**Patented Jan. 23, 1900.**

**G. H. CAVANAGH.**  
**SHEET PILING.**

(Application filed Feb. 27, 1899.)

(No Model.)



*WITNESSES:*

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# UNITED STATES PATENT OFFICE.

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## SHEET-PILING.

SPECIFICATION forming part of Letters Patent No. 641,838, dated January 23, 1900.

Application filed February 27, 1899. Serial No. 706,937. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. CAVANAGH, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Sheet-Piling, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the construction of "sheet-piling," I meaning thereby any system of using timber planking in connection with coffer-dams, dry-docks, and other construction for preventing the passage of water or for the production of strong piling for any position desired.

In accordance with my invention I desire to construct a very strong and serviceable piling, and I desire to hold the various timbers used in the piling firmly together, making the joint connecting them substantially continuous throughout the length of the timbers employed in the piling. To do this, I provide the adjacent edges of the timber used in the piling with grooves, and in these grooves I insert a metallic joint-section, it extending substantially throughout the length of the timbers. This joint-section may and preferably will be driven in the soil upon which the piling stands, for the driving of the ends of the metallic sections adds very greatly to the general stability of the piling.

Figure 1 shows a portion of piling representing my invention. Fig. 2 is an end view of one piece of piling. Fig. 3 shows several sections united together in accordance with this invention. Fig. 4 shows a modification wherein a single timber is used, a section of the timber being shown sawed out at one corner and the piece so removed again cut to leave in the timber a substantially T-shaped groove; and Figs. 5, 6, and 7 represent modifications to be referred to.

In accordance with my invention I take timber, preferably in the form of plank of the desired width and thickness, and groove the same at its edges, and I thereafter shape the plank between said groove and its edges so that when two pieces of plank so grooved are put together their grooves will come in line with each other and leave a suitable groove to receive the edges of a suitable metallic joint-section. This joint-section is

made to occupy a position in said grooves for a considerable length of the timber, preferably throughout the entire length thereof. 55

The metallic joint-section will be of suitable shape to enter the grooves of the timber placed edge to edge and form a metallic connection between the edges of said timbers, locking the same firmly and rigidly together. 60

The metallic joint-section will contain, preferably at its longitudinal edges, suitable enlargements or bends to effect a strong engagement with the timber. For the best results, however, I prefer to use for this joint-section an I-shaped beam, it being of such width between its flaring longitudinal edges that when the edges of the beam are inserted each in its proper groove in the timbers it is to connect the edges of said timber will be brought preferably close together. This I-beam may be in one or more pieces to extend substantially throughout the length of the piling, and it may be driven below the timber or plank into the soil, thus bracing up and stiffening the piling. 75

Referring to the drawings, *a* represents a piling composed of a series of timbers or planks. As herein shown, the plank may be one-half the thickness desired for each member of the piling. Each of these timbers has made in it, at one side, near its longitudinal edges grooves *b*, substantially parallel, and each timber is shown as provided with two such grooves, and a portion of the lip *b'*, left between the grooves *b* and the edges of the timber, is removed to constitute one-half of the space *b<sup>2</sup>* (see Fig. 3) for receiving the shank of the I-beam. 85

Having provided each timber of the piling with two grooves, as stated, I then unite the timbers together firmly by nails or bolts *c* or otherwise, leaving at each side of the piling so formed a T-shaped groove. (See Fig. 2.) I preferably stand the timber up, as shown, and insert one end of an I-beam into the T-shaped groove therein, and I then place the next piece of timber over the T-shaped opposite end of the I-beam, and by a hammer, pressure, or percussion I gradually force the I-beam and the timber down and form the piling. 95 100

The timbers of the piling will be driven down to the desired point to form the piling,



and in such condition it will be understood that adjacent timbers will be held securely together by the metallic I-beam, it constituting a preferred form of metallic joint-section, 5 and by driving the ends of the I-beam below the timbers into the ground, as in Fig. 1, the piling will be thoroughly braced and stiffened. This form of piling may be easily and quickly made, and it is very strong and durable. 10 This invention is not limited, however, to the precise manner of forming the T-shaped grooves or spaces in the timber forming the piling to receive the ends of the I-beam, and instead of making the grooves and spaces to 15 receive the T-shaped end of the I-beam, as hereinbefore described, I may cut or fashion the timber of the piling in any suitable way whereby each end of the I-beam may be made to retain a firm hold upon adjacent timbers 20 of the piling to be made.

Referring to Fig. 4, it shows by full lines a portion of the timber separated from the adjacent part and united by a suitable bolt *o*. This construction would require more 25 pieces, but shows another way of providing the T-shaped groove, and this may be done in solid timber.

I believe that I am the first to unite timbers of piling by metallic joint-sections, said joint- 30 sections locking together the adjacent edges of the timbers used in the piling, and while I prefer to employ for this purpose an I-beam, such as hereinbefore specifically described, yet I consider as within the scope of my invention any metallic connection between the ad- 35 jacent timbers, so long as said connections extend for a distance in the grooves of said timbers and are so applied as to form a lock between the timbers. For instance, Fig. 5 shows 40 a metallic joint-section *d*, it having its parallel edges rounded, as at *d'*, instead of T-shaped, and to apply this section *d* the timber has to have a round hole intersected by a slot. Fig. 6 shows yet another metallic joint-section *e*, 45 it being composed of a sheet of strong metal having its opposite edges *e'* flanged. This

joint *e* is shown as applied to a timber composed of two planks united together. Fig. 7 shows yet another simple method of metallic joint to unite the edges of adjacent timbers, 50 the said joint consisting of a piece of metal *f*, having one of its edges inserted into a groove at one edge of one of said timbers and confined therein by suitable rivets or bolts *f'*, the opposed edge of the said piece of metal being 55 flanged or shaped substantially as shown to enter a groove in the opposed timber.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is— 60

1. A piling consisting of two sections abutting edge to edge, and a coupling member uniting the two sections and holding them in rigid relation relatively to each other and in- 65 closed by said sections.

2. A piling consisting of two sections abutting edge to edge, and a coupling member uniting the two sections and holding them in rigid relation relatively to each other and in- 70 closed by said sections, said coupling member projecting below the lower end of the two sections.

3. A piling composed of timbers having flat faces upon their adjacent edges which are adapted to abut against each other, and a me- 75 tallic coupling member uniting the two timbers and holding them in rigid relation relatively to each other and inclosed by said timbers.

4. A piling consisting of timbers presenting 80 flat engaging faces having T-shaped grooves, and an I-beam adapted to be driven into said grooves and to hold the timbers in rigid relation relatively to each other.

In testimony whereof I have signed my 85 name to this specification in the presence of two subscribing witnesses.

GEORGE H. CAVANAGH.

Witnesses:

GEO. W. GREGORY,  
MARGARET A. DUNN.