My invention has to do with clamp devices for aligning and holding together sheets and the like for welding and other purposes. In its more particular aspects my invention finds one of its chief advantages as a clamp for aligning steel sheets disposed in edge to edge relationship, such as are used in the ship building art.

It is among the principal objects of my invention to provide a clamp capable of being made sufficiently durable to withstand extremely heavy duty use; which is operable to align extremely heavy gage sheets with a minimum of manual effort; which may be divided into sections whereby to permit one section of the clamp to be applied from one side of the work and the other section to be applied from the opposite side of the work to effect the clamping action.

It is another object to provide a device which effectively holds the sheets in aligned position without the aid of any spring means.

It is another object to provide a clamp capable of being applied between the adjacent sheets whose adjacent edges are only slightly spaced apart.

Another object is to provide a clamp capable of being adjusted to various thicknesses of work.

Still further advantages are to be derived from my invention and how those advantages as well as the foregoing specifically named objects are attained will become clear to those skilled in this art from the following detailed description of a presently preferred form of device in which the invention may be carried out. I wish it understood at the outset, however, that, in its broader aspects as defined by the appended claims, my invention is not to be confined to the details of structure, use and association of parts now to be described except insofar as such details may be specifically recited in the claims, since the invention is susceptible of being carried out by means of other specific structures.

In the following description I shall refer to the accompanying drawing, in which:

Fig. 1 is a top plan view showing my device applied to sheets disposed in edge to edge relation;
Fig. 2 is a section on line 2—2 of Fig. 1;
Fig. 3 is an end view taken from the right in Fig. 1;
Fig. 4 is an end view taken from the left in Fig. 1;
Fig. 5 is a fragmentary view showing a variational form of anvil;
Fig. 6 is an end elevation of Fig. 5; and

Fig. 7 is a fragmentary plan view of a further variational form.

My clamp device consists generally of two oppositely disposed sheet engaging body members 5, 6 interconnected by a flexible flat metal plate 7 which extends transversely through the space usually left between adjacent edges of adjacent sheets for welding purposes.

Member 5 has a U-shaped body 10 whose closed end 10a is adapted to bear against one face of the adjacent sheets S, S'. Disposed transversely between the legs 10b, 10c of the body member 5 I pivotally mount an anvil 12 by means of trunnions 14 which rotatably fit in holes 15 in the body legs. Projecting upwardly from the relatively thinner portion of the anvil I provide a plurality of lugs 16, here shown as three in number although this number may be varied as desired, each of which has an undercut 17 in its rear side surface for the purpose to be described. The connecting plate 17 is a relatively thin flat flexible metal plate having two rows of aligned holes 17a, 17b adjacent its respective ends. Lugs 16 project through the holes in row 17a and the plate may be held against longitudinal escape from the lugs by means of a detent plate 18 which is releasably secured to the relatively thicker portion of the anvil 12 by means of a screw 19 having a knurled head 19a and a lock washer 19b. After the lugs are inserted through the holes 17a, the plate is further held against longitudinal escape from the lugs by fitting into the undercuts 17c. End 10a of body member 5 has a rectangular opening 20 to pass plate 17.

To limit the amount of swinging movement of anvil 12 with respect to body member 10, I provide between the legs 10b, 10c and the ends of the anvil, plates 21 secured to the inner faces of the respective legs 10b, 10c as by screws 22. At the outer end of each of the plates there is a pair of spaced turned ears 23 between which the anvil is free to swing but which act as stops to limit such swinging movement.

Member 6 is likewise composed of a U-shaped body 25 whose closed end 25a is adapted to bear against the opposite face of sheets S, S', and which has legs 25b, 25c. A rectangular hole 27 is provided through end 25a to pass plate 25.

A lever 30 has bifurcations 30a pivotally secured to legs 25b, 25c by means of trunnions 31. An anvil or tension applying member 33 is pivotally secured, by trunnions 34, to the respective bifurcations 30a, the axis of trunnions 34 being offset from the axis of trunnions 31 whereby to provide an eccentric which, upon swinging move-
ment of the handle, causes the anvil to be moved towards and away from the end 25a of the body. Movement of the member 33 away from body end 25a places plate 7 in a position. A cross pin 39 extends between legs 25b, 25c of the body and acts as a stop to limit downward swinging of the anvil about the trunnions 34 and also acts to limit swinging movement of the handle. Projecting upwardly from the relatively thinner portion of anvil 32, there are lugs 38, here shown as three in number although this number may be varied. Said lugs project through the holes 7b in plate 7. Each of the lugs likewise has an undercut 39 to prevent longitudinal escape of the plate from the lugs.

Operation of the device is as follows: The plate 7 is applied to the lugs of anvil 12 carried by body member 5 and is inserted between adjacent edges of adjacent sheets 8, 8' until body wall 16a engages the sheets. In this position the opposite end of the plate will project far enough beyond the plane of the opposite face of the sheets to permit the other body member 25 to be secured to the plate by inserting lugs 38 through holes 7b. In that position the handle 30 is in the dotted line position of Fig. 2 and the anvil 32 occupies the dotted line position of Fig. 2. Then the handle 30 is swung downwardly to the full line position of Fig. 2 and thus, by virtue of the axis of trunnions 34 being offset from the axis of trunnions 31, the anvil is moved to the right from the dotted line to the full line position of Fig. 2, which acts to clamp the sheets between portions 16a, 26c of the two body members. In this latter position the axis of trunnions 34 is slightly below the axis of trunnions 31, which serves to lock the parts in that position.

In Figs. 5 and 6 I show a variational form of anvil 35a having provision for adjustability. Here the anvil is divided into an upper portion 40 and a lower portion 41 carrying the upright lugs 38a for insertion through the holes 7a in the plate 7. The contacting faces of anvil portions 40, 41 are toothed as shown at 42 and may be locked together by a screw 45 which extends through an elongated slot 46 in the upper anvil portion 40 and which is threaded at its lower end into the lower anvil portion 41, a lock nut 44 being provided between the screw head and the top surface of anvil portion 40. Trunnions 34a are provided at opposite sides of the upper anvil portion for pivotal mounting on the handle bifurcations 39a. By this construction it is possible to adjust the lower anvil portion 41 with respect to the fixed anvil portion 40 whereby to vary the spacing of lugs 38a from the upper anvil portion and thus adjust the device to clamp sheets of different thicknesses.

In Fig. 7 I show a further variational form of device in which the parts are as before described except that the walls 52, 53 of the closed ends of the body members are curved whereby to clamp curved sheets 8 therebetween, the side walls of the U-shaped body members being designated 50, 51, respectively.

I claim:

1. A clamp for aligning sheets disposed edge to edge, comprising a relatively thin plate insertable between adjacent edges of adjacent sheets, an anchor secured to one end of the plate and having a portion bearable against one face of the sheets, a body member having a portion bearable against the opposite face of the sheets, a handle having bifurcations, trunnion means pivotally mounting the bifurcations in the body member, an anvil detachably secured to the other end of the plate and means pivotally connecting opposite sides of the anvil to the bifurcations about an axis offset from the axis of the trunnions whereby, upon movement of the handle, to move the anvil relative to the body towards and away from the sheets.

2. A clamp for aligning sheets disposed edge to edge comprising a pair of separate, U-shaped body members whose closed ends are adapted to bear against opposite faces of the sheets, an opening through the closed end of each of the body members, a plate extending through said openings and insertable between adjacent edges of adjacent plates, means securing the plate to one of the body members, and operating means movably mounted in the other body member and detachably secured to the other end of the plate, said means being operable to exert a longitudinal pull on the plate whereby to draw the body members against opposite faces of the sheets.

3. A clamp for aligning sheets disposed edge to edge comprising a pair of separate, U-shaped body members whose closed ends are adapted to bear against opposite faces of the sheets, an opening through the closed end of each of the body members, a plate extending through said openings and insertable between adjacent edges of adjacent plates, means securing the plate to one of the body members, an anvil mounted in the other body member to move relative thereto towards and away from the sheets, means for detachably securing the anvil to the other end of the plate, and eccentric means pivotally mounted in the last-mentioned body member, said eccentric means operatively engaging the anvil whereby to move it relative to the last-mentioned body member and towards and away from the sheets.

4. A clamp for aligning sheets disposed edge to edge comprising a pair of separate, U-shaped body members whose closed ends are adapted to bear against opposite faces of the sheets, an opening through the closed end of each of the body members, a plate extending through said openings and insertable between adjacent edges of adjacent plates, a first anvil pivotally mounted in one of the body members and secured to one end of the plate, a second anvil secured to the other end of the plate and mounted in the other body member to move relative thereto towards and away from the sheets, and means carried by the last-mentioned body member and operatively engaging the second anvil to move it relative to the said body member towards and away from the sheets.

5. A clamp for aligning sheets disposed edge to edge comprising a pair of separate, U-shaped body members whose closed ends are adapted to bear against opposite faces of the sheets, an opening through the closed end of each of the body members, a plate extending through said openings and insertable between adjacent edges of adjacent plates, a first anvil pivotally mounted in one of the body members and secured to one end of the plate, a second anvil secured to the other end of the plate and mounted in the other body member to move relative thereto towards and away from the sheets, means engaging the first anvil pivotally mounted in the first body member and means for securing the second anvil to the sheets.
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direction to draw the body members against opposite faces of the sheets.

6. A clamp of the class described comprising a pair of separate body members each having side walls and an end wall providing a work engaging surface, a flexible plate extending from one to the other of the body members, an anvil extending transversely between and journaled at its ends in the side walls of one body member, means detachably securing one end of the plate to said anvil, a second anvil rotatably and laterally movably mounted transversely between the side walls of the other body member, means detachably securing the other end of the plate to the second anvil, and means for moving the second anvil laterally with respect to said other body member.

7. A clamp for aligning sheets disposed edge to edge, comprising a flexible plate insertable between adjacent edges of adjacent sheets, an anchor secured to one end of the plate and having a portion bearable against one face of the sheets, a body member having a portion bearable against the opposite face of the sheets, an anvil having a portion pivotally and laterally movably mounted in the body member and an anchor portion detachably secured to the other end of the plate, and means providing adjustability of the anvil portions with respect to each other.

8. A clamp for aligning sheets disposed edge to edge, comprising, in combination, two oppositely disposed body members bearable against opposite faces of the sheets, a plate insertable between adjacent edges of adjacent sheets, means securing one end of the plate to one of the body members, tensioning means in and movable relative to the other body member, said tensioning means being detachably secured to the other end of the plate and a lever fulcrumed on said other body member and operatively engaging the tensioning means.

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