A support for suspending reinforcing steel relative to a form wall at a spaced distance is provided. The support includes a vertical member having a first end and a second end, a cantilever support arm extending from the vertical member for supporting a length of reinforcing steel orientated horizontally at a predetermined elevation and at a spaced distance from the form wall, and a clamp means for securing the support to the form wall so that the support arm is perpendicular to the form wall and extends towards the opposite side of the form. A plurality of support arms can be provided for suspending many different lengths of reinforcing steel at different elevations. The support is intended to be used in the construction of reinforcing structures, as for grade beams and is removed from the form wall prior to the pouring of concrete into the form.
REINFORCING STEEL SUPPORT

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates generally to a device for positioning concrete reinforcing steel, such as re-bar. More particularly, relating to an apparatus for suspending concrete reinforcing steel relative to a form wall during the construction of a concrete reinforcing structure of reinforcing steel.

[0003] 2. Background of the Invention

[0004] In concrete construction it customary to use concrete reinforcing steel or re-bar to strength a poured concrete structure. To provide the highest level of reinforcement with installation of re-bar in concrete, the re-bar must be accurately and strategically oriented for maximum benefit. One area of concrete construction that is found most labor intensive involves the pouring of grade beams because it is difficult and time consuming to position the reinforcing steel or re-bar properly. Many times a worker becomes frustrated with the task and haphazardly positions the re-bar to accomplish the task more quickly.

[0005] During the construction of grade beams, a plurality of lengths of reinforcing steel or re-bar are orientated horizontally and positioned at different elevations relative to a form wall. Then additional lengths of re-bar are formed around the horizontally orientated lengths so as to form a box like reinforcing structure of reinforcing steel or re-bar. During the construction, it is imperative the elevation of each length of the horizontally orientated reinforcing steel remain level. One typical method used to aid a worker in correctly positioning the horizontal reinforcing steel involves supporting the reinforcing steel with wooden beams, such as 2x4 beams. The use of wooden beams is a very laborious and time consuming process requiring the positioning of a considerable number of beams to support many lengths of reinforcing steel at different elevations. Furthermore, once the reinforcing structure has been constructed it must be lowered onto footings, which requires the removal of the supporting wooden beams.

[0006] The present invention provides for an apparatus allowing quick and accurate placement of horizontal reinforcing steel during the construction of a concrete reinforcing structure used in reinforcing a poured concrete structure such as a grade beam.

SUMMARY OF THE INVENTION

[0007] In accordance with the present invention, a support for suspending concrete reinforcing steel horizontally during the construction of a concrete reinforcing structure of reinforcing steel is provided.

[0008] More specifically, in one embodiment of the present invention, the support comprises a vertical member having a first end and a second end, a support arm extending from the vertical member for supporting a length of reinforcing steel orientated horizontally at a predetermined elevation and at a spaced distance from the form wall, and a clamp means for securing the support to the form wall so that the support arm is perpendicular to the form wall and extends towards the opposite side of the form.

[0009] In an additional embodiment of the present invention, a plurality of support arms are provided which extend from the vertical member at different elevations to support a plurality of different lengths of reinforcing steel horizontally at different elevations.

[0010] There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood and in order that the present contribution to the art may be better appreciated.

[0011] Numerous objects, features and advantages of the present invention will be readily apparent to those of ordinary skill in the art upon a reading of the following detailed description of presently preferred, but nonetheless illustrative, embodiments of the present invention when taken in conjunction with the accompanying drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of descriptions and should not be regarded as limiting.

[0012] As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

[0015] FIG. 1 is a perspective view of an embodiment of the reinforcing steel support constructed in accordance with the principles of the present invention;

[0016] FIG. 2 is a partial, enlarged perspective view of a preferred embodiment of the present invention;

[0017] FIG. 3 is an enlarged cross-sectional view taken along line 3-3 in FIG. 2; and

[0018] FIG. 4 is an in-use perspective view of a plurality of the reinforcing steel support of the present invention attached to a form wall and supporting a plurality of horizontally orientated reinforcing steel members at various elevations.

[0019] The same reference numerals refer to the same parts throughout the various figures.

DETAILED DESCRIPTION OF THE INVENTION

[0020] Referring now to the drawings, and particularly to FIGS. 1-2, a preferred embodiment of the support for
reinforcing steel of the present invention is shown and generally designated by the reference numeral 10.

[0021] Referring to FIG. 1, the support 10 includes a vertical member 12 having a first end 14 and a second 16. Preferably, the vertical member 12 is of a tubular section of a circular cross-section. A support arm 18 extends from and orthogonal to the vertical member 12 at a selected position or elevation between the first and second ends 14 and 16. Preferably, the support arm 18 is of a cantilever type and is only supported by the vertical member 12 at one end 20 with the opposite end 22 projecting in a direction away from the vertical member. Most preferably, the support arm 18 is of a tubular section. The end 20 of the support arm 18 can define a channel section 24 which is adapted to slidably receive the vertical member 12 so that the support arm can be selectively positioned at a desired height or elevation along the vertical member. The channel section 24 can include a locking means 26, such as a thumbscrew or pin, to secure the support arm 18 at a selected elevation along the height of the vertical member 12. Additionally, the vertical member 12 can include a plurality of through holes 27 at spaced distances along the height of the vertical member and the channel section 24 can include a cooperating through hole for alignment with a through hole 27. A fastener 29, such as a bolt or pin can be passed through the aligned through holes to lock the support arm at a desired elevation.

[0022] A clamping means 28 for attaching the support 10 to a form wall is provided and which can either extend from the vertical member 12 approximate the first end 14 and in a direction opposite of the support arm 18 or the clamping means can extend from the first end 20 of the support arm in a direction opposite of the second end 22 of the support arm. Most preferably, the clamping means is attached to the channel section 24 opposite of the support arm 18 and extends therefrom in a direction opposite of the support arm. One possible example of a clamping means 28 that could be used includes a support bar 30 and a bar clamp 32, such as a pony clamp slidably engaged with the support bar.

[0023] A handle 34 can be provided at the first end 14 of the vertical member 12. Preferably, the handle 34 is of the T-type and is attached to the first end 14 of the vertical member in a direction parallel to the support arm 18.

[0024] Turning now to FIGS. 2 and 3, an additional embodiment of the present invention is illustrated which includes an additional example of a possible locking means 26 for securing the support arm 18 to the vertical member 12. More particularly, this embodiment the vertical member 12 is of a square cross-section and has a plurality of horizontal slots 38 formed along the length of the back surface 40. A projection 42 extends from an interior surface of the channel section 24 of the support arm 18. The support arm 18 is secured to the vertical member 12 at a desired elevation therealong by inserting the projection 42 into a corresponding slot 38 formed into the vertical member at the desired elevation. The projection 42 is locked into the slot 38 by a contact force between the upper surface 44 of the projection and the ceiling 46 of the slot which is created by a moment force developed by a moment arm which is equal to the distance of the end of the support arm to the contact point. The contact force is increased as load is applied to the support arm 18 insuring the support arm will remain secured to the vertical member 12 at the desired elevation.

[0025] In additional embodiments, a plurality of support arms 36 can be provided in addition to the support arm 18. The support arms 36 are constructed in exact accordance with the support arm 18 as discussed supra. The support arms 36 can be either of the same length as the support arm 18 or can be of a different length. Preferably, at least one support arm 36 is provided having the same length as support arm 18 and at least one support arm 36 is provide having a shorter length then support arm 18.

[0026] Referring to FIG. 4, which illustrates a plurality of supports 10 depending from a partial section of form wall 100 and supporting a partial section of a reinforcing structure 110 of reinforcing steel members. Each support 10 is attached to the form wall 100 by clamping means 28 and are spaced there along to provide support to horizontally oriented reinforcing steel members 112. The supports 10 allow for the suspension of the reinforcing steel members 112 relative to and at a spaced distance from the form wall 100.

[0027] As illustrated, one possible method of suspending reinforcing steel members 112 is by using a support arm 18 that is positioned approximate end 14 of the vertical member 12. In this example, the support arm 18 is used to suspend or support two separate lengths of reinforcing steel horizontally and at different spaced distances from form wall 100. An additional support arm 36 is also used and is positioned along the vertical member 12 at a lower elevation then support arm 18 and which is of a shorter length then support arm 18. In this example, the support arm 36 is positioned to suspend a single horizontal reinforcing steel member 112 at a spaced distance from form wall 110. Once the horizontal reinforcing steel members 112 are correctly suspended by each support 10, a plurality of vertical steel members 114 are formed around the horizontal members to form a box-like reinforcing structure, which a partial section of a completed reinforcing structure thereof is illustrated.

[0028] Upon completion of the reinforcing structure 110 each support 10 is sequentially removed from the form wall 100 prior to the pouring of concrete by first loosening clamping means 28 and then rotating the support so that support arms 18 and 36 are positioned parallel to the horizontal reinforcing members 112 and within the spaced distance between the reinforcing members and the form wall 100. Then the support 10 can be lifted from the form wall 100 and stored for later use.

[0029] A number of embodiments of the present invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. Accordingly, other embodiments are within the scope of the following claims.

I claim:

1. A support for suspending concrete reinforcing steel relative to a form wall comprising:
   - a vertical member having a first end and a second end;
   - a first support arm extending at a first predetermined elevation and orthogonal from said vertical member; and
   - a clamp means for securing said vertical member to said form wall so that said first support arm is perpendicular to said form wall.
2. The support of claim 1, further comprising:
   a second support arm extending at a second predeter-
   mined elevation and orthogonal from said vertical
   member and parallel to said first support arm.
3. The support of claim 2, wherein said first and said
   second support arms are selectively positionable at different
   elevations along the height of said vertical member.
4. The support of claim 1, further comprising:
   a handle attached to said first end of said vertical member.
5. The support of claim 1, wherein said clamp means for
   securing said vertical member to said form wall is adjustable
   to the thickness of said form wall.
6. The support of claim 1, wherein said support is
   removed from said form wall prior to the pouring of con-
   crete.
7. A temporary support for suspending reinforcing steel
   horizontally and relative to a form wall during the construc-
   tion of a concrete reinforcing structure comprising:
   a vertical member having a first end and a second end;
   at least two support arms extending from said vertical
   support member at different elevations; and
   a clamp means for securing said vertical member to said
   form wall.
8. The temporary support of claim 7, wherein said vertical
   member is attached to said form wall so that said at least two
   support arms are perpendicular to said wall.
9. The temporary support of claim 7, further comprising:
   a handle attached to said first end of said vertical member.
10. The temporary support of claim 7, wherein said at
    least two support arms are selectively positionable along the
    height of said vertical member.
11. The temporary support of claim 10, wherein said at
    least two support arms extend orthogonal from said vertical
    member.
12. The temporary support of claim 7, wherein said support
    is removed from said form wall prior to pouring concrete.
13. The temporary support of claim 7, wherein each of
    said support arms define a channel at one end thereof which
    is adapted to receive said vertical member so that each of
    said support arms are slidably positionable along the height
    of said vertical support bar.
14. The temporary support of claim 13 further compris-
    ing:
    a locking means attached to each of said support arms for
    locking the elevation of said support arm along the
    height of said vertical support member.
15. A system for suspending reinforcing bars relative to a
    concrete form wall during the construction of a concrete
    reinforcing structure of reinforcing bars comprising in com-
    bination:
    at least two reinforcing bar supports positioned along a
    length of said concrete form wall, said at least two
    reinforcing bar supports support at least one horizontally
    orientated reinforcing bar at a spaced distance from said form wall, each of said at least two reinforce-
    ing bar supports comprise:
    a vertical member having a first end and a second end;
    at least one support arm extending from said vertical
    member; and
    a clamp means attached to said support for attaching said
    support to said concrete wall form so that said at least
    one support arm is perpendicular to said form wall.
16. The system of claim 15, wherein said at least one
    support arm extends orthogonal to said vertical member.
17. The system of claim 16, wherein said at least one
    support arm extends orthogonal to said vertical member.
18. The system of claim 15, wherein each of said at least
    two reinforcing bar supports further comprise:
    a handle attached to said first end of said vertical member.
19. The system of claim 15, wherein each of said at least
    two reinforcing bar supports are removed from said form
    wall prior to pouring concrete.