Feb. 7, 1928. 1,658,042

H. DRUSCHEL

PORTABLE ELEVATOR

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FIG. 2.

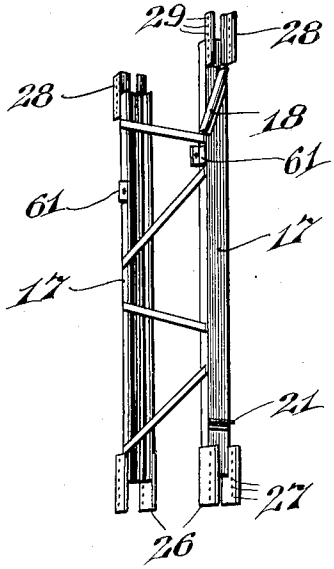


FIG. 1.

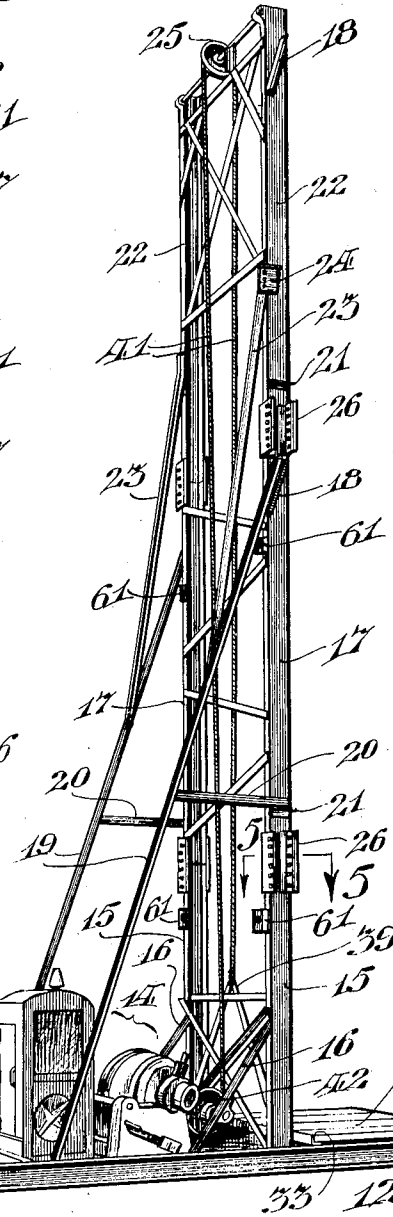


FIG. 3.

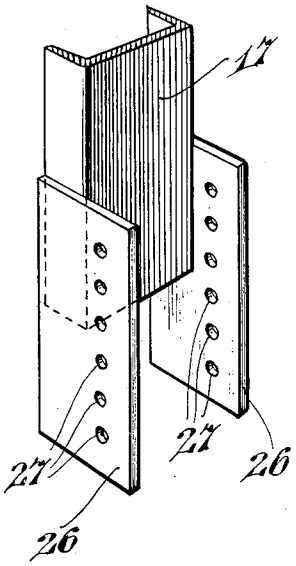


FIG. 4.

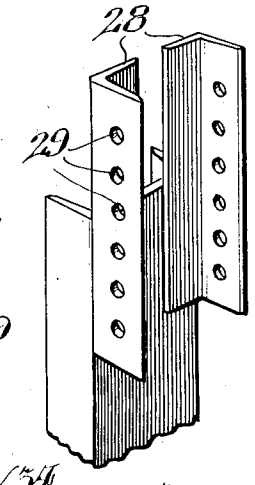
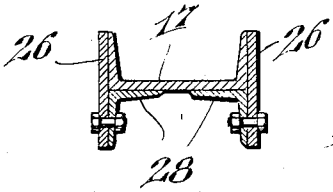


FIG. 5.



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PORTABLE ELEVATOR

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FIG. 6.

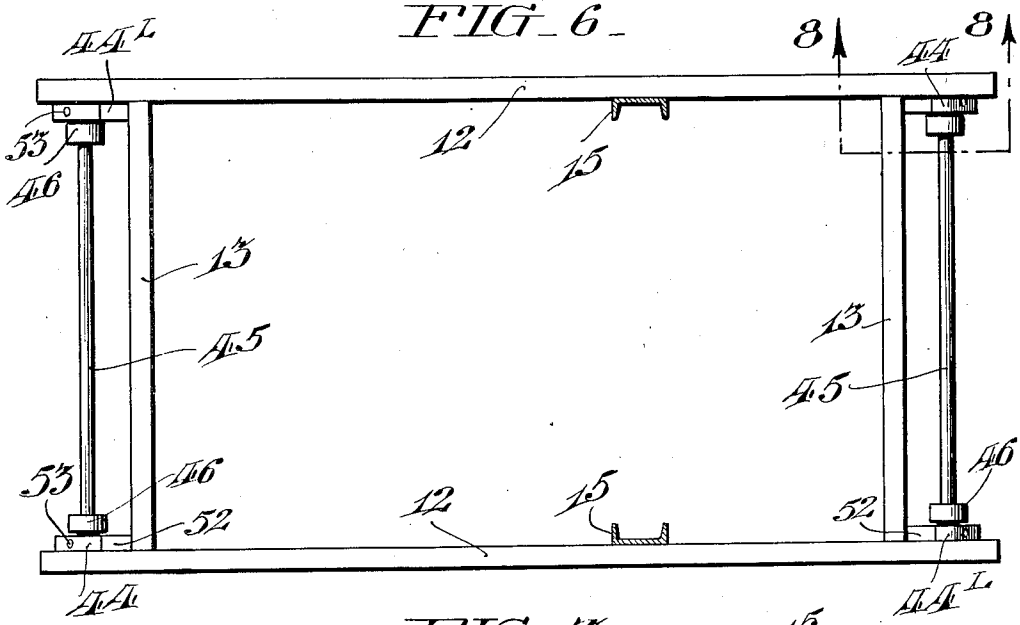


FIG. 7.

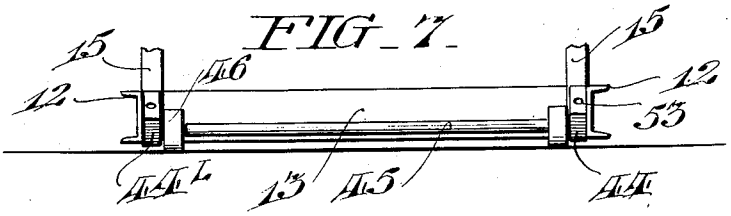


FIG. 8.

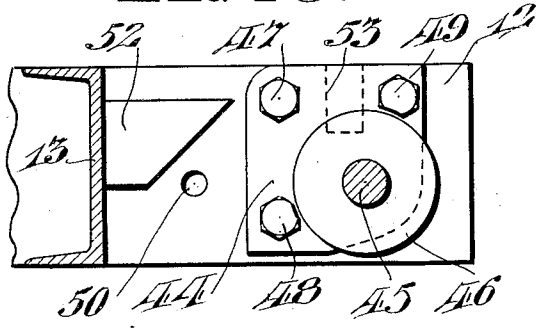
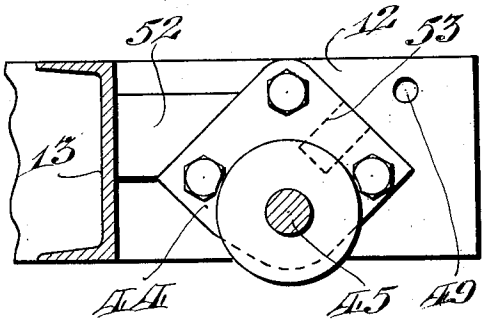


FIG. 9.



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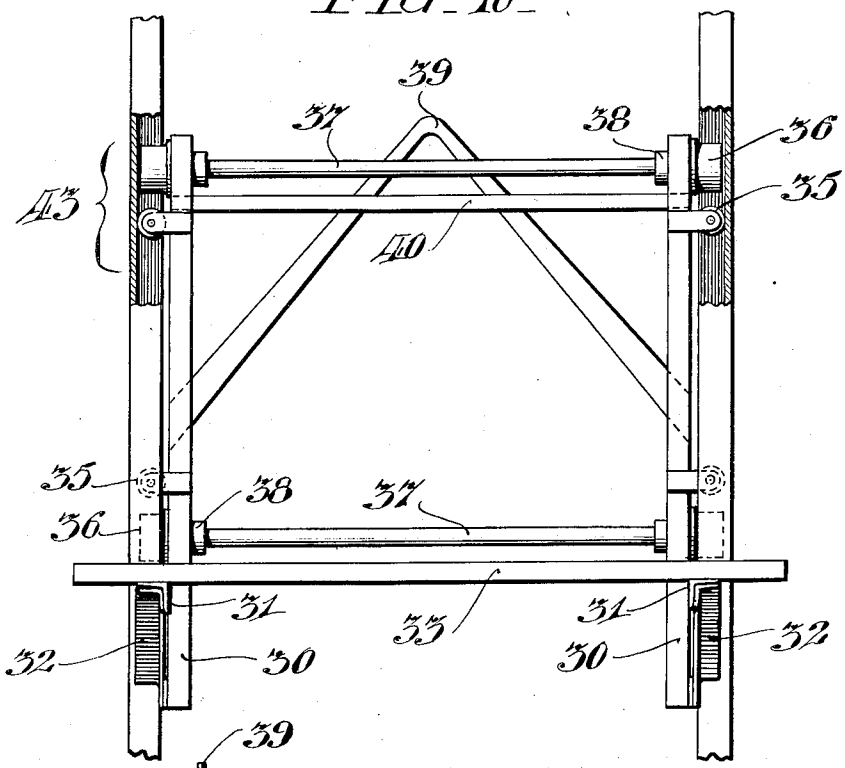
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FIG. 10.



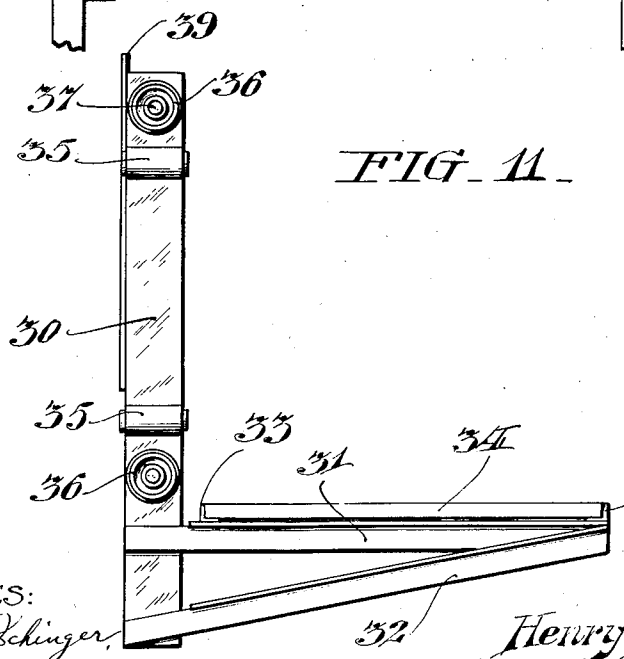


FIG. 11.

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PORTABLE ELEVATOR

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FIG. 12.

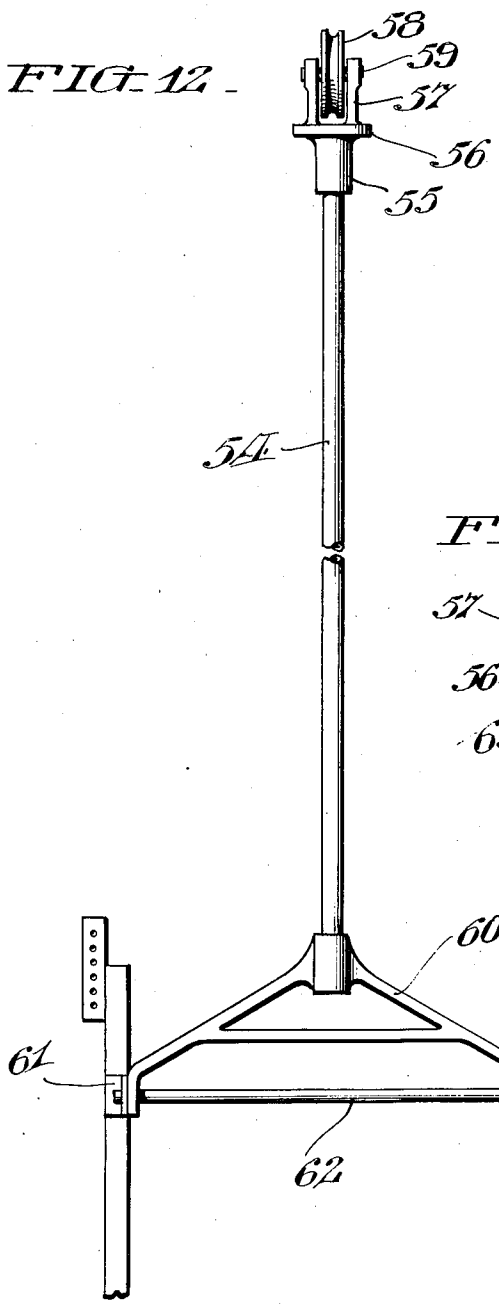


FIG. 14.

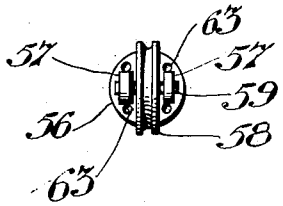
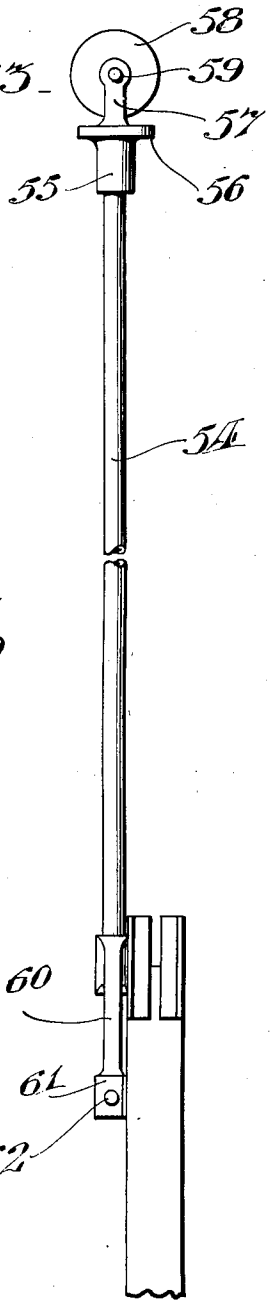


FIG. 15.



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PORTABLE ELEVATOR

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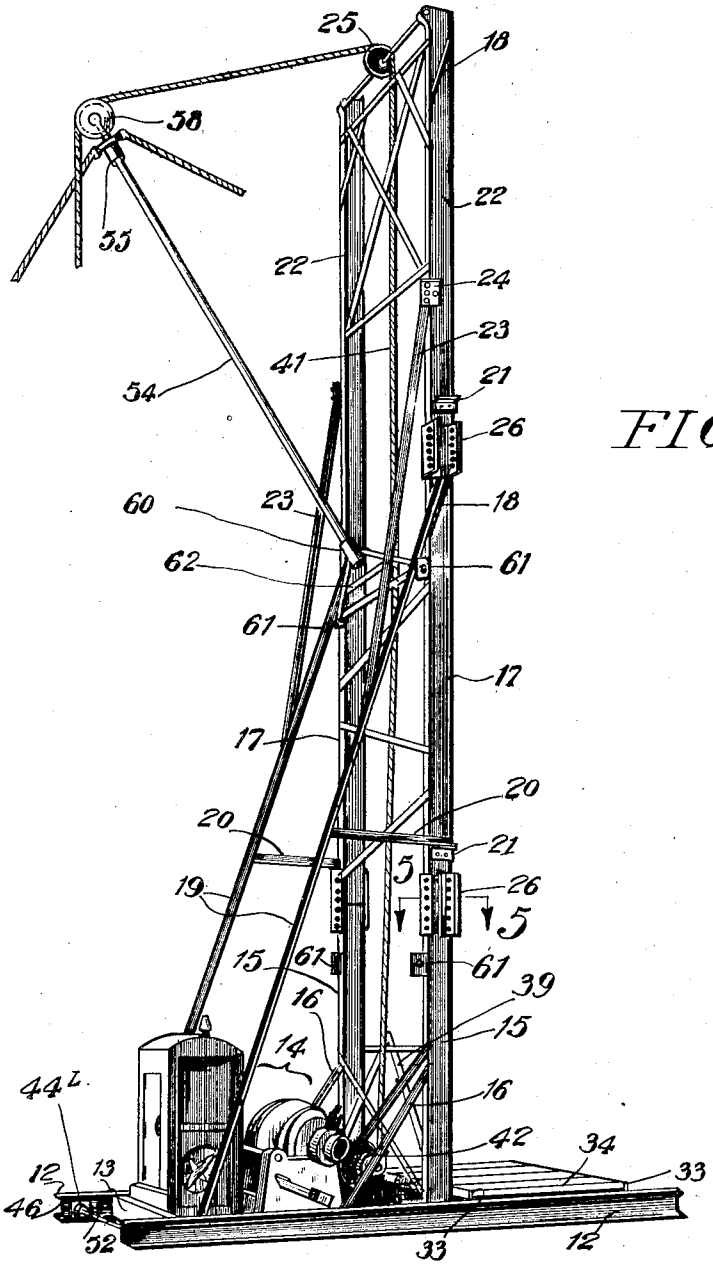


FIG 15

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Patented Feb. 7, 1928. 1,658,042

UNITED STATES PATENT OFFICE.

HENRY DRUSCHEL, OF COLUMBIA, PENNSYLVANIA.

PORTABLE ELEVATOR.

Application filed September 20, 1926. Serial No. 136,490.

My invention relates to elevators and more particularly to portable elevators used in building construction.

Under the present practice of hoisting building material, it is customary to build elevator runways to the wall of the building or to secure them to the floor beams in the interior of the building, and increasing the height of the elevators as the building progresses. This method has many disadvantages as the elevator runways often obstruct certain operations and usually must be so located that the materials must be carried considerable distances after being elevated.

It is seldom that the elevators can be so arranged as to deliver material directly to the scaffolds on which the workmen stand when placing the material. In making alterations and repairs to the outside of a building, it is often impossible to secure elevator runways to the building, thus making it necessary to raise the material by hand.

One of the objects of my invention is to provide an elevator which may be readily moved from place to place and be demountable for loading on cars or vehicles.

Another object is to provide a self-supporting portable elevator which will deliver material to considerable heights without being tied to the building and so designed that the material may be delivered directly to the scaffolds if so desired.

A further object is to provide a portable elevator having sectional runways which may be extended to any desired height by inserting extra sections.

A still further object is to provide a portable elevator, the base of which normally rests upon the ground, with rollers so attached to the base that they may be moved into position to support the elevator and on which the elevator may be moved.

These objects, and other advantageous ends which will be described hereinafter, I attain in the following manner, reference being had to the accompanying drawings in which—

Figure 1 is a perspective view of a preferred embodiment of my invention,

Figure 2 a perspective view of an extra runway section,

Figure 3 a fragmentary view of one of the runway sides, showing the preferred form of splice plate,

Figure 4 another fragmentary view of one of the runway sides, showing the preferred form of splice angle, and

Figure 5 a sectional view, taken on line 5—5 of Figure 1, showing the method of splicing the runways by means of the splice plates shown in Figure 3 and the splice angles shown in Figure 4.

Figure 6 is a plan view of the base, the hoisting machinery having been omitted for the sake of simplicity, and

Figure 7 an end view of the base shown in Figure 6.

Figure 8 is a view, taken on line 8—8 of Figure 6, showing the roller in a raised position, and

Figure 9 a similar view, showing the roller in a lowered position.

Figure 10 is a front elevation of the elevator carriage, and

Figure 11 a side view of the same.

Figure 12 is a rear view, Figure 13 a side view, and Figure 14 a top plan view of an auxiliary hoist; this part has been omitted from Figure 1 for the sake of simplicity.

Figure 15 is a view similar to Figure 1 but showing the addition of an auxiliary hoist.

Referring now more particularly to Figures 1 to 7, 12 represents channels forming the sides of the base, 13 represents cross or tie channels and 14 a hoisting unit, which will not be described as any suitable type may be employed.

Lower runway channels 15 are rigidly secured at right angles to the base channels 12, braced by diagonals 16 and held in proper relation to one another by suitable transverse bracing. In practice, I prefer to rigidly unite these parts, as by welding, but they may be bolted together so as to be demountable.

Abutting the upper ends of the channels 15, is an intermediate runway section having a pair of channels 17, near the tops of which clip angles 18 are rigidly secured. Diagonals 19 have one end bolted to the clip angles 18 and the other end to the base channels 12. Struts 20 have one end connected near the centers of diagonals 19 and the other end to clip angles 21 rigidly secured near the bottom ends of channels 17. Suitable bracing is secured to the rear flanges of channels 17.

The top runway section includes two side

channels 22 abutting the tops of intermediate channels 17 and having suitable bracing secured to their rear flanges. Clip angles 18 and 21 are secured to the channels in positions corresponding to those occupied by similar clips 18 and 21 on channels 17. Diagonal braces 23 are secured at one end to the diagonals 19 and the other end to clip angles 24 secured near the centers of the channels 22. A pulley 25 is rotatably mounted in the top of the upper section midway between the channels.

Splice plates 26, having a series of holes 27, are rigidly secured to the flanges at the bottom end of the upper and intermediate runway channels and splice angles 28, having a series of holes 29, are rigidly secured to the outside of the webs at the upper ends of the lower and intermediate runway channels, as plainly shown in Figures 3 and 4. When the upper and lower channels are aligned with their ends abutting, holes 27 will align with holes 29, and bolts may be passed through these holes to hold the runway sections in proper alignment, as shown in Figure 5.

All permanent connections in the elevator structure are preferably welded, particularly all connections made to the runway channels in order to provide free and smooth tracks on the inside of the channels for the elevator carriage.

I have illustrated the elevator runways as consisting of three sections. However, should this height be unnecessary, the intermediate section and braces 23 may be removed and the top section spliced on the lower section. In this case, the upper ends of diagonals 19 and struts 20 will engage with the clips 18 and 21 secured to the upper channels.

Should a lift to a greater height be necessary, as many additional intermediate sections as is expedient may be inserted. When assembled as illustrated and placed on firm ground, the elevator is entirely self supporting but, when the runways are extended to a considerable height, it is advisable to tie the top of the elevator to the building to prevent swaying.

Referring now more particularly to Figures 10 and 11, 30 represents the carriage side channels which are preferably one inch narrower than the runway channels. Platform supports 31 are secured near the lower end of channels 30 and extend at right angles thereto. Platform braces 32 have one end secured to the outer end of support 31 and the other end to the lower end of channel 30. A stringer 33 is secured to, and extends beyond, the tops of supports 31 at their outer ends and another stringer 33 is similarly placed near the front side of channels 30. The stringers 33 are preferably made of angles and flooring 34 is placed between them.

Rollers 35 are rotatably mounted on the channels 30 with their faces parallel to, but spaced from, the backs of the channels and are adapted to abut the inner webs of the runway channels. Rollers 36, the faces of which are adapted to abut the inside of the flanges on the runway channels, are suitably mounted on axles 37 which extend through both channels 30 and, on the inner side of each channel, a stop collar 38 is provided on each axle.

A V-shaped bail 39 has its ends secured to the channels 30 and is further supported by being connected to a strut 40 which has each end connected to a channel 30.

The carriage is raised and lowered by means of a rope 41 which is connected to the apex of the bail 39, led up over the pulley 25, then downward and under deflector sheave 42 to the drum of the hoisting unit. The carriage rides easily in the runway channels, being held against excessive lateral movement by the rollers 35 and against excessive longitudinal movement by the rollers 36, as shown at 43 in Figure 10 where the runway channels have been broken away in order to more plainly show the action of the rollers. The platform of the carriage, which is of cantilever construction, is held in a level position by means of the rollers 36 bearing against the flanges of the runway channels.

Referring now more particularly to Figures 6, 7, 8 and 9, a bearing 44 is bolted to one end of each base channel 12 and a bearing 44^L, which is opposite hand to bearing 44, bolted to the other end. Axles 45 extend between each pair of bearings having an end mounted in each and carrying rollers 46 adjacent the bearing.

Referring to Figure 8, each bearing 44 is secured to the channel by bolts 47, 48 and 49 passing through correspondingly numbered holes in the bearing and channel. Extra holes 50 and 51 are provided in the channel at 45° from the vertical passing through hole 47 and at the same distance from hole 47 as are the other holes. Hole 50 is shown, but hole 51 is hidden by the axle and roller. A stop 52, having an inclined face, is secured to the channels adjacent each bearing.

When it is desired to roll the elevator to a new location, bolts 48 and 49 are removed, the nut on 47 slightly loosened and the bearing rotated 45° on the bolt 47 by means of a lever inserted in a recess 53 formed in the edge of the bearing. This will bring one edge of the bearing against the inclined face of stop 52 and holes 48 and 49 in the bearing in alignment respectively with holes 50 and 51 in the channel, as shown in Figure 9. The bolts are then inserted in these holes and tightened. As illustrated in Figure 9, this movement brings roller 46 below the channels 12 and consequently raises the elevator.

Referring now to Figures 12, 13 and 14 which illustrate one form of a device for lifting the runway sections into place, 54 represents a pole or mast which is preferably tubular and on the upper end of which is rigidly secured a crown casting 55 having a flange 56 and upstanding arms 57 between which a pulley 58 is rotatably mounted on a shaft 59. A bottom casting 60, which is of lesser width than the distance between the runway channels, is rigidly secured to the lower end of the mast. Bearing angles 61 are rigidly secured to the rear flanges of channels 15 and 17 (see Figures 1 and 15) and are each provided with a pin hole adapted to align with a similar hole in each arm of casting 60.

After the base section of the elevator has been placed in the desired location, the bottom casting is placed between the bearing angles 61 with the holes of each in alignment and a pin 62 slipped through the holes. The mast is then raised until it is approximately vertical and secured in this position by means of ropes suitably connected to holes 63 in crown casting 55. The other end of each rope may be secured to an outer end of a base channel 12 or to any other suitable support.

The runway sections are then raised by passing rope 41 over pulley 58 and securing its end above the center of gravity of the runway section. I prefer to use a mast of sufficient length to raise two sections at the same time but any convenient length may be used. Should it be desired to extend the runway to a greater height than that illustrated in Figure 1, the mast is raised and supported by the angles 61 on the upper channels 17.

After the runway is erected, I prefer to lower the mast by means of rope 41 which has been passed over pulley 25, although the mast is preferably light enough to be readily handled by hand. The elevator is dismantled by raising the mast into position by means of rope 41 and reversing the above described process.

When some of the material to be raised is so long that it cannot be accommodated on the platform, the mast may be mounted on the upper channels 17 and inclined rearwardly until the pulley 58 is over a point beyond the rear end of the elevator base and a rope passed over the pulley and connected to the hoisting unit. If the load to be lifted is relatively light, rope 41 may be passed over pulleys 25 and 58, as shown in Figure 15, and other ways of running the hoisting line will readily suggest themselves to those familiar with hoisting machinery.

While I have described my invention as taking a particular form, it will be understood that the various parts may be changed without departing from the spirit thereof, and hence I do not limit myself to the precise construction set forth, but consider that I am at liberty to make such changes and alterations as fairly come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A portable elevator including a base, a demountable channel runway extending vertically from the base, a carriage slidably mounted in the runway and extending from one side thereof, rollers on the carriage engaging the webs and flanges of the channel runway, and means to raise and lower the carriage.

2. A portable elevator including a base, a hoisting unit mounted on the base, a demountable channel runway extending vertically from the base, a carriage slidably mounted in the runway and extending from one side thereof, rollers on the carriage engaging the webs and flanges of the channel runway, and means to raise and lower the carriage.

3. A portable elevator including a base, rollers on the base, means to raise and lower the rollers, a demountable channel runway extending vertically from the base, a carriage slidably mounted in the runway and extending from one side thereof, rollers on the carriage engaging the webs and flanges of the channel runway, and means to raise and lower the carriage.

4. A portable elevator including a base, a demountable channel runway having interchangeable sections extending vertically from the base, a carriage slidably mounted in the runway and extending from one side thereof, rollers on the carriage engaging the webs and flanges of the channel runway, and means to raise and lower the carriage.

5. A portable elevator including a base, a hoisting unit mounted on the base, rollers on the base, means to raise and lower the rollers, a demountable channel runway having interchangeable sections extending vertically from the base, a carriage slidably mounted in the runway and extending from one side thereof, rollers on the carriage engaging the webs and flanges of the channel runway, and means to raise and lower the carriage.

6. A portable elevator including a base; a demountable carriage runway extending vertically from the base and having side members spliced to one another by means of apertured splice angles welded to the outside of one side member and apertured splice plates welded to the flanges of the adjoining side member, whereby the inner faces of the runway will be free of obstructions or depressions, and the apertures in the splice plates designed to align with the apertures in the splice angles when the splice is made; a car-

riage slidably mounted in the runway and extending from one side thereof, and means to raise and lower the carriage.

7. A portable elevator including a base having side members; apertured bearings secured to the ends of the side members by securing bolts and a pivot bolt; axles mounted in the bearings and rollers mounted on the axles; the base side members having additional apertures so spaced that, when the bearings are turned on the pivot bolt, the securing bolts may be passed through them to secure the bearing in the new position; a hoisting unit mounted on the base; a demountable carriage runway extending vertically from the base; a carriage slidably mounted in the runway and extending from one side thereof, and means to raise and lower the carriage.

8. A portable elevator including a base, a demountable carriage runway extending vertically from the base, a carriage slidably mounted in the runway and extending from one side thereof, means to raise and lower the carriage, and hoisting means hinged to the runway and adapted to coact with the carriage raising means for erecting said runway.

9. A portable elevator including a base, a hoisting unit mounted on the base, a demountable carriage runway extending vertically from the base, a carriage slidably mounted in the runway and extending from one side thereof, means to raise and lower the carriage, and an auxiliary hoist removably secured to the carriage runway.

10. A portable elevator including a base, a hoisting unit mounted on the base, rollers on the base, means to raise and lower the rollers, a demountable carriage runway having interchangeable sections extending vertically from the base, a carriage slidably mounted in the runway and extending from one side thereof, means to raise and lower the carriage, and an auxiliary hoist removably secured to the carriage runway.

In testimony whereof I have signed my name to this specification.

HENRY DRUSCHEL.