

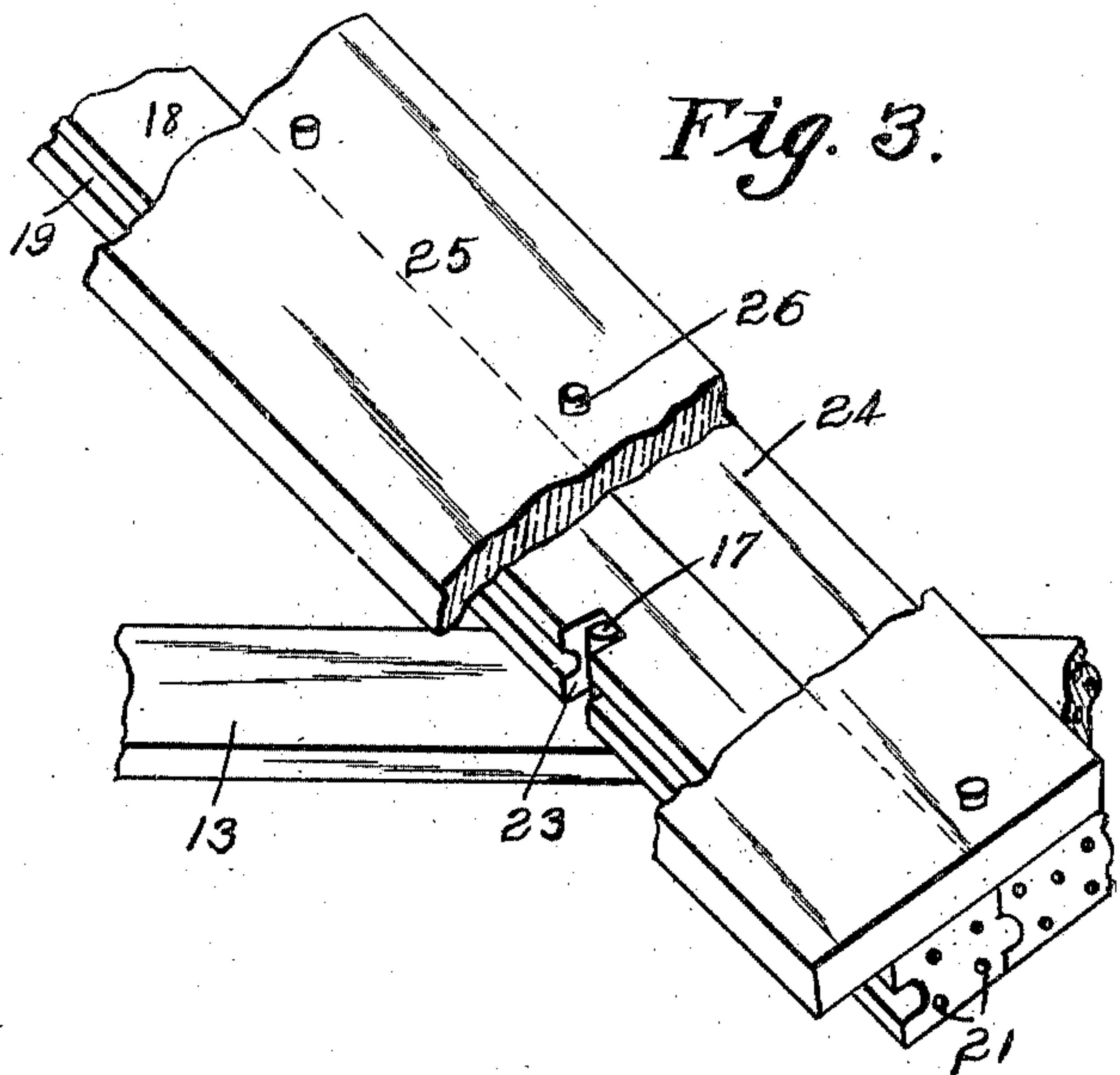
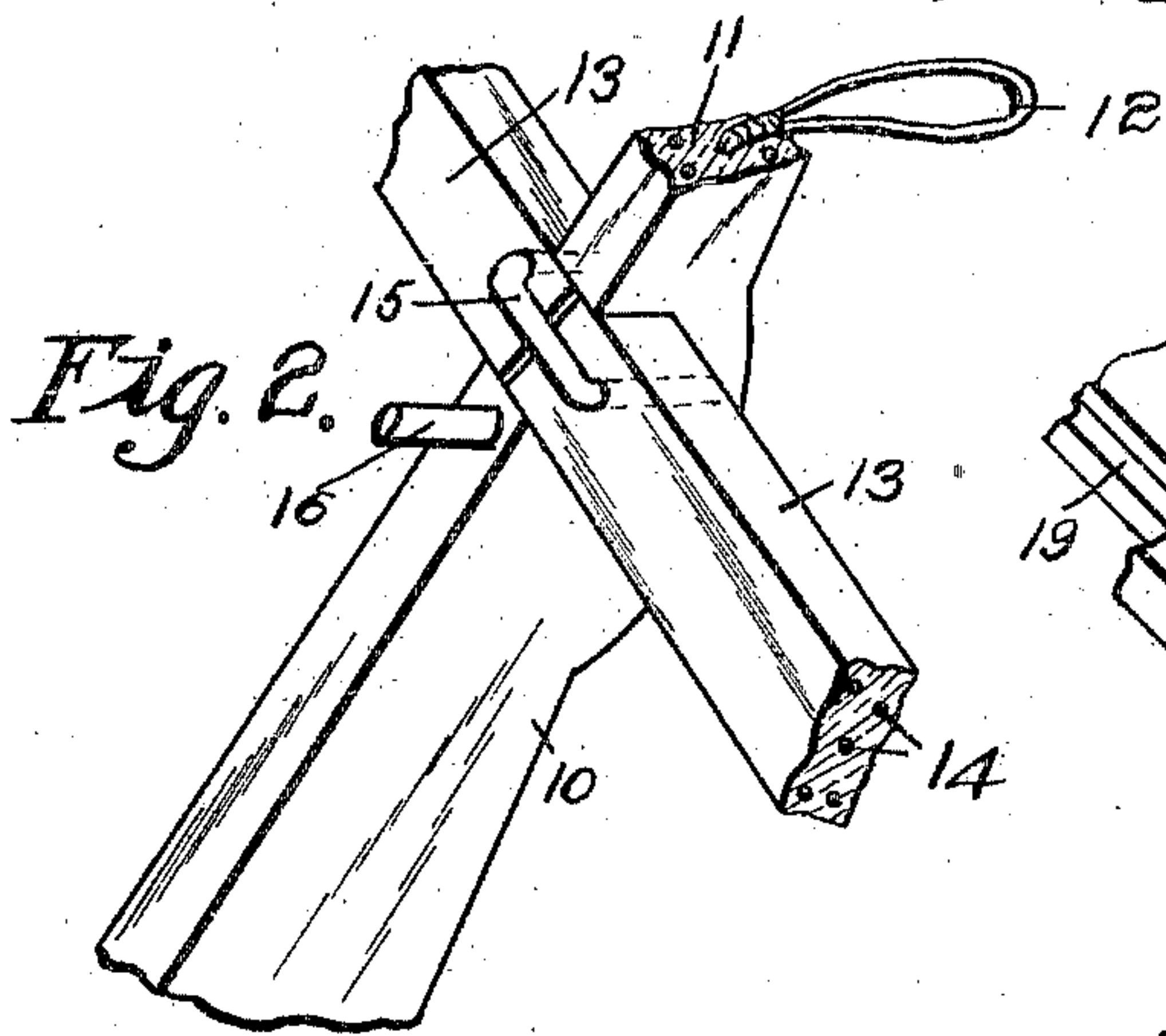
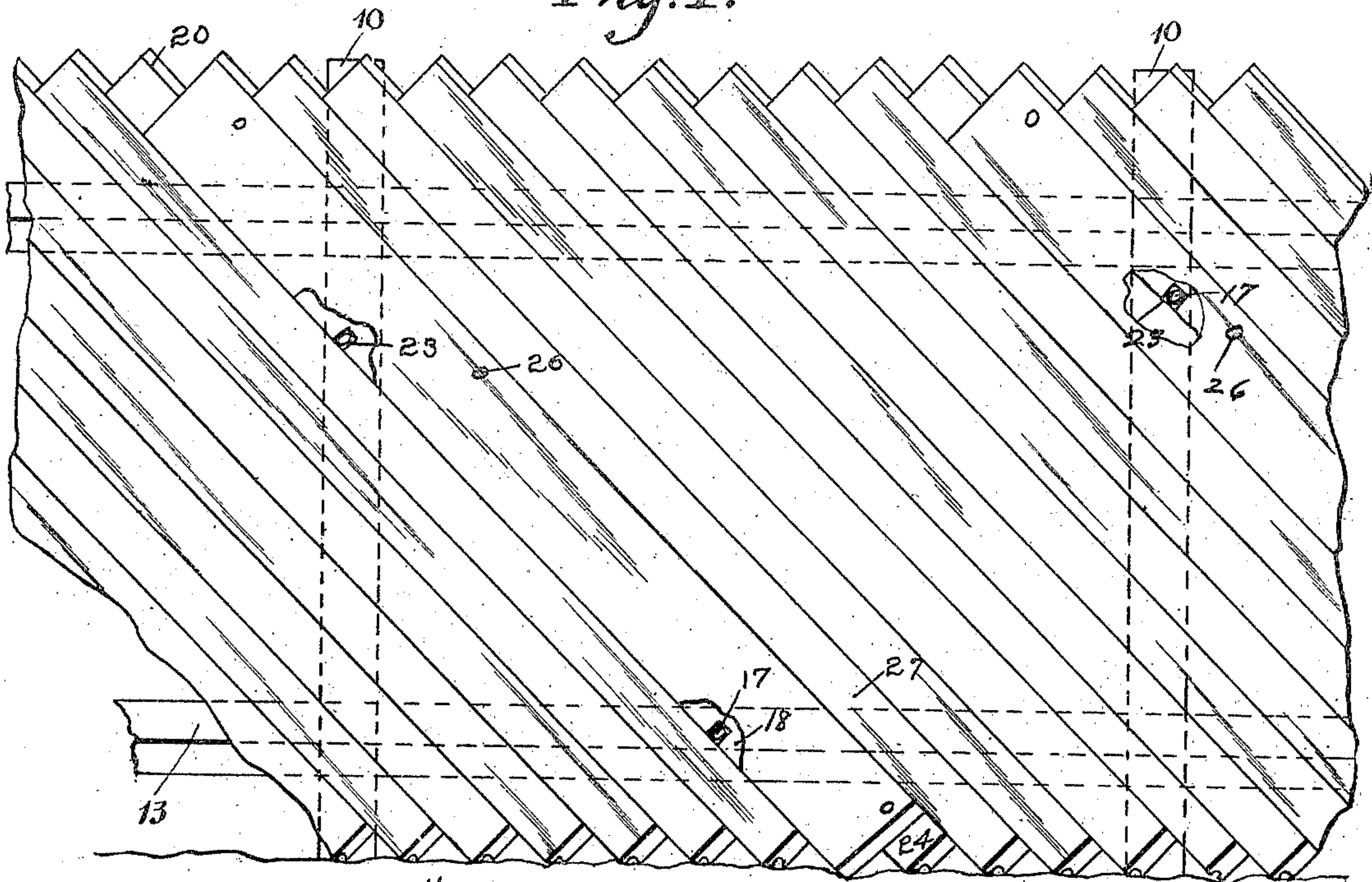
J. A. NORTON.
 REVETMENT.
 APPLICATION FILED JULY 30, 1908.

951,426.

Patented Mar. 8, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
 F. C. Caswell
 A. G. Hague

Inventor
 James A. Norton
 by Oring Lane Attys.

J. A. NORTON.

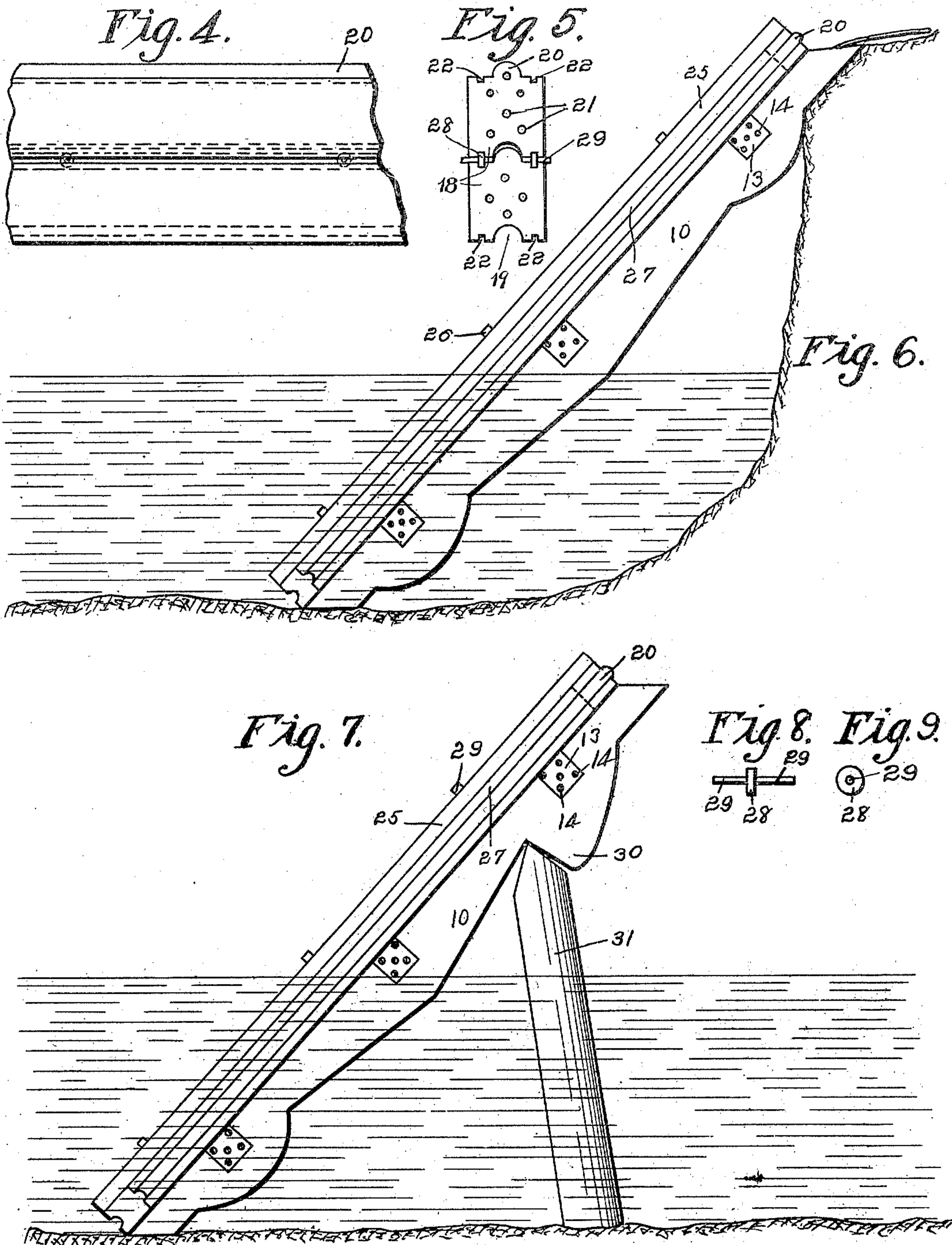
REVTMENT.

APPLICATION FILED JULY 30, 1908.

951,426.

Patented Mar. 8, 1910.

2 SHEETS—SHEET 2.



Witnesses
F. C. Caswell
A. G. Hague.

Inventor
James A. Norton
by Orvig Lane Atty's

UNITED STATES PATENT OFFICE.

JAMES A. NORTON, OF ODEBOLT, IOWA.

REVETMENT.

951,426.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed July 30, 1908. Serial No. 446,097.

To all whom it may concern:

Be it known that I, JAMES A. NORTON, a citizen of the United States, residing at Odebolt, in the county of Sac and State of Iowa, have invented a certain new and useful Revetment, of which the following is a specification.

The object of my invention is to provide a revetment of simple, durable and inexpensive construction, especially designed for protecting the banks of streams and rivers, especially in cases where the current is likely to wash out under stationary walls or the like.

More specifically it is my object to provide a revetment or retaining wall, so arranged that it may be formed complete of reinforced concrete members and may be placed in position against a bank to be protected without in any way altering or changing the shape of the bank, and also so arranged that if the bed of the stream or river on which the revetment or retaining wall is resting should be washed away by the current, the members of the revetment will sink with the bed of the stream or river, and at the same time provide a tight and durable revetment or retaining wall.

A further object is to provide a device of this kind erected in sections and so arranged that if for any reason any one of the sections should become misplaced, the adjacent sections on both sides will not be affected thereby and when any one section is misplaced or dislodged, it may be readily and easily repaired and placed in alinement with the other sections.

My invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which—

Figure 1 shows a front or plan view of a revetment embodying my invention. The dotted lines show the positions of the uprights and longitudinal supports for the members of the revetment wall. Fig. 2 shows a detail perspective view illustrating the upper portion of one of the upright members of the revetment frame, and two of the adjacent longitudinal frame members connected therewith. Fig. 3 shows an en-

larged detail perspective view illustrating a part of one of the lower longitudinal revetment frame members, showing the means for connecting the inclined revetment wall members therewith, and also showing the overlapping revetment wall member at the joint between two sections of the revetment wall. Fig. 4 shows a detail plan view of two of the revetment wall members adjacent to each other. Fig. 5 shows an end view of same. Fig. 6 shows an edge view of a revetment embodying my invention, and resting against the bank of a river or stream. Fig. 7 shows a similar view of a revetment embodying my invention placed in position in midstream for the purpose of deflecting the current. Fig. 8 shows a detail side view of one of the anti-friction rollers, and Fig. 9 shows an end view of same.

Referring to the accompanying drawings, the revetment is composed of a frame comprising upright members 10 which are preferably made of concrete and are provided with longitudinal reinforcing wires 11. In the front face of each of said upright members 10 is a series of notches designed to receive the longitudinal frame members. Said uprights are spaced apart at equal distances from each other with their lower ends resting upon the bed of the stream or river and their upper ends resting against the top of the bank thereof.

I have provided for anchoring the upper ends of said uprights as follows: The numeral 12 indicates a wire loop having one end embedded in the concrete frame member 10. It is intended that this loop be connected to some stationary support on top of the river bank.

The longitudinal frame members are also made of concrete and indicated by the numeral 13. They are provided with longitudinal reinforcing wires or rods 14. These are made of the same lengths as the spaces between the centers of the upright frame members and are placed in the notches in said upright frame members. The two adjacent frame members 13 in each of the notches of the upright members are detachably connected by means of a U-shaped metal bar 15 having its ends inserted in suitable openings formed in the frame members 13, as clearly shown in Fig. 2.

Near the upper portion of each upright

10 is an outwardly projecting pin 16, and near the central portion of each of the lower horizontal members 13 is an outwardly projecting pin 17.

5 The revetment wall members each comprise a straight body portion 18 having a groove 19 on one side and a rib 20 on the other side. These wall members are provided with reinforcing wires or rods 21 and
10 on each side edge are two longitudinal grooves 22. Each section of revetment wall is provided with a member having two notches 23 therein, said notches being designed to receive one of the pins 16 and one
15 of the pins 17, thus supporting said wall member at an angle of about sixty degrees relative to a horizontal line. The revetment wall member adjacent to the one having notches 23 is indicated by the numeral 24 and is similar to the member 18, except for the notches, and in addition it is provided with an overlapping revetment wall member 25. This latter is connected with the wall member 24 by the pins 26 and is of
20 such width as to overlap the revetment wall member 18 and also to project some distance beyond it and to overlap the revetment wall member on the side of the member 18 opposite from the member 24, as clearly shown in Fig. 3. The other revetment wall members are indicated by the reference numeral 27 and are similar to the member 18, except for the notches.

In constructing the wall, I first place one
35 of the wall members 18 in position as shown and then I place in the grooves 22 thereof a number of rollers 28, each having a short hub 29 on each side, said rollers being designed to permit the revetment wall members to freely slide longitudinally relative to each other.

In practical use and assuming that it is desired to place a revetment against the bank of a river or stream, I first erect a
45 frame in the manner before described and this frame may be made to rest upon the bank and bed of the river without changing the shape of same to adapt it for the revetment and no excavation of any kind is
50 necessary. I then place one of the revetment wall members 18 in position on the pins 16 and 17 with its lower end resting on the bottom or bed of the river or stream. I then place the rollers in position; then
55 one of the revetment wall members 24 is placed on top of the member 18, and its lower end is permitted to rest upon the bed or bottom of the river or stream with the part 25 overlapping the part 18 and projecting beyond it; then the other revetment wall members 27 are placed in position.

One of the reasons why my improved revetment wall may be erected at a minimum of cost is that the material used therein
65 is composed principally of sand or gravel

and this may usually be obtained along the banks of rivers or streams at the points where it is intended to use the revetment, hence, all the material that need be transported to the place where the revetment is being erected is the cement and reinforcing wires and pins. 70

It is, obviously, not at all necessary that the last one of the revetment wall members 27 in each section be exactly parallel with
75 the first revetment wall member 18 in the adjoining section, for the reason that the wall member 25 will overlap the joint between these two wall members and prevent the passage of water between them, hence, 80 if the wall members of one section should sink into the river bed or bottom farther than the adjoining sections, the wall would still remain intact and proof against the flow of water through it. In the event that
85 some of the wall members should sink a great distance into the river bed or bottom on account of the washing of the current under same, then in order to repair the wall it is only necessary to replace new revetment
90 wall members on top of those that are too low and it is not at all necessary to disturb the wall as originally erected, hence, if some of the revetment wall members should sink
95 into the river bottom a distance corresponding to their entire length, new ones could be readily and easily substituted, at any time, without injury to the wall and without moving any of the revetment wall members. The new revetment wall members that
100 are substituted for those that sink into the river bottom or bed may be constructed of the desired length so that the top of the wall will remain uniform.

In the modified form shown in Fig. 7, I
105 have shown a wall especially designed for use in deflecting currents in rivers or streams or as a breakwater. This form of revetment wall is the same as the one previously described, except that on each of
110 the uprights 10, I form a shoulder 30, and I place in the river bed or bottom a piling 31 for each upright 10 designed to rest against said shoulder 30. The piling is also preferably made of concrete. By this means
115 the revetment is pivotally supported upon the pilings 31, so that if its lower edge should sink into the bed or bottom of the river, it would simply change the angle of the revetment wall without in any way in-
120 juring the wall.

I claim as my invention.

1. An improved revetment, comprising a frame and a series of revetment wall members slidingly connected with each other and
125 inclined downwardly and laterally.

2. An improved revetment, comprising a frame and a series of revetment wall members slidingly connected with each other and inclined downwardly and laterally, said wall
130

members each being provided with a longitudinal rib on one side and a groove on the other.

3. An improved revetment, comprising a frame and a series of revetment wall members slidingly connected with each other and inclined downwardly and laterally, said wall members each being provided with a longitudinal rib on one side and a groove on the other, each also being provided on both sides with longitudinal grooves, and rollers in said grooves.

4. An improved revetment, comprising a frame, a revetment wall member fixed to the frame and inclined downwardly and laterally, a second revetment wall member resting on the upper edge of the first, and a third revetment wall member fixed to the second and placed in position overlapping the first and projected below the lower edge of the first.

5. An improved revetment, comprising a frame, a revetment wall member fixed to the frame and inclined downwardly and laterally, a second revetment wall member resting on the upper edge of the first, and a third revetment wall member fixed to the second and placed in position overlapping the first and projected below the lower edge of the first, said first and second wall members being slidingly connected.

6. An improved revetment, comprising a frame, supporting pins fixed to the frame, a revetment wall member having notches therein to receive said pins to firmly connect same with the frame, said wall member being provided on its under side with a longitudinal groove and on its upper side with a longitudinal rib, a second revetment wall member on top of the first being provided with a corresponding rib and groove, a third retaining wall member fixed to the second and placed in position overlapping the first and projecting below it, and anti-friction rollers interposed between the first and second wall members.

7. In a revetment, the combination of a number of upright frame members having notches therein, a number of longitudinal

frame members with their ends in said notches, and means for connecting said ends with each other.

8. An improved revetment, comprising a frame designed to be placed in position with its upper end resting against a bank, and its lower end resting on a bed or bottom of a river or stream, a series of sections of revetment wall members connected with said frame, each section comprising one revetment wall member fixed to the frame and extended downwardly and laterally, and other revetment wall members placed on top of the first and slidingly connected therewith and having their lower ends resting on the bed or bottom of the river or stream.

9. An improved revetment, comprising a frame designed to be placed in position with its upper end resting against a bank, and its lower end resting on a bed or bottom of a river or stream, a series of sections of revetment wall members connected with said frame, each section comprising one revetment wall member fixed to the frame and extended downwardly and laterally, and other revetment wall members placed on top of the first and slidingly connected therewith and having their lower ends resting on the bed or bottom of the river or stream, one of the revetment wall members in each section being provided with an extension wall member designed to overlap the last wall member of the adjacent section.

10. An improved revetment, comprising an upright having a shoulder on one side, longitudinal frame members connected with the upright, revetment wall members connected with the frame and a piling or post fixed in position and having said shoulder resting upon it, the lower ends of the upright frame members and the lower ends of the revetment wall members being designed to rest upon the bed or bottom of a stream.

Des Moines, Iowa, July 17, 1908.

JAMES A. NORTON.

Witnesses:

RALPH ORWIG,
M. B. GOLDIZEN.