Aug. 8, 1961 J. P. BERGER 2,995,236

LUMBER ELEVATOR

Filed Nov. 14, 1957 3 Sheets-Sheet 1

Fig. 1.

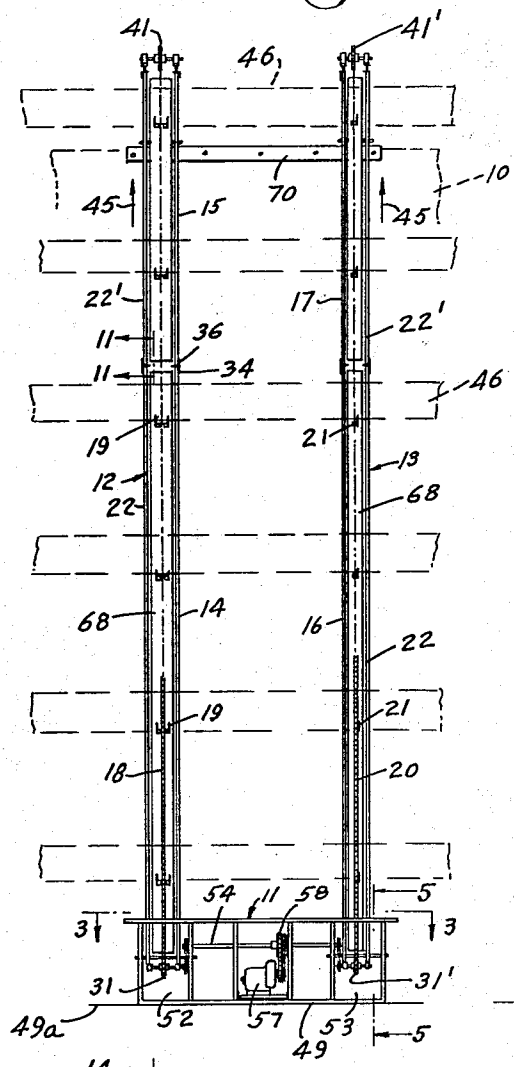
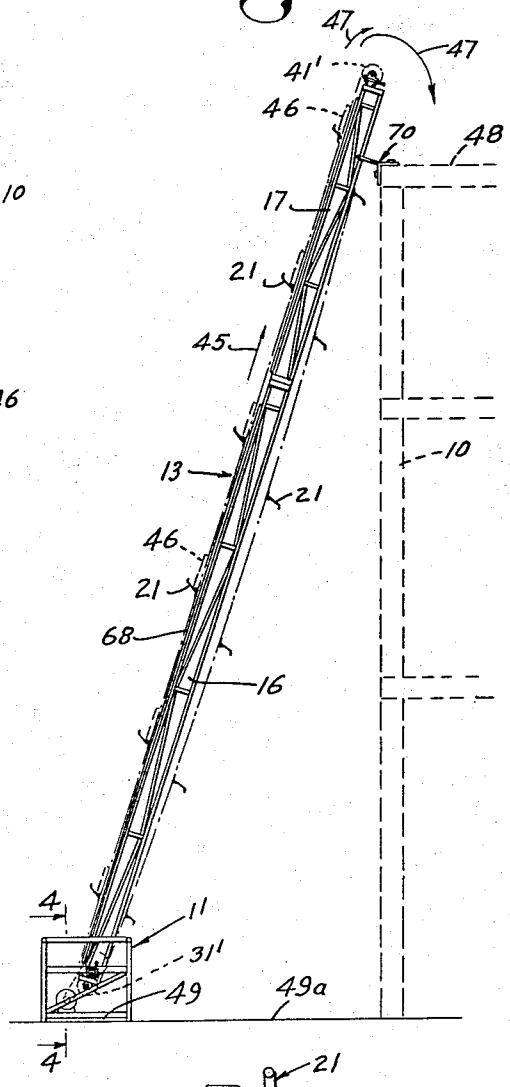


Fig. 2.



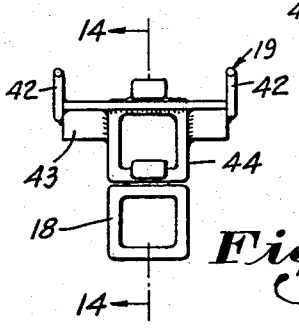


Fig. 13.

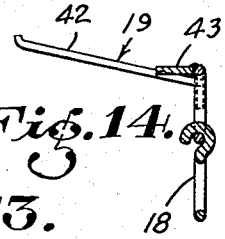


Fig. 14.

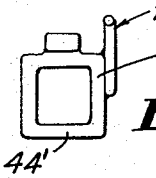


Fig. 15.

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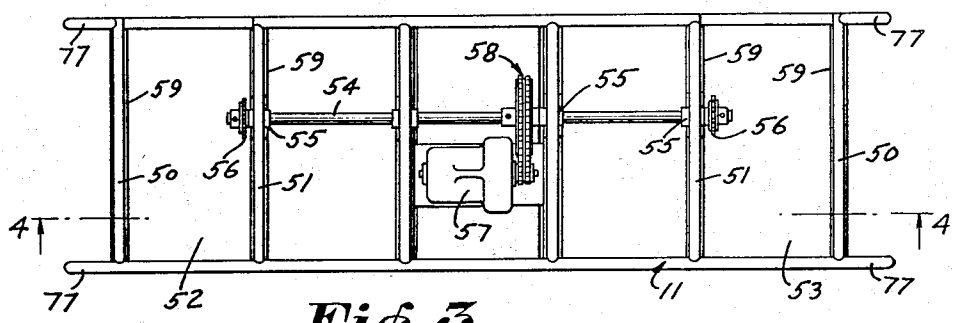

Fig. 3.

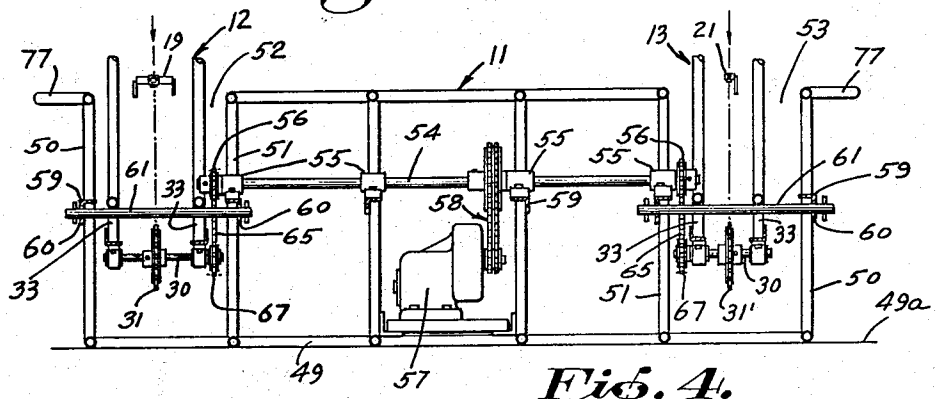

Fig. 4.

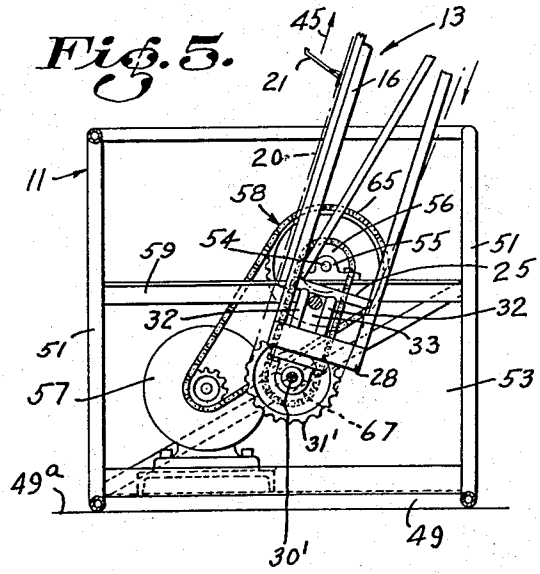

Fig. 5.

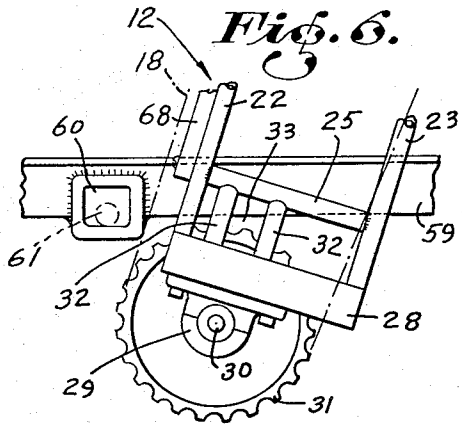

Fig. 6.

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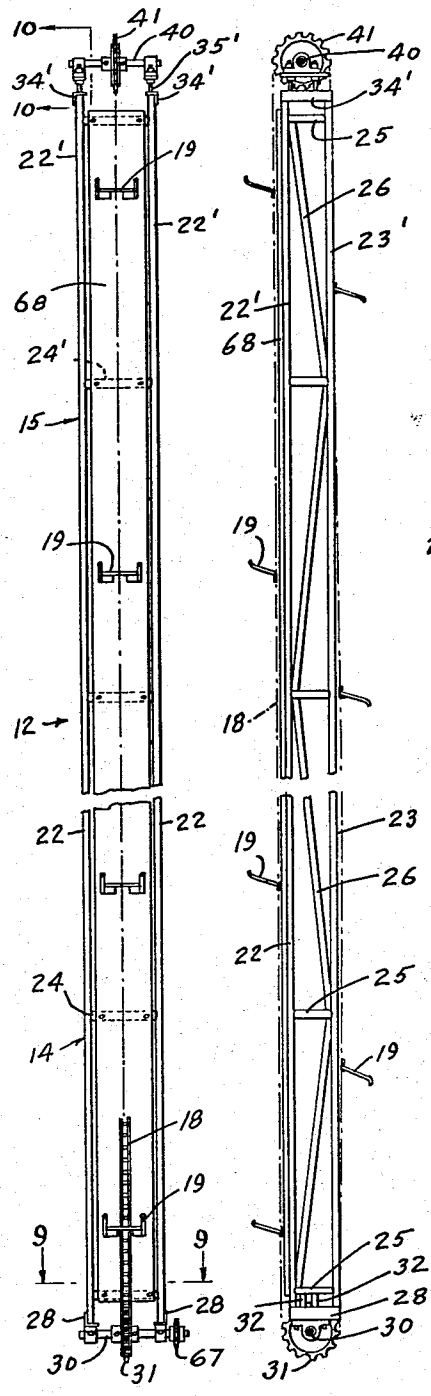

Fig. 7. Fig. 8.

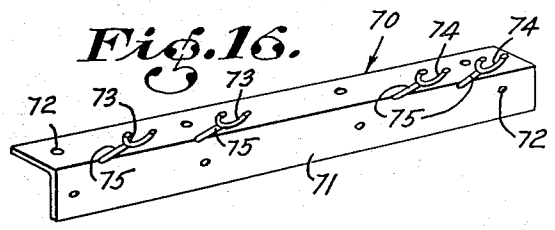

Fig. 16.

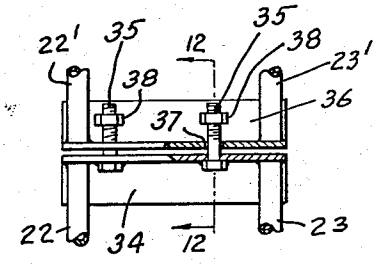

Fig. 11.

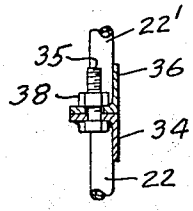

Fig. 12.

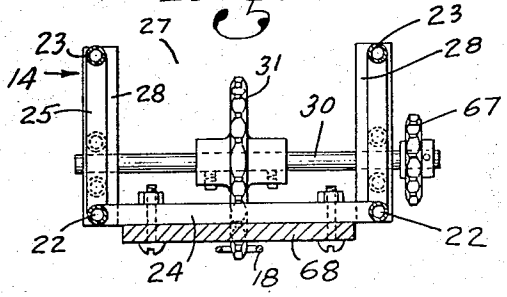

Fig. 9.

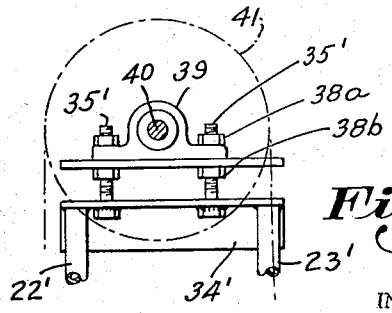

Fig. 10.

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LUMBER ELEVATOR

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5 Claims. (Cl. 198—154)

This invention relates to a device for use during building operations for moving lumber and equipment from ground level to the roof or upper floor levels of a structure. In the erection of structures it is a practice to employ workmen to carry the components of the structure to the places where they are needed. In single story construction, for example, a residence, this practice is followed without great difficulty, but where the material, such as heavy pieces of lumber, are to be transported to the roof or upper floors of a multistory structure, the problem of getting the building components to their desired locations is of importance because of the time and expense involved.

It is an object of the invention to provide a simple portable elevator which may be set up in a relatively small space adjacent a wall of a building and which will effectively carry lumber and other things to the upper levels.

It is an object of the invention to provide a lumber elevator having separate parts which may be transported readily on a truck and may be quickly assembled on location. The component parts of the invention may be readily handled, and therefore, may be assembled in operative condition on location without difficulty.

Further objects and advantages of the invention will be brought out in the following part of the specification wherein details are for the purpose of disclosure without limiting the scope of the invention which is defined by the appended claims.

Referring to the accompanying drawings which are for illustrative purposes only:

FIG. 1 is a schematic front elevation of a preferred form of the invention;

FIG. 2 is an elevational view corresponding to FIG. 1;

FIG. 3 is a plan view of the base of the elevator drawn to enlarged scale;

FIG. 4 is a sectional view of the base, to enlarged scale, taken as indicated by the line 4—4 of FIG. 2;

FIG. 5 is an enlarged sectional view taken as indicated by the line 5—5 of FIG. 1;

FIG. 6 is an enlarged fragmentary view showing the lower end of an elevator riser being moved into operative position in the base;

FIG. 7 is a face view, to enlarged scale, of one of the riser sections;

FIG. 8 is a side view corresponding to FIG. 7;

FIG. 9 is a section to enlarged scale taken as indicated by the line 9—9 of FIG. 7;

FIG. 10 is a sectional view, to enlarged scale taken as indicated by the line 10—10 of FIG. 7;

FIG. 11 is a fragmentary sectional view taken as indicated by the line 11—11 of FIG. 1, showing the joint between riser sections;

FIG. 12 is a sectional view taken as indicated by the line 12—12 of FIG. 11;

FIG. 13 is a face view to enlarged scale showing one of the elevator flights;

FIG. 14 is a sectional view taken as indicated by the line 14—14 of FIG. 13;

FIG. 15 is a face view to enlarged scale showing a chain link having a single flight thereon; and

FIG. 16 is a prospective view to enlarged scale showing the support for the upper ends of the elevator risers.

FIGS. 1 and 2 show the elevator set up adjacent a structure 10, having a height of several stories. It includes a base or power unit 11 constructed from metal tubes so that it may be readily loaded onto a truck with other elevator parts and transported to a location where its use is desired. The elevator includes risers 12 and 13 which extend upwardly from the base adjacent a side of the structure 10. The riser 12 comprises detachable sections 14 and 15 and the riser 13 comprises detachable sections 16 and 17. A chain 18 is operative on the riser 12 and is provided with spaced, double flights 19 made as shown in FIGS. 13 and 14, and a similar chain 20, operative on the riser 13 is provided with single flights 21 which are mounted on chain links, as shown in FIG. 15.

The risers 12 and 13 are similar in construction except that, as shown in FIG. 1, the riser 13 is narrower than the riser 12 so that the sections 16 and 17 of the riser 13 may be nested in the respective sections 14 and 15 of the riser 12 during transportation; therefore, a detailed description of the riser 12 will likewise make known the construction of the riser 13. As shown in FIGS. 1, 7, 8 and 9, the lower section 14 of the riser 12 comprises parallel front longitudinal members 22 and rear parallel longitudinal members 23. The longitudinal members 22 are connected by cross members 24, and the longitudinal members 23 are connected to the members 22 by transverse and diagonal members 25 and 26, the section 14 having, when viewed as shown in FIG. 9, the form of a channel open along the back 27. The lower extremities of the members 22 are connected to the lower extremities of the members 23 by angle plates 28 to which are attached bearings 29 supporting a shaft 30 which carries a sprocket 31 thereon, as also shown in FIGS. 5 and 6.

As shown in FIG. 6, each lowermost transverse member 25 is spaced a short distance above a plate 28, and bars 32 are extended between each plate 28 and the transverse member 25 adjacent thereto so as to define two aligned openings 33. As shown in FIGS. 1 and 11 the upper end of each longitudinal member 22 is connected to the upper end of a longitudinal member 23 lying adjacent thereto by an angle plate 34 having studs 35 extending upwardly therefrom.

The upper section 15 is of construction similar to that of the lower section 14 and the similar parts will be defined by similar numerals with prime marks added thereto. The longitudinal members 22′ thereof are connected to the parallel longitudinal members 23′ by transverse and diagonal members 25′ and 26′, and the longitudinal members 22′ are connected by cross members 24′. As shown in FIG. 11, the lower ends of the longitudinal members 22′ and 23′ are connected by angle plates 36 having therein openings 37 to receive the studs 35 after which the nuts 38, FIG. 11, may be applied to the studs 35 and then tightened, as shown in FIG. 12, so as to clamp the angle members 34 and 36 tightly together and connect the lower end of the upper section 15 to the upper end of the lower section 14. The upper end of each longitudinal member 22′ is connected to the upper end of the adjacent longitudinal member 23′ by an angle plate 34′ substantially identical to the plate 34 and having studs 35′ extending upwardly therefrom, as shown in FIG. 10, for supporting bearings 39 which carry a horizontal shaft 40 on which an upper sprocket 41 is mounted in alignment with the lower sprocket 31. The chain 18 is in the form of a loop and runs over the sprockets 31 and 41. To adjust the tension in the chain 18, the bearings 39 are adjustably supported on the studs 35′ by use of upper and lower adjusting nuts 38*a* and 38*b*, as shown in FIG. 10, positioned on the studs 35′ above and below the bearing members 39. As shown in FIGS. 1 and 2, the chain 20 is in the form of a loop and runs over similar lower and upper sprockets 31 and 41 specifically identified by the numerals 31′ and 41′.

As shown in FIGS. 13 and 14, the double flights **19** include spaced fingers **42** which are welded onto the ends of angles **43** which are in turn secured by welding to selected links **44** of the chain **18**. As shown in FIGS. 1, 2 and 15, the flights **21** comprise single fingers welded onto selected links **44'** of the chain **20**. During the operation of the elevator the front portions of the chains move upwardly as indicated by the arrows **45**. The flights **19** and **21** are horizontally aligned so that long pieces of building material, such as lengths of lumber **46** or the like, may be placed upon adjacent flights **19** and **21** which will carry them up and over the upper end of the elevator, as indicated by arrows **47** in FIG. 2 onto the roof or platform **48** of the structure **10**. Small articles, such as containers of nails, etc., may be transported onto the platform **48** by placing them upon the double flights **19**, the fingers **42** of which provide several points of contact with the article being lifted.

Referring now to FIGS. 1 to 5, the base **11** is of generally rectangular prismoidal form and is made from steel tubes welded together, the lowermost tubes providing a bottom **48** which may be rested upon a supporting surface **49** adjacent the structure **10**. At one end thereof, the base **11** has spaced supports **50** and **51** extending upwardly from the bottom **48**, these supports defining a recess or chamber **52**. At the opposite (right) end of the base **11** there are similar supports **50** and **51** defining a chamber or recess **53**. A longitudinal drive shaft **54** is supported by bearings **55** in the base **11**, this shaft **54** projecting into the recesses **52** and **53** and having on the ends thereof drive sprockets **56**. An electric motor **57** mounted within the base **11** drives the shaft **54** through a sprocket and chain transmission **58**.

As shown in FIGS. 4, 5 and 6, each support **50** and **51** includes a transverse angle **59** having intermediate its ends an eye **60**, these eyes **60** being aligned so as to receive riser supporting bars **61** which also pass through the aligned openings **33** in the lower ends of the risers **12** and **13**, as shown in FIGS. 4 and 5. After the risers **12** and **13** are assembled, with the chains **18** and **20** properly placed, the lower ends of the risers are moved into the recesses **52** and **53** and the openings **33** are brought into alignment with the eyes **60**. Fig. 6 shows the lower end of the riser **12** in one of the positions through which it passes during the process of installation. The lower end of the riser **12** is moved leftwardly from the position in which it is shown until the opening **33** is aligned with the eye **60** whereupon a supporting bar **61** is passed through the eyes and the openings, thereby pivotally supporting the lower end of the riser so that its upper end may be leaned toward the upper portion of the structure **10**. Drive chains **65** are then placed so as to connect the sprockets **56** with sprockets **57** which are mounted on the projecting ends of the shafts **30** and **30'** which are carried by the bearings at the lower ends of the risers **12** and **13** and which have the sprockets **31** and **31'** fixed thereon.

Slide members **58** comprising wood strips are secured to the cross members **24** of the riser sections **14**, **15**, **16** and **17**, the outer surfaces of which are lubricated so that the chains **18** and **20** will readily slide thereon. The upper ends of the risers **12** and **13** are supported, as shown in FIG. 2, in spaced relation to the upper part of the structure **10** so as to provide a clearance through which the lights **19** to **21** may move downwardly from the upper sprockets **41** and **41'**. For this purpose a support **70** is provided which includes a metal angle **71** having openings **72** therein through which nails may be driven to secure it to the structure **10**, and having spaced cradles **73** and **74**, arranged in pairs as shown in FIG. 16 to receive the upper portions of the longitudinal members **23'** of the risers **12** and **13**, these cradles **73** and **74** being secured to the ends of outstanding arms **75**, the inner ends of which are welded to the angle **71**.

The number of sections employed in the risers **12** and **13** depends upon the height to which materials are to be lifted. For example, the risers may be shortened by removing the upper sections **15** and **17** which is accomplished by removing the nuts **38** from the studs **35**, FIGS. 11 and 12. Then, the upper sprocket assemblies may be shifted down onto the upper ends of the lower sections **14** and **16**, at which time the studs **35** at the upper ends of the sections **14** and **16** are employed as supports for the bearings **39** which carry the upper shafts **40** and the upper sprockets **41** and **41'**. Under these new conditions of operation the chains **18** and **20** are suitably shortened. When removal of the elevator to a new location is desired a reversal of the erection procedure, described in the foregoing, is followed. Owing to the light weight thereof the component parts of the elevator may be readily placed upon a truck, handles **77** being provided at the ends of the base **11** to facilitate handling thereof.

I claim:

1. For use against a building a portable elevator for building materials or the like: a portable base including an engine, elongated drive shaft means rotationally driven by said engine, and a plurality of drive elements fixed on said drive shaft in spaced relation longitudinally of said drive shaft and driven by said drive shaft; a pair of risers adapted to be supported in spaced relationship by said portable base, each of said risers including a flexible loop element running from top to bottom, gear means on each of said risers around which said flexible loop element extends, and a driven gear connected to one of said gear means on each of said risers for driving said flexible loop element; separate means pivotally and detachably connecting each of said respective risers to said portable base so that said risers are independently pivotable and detachable; and drive means connections between said driven gear of each of said risers and one of said drive elements on said drive shaft.

2. For use against a building, a portable elevator for lumber or the like: a base; a motor on said base; a first riser on said base; a separately removable bar disposed in openings in said first riser aligned with openings in said base pivotally connecting said first riser to said base; a first driven shaft rotatably mounted on said first riser; a driving element fixed on said first driven shaft; a first flexible loop element mounted on said driving element on said first driven shaft and extending longitudinally of said first riser; a second riser on said base spaced transversely from said first riser; a separately removable bar disposed in openings in said second riser aligned with openings in said base pivotally connecting said second riser to said base; a second driven shaft rotatably mounted on said second riser; a driving element fixed on said second driven shaft; a second flexible loop element mounted on said driving element on said second driven shaft and extending longitudinally of said second riser; an elongated drive shaft on said base extending between said first riser and said second riser and rotationally driven by said motor; a first drive element fixed on said drive shaft; a second drive element fixed on said drive shaft in spaced relation longitudinally of said drive shaft to said first drive element; a first driven element fixed on said first driven shaft in spaced relation longitudinally of said first driven shaft to said driving element thereon and lying in substantially the same plane of said first drive element; a second driven element fixed on said second driven shaft in spaced relation longitudinally of said second driven shaft to said driving element thereon and lying in substantially the same plane as said second drive element; a first detachable transmission means rotationally connecting in definite relationship said first drive element and said first driven element; and a second detachable transmission means rotationally connecting in definite angular relationship said second drive element and said second driven element, whereby said first loop element and said second loop element are moved in unvarying horizontal alignment to each other and at the same speed.

3. In combination with a building being constructed, an elevator for lumber or the like: a base; a motor on said base; a first riser on said base; an independently and slidably removable bar pivotally and detachably connecting said first riser to said base; a second riser on said base spaced transversely from said first riser; an independently and slidably removable bar pivotally and detachably connecting said second riser to said base; an elongated drive shaft on said base extending between said first riser and said second riser and rotationally driven by said motor; a first drive sprocket wheel fixed on said drive shaft adjacent to said first riser; a second drive sprocket wheel fixed on said drive shaft adjacent to said second riser and in spaced relation longitudinally of said drive shaft to said first drive sprocket wheel; a first driven shaft rotatably mounted on said first riser with its axis substantially parallel to the axis of said drive shaft; a first driving sprocket wheel fixed on said first driven shaft; a first endless sprocket chain mounted on said first driving sprocket wheel engaging the teeth thereof and extending longitudinally of said first riser; a first driven sprocket wheel fixed on said first driven shaft in longitudinally spaced relation to said first driving sprocket wheel thereon and lying in the same plane as said first drive sprocket wheel and in a plane parallel to the plane of said first driving sprocket wheel; an endless sprocket chain extending between said first drive sprocket wheel and said first driven sprocket wheel and engaging the teeth of both thereof; a second driven shaft rotatably mounted on said second riser with its axis substantially parallel to the axis of said drive shaft; a second driving sprocket wheel fixed on said second driven shaft; a second endless chain mounted on said second driving sprocket wheel engaging the teeth

thereof and extending longitudinally of said second riser; a second driven sprocket wheel fixed on said second driven shaft in longitudinally spaced relation to said second driving sprocket wheel thereon and lying in the same plane as said second drive sprocket wheel and in a plane parallel to the plane of said second driving sprocket wheel; and an endless sprocket chain extending between said second drive sprocket wheel and said second driven sprocket wheel and engaging the teeth of both thereof, said risers being supported on said building adjacent their upper ends.

4. For use against a building, an elevator for lumber or the like having plural risers spaced from each other and mounted on a base which has a motor thereon driving conveyor loop elements extending lengthwise of each riser, the combination therewith of slidable bars pivotally and detachably connecting each of said respective risers to said base and detachable transmission means movably connecting each of said conveyor loop elements with said motor in definite relationship to the rotation of the drive shaft of said motor, said conveyor loop elements being in fixed horizontal alignment with each other.

5. The invention according to claim 4 including means adjacent the upper ends of said risers to engage with and support said risers on said building.

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