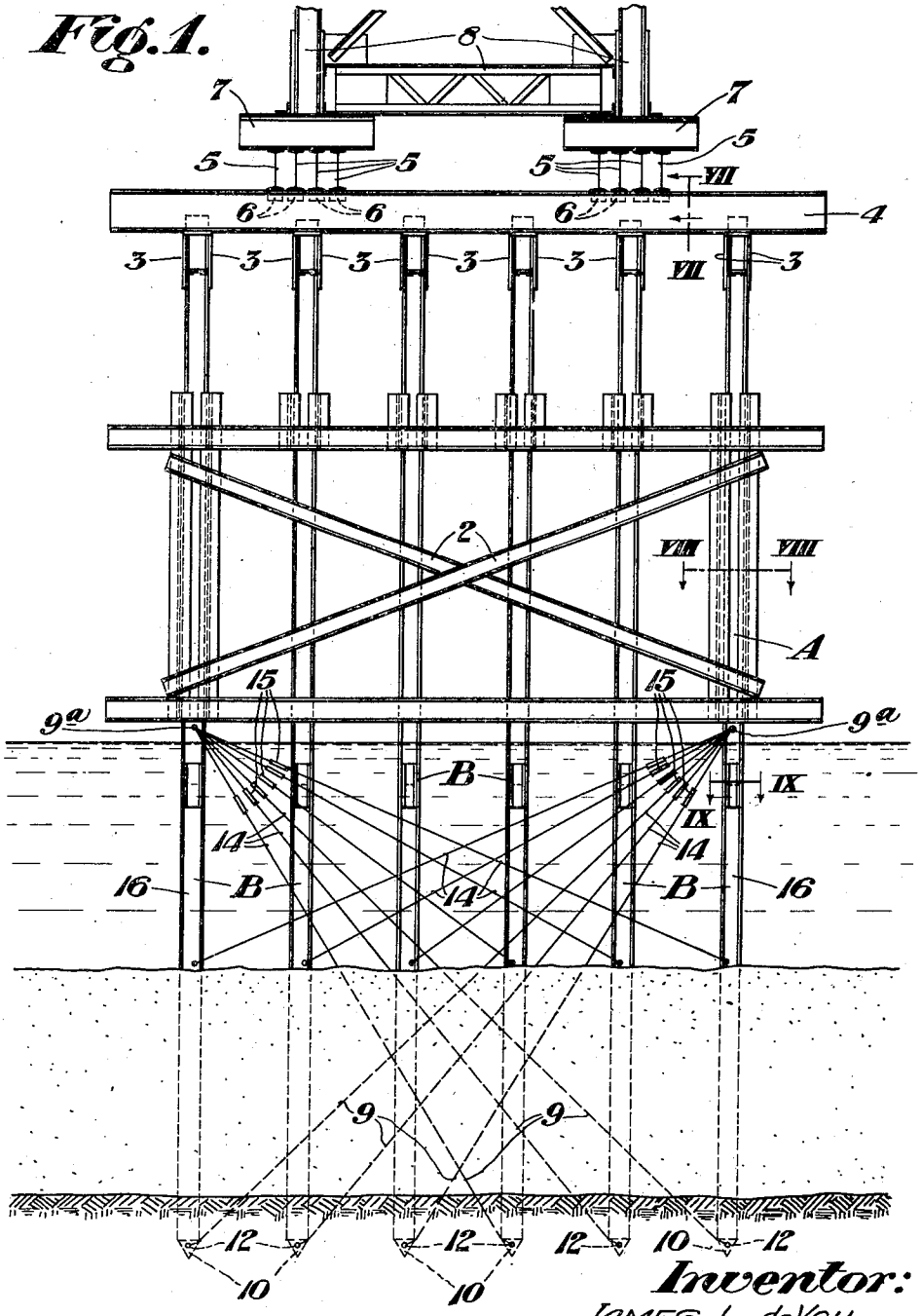
May 17, 1932. J. L. DE VOU 1,858,918

PILING CONSTRUCTION

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Fig. 1.



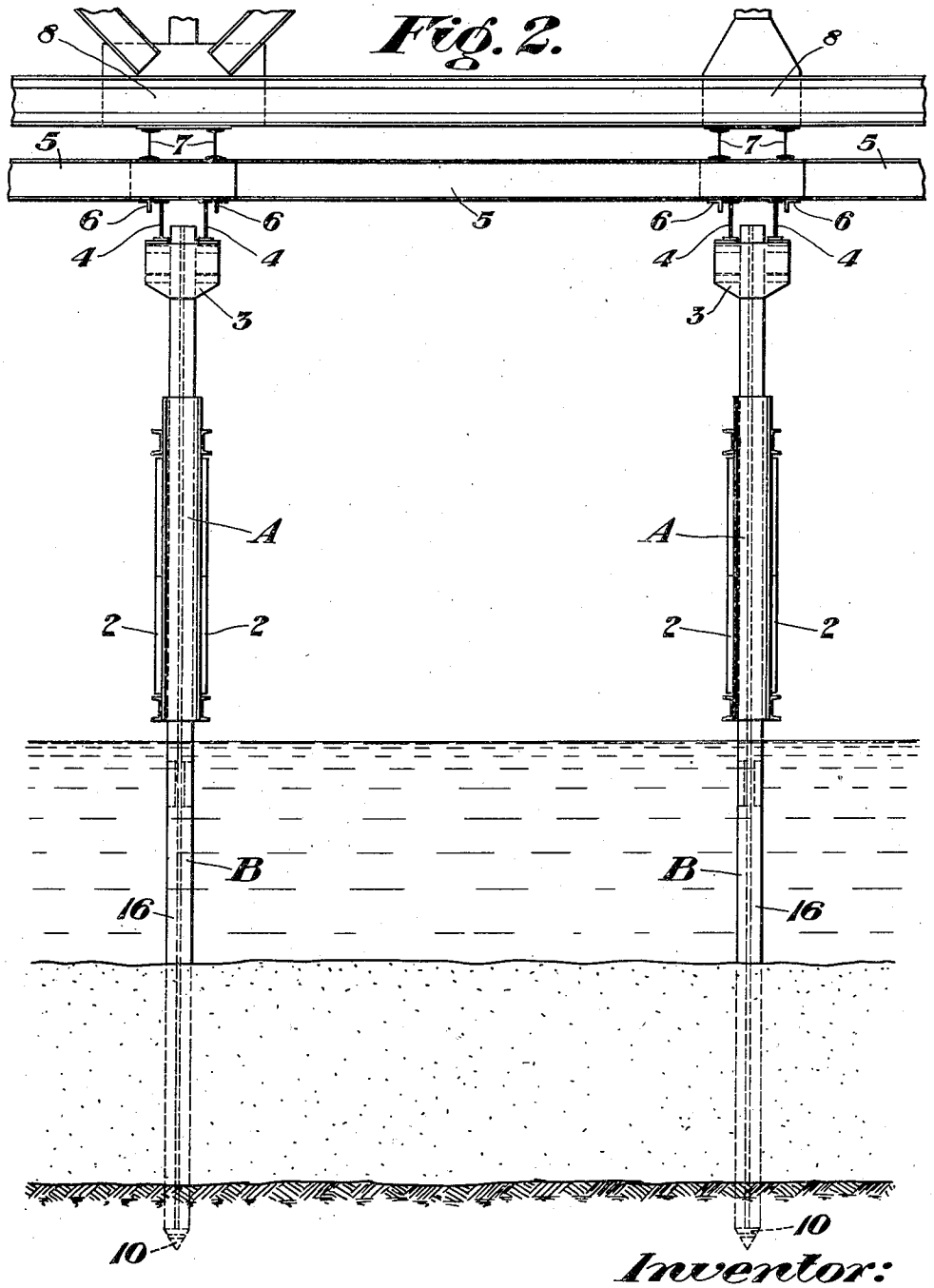
Inventor:
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Fig. 2.



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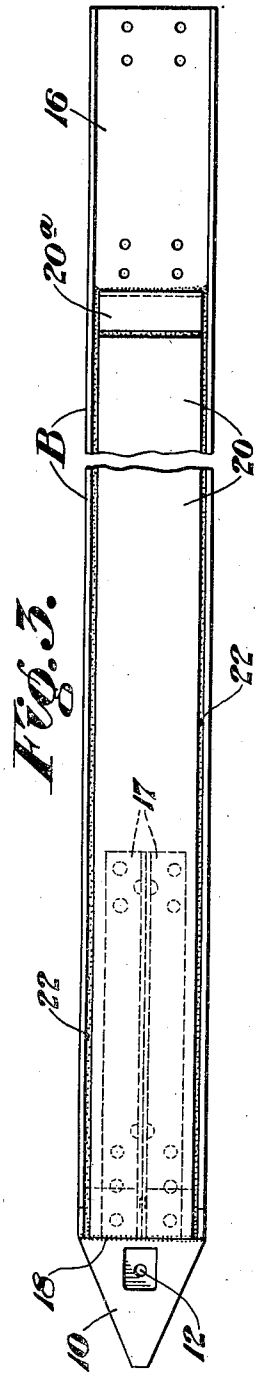


Fig. 3.

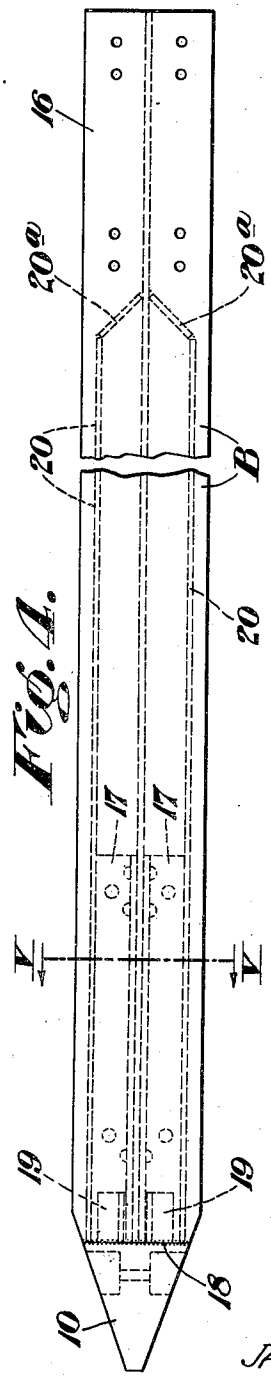


Fig. 4.

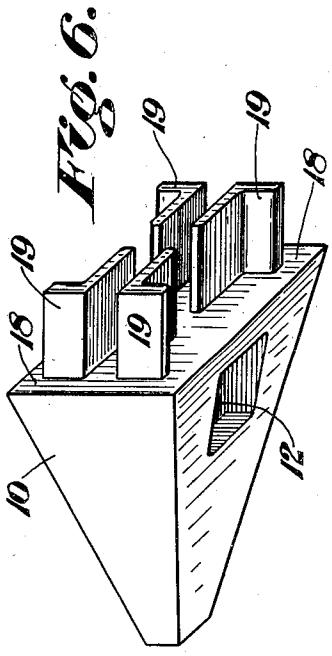


Fig. 6.

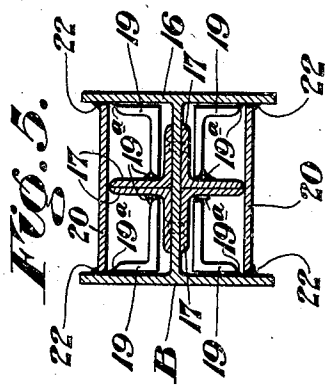


Fig. 5.

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PILING CONSTRUCTION

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Fig. 7.

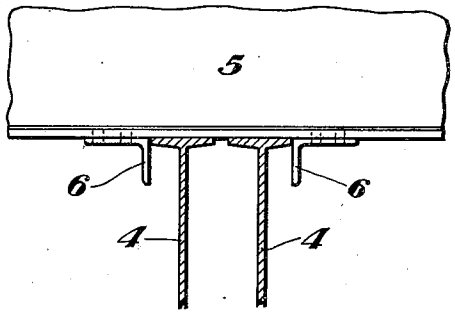


Fig. 8.

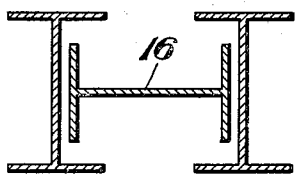


Fig. 9.

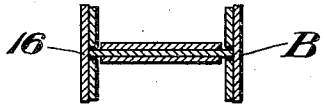


Fig. 10.

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Patented May 17, 1932 1,858,918

UNITED STATES PATENT OFFICE

JAMES L. DE VOU, OF PITTSBURGH, PENNSYLVANIA

PILING CONSTRUCTION

Application filed July 25, 1930. Serial No. 470,125.

This invention relates to false work structure for bridges and the like, and more particularly to steel pile bents and has for one of its objects the provision of a novel form of steel pile which is formed primarily from standard rolled metal shapes.

Another object is to provide a novel form of pile which can be driven into rock so as to provide a strong support that will withstand severe shocks during floods and other extreme conditions.

A further object is to provide a steel bent unit having a materially greater strength than the bent units heretofore in general use, thereby providing supports which may be spaced a greater distance apart so as to provide a wide waterway between the bents.

A still further object is to provide a novel form of adjustable diagonal bracing for the lower portion of the pile bent structure.

The steel pile bent construction of this invention has many advantages over the prior art. The structure is such that its life is substantially everlasting if kept painted; it cannot be damaged by floods, ice, drift, boats or barges, and therefore work can be carried on in rivers during the whole year without danger of losing the spans before they are completed, and the piles may be driven into a rock bottom and are safe even when the silty river bottom is washed out by floods. Many other advantages, too numerous to set forth in detail, will be apparent to those skilled in the art.

In the drawings:

Figure 1 is a side elevation of a steel pile bent unit constructed in accordance with this invention.

Figure 2 is an end elevation showing two of the bents in position.

Figure 3 is an enlarged side elevation of one of the piles.

Figure 4 is a similar view taken at right angles to Figure 3.

Figure 5 is a transverse sectional view taken on the line V—V of Figure 4.

Figure 6 is a perspective view of the point member of the pile.

Figures 7, 8 and 9 are transverse fragmentary sections taken one the lines VII—VII, VIII—VIII, and IX—IX, respectively, of Figure 1.

Figure 10 is an enlarged detail of one of the ratchet take-up devices for tensioning the cable truss members.

Referring more particularly to the drawings, the letter A designates the steel pile bent as a whole, which is composed of a plurality of steel piles B, having their points driven into the permanent river bottom and being stiffened and held in spaced relation by a pile framing 2 composed of standard rolled metal shapes mounted intermediate the ends of the series or group of piles comprising one bent.

The upper ends of the piles B are provided with brackets 3 which support cap beams 4. False work stringer beams 5 are mounted on the cap beams 4 and extend from bent to bent. The false work beams or stringers 5 are provided with angle clips 6 which engage the cap beams and prevent shifting of the stringers.

Suitable blocking beams 7 are mounted on the false work stringers 5, and the bridge truss 8 is supported on said blocking beams.

The piles B are supported below the pile framing 2 by flexible diagonal bracing members 9 which are adjustable.

Each of the piles B is provided with a point casting 10 secured to its lower end to facilitate the driving of the piles into the river bottom. The point castings 10 are provided with cored holes 12 in which the lower ends of lengths of cable forming the diagonal members 9 are secured. The members 9 are trained diagonally upward and are secured to the end pile farthest from the pile to which their lower ends are secured at a point 9^a above the water level. In the type of pile bent shown, six piles are used, three of the members being arranged diagonally in one direction and three in the other direction.

In the particular construction shown a second set of flexible diagonals 14 are provided which have their lower ends secured to the piles intermediate their lower ends and the bottom of the framing 2. The diagonals 14 are arranged so that their upper ends ter-

minate at approximately the same point as the diagonals 9.

Each of the diagonals 9 and 14 is provided with a ratchet take-up device 15 by which their tension may be adjusted.

The diagonals 9 and 14 are adapted to be secured to the piles before they are driven into the river and to be tensioned when the silt bottom goes out during a flood, thereby adding materially to the rigidity of the structure.

The piles B are of particularly novel design and comprise one or more lengths of standard, heavy rolled H-beam sections 16. The lower end of each pile is stiffened from its lower end upwardly for an appreciable distance by means of pairs of angle stiffening members 17 which are mounted in pairs on the opposite sides of the web of the beam member 16. The members 17 are arranged back-to-back and are riveted together and to the web of the beam 16. The H-beam sections of each pile are spliced in the field by plates 16^a. These splices may be quickly made without materially interfering with the pile driving operations. The plates 16^a may be either welded, riveted or bolted in position, or a combination of such attaching means may be used.

The pile point castings 10 comprise a pointed body portion having a flat upper face 18 provided with four upstanding angle-shaped legs 19 which extend upwardly between the flanges of said beam section and to the backs of said stiffening members 17, as at 19^a.

Side plate members 20 are mounted between the flanges of the H-beam section 16 on each side of the web to form a swelled or box-like portion, giving the pile the ability to force the ground apart when it is driven and so develop skin friction which gives it additional supporting power over a plain H-section.

The side plates 20 extend upwardly adjacent the outer edges of the beam flanges from the lower end of the beam section 16 to a point materially above the stiffening members 17 and preferably to such a point that they will extend above the river bottom in which the piles are driven. The upper ends of the plates 20 are bent inwardly, as at 20^a, so that their upper ends contact with the web of the beam 16, thereby closing the upper end of the box-like portion of the pile.

The side plates 20 have their lower ends secured to the top face of the point 10, their side edges secured to the flanges of the beam section 16, and their upper ends secured to the web of the beam section 16 by line welds 22, thereby forming water-tight joints.

Piles like that described above are particularly adapted for use in bridge work where the piles must be driven into a rock bottom since their great strength and the penetrating power of the points 10 permit them to enter the rock.

While I have shown and described one specific embodiment of my invention it will be understood that I do not wish to be limited thereto since various modifications may be made in the bent assembly and the pile structure without departing from the scope of my invention, as defined in the appended claims.

I claim:

1. A steel pile for use in erecting bridges and the like comprising a length of rolled metal H-beam section having a point at its lower end, side plates extending upwardly from the lower end of said H-beam section a material distance, the distance said plates extend upwardly along said pile being at least equal to the distance said pile is to be driven into the earth, said side plates being arranged between the flanges of said H-beam section adjacent the outer edges thereof and having their upper ends bent inwardly into contact with the web of said H-beam section, and said plates being secured to said H-beam section by line welds forming water-tight connections.

2. A steel pile for use in erecting bridges and the like comprising a length of rolled metal H-beam section having a point at its lower end, stiffening means extending from the lower end of said H-beam section upwardly for an appreciable distance, side plates extending upwardly from the lower end of said H-beam section a material distance, the distance said plates extend upwardly along said pile being at least equal to the distance said pile is to be driven into the earth, said side plates being arranged between the flanges of said H-beam section adjacent the outer edges thereof and having their upper ends bent inwardly into contact with the web of said H-beam section, and said plates being secured to said H-beam section by line welds forming water-tight connections.

3. A steel pile bent construction comprising, in combination, a plurality of rolled metal H-beam piles having their lower ends provided with cast steel points rigidly connected thereto, pile framing arranged intermediate the ends of said piles for maintaining the piles in spaced relation and for stiffening the structure, said points of said piles being provided with holes, cables having their lower ends secured in the holes in the points of said respective piles, said cables being trained diagonally upward and having their upper ends connected to a point above the water level on the end pile farthest from the pile to which their lower ends are connected forming flexible diagonal bracing, other cables having their lower ends connected to said respective piles at points intermediate the lower ends of said piles and the

bottom of said pile framing, said last named cables being trained diagonally upward and having their upper ends connected to a point above the water level on the end pile farthest from the pile to which their lower ends are connected forming other flexible diagonal bracing, and means for adjusting the tension of all of said cables.

4. In a steel pile structure, a body portion comprising a length of rolled metal H-beam section, a pair of angle stiffening members arranged back to back on each side of the web of said H-beam section, said stiffening members extending from the lower end of said H-beam section upwardly a material distance and being secured together and to the web of said H-beam section and side plates arranged between the flanges of said H-beam section and extending from the lower end of said beam upwardly to a point materially above the upper ends of said stiffening members and having their upper ends bent inwardly into engagement with the web of said H-beam section, said plates being secured to said flanges and said web of said H-beam section by continuous line welds to form water-tight joints.

In testimony whereof, I have hereunto set my hand.

JAMES L. DE VOU.