April 12, 1932. A. T. SCANNELL 1,853,086

TOWER FOR ELEVATING CONSTRUCTION MATERIALS

Original Filed March 11, 1929 3 Sheets-Sheet 1

Fig. 1

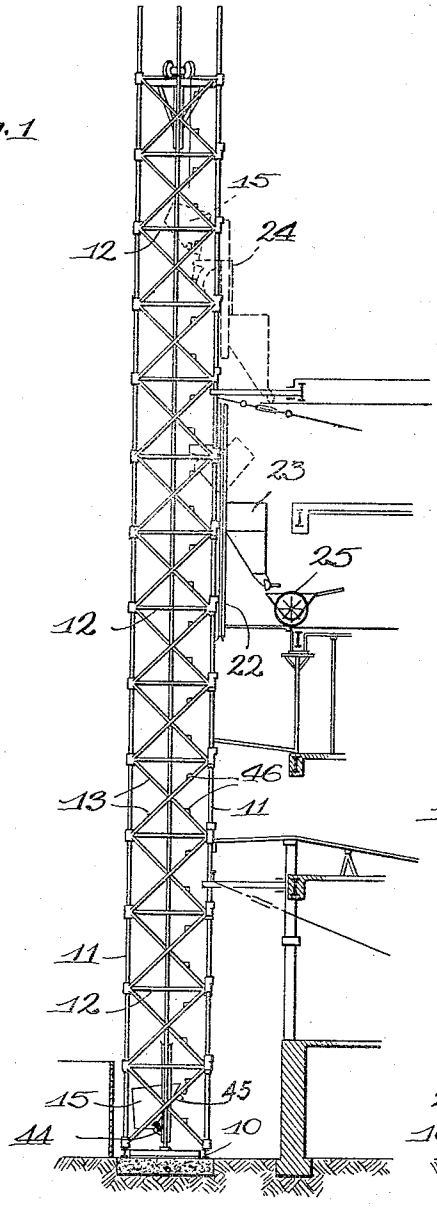
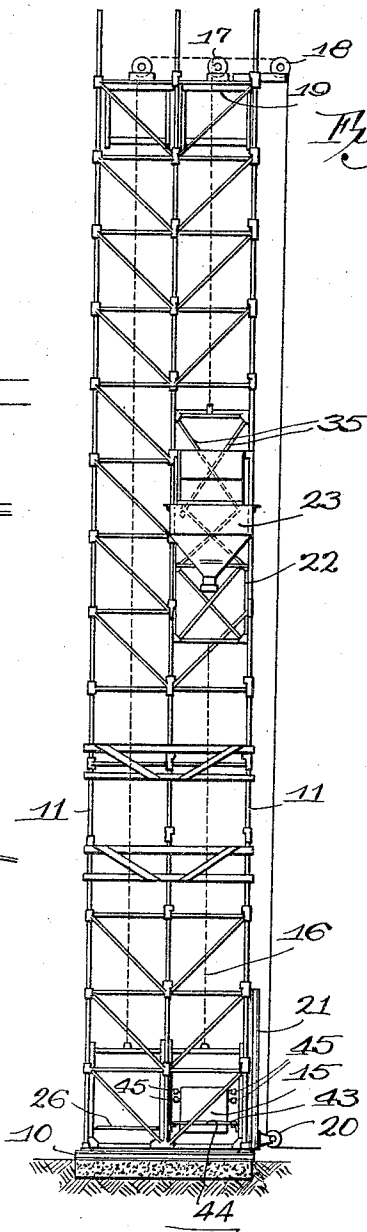


Fig. 2



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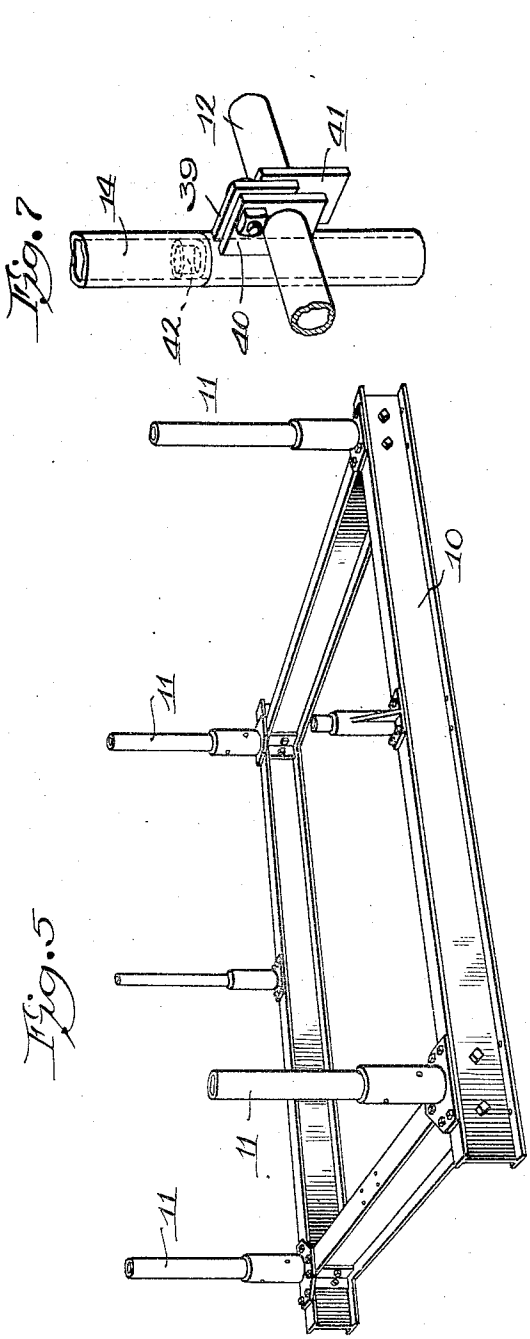
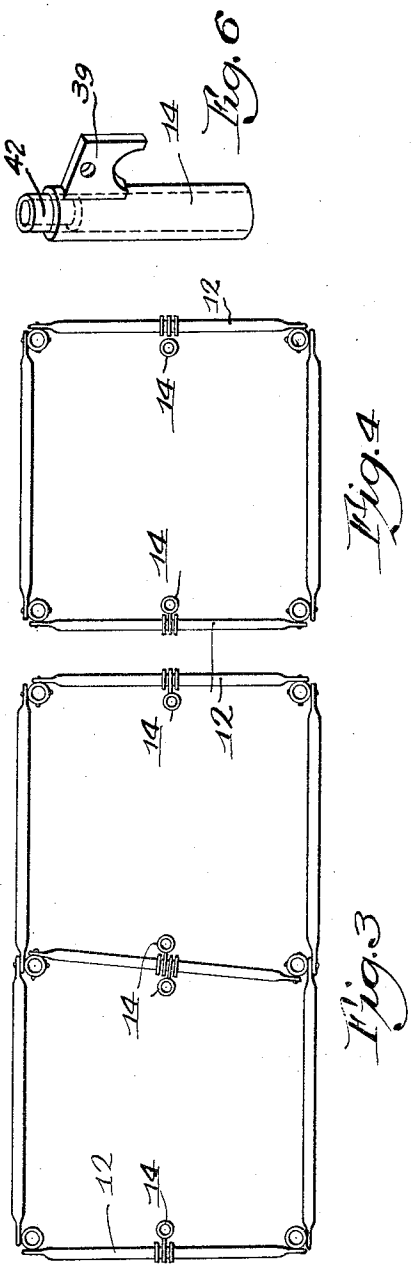
TOWER FOR ELEVATING CONSTRUCTION MATERIALS

Original Filed March 11, 1929 3 Sheets-Sheet 2





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TOWER FOR ELEVATING CONSTRUCTION MATERIALS

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Fig. 8

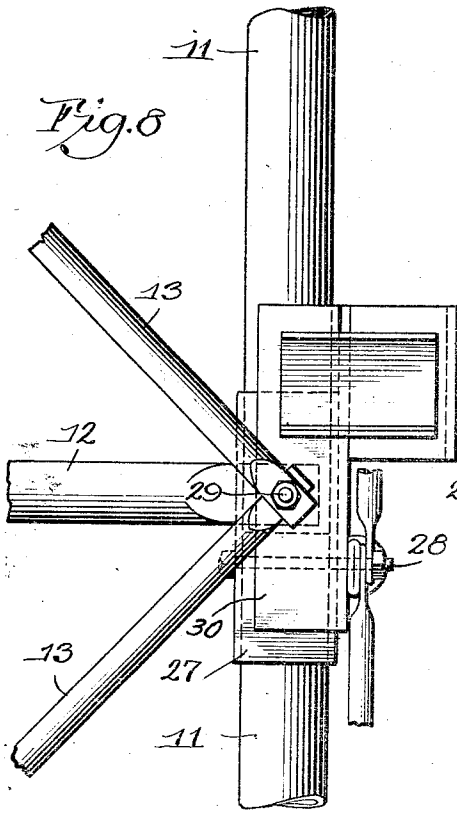


Fig. 9

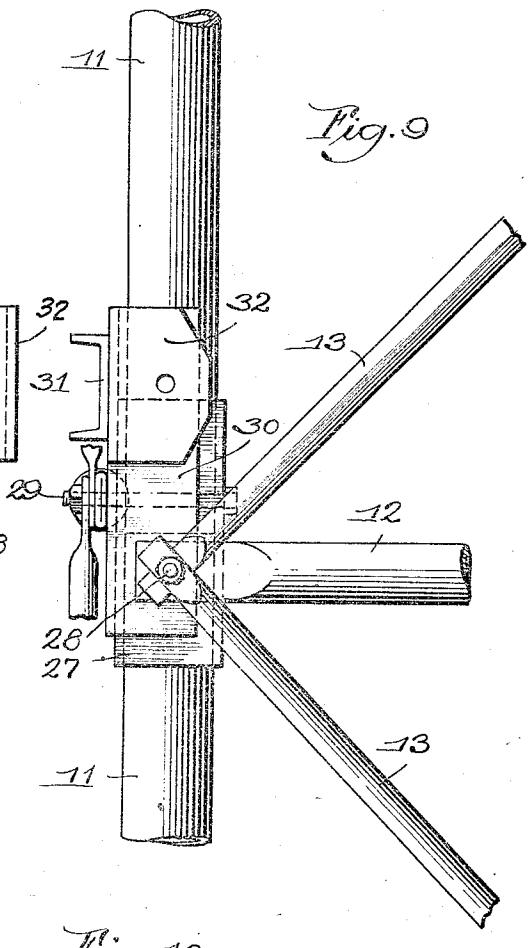
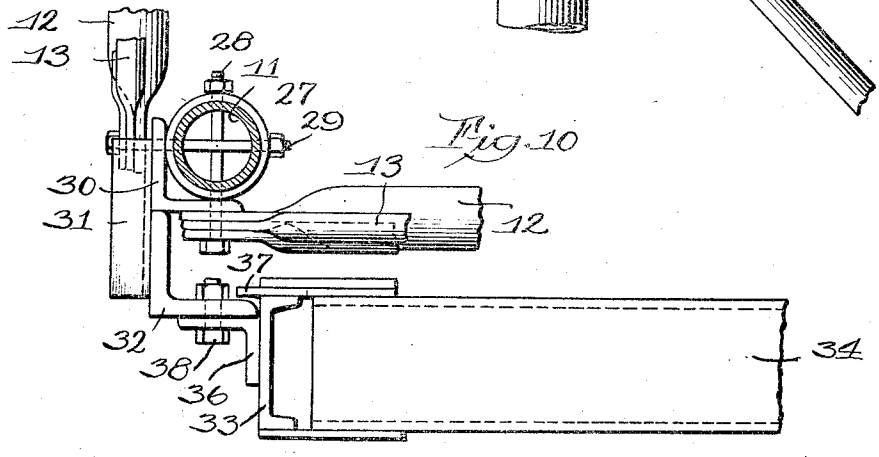


Fig. 10



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Patented Apr. 12, 1932 1,853,086

UNITED STATES PATENT OFFICE

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TOWER FOR ELEVATING CONSTRUCTION MATERIALS

Original application filed March 11, 1929, Serial No. 345,963. Divided and this application filed December 30, 1929. Serial No. 417,364.

My invention relates to improvements in towers for elevating construction materials. This application is a division of my application Serial No. 345,963 filed March 11, 1929, for improvements in towers for elevating construction materials. Certain features are also claimed in another divisional application, 462,861, filed June 21, 1930, which issued March 31, 1931, as Patent 1,798,501.

The commercial embodiment of the invention illustrated in the drawings is of the type known as a sectional pipe tower in that the vertical corner members are made of short lengths of pipe arranged end to end in vertical alignment and having horizontal girts and diagonal bracing also made of pipe, the sections thus formed being strong, light, and the parts thereof being readily fitted together, whereby a tower may be erected fairly rapidly and after being used may be taken apart and reassembled in a new location.

Many of the improvements described herein are applicable to construction towers in general, regardless of the cross section of the vertical compression members, that is, they may be used in connection with a wooden tower, a steel tower built up of angle iron, channels, I beam sections or other sections and of any suitable material.

The objects of the invention are: to provide a light, strong tower, the parts of which may be quickly elevated and fitted to the preceding sections; to provide a tower having a track or vertical guides for the dump bucket or the material platform made in sections which may be readily secured to the tower sections and fitted together in vertical alignment; to provide a series of short members, secured to the outside of the tower and arranged in vertical alignment to form, in effect, a special vertical track whereby the hopper frame may be secured thereto and raised from time to time as necessary but without requiring a continuous track, thereby eliminating this expense; to provide a construction in which a cat-head can be arranged to slide vertically inside the tower whereby the labor and expense of raising said cat-head from time to time is greatly reduced; to provide a single well tower in which a cat-head is vertically adjustable inside the tower, and a concrete bucket may operate inside the tower and a material elevator operating outside the tower whereby a single tower may perform the function of a double tower. Various other objects and advantages will be apparent from the following description.

In the drawings:

Fig. 1 is a side elevation of a double tower, although it may serve also to illustrate a single tower,

Fig. 2 is a front elevation of a double tower,

Fig. 3 is a top plan view thereof,

Fig. 4 is a top plan view of a single tower,

Fig. 5 is a perspective view of the base,

Fig. 6 is a perspective view of one of the tubular track sections,

Fig. 7 is a perspective view of two aligned sections and the supporting horizontal girt.

Fig. 8 is an enlarged side view of two aligned corner posts and associated parts,

Fig. 9 is a front view thereof,

Fig. 10 is a top plan view.

Where a single tower is to be erected, a base 10 is provided for supporting the tubular corner posts 11, of which there are four, the lower ends of said posts or pipe lengths being received within suitable corner sockets as shown. Where a double tower comprising four corner posts and two intermediate posts is to be erected, the rectangular base is made proportionately longer.

The individual corner posts may be of any desired length, experience having shown that a length of six feet six inches, is a convenient one.

The corner posts are connected at or near their ends by horizontal girts 12 and diagonal bracing 13, all of which is preferably of tubular form, i. e. consisting of tubes flattened at the ends and bolted to the upright members, as hereinafter described.

Within the tower is a vertical track consisting of a pair of tubular members 14, (see Figs. 1 and 4) one on each side of the tower, and where a double tower is erected, such a track is provided in each well (see Fig. 3).

The concrete bucket 15 is arranged to slide up and down on the track in what may be called the concrete hoisting well, in a double tower. A material elevator, hereinafter referred to, slides up and down on the track in what may be called the construction material hoisting well.

A cable 16 is attached to the bucket frame and extends upwardly, passing over sheaves 17, 18 on a cat-head 19, said cable passing downwardly and under another sheave 20 on a sheave frame 21, bolted to the bottom of the tower.

A hopper frame 22 is arranged to slide up and down on what is called the front face of the tower which is the side thereof facing the building under construction, and is bolted thereto, except when being raised to successively higher positions. It carries a hopper 23 fixed thereto and in the form shown also has a chute 24 pivoted thereto above the hopper and arranged to extend into the tower, the hopper being on the outside thereof. The arrangement is such that the dump bucket 15 dumps concrete into the chute 24, from which it flows into the hopper 23 and thence is delivered into cars 25, or to chutes, or is otherwise distributed.

A construction material platform 26 is arranged to slide vertically in the other of the two wells. In fact the frame which carries the concrete dump bucket is designed to have a platform substituted for the dump bucket after the concrete work is finished so as to provide a second construction material platform as hereinafter explained.

The corner posts are connected, in vertical alignment, and are braced, as shown in Figs. 8 and 9. Each tubular corner post 11, as well as the two intermediate posts, in the case of a double tower, has a tubular member or sleeve 27 fitted over the end thereof, preferably the upper end, and projecting beyond the same to form a socket for the lower end of the pipe length above it. This tubular sleeve is bolted to the lower of the two adjacent pipe lengths by a bolt 28 and is bolted to the upper of the two by a bolt 29. These bolts also pass through the flattened ends of the tubular diagonal braces 13.

In Fig. 2 there are three vertically aligned series of tubular posts on the side of the double tower facing the building. The two right hand series have means thereon constituting an interrupted track on which the hopper frame may slide. These additional members are shown also in Figs. 8 and 9 and comprise short lengths of angle irons 30 secured to the pipes 11 by the same two bolts 28 and 29 which pass also through the horizontal girts and diagonal braces. Each angle iron 30 has a channel 31 welded thereto which supports a short length of angle iron 32 in spaced relation to the tower. The outer flange of this angle iron constitutes the guide or interrupted track and has one or more openings therein to permit the hopper frame to be bolted thereto. These flanges are arranged in vertical alignment and the hopper frame is preferably long enough to overlie at least three of them at a time, whereby they serve as a track as well as supporting brackets for said hopper frame when the latter is bolted in any position of vertical adjustment.

The hopper frame is indicated fragmentally in Fig. 10 and consists preferably of vertical channel members 33 and transverse channel members 34 together with diagonal braces 35 shown in Fig. 2. The latter are important, as some of the diagonal bracing of the tower is removed when the equipment is in use with the hopper frame in fixed position. This diagonal bracing on the hopper frame serves, in effect, to replace the diagonal bracing removed. In other words, the hopper frame stiffens the tower.

The channel frame has angle irons 36 secured thereto with a series of aligned openings therein to enable said frame to be bolted to the tower. These angle irons together with the adjacent parallel bars 37, (see Fig. 10) constitute the guides which slide on the angle irons 32 previously referred to. Bolts 38 secure the angle irons 36 to the angle iron 32 as shown also in Fig. 10.

When it is necessary to raise the hopper, a cable is secured to the top thereof and, passing over a suitable sheave at the top of the tower, is operated by power or a block and tackle are used.

The construction of the vertical track for the dump bucket frame will now be described. Each section 14, as shown in Figs. 6 and 7, consists of a pipe having a notched plate 39 welded thereto at its upper end, which plate may be hooked over the horizontal girt 12 to support said pipe. Said horiontal girt has plates 40, 41 welded thereto, one of which projects preferably a little higher than the other, said other projecting a little lower than the first one and said plates being spaced apart far enough to receive the plate 39 between them. These fixed plates prevent lateral movement of the pipe sections 14 and insure vertical alignment thereof, even though each pipe section is supported at one point only. The staggered arrangement of the plates 40 and 41 make it easy to lower the notched plate 39 between them, regardless of the manner in which the horizontal girt is bolted in place; for example, it is immaterial if the end to end arrangement of said girt is reversed, as in either position one of the fixed plates projects above the other. Each tube 14 has an insert 42 therein, either a short length of pipe or a solid plug which projects therefrom and serves to lock the adjacent pipe lengths together. As shown in Fig. 7, the notched plate may be bolted between the adjacent

fixed plates, at intervals, to prevent the pipe sections 14 from lifting, in case the elevator guides should stick to them for any reason.

The dump bucket frame 43 in Figs. 1 and 2 is identical with the frame 26 which latter serves to support a material platform. In other words, the same frame may be used for either purpose. In fact, in either a single or a double well tower, after the concrete has been poured, the dump bucket is removed and a material platform substituted in the frame.

When said frame supports the dump bucket 15, the latter is pivoted thereto about the rod 44 as shown in Figs. 1 and 2, the rollers 45 engaging guides on the pivoted chute 24 as the bucket moves upwardly past it, in a manner which is well understood. The construction of the bucket, the sliding frames and of the hopper and its frame are described in detail in my above identified application. The bucket dumps entirely within the tower, that is, as it turns up side down, it clears the inner sides of the tower, whereas dump buckets used heretofore inside of a tower have been arranged to strike fixed brackets or guides on the tower, the bucket, as it inverts, swinging upwardly beyond the plane of the tower to dump into a hopper outside of the tower.

By the arrangement provided herein, the concrete is conveyed from the bucket within the tower to the hopper without the tower by the pivoted chute which passes through the plane of one face of the tower as previously described. While a tilting dump bucket is preferred, many of the advantages of the arrangement described may be retained by using a bottom dump bucket.

The cables for raising and lowering the dump bucket pass over sheaves supported by the cat-head 19 which is shown in detail in the above mentioned application.

The cat-head is usually located near the top of the tower, as shown in Fig. 1, with four corner posts 11 projecting above it. When it is desired to raise said cat-head, the tower is built up four or five sections higher and a sheave, on a suitable frame, is positioned at the top of the tower to enable the cat-head frame to be raised by a cable or a rope passing over the sheave. After the cat-head is bolted in its new position, the cables for the concrete bucket and material elevator are repositioned over the sheaves and the tower is again in condition for use after a comparatively short delay as compared with the delays previously experienced.

To facilitate climbing the tower, suitable steps 46 are secured to the diagonal bracing, being made preferably of metal straps bent to triangular form.

What I claim is:

1. A construction tower comprising four vertical tubes for corner posts each tube having a sleeve at one end projecting beyond the same to form a socket to receive the adjacent end of the next tube, the two tubes on one side of said tower being connected by a horizontal girt bolted through said sleeves to said tubes and the remaining two tubes on the opposite face being connected in like manner, the tubes defining a third face of said tower being connected by a horizontal girt bolted to the opposite ends of said tubes from which said first mentioned girts are bolted.

2. A construction tower comprising four vertical tubes for corner posts each tube having a sleeve at one end projecting beyond the same to form a socket to receive the adjacent end of the next tube, the two tubes on one side of said tower being connected by a horizontal girt bolted through said sleeves to said tubes, the remaining two tubes on the opposite face being connected in like manner, the tubes defining a third face of said tower being connected by a horizontal girt bolted to the opposite ends of said tubes from which said first mentioned girts are bolted and vertical angle irons secured in place by the same bolts to form guides for a vertical runaway.

3. A double tower comprising four tubular corner posts with horizontal side and end girts connecting the same and two intermediate tubular posts also connected to said side girts, additional horizontal girts connecting said two intermdiate posts, one end of each of said additional girts being secured to one of said intermediate posts on one side thereof and the other end secured to the other side of the remaining intermediate posts to position said intermediate girts somewhat diagonally, means on said end girts for positioning vertical guides, and means centrally located on said additional girts to position additional vertical guides in the same location with reference to said first guides regardless of the end to end reversal of any of said additional girts.

4. The combination with a tower structure comprising vertical corner posts formed of vertically aligned sections, transverse girts and braces therefor, connecting members each bolted adjacent a top of one post section and the bottom of the next upper section, said bolts being disposed at right angles one to the other and each securing the ends of certain of said girts and braces to said posts, and track members having laterally extending spacing means secured to said connecting members for holding said track members in a plane spaced from said braces and girts of one face of said tower.

In testimony whereof, I have subscribed my name.

ALBERT T. SCANNELL.