G. F. CHAPMAN.

ELEVATOR.

APPLICATION FILED SEPT. 3, 1913.

1,136,773.

Patented Apr. 20, 1915.

3 SHEETS—SHEET 1.

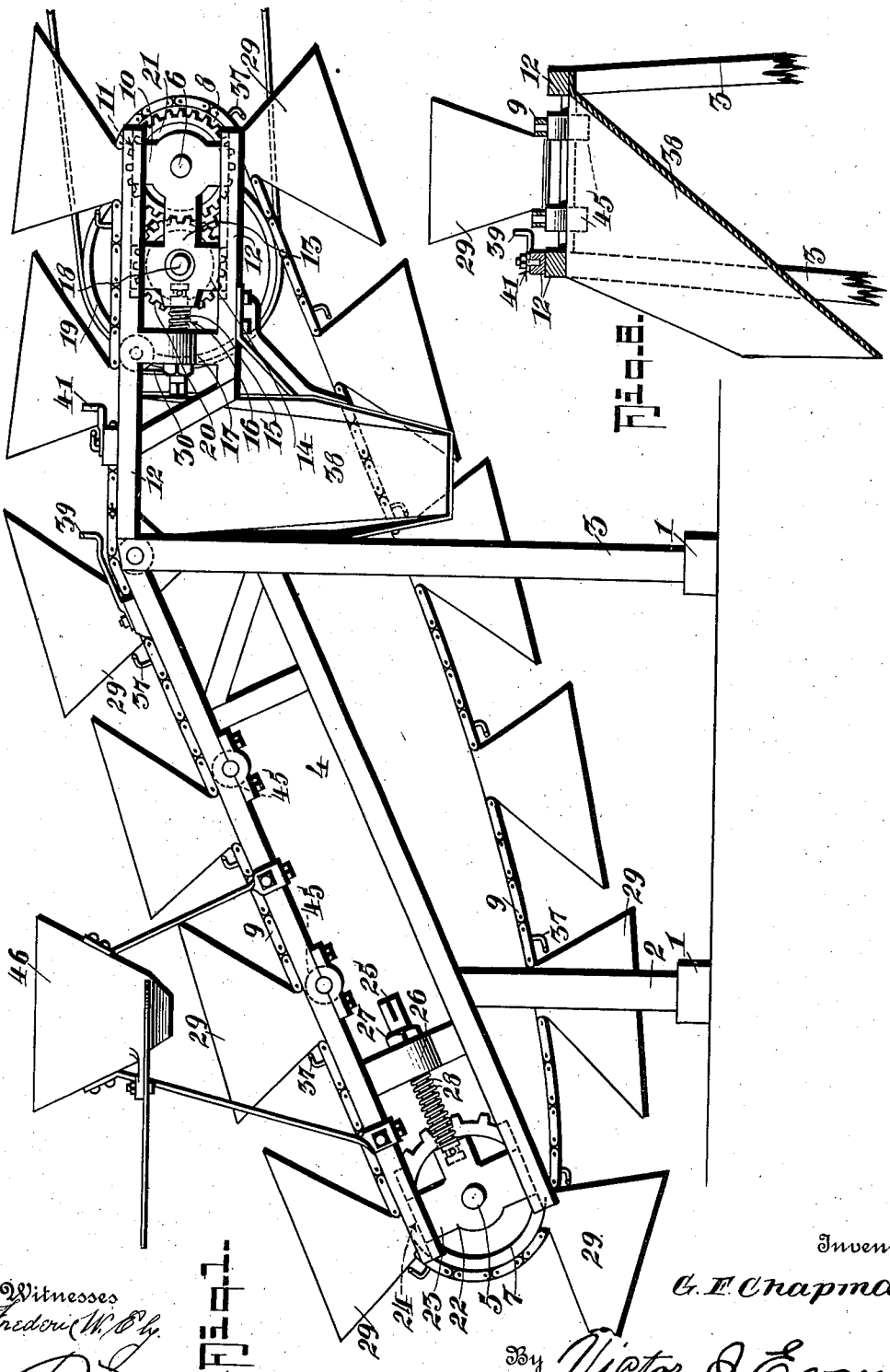


Fig. 1.

Fig. 8.

Witnesses
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3 SHEETS—SHEET 2.

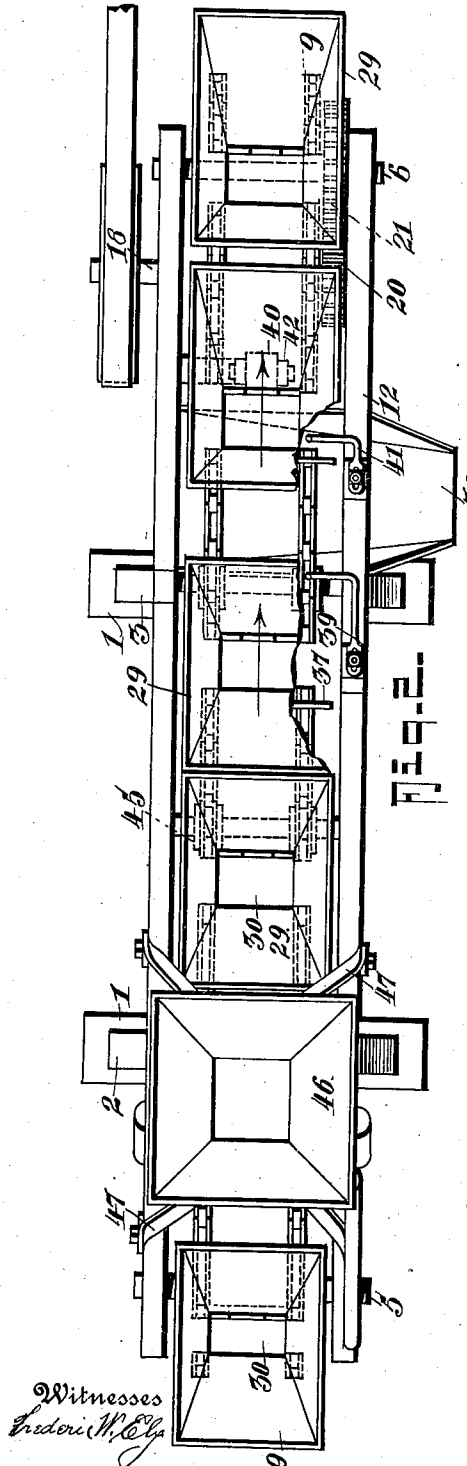


Fig. 2.

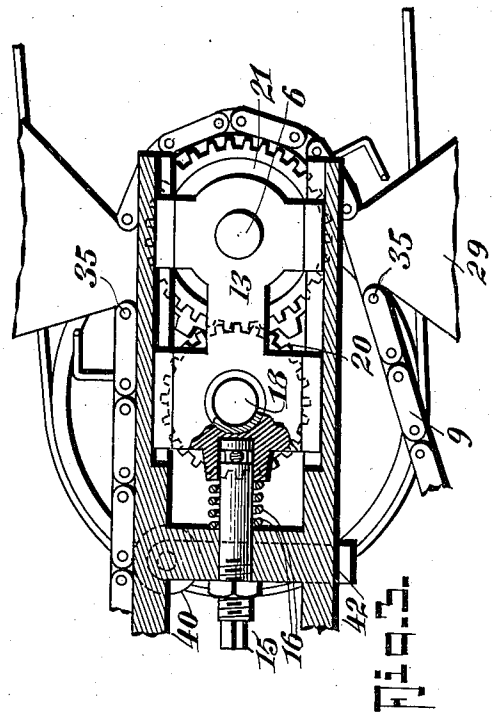


Fig. 3.

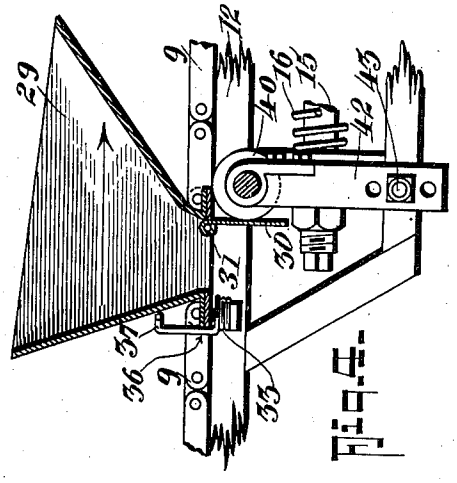


Fig. 4.

Witnesses

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3 SHEETS—SHEET 3.

Fig. 7.

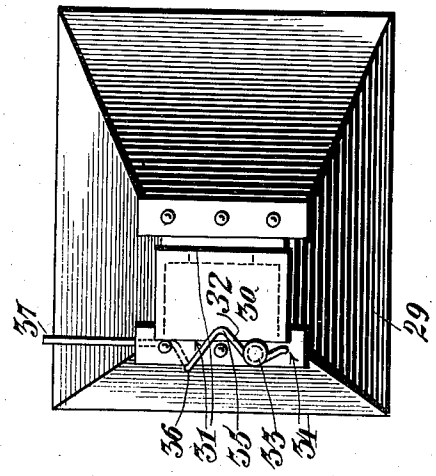


Fig. 5.

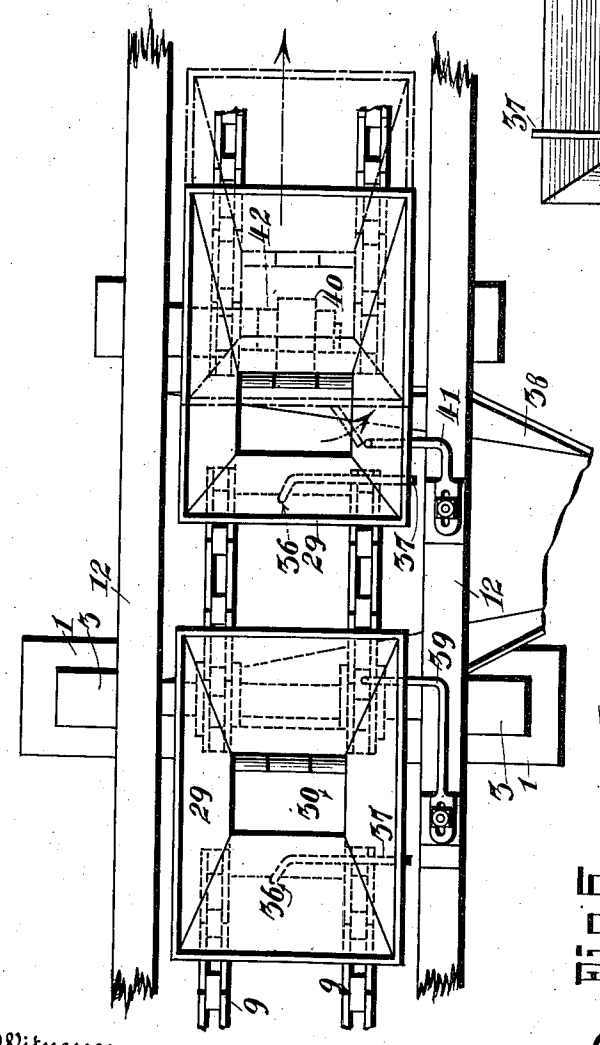
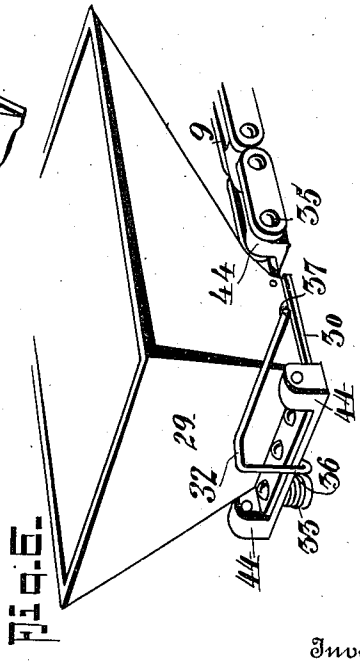


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

GUY F. CHAPMAN, OF BROOK, INDIANA.

ELEVATOR.

1,136,773. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed September 3, 1913. Serial No. 787,942.

To all whom it may concern:

Be it known that I, GUY F. CHAPMAN, a citizen of the United States, residing at Brook, in the county of Newton and State of Indiana, have invented new and useful Improvements in Elevators, of which the following is a specification.

This invention relates to elevators, the object in view being to produce a simple and reliable elevator for raising and dumping various materials such as grain, stone, gravel, coal, sand, clay, cement, plaster and the like, the elevator being adapted to handle such materials without spilling the same and without any possibility of the mechanism of the elevator becoming choked with such materials.

A further object of the invention is to provide in combination with an elevator embodying the endless series of buckets, novel means for unlatching and relatching, dumping and closing the doors of the buckets, whereby the material carried in the buckets may be dumped into a discharge spout connected with any desired point of delivery.

A further object of the invention is to provide a construction of elevator which will admit of the ready removal and replacement or renewal of any part thereof which may become broken, injured or damaged.

A further object of the invention is to produce a construction which will enable the elevator as a whole to be manufactured economically and placed on the market at a comparatively low price.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts, as will hereinafter be more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a side elevation of an elevator embodying the present invention. Fig. 2 is a plan view thereof. Fig. 3 is a detail vertical longitudinal section illustrating the chain tightening means. Fig. 4 is a similar view illustrating the door closing means. Fig. 5 is a fragmentary plan view showing a portion of the elevator. Fig. 6 is a detail perspective view of one of the buckets, showing also the latch. Fig. 7 is a bottom plan view of the same. Fig. 8 is a vertical cross section through the elevator taken adjacent to the discharge spout.

In the preferred embodiment of this invention the elevator comprises a supporting base 1 extending upward from which are posts 2 and 3 arranged in parallel pairs and supporting the inclined frame of the elevator proper.

The elevator frame embodies the substantially parallel open work or skeleton side bars 4 which are inclined at the desired angle as shown and at this point it may be noted that the upper end portions of the side bars are arranged at an angle to the lower portions thereof in order to enable the uppermost buckets to travel in a substantially horizontal plane during the dumping and door closing operations.

At one end of the inclined frame of the elevator is arranged a chain shaft 5, a similar shaft 6 being arranged at the opposite end of the elevator frame. On the shaft 5 are mounted parallel sprocket wheels 7, while corresponding sprocket wheels 8 are mounted on the shaft 6. Passing around the sprocket wheels 7 and 8 are parallel sprocket chains 9 to which the buckets hereinafter particularly described are attached and by which they are carried up and down the inclined frame of the elevator.

The shaft 6 is provided with oppositely extending lugs 10 which are adapted to slide or travel back and forth in grooves 11 in the inner faces of the parallel upper and lower portions 12 of the side bars of the elevator frame. Extending inward from the bearings of the shaft 6 are arms 13 connected to runners 14 which also travel in the grooves 11 referred to, each of the runners 14 being provided with a stem 15 around which is placed a coiled cushioning spring 16 interposed between the runners 14 and a shoulder formed by a portion 17 of the frame. The springs 16 serve to cushion the chain in its operation and provide for the smooth running of the chains over the sprocket wheel thereby avoiding sudden jars and vibrations which might otherwise be imparted to the buckets hereinafter described. A drive shaft 18 is journaled in the oppositely located runners 14 and has fast thereon a band pulley 19 adapted to be driven by a belt from any suitable motive power. On the opposite end of the shaft 18 is a spur gear wheel 20 which meshes with a corresponding gear wheel 21 fast on the adjacent end of the shaft 6, whereby motion is imparted to the shaft 6 and the

sprocket wheel carried thereby and consequently to the chains passing around said sprocket wheels.

The shaft 5 is mounted in slidable bearings 22 having oppositely extending lugs 23 which travel back and forth in grooves 24 in the adjacent end of the elevator frame, each of the bearings 22 being provided with a threaded guide bolt 25 which passes through a part 26 of the elevator frame, the outward movement of the bearings 22 being limited by nuts 27 on the bolts 25. Coiled tension springs 28 are placed around the bolts 25 and interposed between the part 26 of the frame and the bearings 22, said springs serving to keep the chains 9 taut. An endless series of buckets 29 is carried by the chain, each of said buckets being preferably in the form of a frustum of a pyramid, all of the sides of each bucket converging and sloping toward a door 30 which forms the bottom of the bucket when the latter is traveling along the top run of the chain. The door 30 is hinged to the bottom of the bucket along the advance edge as shown at 31 and is normally held closed by a spring latch 32 of peculiar construction. The latch 32 is formed of spring wire and is provided intermediate its ends with a spring coil 33, one end of the wire being extended away from said coil and fastened to the bottom of the bucket at 34. The other end of the wire is extended away from the coil and formed with a lip 35 which normally engages under the door 30 and holds the same closed. The wire of which the latch is formed is then bent laterally and upwardly to embrace the edge of the bucket and form a stop 36 for limiting the inward swinging movement of the latch. The latch is then extended outwardly to one side of the bucket to form an operating arm 37, the said arm of the latch being adapted to be tripped automatically by means to be described.

38 designates a discharge spout arranged under the top run of the chain and extending laterally to one side as shown in Fig. 8 so as to discharge at one side of the elevator frame. The top of the spout 38 is left open so that each of the buckets may dump its contents in the same after it arrives in line therewith and above the same.

At a point in advance of the spout 38, a trip arm 39 is mounted on the elevator frame, said arm having a hook, the extremity of which is adapted to engage the arm 37 of the latch as the bucket moves toward the spout 38, the said trip arm 39 being so located that it trips the latch and allows the door 30 of the bucket to fall just as the bucket arrives over the spout 38. As the bucket continues to move onward, the pendent bottom 30 thereof comes into contact with a door closing roller 40 and just before said roller has fully closed the door, the arm 37 of the latch comes into contact with another trip arm 41 which acts to again open the latch just as the door is being fully closed by the roller 40. As soon as the arm 37 snaps by the arm 41, the latch closes quickly and engages and supports the bottom door 30 of the bucket 29.

The roller 40 which operates to close the door is journaled in the upper end of a vertically adjustable post 42 fastened to the frame by one or more bolts 43 by the loosening of which the roller 40 may be adjusted up and down or toward and away from the path of movement of the door 30 when in its closed position, thus enabling the door to be closed sooner or later in accordance with the position of the latch tripping arm 41. It is also desirable to provide means for adjusting the trip arm 41 so that it will operate on the latch at the proper time to admit of the complete closing of the door 30 preparatory to resetting the latch.

Each of the buckets 29 is provided on the bottom thereof with lugs 44 to which the chains are connected.

The top run of the chain is supported at intervals by rollers 45 journaled on the inclined elevator frame and lying under the top runs of the sprocket chains as shown. These rollers prevent the top runs of the chains from sagging and permitting the buckets to tilt.

46 designates a filling hopper connected to the elevator frame by supporting legs 47, the material being discharged from said hopper into the buckets 29 as they successively pass beneath said hopper.

From the foregoing description it will be seen that the chain of buckets operates continuously, the buckets being carried beneath the hopper 46 and being successively filled. Upon reaching the discharge spout 38, the door of each bucket is unlatched and allowed to drop thus dumping the contents into the discharge spout 38. As the bucket thus moves onward, the door thereof is closed by the roller 40 but just before the door is completely closed, the latch is moved out of the way of the closing door and after the door has been completely closed the latch springs into engagement therewith and holds the door closed throughout the remainder of its travel, the bucket being then in readiness to receive another charge from the hopper 46. It will also be seen that the springs 16 and 28 serve to cushion the chains and automatically take up slack therein and that more or less tension may be imparted to the chains by the adjustment of the nuts 27. The entire operation of the elevator is automatic and on account of the manner in which the elevator as a whole is constructed, it will be apparent that the parts thereof may be readily disas-

sociated for repair or replacement with a minimum amount of labor and in a short period of time.

What I claim is:—

In an elevator of the class described, a bucket, a hinged drop door forming the bottom of said bucket, a door latch on said bucket consisting of a spring fastened at one end to the bucket and having its free end extended to form an arm projecting laterally and horizontally from one side of said bucket, and stationary devices coöperating with said latch arm operating automatically and successively to unlatch said door and reset the latch thereof.

In testimony whereof I affix my signature in presence of two witnesses.

GUY F. CHAPMAN.

Witnesses:
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EMANUEL M. BUFF.