C. W. SPONSEL.

ELEVATING TRUCK.

APPLICATION FILED FEB. 21, 1921.

1,383,669.

Patented July 5, 1921.

3 SHEETS—SHEET 1.

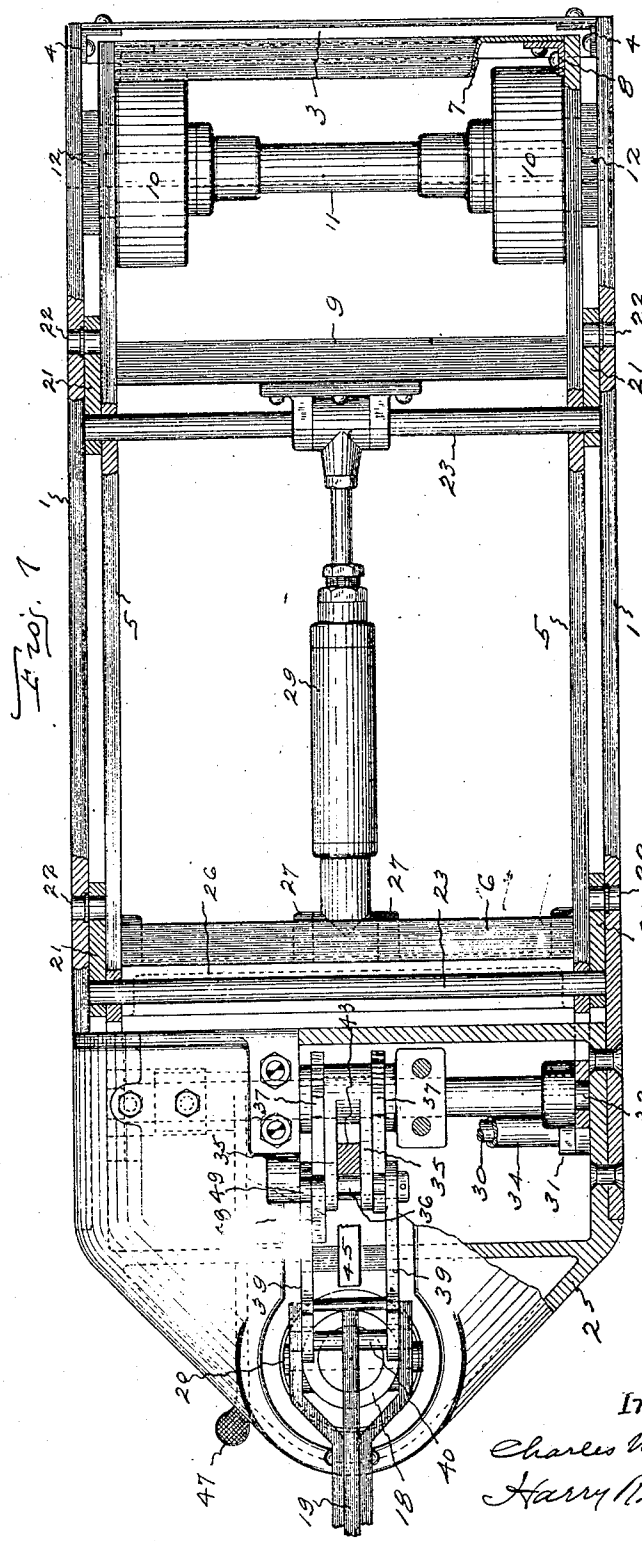


Fig. 1

Inventor.
Charles W. Sponsel by
Harry R. Williams
Atty.

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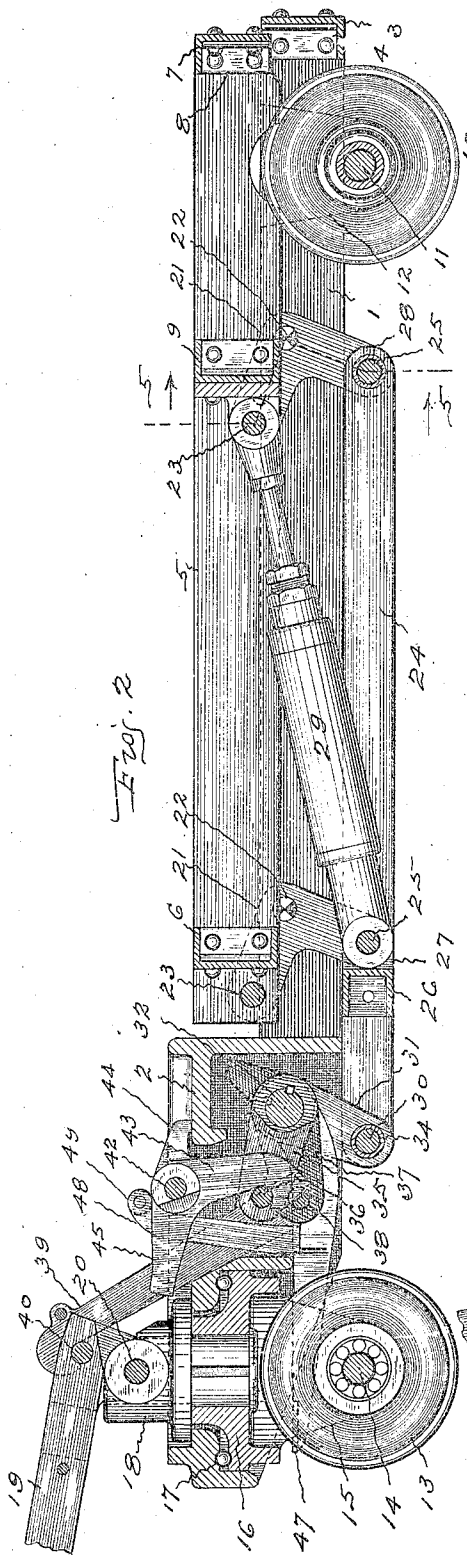


Fig. 2

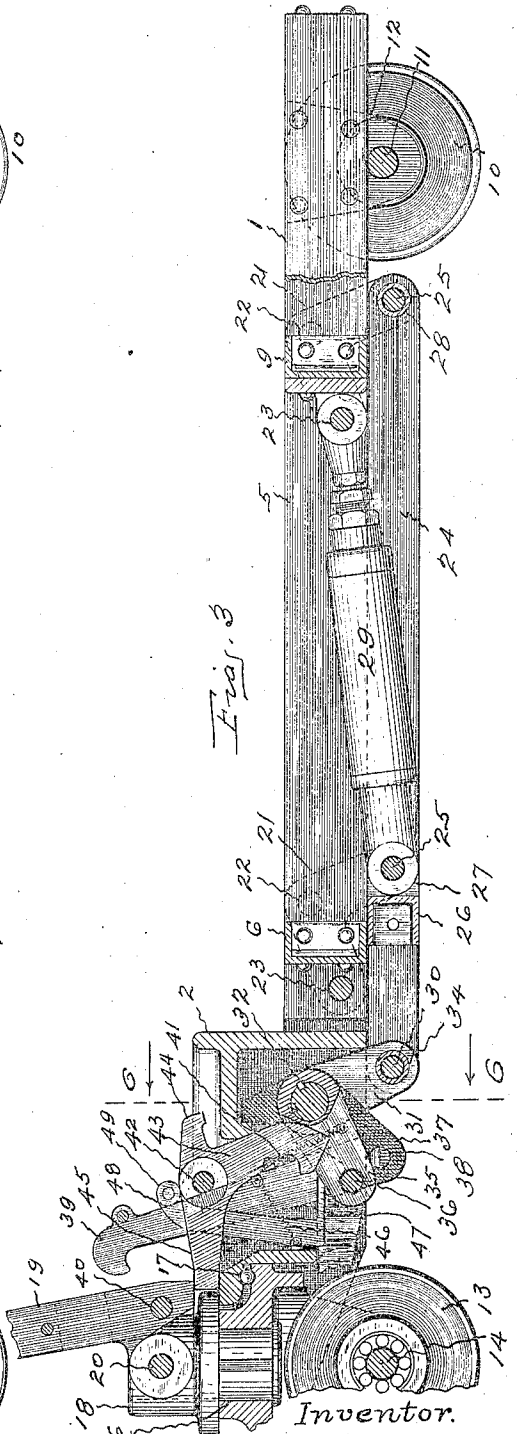


Fig. 3

Inventor.

Charles W. Sponsel by

Harry R. Williams

Atty.

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3 SHEETS—SHEET 3.

Fig. 4

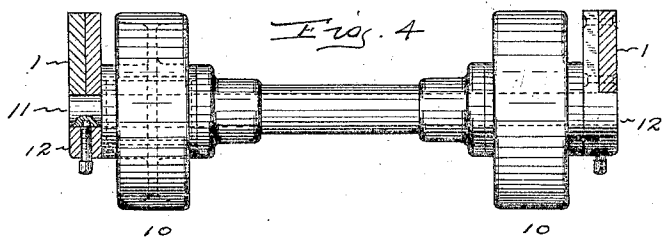


Fig. 5

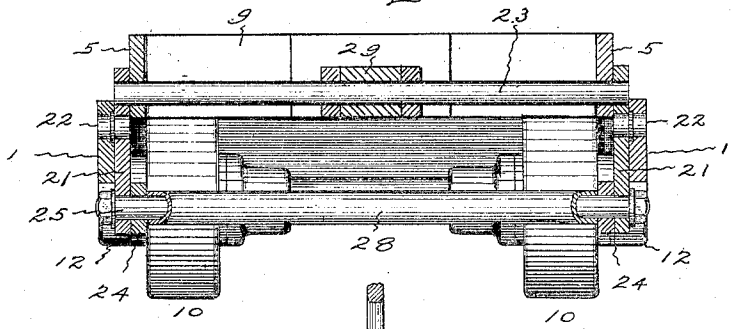
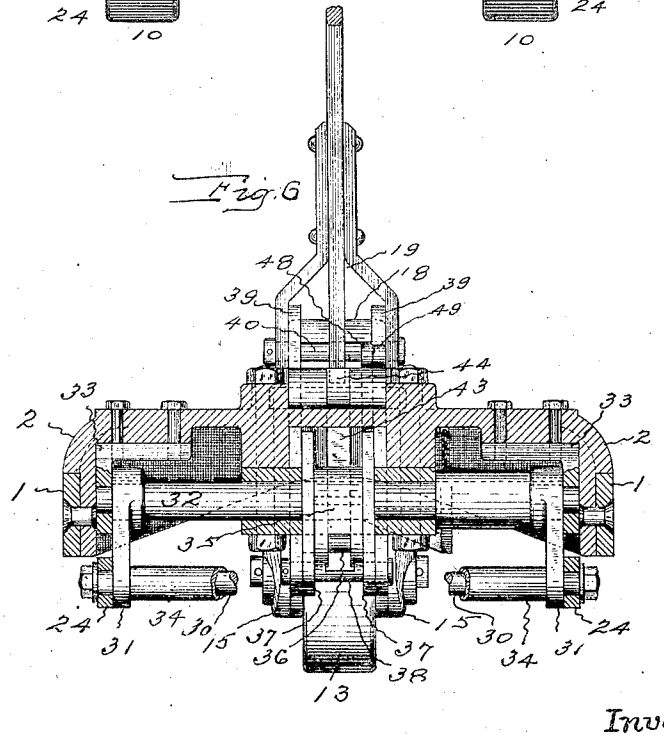


Fig. 6



Inventor.

Charles W. Sponsel by

Harry P. Williams

Atty.

UNITED STATES PATENT OFFICE.

CHARLES W. SPONSEL, OF WETHERSFIELD, CONNECTICUT.

ELEVATING-TRUCK.

1,383,669. Specification of Letters Patent. Patented July 5, 1921.

Application filed February 21, 1921. Serial No. 446,597.

To all whom it may concern:

Be it known that I, CHARLES W. SPONSEL, a citizen of the United States, residing at Wethersfield, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Elevating-Trucks, of which the following is a specification.

This invention relates to those trucks which are provided for use in manufacturing establishments where it is desired to transfer material from one locality to the other without handling each piece of material, the trucks being pushed under racks holding the material and elevated for lifting the racks with their loads from the floor, and after being drawn to the desired locality lowered for depositing the loaded racks.

The object of the invention is to provide a truck of this character which has relatively few parts, is cheap to build and strong and durable in use, and which is so designed that it can be manipulated for elevating and loading with less power than the trucks of this type in common use.

In the accompanying drawings, Figure 1 shows a plan of a truck, with parts cut in section, which embodies the invention. Fig. 2 is a longitudinal section of the truck with the parts in the positions occupied when the elevating frame is raised. Fig. 3 is a similar view with the parts in the positions occupied when the elevating frame is lowered. Fig. 4 shows the rear wheels and their bearings. Fig. 5 shows a section on the line 5—5 on Fig. 2. Fig. 6 shows a transverse vertical section through the head on the line 6—6 on Fig. 3 looking toward the front.

The body frame of the truck is formed of side plates 1 fastened at their front ends to the head casting 2 and connected at their rear ends by an angle iron 3 which is secured to the side plates by corner brackets 4. The elevator frame which sets inside of the body frame is formed of side plates 5 connected at their front ends by a channel iron 6 and at their rear ends by an angle iron 7, corner brackets 8 being used to fasten the parts together. The elevator frame plates are also connected by a channel iron 9. The body frame is supported at the rear end by a pair of wheels 10 which turn loosely on an axle 11 that is mounted at its ends in bearing brackets 12 fastened to the inside of the side plates of the body frame. At the front end the head is supported by a single wheel 13 on an axle 14 held in bearing brackets 15 that extend downward from a hub 16 which turns in an opening in the head, anti-friction bearings 17 being arranged between the hub and the head. Extending from and keyed to the hub is a post 18 to the upper end of which the forked end of the draft handle 19 is pivoted by a pin 20.

The elevator frame is supported within the body frame by four bell crank levers 21 that fit, two on each side, between the side plates of the frames. The bell crank levers are connected to the side plates of the body frame by pivot studs 22. The upper ends of the levers are connected to the side plates of the elevator frame by pivot rods 23 that extend across the elevator frame. The lower ends of the levers on each side are connected by bars 24 that extend below the elevator frame and which are pivotally attached to the levers by rods 25 that extend from side to side. These bars are connected near the front end by a channel iron 26 which at the middle has ears 27 through which front pivot rod 25 extends. On the rear pivot rod is a tubular sleeve 28 which is designed to keep the bars apart. A hydraulic releasing check 29 of common form is pivoted to the rod 25 that connects the lower ends of the front bell crank levers, and pivoted to the rod 23 that connects the upper ends of the rear bell crank levers.

The connecting bars 24 at their front ends are connected by a rod 30 and pivoted on this rod near each end are rocker arms 31 that are keyed upon a shaft 32 which extends across the head casing and is supported at its ends by angle brackets 33. The shaft 32, by reason of its intermediate position or location between the power applying mechanism, by which it is rocked, and the elevating mechanism to which it transmits the rocking movement, is termed the transmitting shaft. A tubular sleeve 34 is placed on the rod 30 to keep the rocker arms and ends of the connecting rods properly spaced. Keyed upon the shaft 32 near the middle of the head is a forked rocker arm 35, the ends of which are connected by a short pin 36. Loosely mounted on the shaft 32 at the sides of the forked rocker arm 35 are angle arms 37, the lower ends of which

are connected by a pin 38. On the outer ends of this pin 38 two hooked fingers 39 are pivoted. The upper ends of these hooked fingers are adapted to be engaged by a pin 40 that extends between the forked ends of the draft handle 19. A spring 41 normally tends to draw the hooked fingers backward away from the end of the draft handle. Pivotally mounted on an arbor 42 supported by the head at the middle is a hooked latch arm 43, projecting rearwardly from which is a stop lug 44, and projecting forwardly from which into the path of the end of the draft handle is a release lug 45. A spring 46 normally tends to draw the hooked end of the latch forward. A treadle 47 is loosely hung upon the shaft 32 and connected with the treadle is an upwardly extending finger 48 that at its upper end may have a roll 49 which is adapted to engage the back of one of the hooked fingers 39 when the treadle is depressed so as to force the hooked fingers forward.

The truck is drawn from place to place by the draft handle which normally is free from the operating mechanism. When it is desired to raise the elevator frame the handle is turned up and the hooked fingers 39 are by depressing the treadle engaged with the pin 40 carried by the end of the handle. The front end of the handle is then turned forward and down. This movement causes the pin 40 to draw up the fingers 39 which in turn lift the arms 37 so that at the pin 38 which these arms carry engages the arms 35 and causes them to turn the shaft 32. Turning the shaft in this manner swings the rocker arms and draws the connecting bars forward. This swings the bell crank levers so that they will lift the elevator frame from the position shown in Fig. 3 to the position shown in Fig. 2. When the elevator frame is fully lifted the pin 36 connecting the ends of the arms 35 is engaged by the hook of the latch 43 (Fig. 2) so that the parts will be held with the elevator raised. When the elevator is thus locked in its raised position the truck may be drawn and manipulated into any position without danger of the elevator becoming unfastened and dropping the load, the draft handle being free at this time for such purpose. When it is desired to lower the elevator the handle is turned upward to the position shown in Fig. 3, so that its lower end will engage the releasing lug 45 and depress the lug and cause the latch to turn back and release its hooked end from the pin 36. Then the elevator is free to lower itself under the influence of its load and as controlled by the hydraulic check.

In this truck the body frame and elevator frame are very rigid, the latter normally setting within the former. The bell crank levers are firmly supported between the two frames and are all connected with each other through the interposition of the connecting bars and cross rods so that they will operate in unison. The arrangement of bell crank levers is such that the whole structure is low and yet the leverage is so very powerful that heavy loads can be easily lifted by anyone capable of swinging the draft handle forward. It is a simple matter to connect and disconnect the draft handle from the operating mechanism and when released, although carrying a heavy load, the elevator lowers itself gently.

The invention claimed is:—

1. An elevating truck comprising a body frame, wheels supporting said frame, an elevator frame, bell crank levers fulcrumed to the body frame and having the upper limb of each pivoted to the elevator frame, bars connecting the lower limbs of the bell crank levers on each side, a transmitting shaft extending transversely of the body frame, rocker arms keyed on the transmitting shaft and jointed to the ends of said connecting bars, an arm keyed to the transmitting shaft, a latch pivotally mounted on the body frame and adapted to engage and hold said arm lifted, arms pivoted on the transmitting shaft and adapted to engage and lift the arm keyed to the transmitting shaft, fingers connected to said lifting arms, a steering wheel post mounted in the body frame, a draft handle pivoted to said post, means for engaging said fingers with the draft handle, and means for disconnecting said latch from the arm with which it is engaged.

2. An elevating truck comprising a body frame, wheels supporting said frame, an elevator frame, bell crank levers fulcrumed to the body frame and having the upper limb of each pivoted to the elevator frame, bars connecting the lower limbs of the bell crank levers on each side, a transmitting shaft extending transversely of the body frame, rocker arms keyed on the transmitting shaft and jointed to the ends of said connecting bars, an arm keyed to the transmitting shaft, a latch pivotally mounted on the body frame and adapted to engage and hold said arm lifted, arms pivoted on the transmitting shaft and adapted to engage and lift the arm keyed to the transmitting shaft, fingers connected to said lifting arms, a steering wheel post mounted in the body frame, a draft handle pivoted to said post, a treadle and arm for connecting said fingers with the draft handle, and means for disconnecting said latch from the arm with which it is engaged.

3. An elevating truck comprising a body frame, wheels supporting said frame, an elevator frame, bell crank levers fulcrumed to the body frame and having the upper limb of each pivoted to the elevator frame, bars connecting the lower limbs of the bell

crank levers on each side, a transmitting shaft extending transversely of the body frame, rocker arms keyed on the ends of the transmitting shaft and jointed to the ends of said connecting bars, a forked arm keyed to the transmitting shaft, a latch pivotally mounted on the body frame and adapted to engage and hold the forked arm lifted, arms pivoted on the transmitting shaft and adapted to engage and lift said forked arm, hooked fingers connected to said lifting arms, a steering wheel post swiveled in the body frame, a draft handle pivoted to said post, means for connecting said fingers with the draft handle, and means for disconnecting said latch from the forked arm.

4. An elevating truck comprising a body frame, wheels supporting said frame, an elevator frame, bell crank levers fulcrumed to the body frame and having the upper limb of each pivoted to the elevator frame, bars connecting the lower limbs of the bell crank levers on each side, a transmitting shaft extending transversely of the body frame, rocker arms keyed on the transmitting shaft, and jointed to the ends of said connecting bars, an arm keyed to the transmitting shaft, a latch pivotally mounted on the body frame and adapted to engage and hold said arm lifted, arms pivoted on the transmitting shaft and adapted to engage and lift the arm keyed to the transmitting shaft, fingers connected to said lifting arms, a steering wheel post mounted in the body frame, a draft handle pivoted to said post, and means for connecting said fingers with the draft handle, said handle having means for engaging and disconnecting said latch from the arm with which it is engaged.

5. An elevating truck comprising a body frame, wheels supporting said frame, an elevator frame, bell crank levers fulcrumed to the body frame and having the upper limb of each pivoted to the elevator frame, bars connecting the lower limbs of the bell crank levers on each side, a transmitting shaft extending transversely of the body frame, rocker arms keyed on the transmitting shaft, and jointed to the ends of said connecting bars, an arm keyed to the transmitting shaft, a latch pivotally mounted on the body frame and adapted to engage and hold said arm lifted, arms pivoted on the transmitting shaft and adapted to engage and lift the arm keyed to the transmitting shaft, fingers connected to said lifting arms, a steering wheel post mounted in the body frame, a draft handle pivoted to said post, a treadle and arm for connecting said fingers with the draft handle, and means extending from the handle for engaging and disconnecting said latch from the arm with which it is engaged.

6. An elevating truck comprising a body frame, an elevator frame within the body frame, bell crank levers located between said frames, said bell cranks being fulcrumed to the body frame and having their upper limbs pivoted to the elevator frame, a bar connecting the lower limbs of the bell cranks on each side, a transmitting shaft extending transversely of the body frame, rocker arms keyed on the transmitting shaft, and jointed to said bars, an arm keyed to the transmitting shaft, a latch pivotally mounted on the body frame and adapted to engage and hold said arm lifted, means adapted to engage and lift said arm, a steering wheel post swiveled in the body frame, a draft handle pivoted to said post, means for connecting the draft handle with said arm lifting means and means for disconnecting said latch from said arm.

7. An elevating truck comprising a body frame, an elevator frame within the body frame, bell crank levers located between said frames, said bell cranks being fulcrumed to the body frame and having their upper limbs pivoted to the elevator frame, a bar connecting the lower limbs of the bell cranks on each side, a transmitting shaft extending transversely of the body frame, rocker arms keyed on the transmitting shaft and jointed to said bars, an arm keyed to the transmitting shaft, a latch pivotally mounted on the body frame and adapted to engage and hold said arm lifted, means adapted to engage and lift said arm, a steering wheel post swiveled in the body frame, a draft handle pivoted to said post, means for connecting the draft handle with said arm lifting means, means for disconnecting said latch from said arm and a fluid check connected between the lower limbs of the front pair of bell cranks and the upper limbs of the rear pair of bell cranks.

8. An elevating truck comprising a body frame, wheels supporting said frame, an elevator frame within the body frame, bell crank levers located between said frames, said bell cranks being fulcrumed to the body frame and having their upper limbs pivoted to the elevator frame and their lower limbs connected by side bars, means for reciprocating said connecting bars and through the bell cranks raising the elevator frame, means for holding the said reciprocating means with the elevator frame raised, and a handle for operating said reciprocating means for lifting the elevator frame and for releasing said holding means.

CHARLES W. SPONSEL.