(No Model.) 4 Sheets—Sheet 1.

A. E. BAXTER & A. G. MATHER.

CONVEYER.

No. 511,315. Patented Dec. 19, 1893.

Fig. 1.

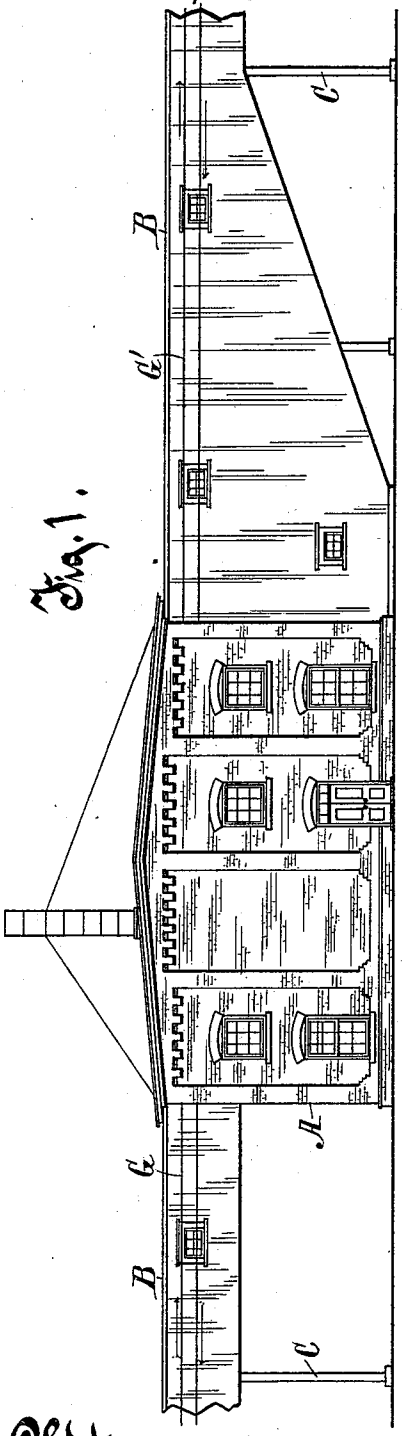
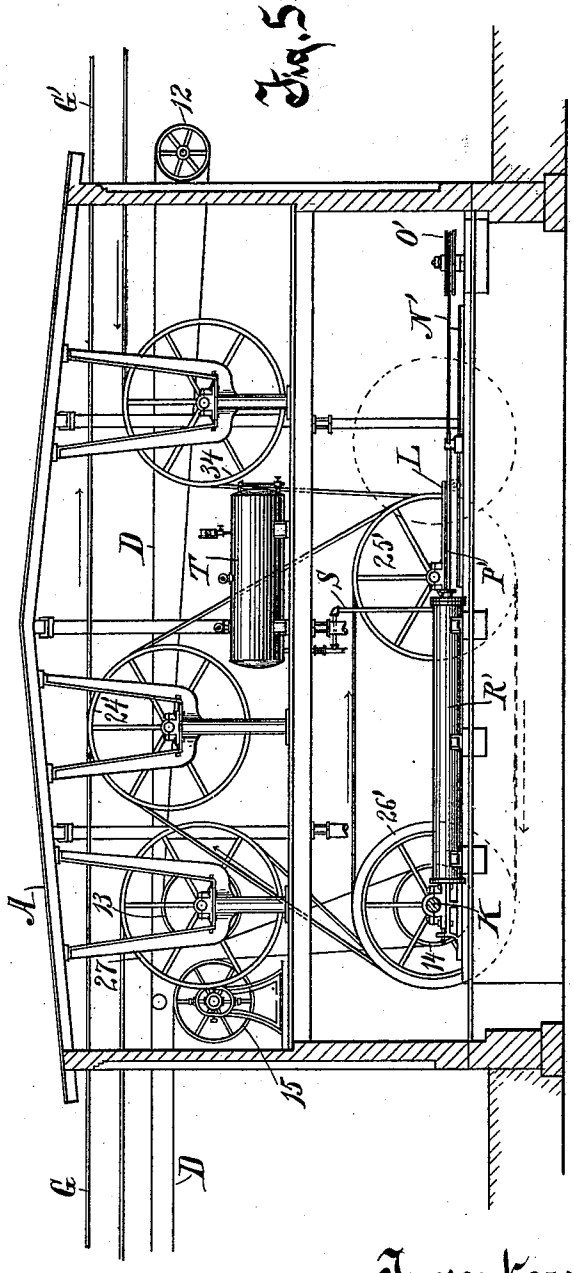


Fig. 5.



Witnesses.
C. F. Kenny.
Amos V. Faust.

Inventors.
Alfred E. Baxter
Allan G. Mather
By Benedict & Morsell
Attorneys.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

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A. E. BAXTER & A. G. MATHER.

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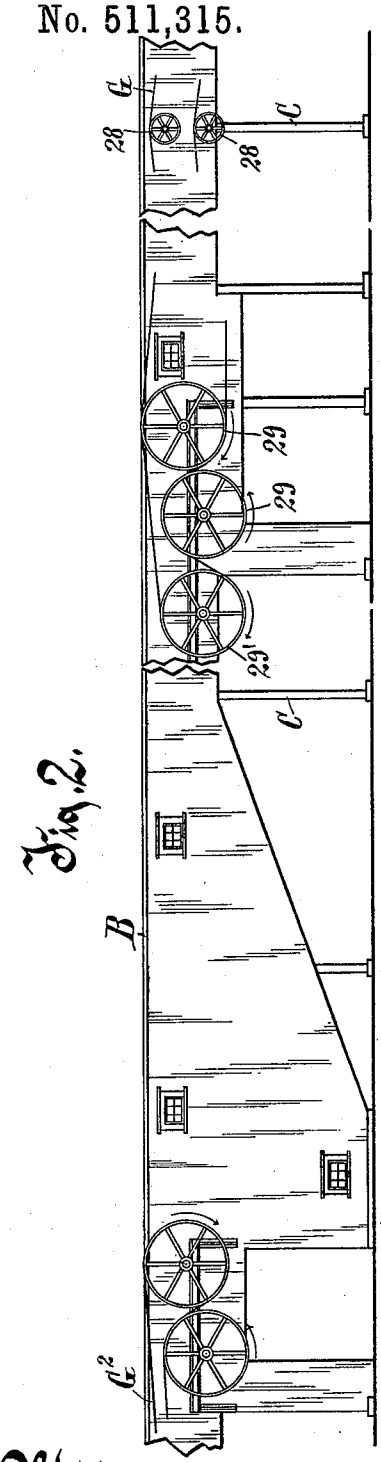

Fig. 2.

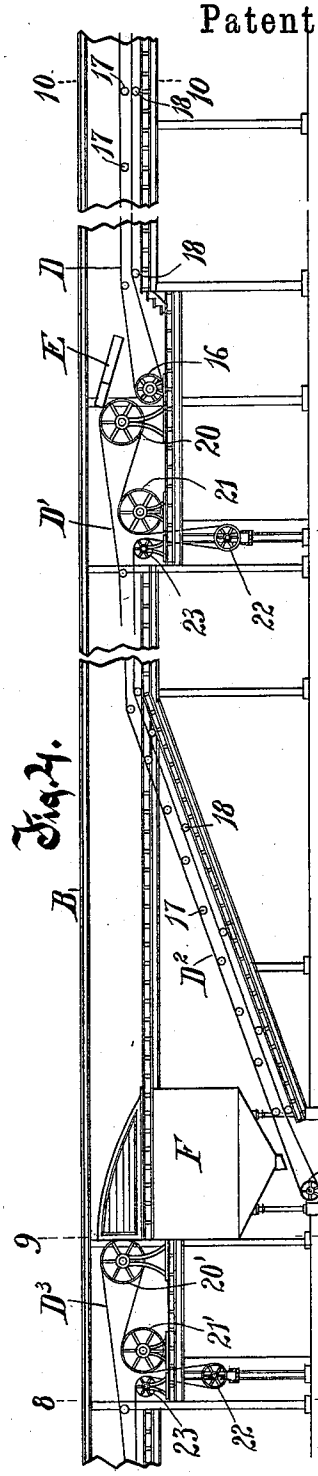

Fig. 4.

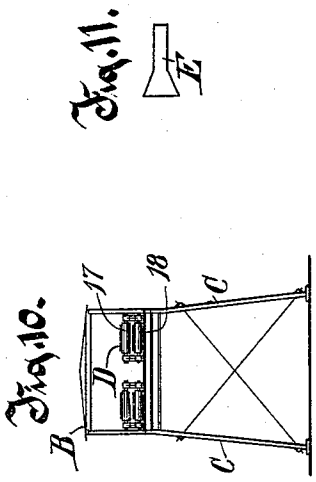

Fig. 10.

Fig. 11.

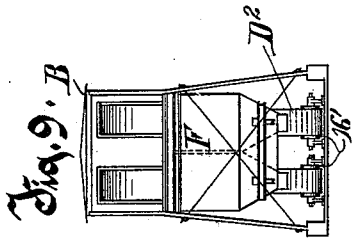

Fig. 9.

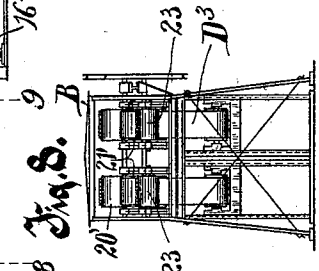

Fig. 8.

Witnesses.
C. F. Kenny,
Anna V. Faust

Inventors.
Alfred E. Baxter
Allan G. Mather
By Benedict & Morsell,
Attorneys.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

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Fig. 3.

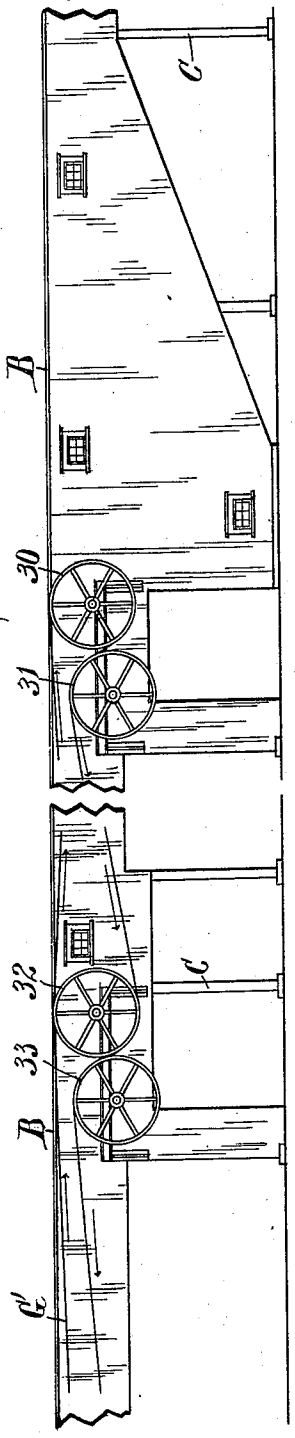
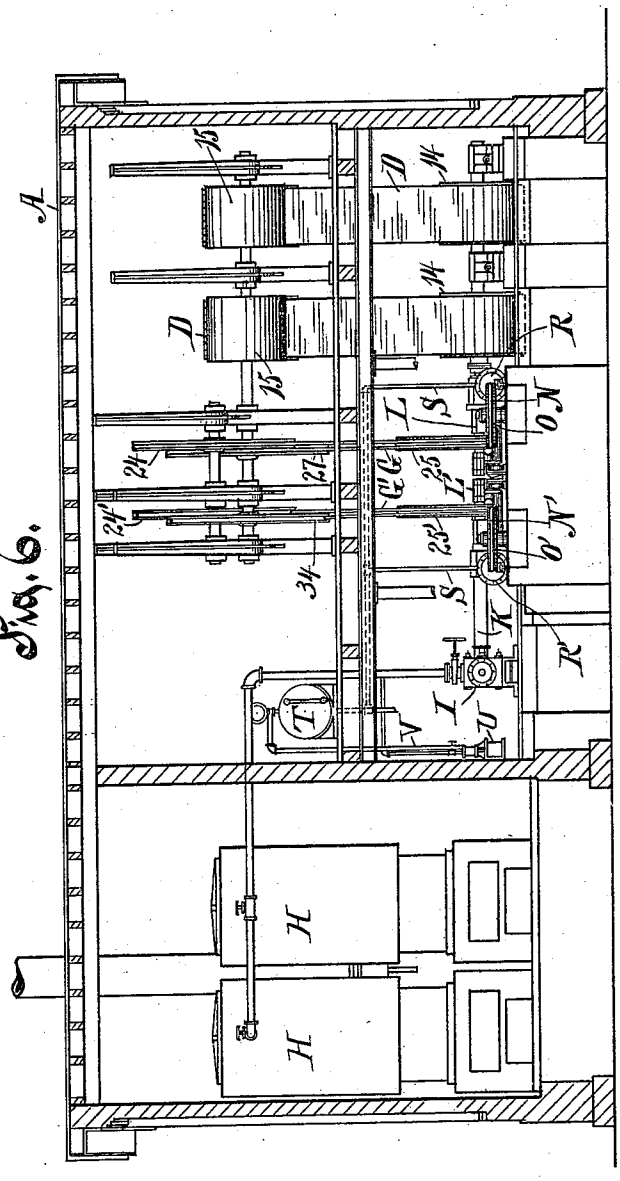


Fig. 6.



Witnesses.
A. F. Keeney.
Anna C. Faust

Inventors.
Alfred E. Baxter
Allan G. Mather
By Benedict & Morsell
Attorneys.

THE NATIONAL LITHOGRAPHING COMPANY.
WASHINGTON, D. C.

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A. E. BAXTER & A. G. MATHER.

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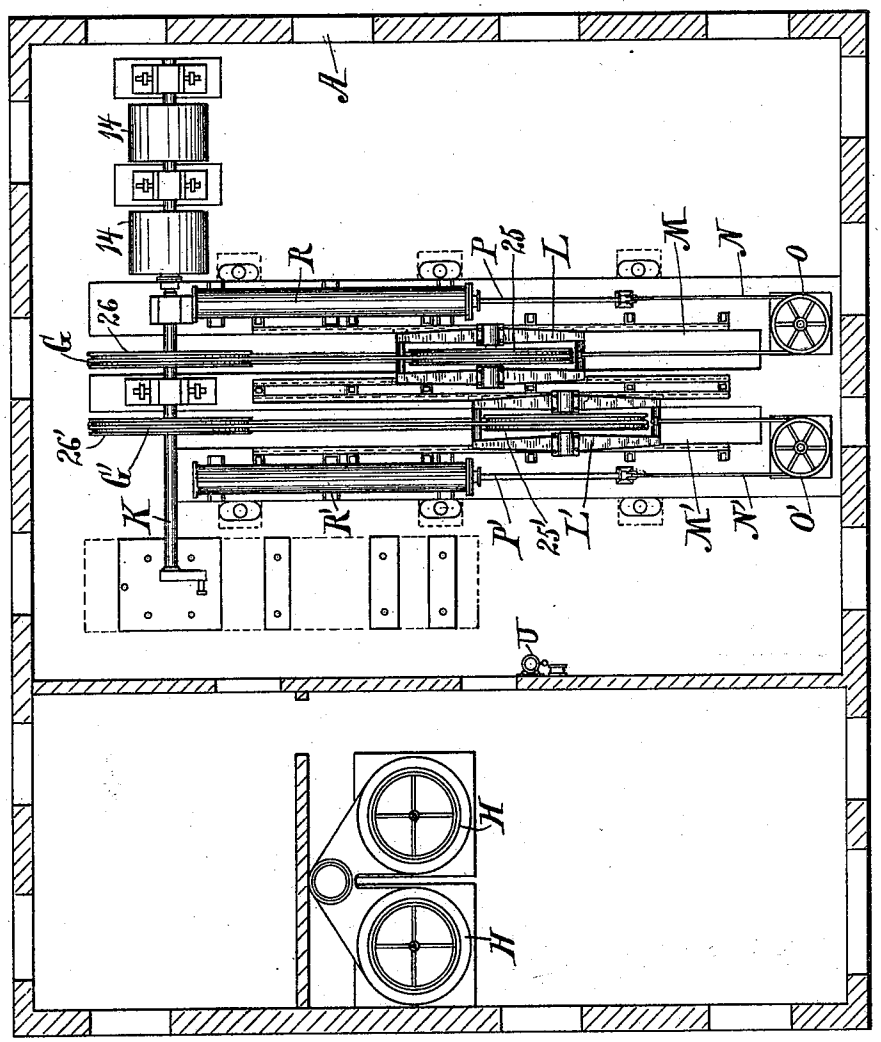
Fig. 1.



Witnesses.
O. N. Keeney.
Anna V. Faust.

Inventors.
Alfred E. Baxter
Allan G. Mather
By Benedict & Morrell
Attorneys.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALFRED E. BAXTER AND ALLAN G. MATHER, OF MILWAUKEE, WISCONSIN.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 511,315, dated December 19, 1893.

Application filed April 4, 1893. Serial No. 469,001. (No model.)

To all whom it may concern:

Be it known that we, ALFRED E. BAXTER and ALLAN G. MATHER, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Conveyers, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

The object of our invention is to provide means for transporting grain or other solid material, especially such as exists in grains, granules or broken or pulverized condition, from one locality to another even for a considerable distance, in a convenient, reliable, satisfactory and inexpensive manner.

The invention consists of the devices and their combinations as herein described and claimed, or their equivalents.

In the drawings, Figure 1, is an elevation of the power house and laterally extending portions of the covered way for the belts and cables, running therefrom. Fig. 2, is an elevation of fragments of the covered way for the belts, with the power supplying cable and its pulleys in connection therewith; the parts shown in this figure being a continuation of the belt-way, toward the left, of Fig. 1. Fig. 3, is an elevation of fragments of the belt-way, with the power supplying cable and its pulleys in connection therewith; the belt-way shown in this figure being a continuation of Fig. 1 toward the right. Fig. 4, is a vertical, longitudinal section, and elevation of the interior, of that portion of the belt way shown in Fig. 2; the parts being arranged correspondingly therewith. Fig. 5, is a vertical section of the power-house shown in Fig. 1, the driving mechanism being mostly shown therein in elevation. Fig. 6, is a transverse, vertical section of the power-house shown in Fig. 1; the power supplying mechanism being mostly shown in elevation, at a right angle to the view taken in Fig. 5. Fig. 7, is a plan of the power-house and the driving mechanism therein. Figs. 8, 9 and 10 are transverse, vertical sections of the belt-way on lines 8—8, 9—9 and 10—10 respectively of Fig. 4. Fig. 11 is a detail of a chute.

In the drawings, A (Fig. 1) is the power-house, containing the engine and mechanism for driving the belts. The power supply is preferably located medially of a series of belts, which series may extend considerable distance each way from the power supply. For suitably inclosing the belts and providing supports therefor and for the cables by which the belts are driven, we have shown as a desirable form of construction therefor, elongated elevated inclosed buildings forming the belt-houses or belt-ways B B. These belt-houses or belt-ways are conveniently supported on posts C C. The belt-ways are desirably so constructed and arranged, as to carry the belts in straight lines on a horizontal plane, but may be turned at an angle at the power-house, or at the end of a section of the belts, and may be elevated or depressed along the line, so as to rise over elevations or descend in depressions of the surface of the ground.

The conveyer belts may be of rubber, leather, canvas or other suitable material, and are preferably about four feet wide, and are in endless sections extending in duplicate form about one thousand yards each. One of these belts D running on a driven pulley in the power-house extends to the left therefrom, and forms the section adjacent thereto. The belt D extends toward the left (see Fig. 4) about a thousand yards where its terminus is met by another belt D′, coming from the left. This belt D′ extends away toward the left for another thousand yards to its terminus. Thereafter other belts in the series extend away successively toward the left about a thousand yards each, to the end of a division of the series, that is to the end of that portion of the series which is driven by a power supply in the power house A. The tail end or undriven extremity of this last belt of the division, is shown at D^2. At its extremity it is met by the belt D^3, which as shown in Fig. 4, is the head or driven end of a section of the belt, belonging to a preceding division of the system, this belt D^3 being driven by another power supply at a considerable distance to the left and not shown in the drawings. The belt D at its head end, runs about the idle pulley 12, and adjacent thereto in the power-house about the driven pulleys 13, 14 and 15, whereby the belt is operated, the upper side of the belt being pulled from the left toward the right. The other extremity of the belt D runs about

the idle pulley 16 and is supported medially by interposed idle pulleys or rollers 17, 17, 18, 18. The other belts D′ D^2 and D^3 are carried and driven in substantially the same manner as the belt D, except that in each case the pulleys 20, 20′ and 21, 21′ are driven pulleys, and the pulleys 22 and 23 are idle pulleys. The head extremity of each belt section is elevated so that its upper and delivering side is somewhat above the surface of the upper side of the tail end of the succeeding section, and ordinarily for the delivery of the load from one section of the belt to another a chute E, (Figs. 4 and 11) is used, which is supported in the belt-house, and is so arranged as to catch the grain or material which is, by its momentum horizontally, thrown forwardly from the belt into the chute where the belt turns about the pulley at its head terminus, and is thereby, by gravity and the momentum of the material, delivered from the chute, which is somewhat inclined therefor, to the succeeding belt. At the terminus of each division of the system, we preferably provide bins F, adapted to hold a considerable quantity of material, into which the material or grain is discharged from the preceding belt, and from which it is discharged immediately or at the will of the operator on to the succeeding belt.

A gate, of any form in common use, may be provided in the throat of the bin for closing it, and thereby retaining the grain or material being discharged therein by the preceding belt, temporarily, so that in case of any accident whereby any operative division of the system is incapacitated for work, the material can be taken and accumulated limitedly in these binds.

The belts, other than the one D that is driven by pulleys in the power-house, are operated by endless cables G G′ G^2, which are driven by mechanism in the power house. The cable G runs on sheaves 24, 25, 26 and 27 in the power-house, and thence extends toward the left, running on idle sheaves 28, 28 (Fig. 2), and at its terminus runs on the sheaves 29, 29 and 29′, of which sheaves 29, 29 are fixed on the axles of belt pulleys. The sheave 29′ is an idler, serving merely to carry and turn the cable. A sufficient number of sheaves similar to 28, 28 are used along the line to properly support the cable between its terminals. In Fig. 3 the sheaves 30, 31 carry the right hand terminal of the cable G′, the sheaves 30, 31 being fixed on the axles of belt pulleys at a head end of a section of belt, the same being also the end of a division of the system. The sheaves 32, 33 show the arrangement of cable sheaves fixed on belt pulley axles at the head end of a belt section, corresponding to the head end of belt D′, in Fig. 4. This cable G′ runs in the power-house on the sheaves 34, 25′, 26′ and 24′. All these pulleys, sheaves and rollers are suitably mounted in bearings therefor fixed in the belt-way or power house respectively.

It will be noted particularly in Figs. 6, 7, 8, 9 and 10 that duplicate belt devices for a duplicate series are shown, and this is because it is deemed advisable and economical to construct two belt systems in the same belt-way. A greater number of belt systems may be constructed in the same belt-house if desired.

In the power-house A we have shown as a means for operating the belts, directly, and indirectly by means of cables, a set of boilers H, H and a steam engine I. The engine is connected to and drives the shaft K on which the pulley 14 is fixed, which drives the belt D, and on which the cable driving sheaves 26, 26′ also are fast. The other pulleys and sheaves in the power-house on which the belt and the cables run are idle pulleys and sheaves.

The sheaves 25, 25′ are mounted independently in frames L L′ reciprocable toward and from the sheaves 26, 26′ respectively, on ways M and M′. These sheaves 25, 25′ so mounted, are parts of tension devices, adapted to take up the slack in the cables and hold them taut. The reciprocable frames L L′ are connected by cables N and N′ respectively running about idle pulleys O and O′ to the rods P, P′ of pistons working liquid tight in the cylinders R, R′. The pistons in these cylinders R are forced rearwardly, whereby the cables are held taut. This is accomplished by filling the cylinders in front of the pistons with oil, water or other suitable liquid, which liquid also partially fills the pipes S S leading to the reservoir T, which is supplied with compressed air by the automatic air pump U, there being a suitable pipe V from the pump to the reservoir T therefor. The air pump is such as is in common use, and may be operated by hand or by steam power as desired.

The direction of the line of transportation, may if desired, be changed at the junction of the belt sections, it being only necessary in such case, to make such disposition and arrangement of the belt pulleys and cable sheaves therefor, as would occur to any skilled mechanic. And if the change of direction is made at a belt junction where a chute (E) is used, it will be necessary to provide a curved or angled chute, conforming to the change of direction of the belts.

It will be understood that the grain or material to be transported is dumped or loaded directly on the top surface of the upper side of the wide endless belt, and is carried forward thereon by the motion of the belt.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In an organized apparatus for transporting grain, or other material, the combination, of a driving shaft, said shaft carrying a belt pulley, and a plurality of cable-operating sheaves, an endless conveyer belt passing around the belt pulley, and extended to and around an idle pulley at a distance laterally from the driving shaft, other conveyer belts extending in both directions from the shaft-driven belt, each conveyer belt preceding the last one being arranged to discharge its load at

its terminus on to the succeeding belt, driven belt-pulleys at the head ends of said conveyer belts other than the shaft-driven belt, idle pulleys at the terminal ends of the belts, cable sheaves fixed on the axles of the belt pulleys at the head ends of the belt sections other than the shaft-driven belt, and cables connecting said sheaves with the cable sheaves on the driving shaft, substantially as set forth.

2. In an organized apparatus for transporting grain, or other material, consisting of a series of divisions, each division in turn comprising a series of belt sections, the combination of a driving shaft for each division, arranged medially thereof, said shaft carrying a belt pulley and a plurality of cable-operating sheaves, an endless conveyer belt passing around the driving pulley and extended to and around an idle pulley at a distance laterally from the driving shaft, said belt constituting a medial section of a division, other conveyer belts disposed successively before and after said medial section, each conveyer belt preceding the last one being arranged to discharge its load at its terminus on to the succeeding belt, driven belt-pulleys at the head ends of said conveyer belts other than the shaft-driven belt, idle pulleys at the terminal ends of the belts, cable sheaves fixed on the axles of the pulleys of the belt-sections other than the shaft-driven section, and cables connecting said sheaves with the cable sheaves on the driving shaft, substantially as set forth.

3. In an organized apparatus for transporting grain, or other material, consisting of a series of divisions, each division in turn comprising a series of belt sections, the combination, of a driving shaft for each division, arranged medially thereof, said shaft carrying a belt pulley and a plurality of cable operating sheaves, an endless conveyer belt passing around the belt pulley, and extended to and around idle pulleys at a distance laterally in both directions from the driving shaft, series of conveyer belts disposed before and after and successively with the shaft-driven section, each conveyer belt preceding the last one, being arranged to discharge its load at its terminus on to the succeeding belt, driven belt-pulleys at the head ends of said conveyer belts, idle pulleys at the other terminal ends of the belts, cable sheaves fixed on the axles of the belt pulleys at the heads of the sections other than the shaft-driven section, cables connecting said sheaves with the cable pulleys on the driving shaft, bins arranged between the terminal receiving and discharging sections, respectively, of the divisions, said bins adapted to receive the grain from the discharging sections of the preceding divisions, and to discharge it upon the receiving sections of the succeeding divisions, and a gate within each bin, said gate constructed to close the opening of the bin, and to shut off temporarily the flow of material to the receiving terminal belt, whereby, when any operative division of the system is incapacitated for work the material can be taken and accumulated limitedly in the bin, substantially as set forth.

4. In an organized apparatus for transporting grain, or other material, the combination of a driving shaft, said shaft carrying cable-operating sheaves, a series of conveyer belts disposed successively upon opposite sides of the driving shaft, each conveyer belt preceding the last one, arranged to discharge its load at its terminus on to the succeeding belt, driven belt pulleys at the head ends of said conveyer belts, idle pulleys at the terminal ends of the belts, cable sheaves fixed on the axles of the belt driving pulleys, sheaves opposite to the cable sheaves of the driving shaft, independently reciprocable frames in which the last mentioned sheaves are mounted, and cables passing around the sheaves of the driving axle and the sheaves of the reciprocable frames, and extended to the cable sheaves fixed on the axles of the belt pulleys, substantially as set forth.

5. In an organized apparatus for transporting grain, or other material, the combination, of a driving shaft, said shaft carrying a plurality of cable operating pulleys, a series of conveyer belts disposed successively upon opposite sides of the driving power, each conveyer belt preceding the last one, arranged to discharge its load at its terminus on to the succeeding belt, driven belt pulleys at the head ends of said conveyer belts, idle pulleys at the terminal ends of the belts, cable sheaves fixed on the axles of the belt driving pulleys, tension regulating frames reciprocable toward and from the cable sheaves on the driving shaft, sheaves mounted independently in said frames, cylinders, pistons working therein, cables connecting the frames with the piston rods, and cables passing around the sheaves of the driving axle and the sheaves of the tension regulating frames, and extended to the cable sheaves fixed on the axles of the belt-driving pulleys, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ALFRED E. BAXTER.
ALLAN G. MATHER.

Witnesses:
C. T. BENEDICT,
ANNA V. FAUST.