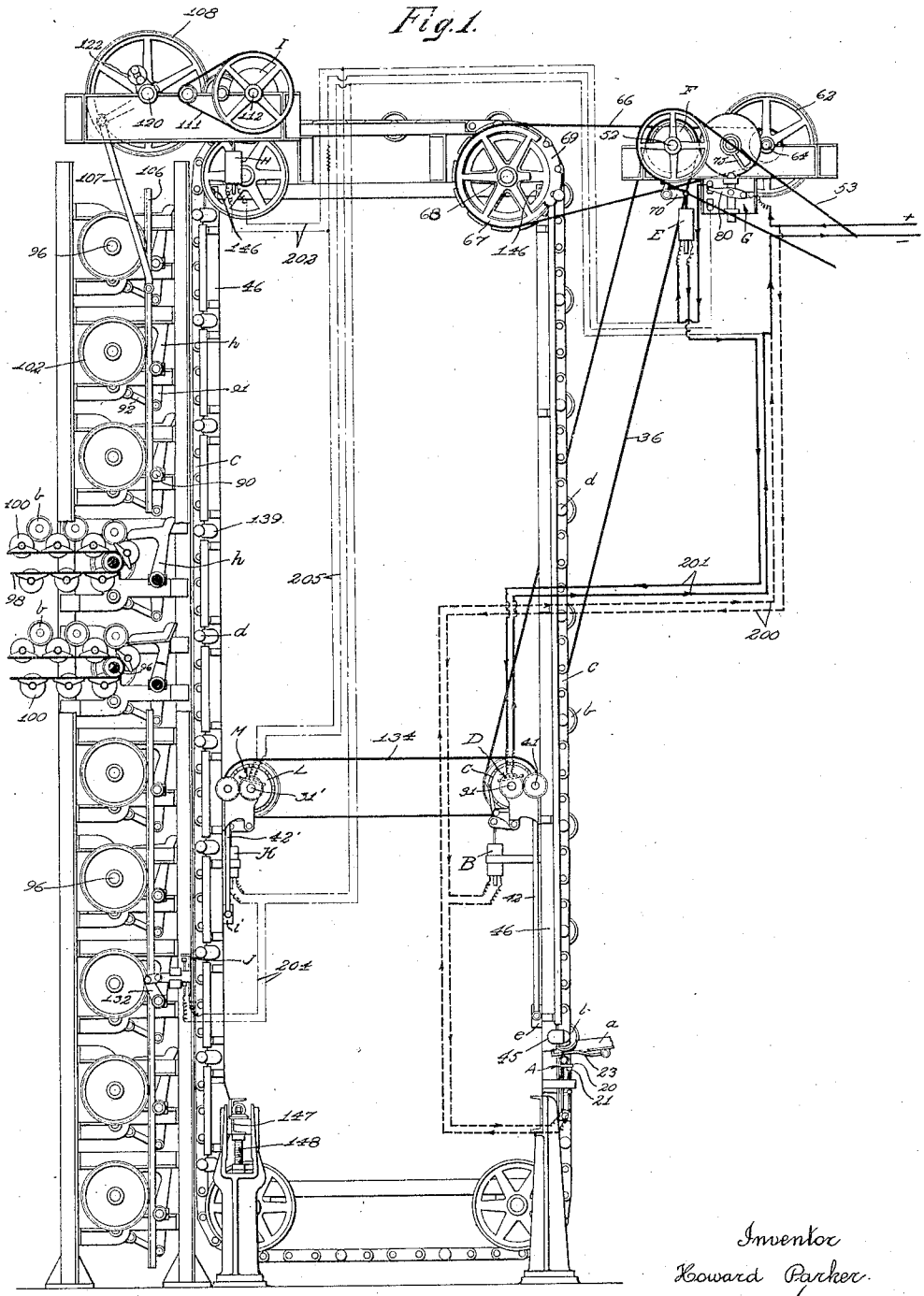
Sept. 4, 1923. 1,467,008

H. PARKER

APPARATUS FOR HANDLING PAPER OR PULP TUBES OR SIMILAR ARTICLES

Filed April 2, 1921 . 8 Sheets-Sheet 1

Fig. 1.



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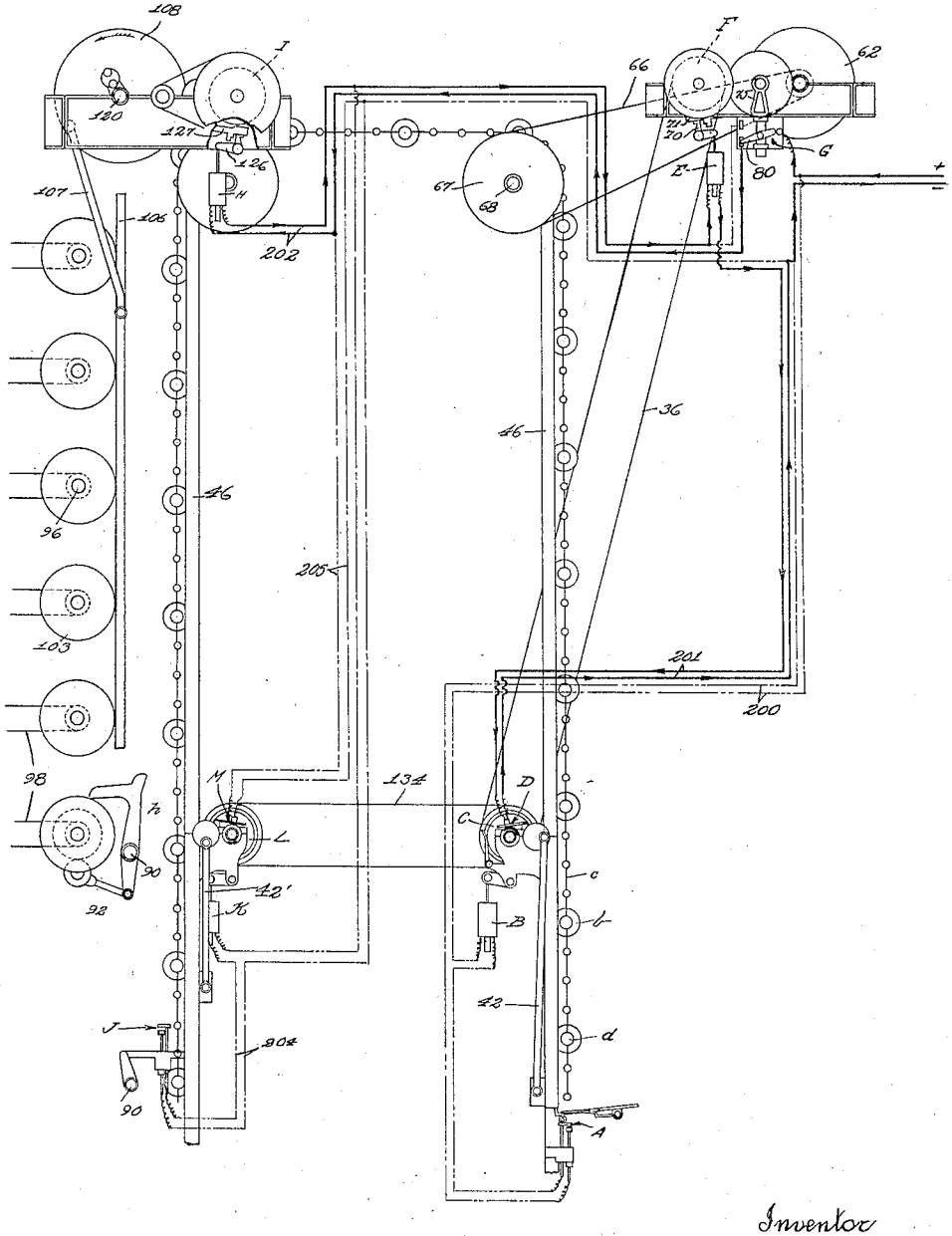
Sept. 4, 1923. 1,467,008

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APPARATUS FOR HANDLING PAPER OR PULP TUBES OR SIMILAR ARTICLES

Filed April 2, 1921 8 Sheets-Sheet 2

Fig. 2.



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APPARATUS FOR HANDLING PAPER OR PULP TUBES OR SIMILAR ARTICLES

Filed April 2, 1921 8 Sheets-Sheet 3

Fig. 3.

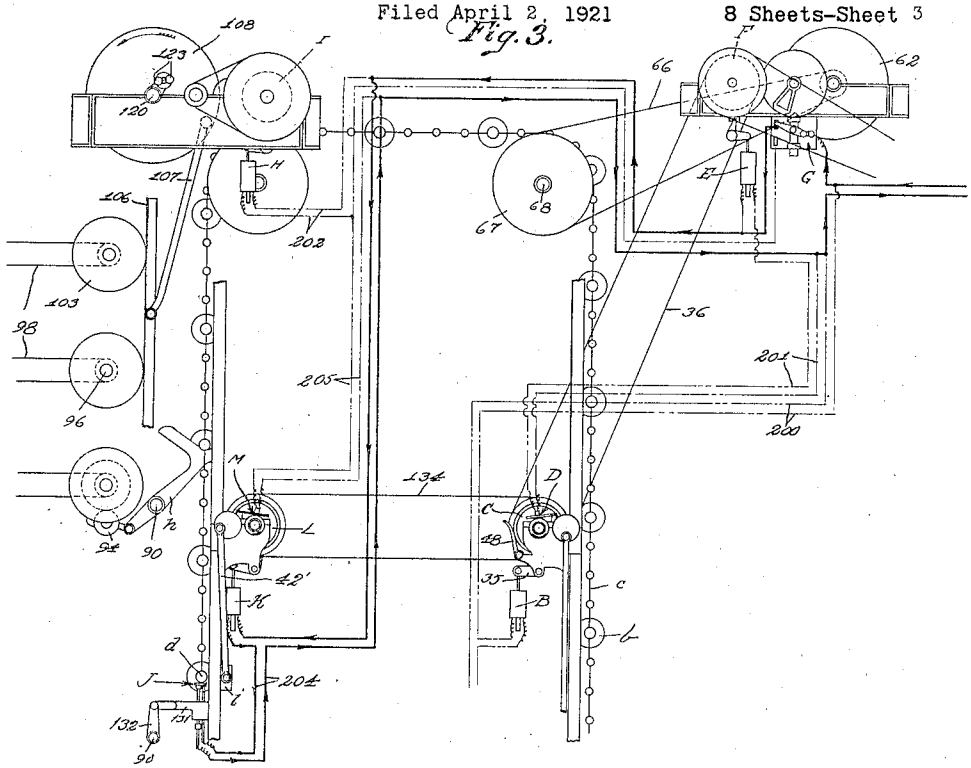
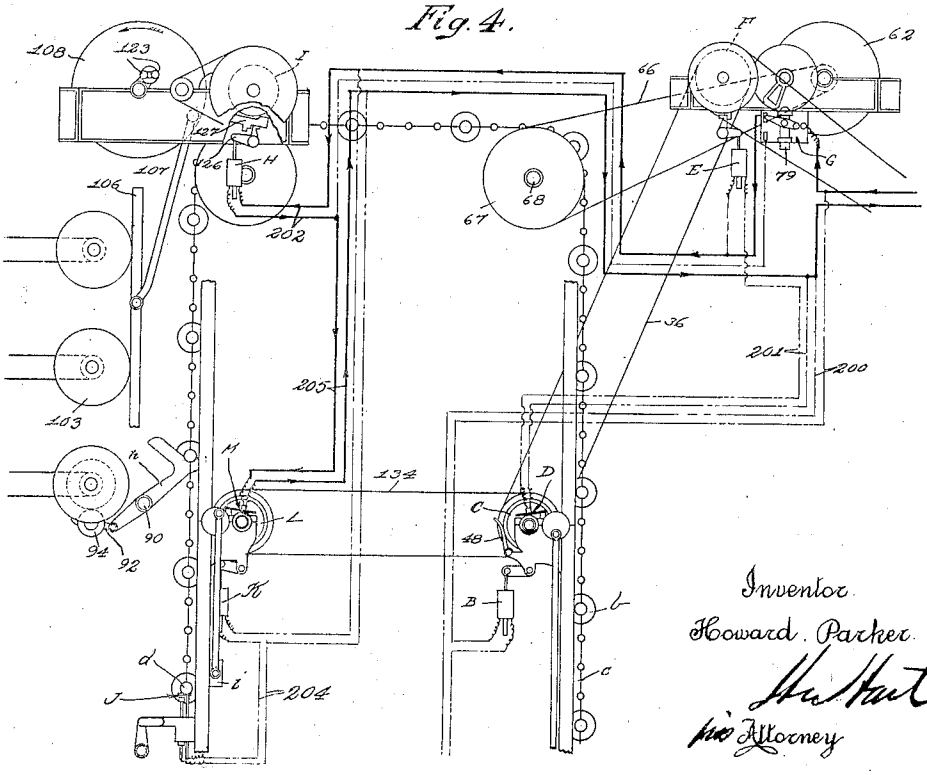


Fig. 4.



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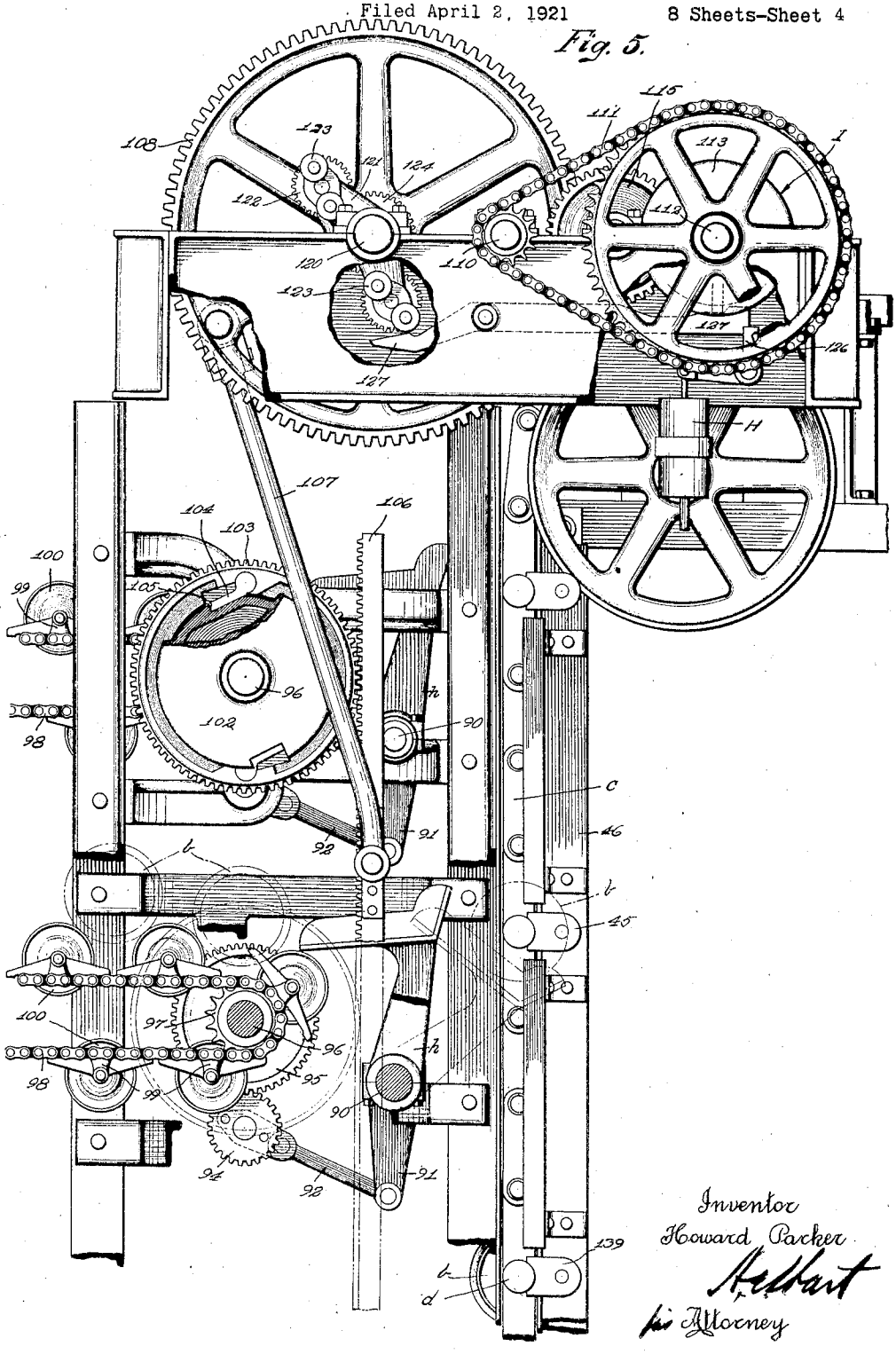
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APPARATUS FOR HANDLING PAPER OR PULP TUBES OR SIMILAR ARTICLES

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Fig. 5.



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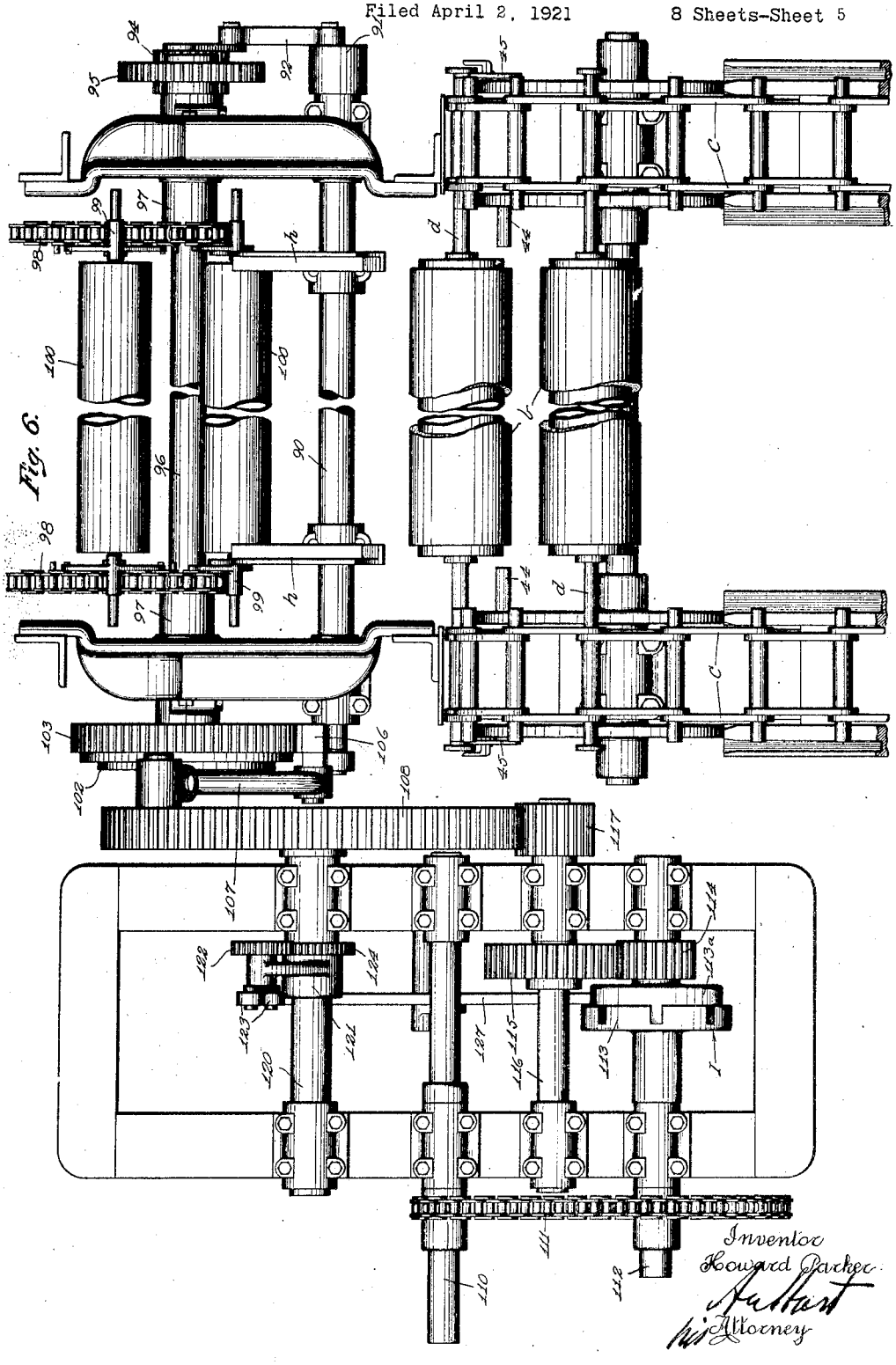


Fig. 6.

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APPARATUS FOR HANDLING PAPER OR PULP TUBES OR SIMILAR ARTICLES

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Fig. 7.

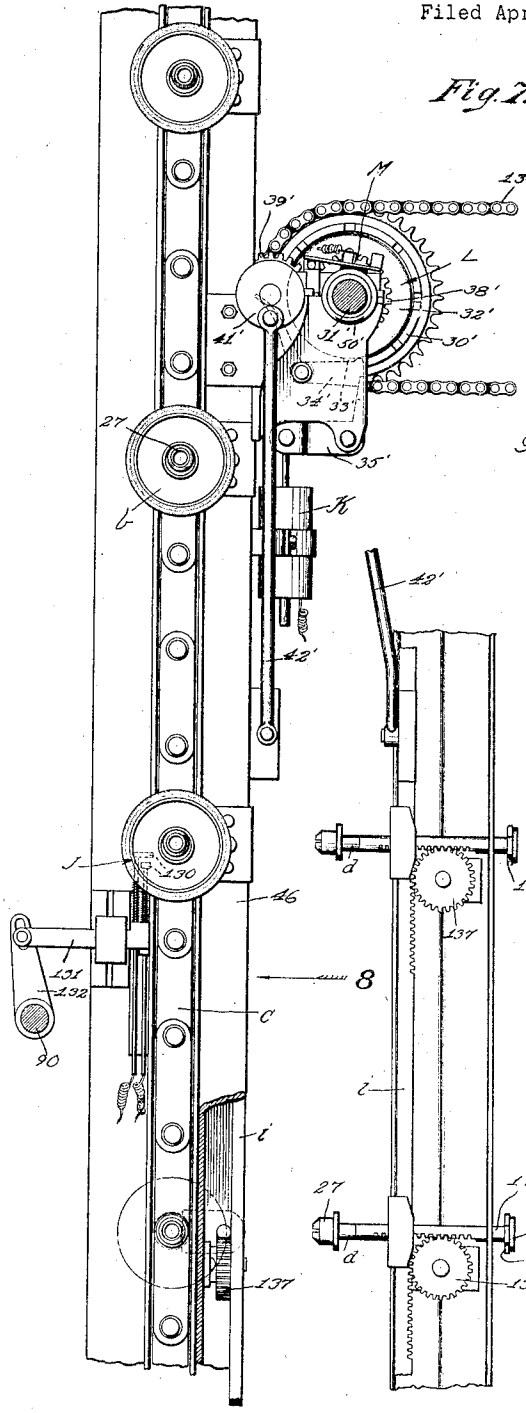
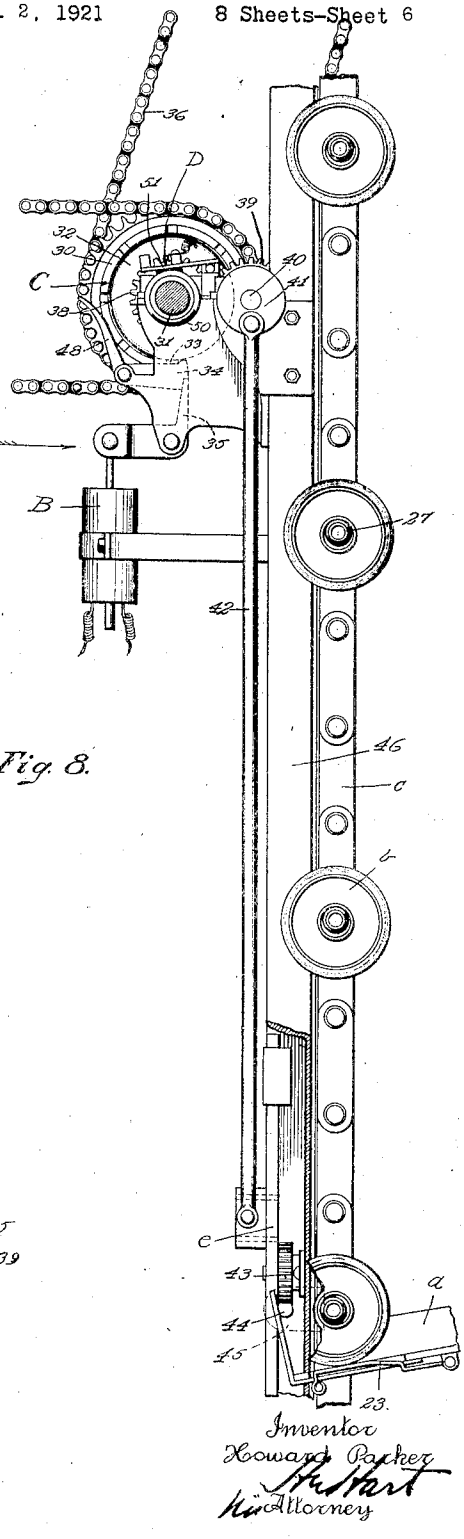


Fig. 8.



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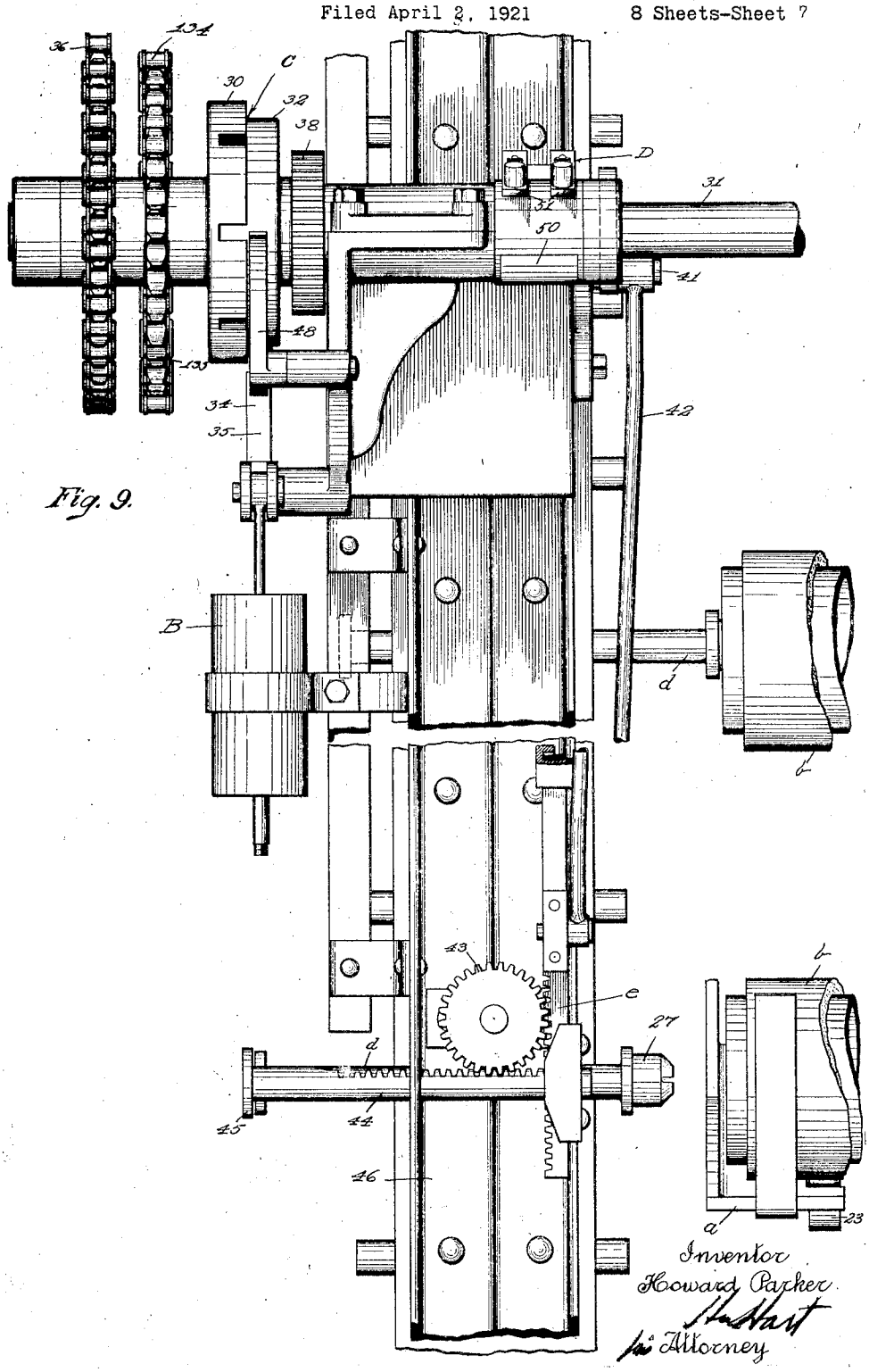


Fig. 9.

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APPARATUS FOR HANDLING PAPER OR PULP TUBES OR SIMILAR ARTICLES

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Fig. 10.

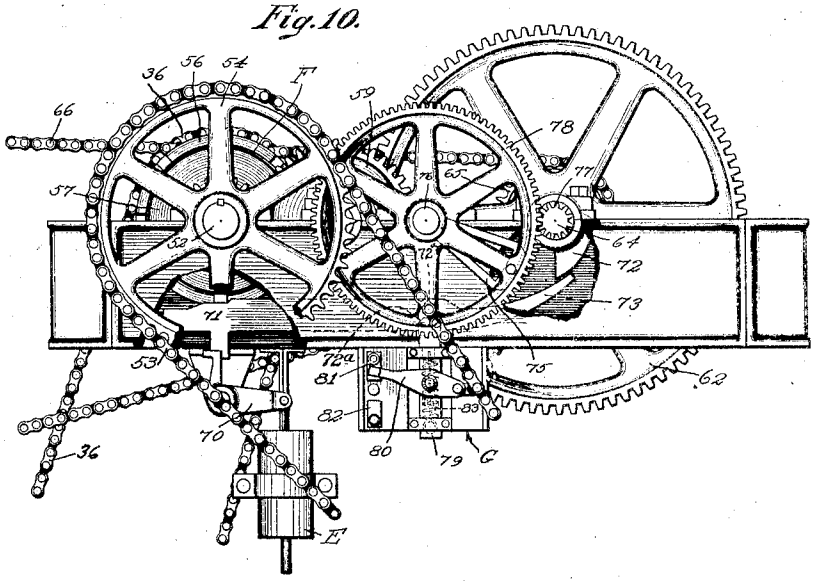
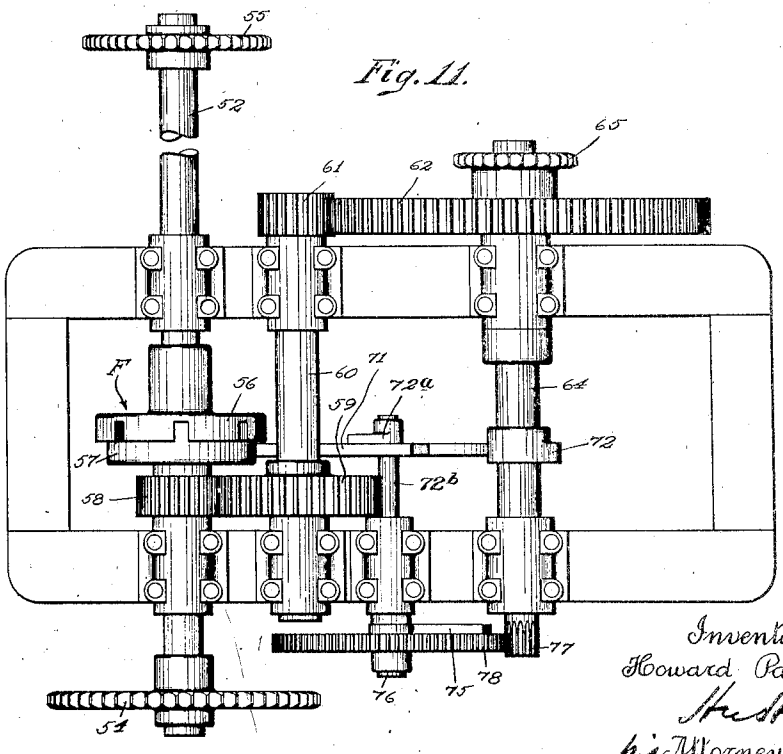


Fig. 11.



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Patented Sept. 4, 1923. 1,467,008

UNITED STATES PATENT OFFICE.

HOWARD PARKER, OF BERLIN, NEW HAMPSHIRE, ASSIGNOR TO BROWN COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

APPARATUS FOR HANDLING PAPER OR PULP TUBES OR SIMILAR ARTICLES.

Application filed April 2, 1921. Serial No. 458,108.

To all whom it may concern:

Be it known that I, HOWARD PARKER, a citizen of the United States, and resident of Berlin, county of Coos, State of New Hampshire, have invented certain new and useful Improvements in Apparatus for Handling Paper or Pulp Tubes or Similar Articles, of which the following is a specification.

As an instance of a use to which the machine of the present invention may be applied, reference may be had to my co-pending application S. No. 450,370, filed March 7, 1921, which discloses an installation wherein the apparatus of the present invention is illustrated in connection with a machine for forming tubes or articles made from pulp, and a machine for drying the tubes.

The present invention is more particularly concerned with the mechanism for automatically transferring articles delivered by the tube forming machine to the drying machine; and to the control of the transfer mechanism, and the control of the drying machine, in part, through the transfer mechanism.

While the various features of invention will be described with reference to their use in the particular machine here selected for the purpose of illustration, I desire it to be clearly understood that the invention is susceptible of other embodiments, and that the terms herein used are merely terms of description and are not in any sense terms of limitation.

In the accompanying drawings:—

Fig. 1 is a side view of the complete transfer mechanism showing at the left the associated parts of the receiving end of the drier.

Figs. 2, 3 and 4 are diagrammatic views of part of what is shown in Fig. 1 and illustrate the electrical control as will be hereinafter described.

Fig. 5 is an enlarged detail view of two upper stages of the drier with the transfer mechanism associated therewith, and driving and controlling mechanism therefor, some parts being broken away to show construction.

Fig. 6 is a plan view of the parts shown in Fig. 5 and including the opposite side of the apparatus.

Fig. 7 is a view of the central section of the transfer mechanism showing on an enlarged scale operative parts of the control mechanism.

Fig. 8 is a view of the left side of the conveyor mechanism of Fig. 7, looking in the direction of the arrow 8.

Fig. 9 is an enlarged detail view of the right side of the conveyor mechanism, looking in the direction of the arrow 9.

Fig. 10 is a detail view of the drive for the transfer mechanism and the associated control mechanism.

Fig. 11 is a plan view thereof.

In describing the machine, it may be assumed that mandrels on which pulp tubes have been wound are being handled.

Referring to Fig. 1, *a* is a table adapted to receive such mandrels *b* and deliver them to a position which, for convenience, may be referred to as a supply point of the transfer apparatus, where they may be engaged with or picked up by the transfer mechanism. Thus, there is a single point at which the mandrels are supplied to and engaged with the transfer apparatus. This transfer apparatus includes a pair of chains *c*, one at each side of the machine, carrying pairs of alined mandrel engaging chuck bars *d* with oppositely arranged chucks 27, and these chains travel upwardly from the supply point, then laterally, and then downwardly in front of the receiving end of whatever apparatus the mandrels are to be delivered to, in this case a drier. The drier has ten superposed stages, and this machine is designed to simultaneously deliver ten mandrels to the drier, one mandrel being delivered to each stage. Interposed between each stage of the drier and the transfer chains are shifting arms *h* which receive mandrels from the transfer chains and deliver them onto the carriers of the drier which are composed of rolls 100 suitably mounted and supported therein and adapted to be moved intermittently therethrough.

Since there is but a single supply point for the transfer apparatus (which includes the transfer chains *c* and the shifting arms *h*) and ten discharge points to the drier stages, it results that after ten mandrels have been delivered to the drier neither the shifting arms nor the drier carriers are operated again until ten new mandrels have been picked up at the supply point. In one manner of speaking, either the shifting arms

or the drier carriers, or both, may be considered as constituting mechanism for receiving articles from the discharge point or points of the transfer chains. In addition to the details of construction embodied in this transfer apparatus, the invention contemplates the automatic electrical control of the successive steps or operations of the apparatus and the proper timing of the operating parts for the accomplishment of the purposes for which they are designed.

With this brief outline of the general scheme of operation, a more detail description of the apparatus and its operation and control will now be given.

When a full mandrel rolls down the table *a* into position at the supply point of the transfer chains, it depresses a lever 23 causing the switch A, through the contacts 20, 21, to close a circuit (indicated by heavy dash lines, Fig. 1) through a solenoid B which results in the engagement of the clutch C and the operation thereby of the rack *e* for moving the chuck bars into engagement with the mandrel now positioned at the supply point as will now be described.

The clutch C is illustrated (see Figs. 7 and 9) as comprising a notched drum 30 loose on a shaft 31 and constantly driven by chain 36; a cooperating drum 32 fixed to that shaft; a radially movable pawl 33 carried by the fixed drum 32 and adapted when released to move outwardly thereof to enter a notch of drum 30 and connect the two drums together; and a cam 34 normally holding the pawl 33 in retracted or inoperative position. The cam 34 is held in its pawl retracting position by a pivotally mounted latch 35 to which the armature of the solenoid B is connected. On each end of the shaft 31, which extends across the machine, (there being like mechanisms at each side of the machine) is fixed a pinion 38 meshing with a pinion 39 on an auxiliary shaft 40 carryng at its inner end a crank 41 to which is connected a link 42 secured at its lower end to the rack *e* which meshes with a pinion 43 and which in turn meshes with the teeth of a plunger 44 slidably mounted in the conveyor frame 46 at a point adjacent the lower end of the inclined table *a*. Each of the plungers 44 has a head 45 at its outer end in front of which the ends of the chuck bars *d* are brought as these chuck bars successively move into position opposite the supply point. Now, upon energization of the solenoid B, the armature thereof moves upwardly swinging the latch 35 connected thereto in a dircetion to release the cam 34 which drops of its own weight and as the pawl is now relased it jumps outwardly so that it connects the fast and loose drums of the clutch C, whereupon the shaft 31 and the auxiliary shafts 40 with the cranks 41 thereon are rotated. Upon rotation of the cranks 41, the racks *e* are first moved upwardly causing the plungers 44 to move inwardly thus pushing the chucks forward to engage them with a mandrel, and then the racks *e* are lowered to withdraw the plungers into the position shown in Fig. 9 so that when the next pair of chuck bars *d* are brought into position to pick up a mandrel, the heads thereof will lie in front of the heads of the plungers 44. When the shaft 31 has almost completed one revolution, the pawl 33 engages the lever 48 fixed to the cam 34 to rock the latter up into position to retract the pawl 33 and disengage the parts of the clutch C, the cam being held up in this position by the weighted latch 35 which has returned to normal position.

After the chucks are thus engaged with the mandrel, the transfer chains are automatically stepped forward one step and this is brought about through the closing of a switch D which comprises a circuit closer 50 rotatable with the shaft 31 and cooperating with a pair of terminals 51. Closing of this switch causes, through the circuit indicated by heavy full lines of Fig. 1, momentary energization of a solenoid E to engage the parts of a clutch F, (similar to clutch C) of the driving mechanism for the transfer chains, this driving mechanism being shown in detail in Figs. 10 and 11. Referring to these figures, 52 is a shaft constantly driven in any suitable manner as by means of a chain 53 passing about a sprocket 54 fixed to one end of this shaft. On the other end of the shaft is a sprocket wheel 55 receiving the chain 36 through which the operating mechanism for the chuck engaging means is driven, as has been described. Also on the shaft 52 is the clutch F having a fixed drum 56 and a loose drum 57 to the hub of which is fixed a pinion 58 connected through gear 59, shaft 60, pinion 61 and gear 62 with a shaft 64 to one end of which is fixed a sprocket 65 connected by a chain 66 to a sprocket 67 fixed on the shaft 68 on which the driving sprockets 69 for the transfer chains *c* are mounted. When the solenoid E is energized, its armature rises and rocks the latch 70 to release the cam 71 pivoted as at 72^a, and the cam thereupon drops permitting the pawl of the clutch F to jump outwardly to engage the drums thereof and thereby cause rotation of the shaft 64 which through the chain 66 drives the sprockets 69. The cam 71 is pivoted as at 72^a on a rod 72^b which is positioned below the shaft 76. The shaft 64 carries a dog 72 which engages the tail end 73 of the cam 71 and returns the latter to the normal position shown in Fig. 10 to disengage the clutch F upon completion of the step movement of the transfer chains.

So much of the transfer mechanism as

has been described operates each time a mandrel is delivered to the supply point, that is to say, a pair of chucks on the transfer chains are engaged with that mandrel and then the chains are moved forward one step to raise the engaged mandrel and bring another pair of empty chucks into position ready to pick up a new mandrel when it is delivered to the supply point.

After the tenth mandrel has been engaged with the transfer chains and these transfer chains start to move, there is a mandrel being brought into position in front of the receiving end of each stage of the drier. At that time, a segment 75 (which is fixed to a stub shaft 76 driven from the shaft 64 through the pinion 77 and gear 78) engages a slide 79 to which is connected a pivoted contact arm 80 of a switch G and moves it from the upper terminal 81 into contact with the lower one 82 closing a circuit (shown by heavy full lines in Fig. 2) which energizes a solenoid H and thereby sets into operation certain mechanism for throwing the shifting arms *h* (one at the forward end of each stage of the drier) out beneath the now descending tubes on the transfer chains. The contact arm 80 is normally held on the upper stationary terminal 81 by a spring 83.

Referring particularly to Figs. 5 and 6, it will be seen that at the forward end of of each stage of the drier is a rock shaft 90 carrying a pair of spaced shifting arms *h*, and at one end a crank 91 connected by a link 92 with a gear 94 meshing with a gear 95 twice its size. The gear 95 is fixed to one end of a shaft 96 carrying a pair of spaced sprockets 97 about which pass the carrier chains 98 one at each side of the machine. Connected to the links of these carrier chains are suitable bearing members 99 for the rollers 100 on which the tubes to be dried are supported.

On one end of each shaft is a ratchet clutch having a disc 102 fixed to the shaft and a cooperating gear 103 loose on the shaft. This gear carries spring pressed pawls 104 which engage teeth 105 on the disc 102 causing the latter to rotate when the gear is rotated in a counterclockwise direction, referring to Fig. 5.

Meshing with all of the gears 103 is a common rack 106 connected by a link or pitman 107 to a large gear 108. This gear, as most clearly shown in Figs. 5 and 6, is driven from a main shaft 110 through a chain 111, a shaft 112 on which is secured the notched drum 113 of a clutch I whose other drum member 113ª is normally loose on the shaft and carries a pinion 114 meshing with a gear 115 fixed to an intermediate shaft 116 to which is also fixed a pinion 117 meshing with the gear 108.

Now, as shown in Fig. 2, when the segment 75 throws the contact arm 80 into engagement with the lower terminal plate 82 (and which occurs, as stated, after the tenth mandrel has been engaged with the transfer chains and these chains have started to move) the solenoid H is energized actuating a latch 126 to release a cam 127 and thus engage the drums 113, 113ª of the clutch I so that the large gear 108 is driven. While this gear is rotating through an angle which brings the upper end of the pitman 107 from the position shown in Fig. 1 to its lowermost position, the rack 106 will be lowered and the gears 103 meshing therewith will be rotated in a clockwise manner without rotating the disc 102. As the gear continues to rotate through approximately the next 90° i. e., to the position shown in Fig. 3, it raises the rack 106 which turns the gears 103 in a counter-clockwise direction and the pawls 104 engage the teeth 105 of disc 102 to rotate each shaft 96 about one-fourth of a turn, and due to the ratio of the intermeshing gears 95, 94, the latter will be rotated 180° throwing the shifting arms *h* out into the full line position of Fig. 3 and the dotted line position of Fig. 5 below the descending mandrels. While the shaft 96 is thus rotated, the carrier chains will, of course, be moved forward a part of one step since the carrier chain sprockets 97 are fixed to this shaft.

Carried by the shaft 120, on which the gear 108 is fixed, is a bracket 121 having a pair of arms in the end of each of which is journaled a stud carrying at one end a gear 122 and at its other end a pair of eccentrically positioned rollers 123. The gears 122 mesh with a gear 124 encircling the shaft 120 but fixed to the frame or bearing in which this shaft is mounted. The arrangement is in the nature of a planetary gearing. When the gear 108 has made about one-third of a revolution, that is when the upper end of the pitman has been brought to the approximate position shown in Fig. 3, one of the rollers 123 of the planetary gearing engages the tail end of the pivoted lever 127 throwing the same upwardly and disconnecting the parts of the clutch I, whereupon the mechanism will come to rest with the arms *h* in the position shown in Fig. 3. In the meantime, the transfer chains are continuing to move to bring each of the ten mandrels on the delivery side of these chains into position immediately above the now outwardly positioned shifting arms, and as these chains approach the completion of their step (that is, just before the dog 72, Fig. 10, strikes the cam 71 of the clutch F) the head of one of the clutch bars *d* engages the contact members 130 of the switch J which may be similar in construction to the switch A. These contact members are carried by a slide 131 connected by a crank 132 with one

of the shafts 90 (see Figs. 3 and 7) so that when the shifting arms are thrown out into the position shown in Figs. 3 and 4, the switch J is moved into position directly under a descending chuck bar head. The result of closing the switch J is to energize the solenoid K and thereby engage the drums of a clutch L of the operating mechanism for disengaging the chucks from the mandrels. This mechanism may be identical in construction and operation with the heretofore described mechanism for operating the chuck engaging means at the supply point of the transfer chains, and therefore the parts thereof are designated by like characters, except that they are primed. The loose drum member 30′ of the clutch L may be continuously driven by means of a chain 134 passing about a sprocket 135 fixed to the hub of the loose drum 30 of the clutch C. Upon engagement of the clutch L, the crank 41′ is rotated and through the link 42′ the rack *i* is lowered and through pinions 137 (see Figs. 7 and 8) moves the plungers 138 outwardly from the position shown in Fig. 8 to withdraw the chucks from the mandrels which are now in position on the shifting arms. It will be understood, of course, that there are ten pairs of plungers 138, there being a pair positioned at each discharge point of the transfer chains. These plungers are similar to the plunger 44, except that the heads 139 are adapted to lie behind the heads 45 of the chuck bars *d*, so that when the plungers 138 are moved outwardly, the chuck bars are withdrawn.

As the mechanism, of which the clutch L forms an element, continues to operate, a switch M, associated therewith and similar to the switch D, is closed causing the current to flow through the circuit shown in heavy full lines Fig. 4 to again energize the solenoid H whereupon the clutch I is again engaged and the gear 108 completes its revolution. As the gear 108 moves the pitman 107 from the position shown in Fig. 4, the rack 106 is raised to complete the step movement of the drier carriers and throw the shifting arms *h* forward to deliver the mandrels supported thereon onto the pairs of supporting rolls 100 of the carriers which have just been brought into position to receive the same. As the gear 108 approaches the end of its revolution, the rack 106 is lowered into normal position and one of the rollers 123 of the planetary gearing again raises the cam 127 to throw the clutch I out of engagement so that the parts are now brought to their normal positions of rest.

To adapt the apparatus for the handling of tubes of various sizes, the delivery side of the conveyor, comprising the transfer chains *c*, is vertically adjustable. In the present instance, the parts of the frame 24 about which the chains *c* pass, are hingedly connected together as at 146 (see Fig. 1) and the left end of this frame is supported by a transverse bar 147 adapted to be vertically adjusted by screws 148.

The complete chain of operations of the machine will be very briefly described in connection with a brief explanation of the circuits through which the control of the parts thereof is effected.

As each and every mandrel is delivered (for instance from the tube forming machine) onto the table *a*, it rolls down the latter and engages the switch A, thereby momentarily closing that circuit which includes the wires 200 (shown in heavy dash lines, Fig. 1) and the solenoid B causing the latter to be energized which results in the engagement of the clutch C and the operation of the rack *e* to engage the chucks with the mandrel now positioned at the lower end of the table *a*, as shown in Fig. 1. The switch D is then closed and the current will pass through the circuit 201 and the solenoid E as indicated by heavy full lines, Fig. 1. Upon energization of the solenoid E, the clutch F is engaged and the transfer chains are driven forward one step through this clutch. These operations repeat for ten mandrels. After the tenth mandrel has been picked up by the transfer chains and these chains start to move, the pivoted arm 80 of the switch G is swung down by the segment 75 and at this time the switch D is still closed so that the current passes through the circuit indicated by heavy full lines Fig. 2. This circuit includes the wires 201 and the solenoid E, but the current is now passing through these wires in a direction opposite to that shown in the circuit indicated by heavy full lines, Fig. 1. This circuit also includes the wires 202 connected to the solenoid H. When this circuit is closed, the solenoid H is energized and the clutch I engaged, whereupon the gear 108 will make a partial revolution, throwing the shifting arm *h* outwardly below the descending mandrels on the delivery side of the transfer chains, moving the switch J into operative position and also moving the drier carriers forward a portion of one step. The planetary gearing then disengages the clutch I and one of the descending chuck bars will close the switch J causing the current to flow through the circuit shown in heavy full lines Fig. 3 and which circuit includes the wires 204 and the solenoid K. When this solenoid is thus energized, the clutch L is engaged and the chucks are withdrawn from the mandrels positioned above the now outwardly positioned shifting arms *h*. The switch M is now closed, whereupon the current will flow, as shown by heavy full lines, Fig. 4, through the wires 205, 202, again energizing the solenoid H and engaging the clutch I whereupon the gear 108 will com-

plete its revolution during which time the step movement of the carriers will be completed and the shifting arms *h* will be thrown forward to deliver the mandrels thereon onto the supporting rolls 100 which have been brought into position to receive the same. When the gear 108 has completed its revolution, the planetary gearing again engages the lever or cam 127 to disengage the clutch I and thus the parts are brought into their normal positions of rest.

I claim as my invention:—

1. A supply point, a conveyor provided with article holding devices adapted to traverse said supply point and to receive articles one by one therefrom, and means controlled by the delivery of the articles to said supply point for actuating said devices to engage them with the articles.

2. A supply point, a conveyor provided with article holding devices traversing said point, means for engaging said holding devices with articles supplied to said supply point, driving means for moving said conveyor ahead one step each time an article is engaged therewith, and a system of control for said engaging and driving means controlled by the delivery of articles to the supply point.

3. A supply point, a conveyor adapted to receive articles therefrom one by one and provided with article holding devices, means for moving said conveyor ahead one step each time an article is received thereby, means for actuating said devices, and a system controlled by the delivery of the articles.

4. A supply point, a conveyor provided with pairs of alined article holding devices traversing said point, and means controlled by the articles as they are delivered to the supply point for actuating said devices to engage them with the articles.

5. A supply point, a conveyor provided with pairs of alined article holding devices traversing said point, means for engaging said holding devices with articles supplied to said supply point, driving means for moving said conveyor ahead one step each time an article is engaged therewith, and a system of control for said engaging and driving means controlled by the delivery of articles to the supply point.

6. A supply point, a conveyor provided with article holding devices traversing said supply point, means for engaging said holding devices with articles supplied thereto, operating means therefor controlled by the delivery of articles to the supply point, and means controlled by said operating means for moving said conveyor ahead step by step.

7. A supply point, a discharge point, a transfer conveyor including article holding devices traversing said points, means for engaging said devices with articles supplied to the supply point, and means for disengaging said holding devices from the articles at the discharge point, both of said means being controlled by the delivery of articles to the supply point.

8. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with articles supplied thereto, means for moving said conveyor ahead one step each time an article is engaged therewith, and means for disengaging said holding devices from the articles at the discharge point, all of said means being controlled by the delivery of the articles to the supply point.

9. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with articles supplied thereto, means for moving said conveyor ahead one step each time an article is delivered thereto, means for disengaging said holding devices from the articles at said discharge point, and an electrical system of control for all of said means and including a switch closed by articles as they are delivered to said supply point.

10. A supply point, a discharge point, a conveyor provided with pairs of alined article holding devices traversing said points, means controlled by the articles delivered to the supply point for engaging said holding devices with the articles at the supply point, means controlled by said engaging means for periodically driving said conveyor, and means controlled by the operation of said conveyor for disengaging said devices from the articles at the discharge point.

11. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with articles supplied thereto, means for moving said conveyor one step each time an article is engaged therewith, means for disengaging said devices from the articles at said discharge point, and a system of control for all of said means including mechanism actuated by the delivery of articles to the supply point.

12. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with articles supplied thereto, means for moving said conveyor one step each time an article is engaged therewith, means for disengaging said devices from the articles at said discharge point, and a system of control for all of said means including mechanism actuated by the articles as they are delivered to the supply point.

13. A supply point, a conveyor provided with article holding devices traversing said point, means for engaging said devices with articles supplied thereto, means for driving

said conveyor ahead one step each time an article is engaged therewith, and a system of control through which said engaging means controls said driving means.

14. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with articles supplied thereto, means for driving said conveyor ahead one step each time an article is engaged therewith, means for disengaging said devices from the articles at the discharge point, and a system of control through which said engaging means controls said driving means and the operation of said conveyor controls said disengaging means.

15. A discharge point, a conveyor provided with article holding devices traversing said point, means for disengaging said devices from the articles at the discharge point, and controlling means for said means periodically actuated by the operation of said conveyor.

16. A discharge point, a conveyor provided with article holding devices traversing said point, means for periodically driving said conveyor, means for disengaging said holding devices from the articles at the discharge point, operating means therefor, a switch actuated by the engagement of the conveyor therewith and controlling said operating means, and means controlled by said driving means for moving said switch into and out of the path of movement of said conveyor.

17. A supply point, a discharge point, a conveyor traversing said points, intermittently actuated mechanism for receiving articles from said conveyor at the discharge point, and a system of control through which said mechanism is controlled by the operation of said conveyor.

18. A supply point, a discharge point, a conveyor traversing said points, driving means for moving said conveyor ahead one step each time an article is delivered thereto, mechanism for receiving articles from said conveyor at the discharge point, operating means for intermittently actuating said mechanism, and a system of control through which said driving means controls said operating means.

19. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for intermittently driving said conveyor, means for disengaging said devices from the articles at the discharge point, mechanism for receiving articles from said conveyor at the discharge point, operating means for periodically moving the same, and a system of control through which said driving means and disengaging means control said operating means.

20. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with the articles at the supply point, means controlled by said engaging means for driving said conveyor each time an article is engaged therewith, means controlled by the operation of said conveyor for disengaging said devices from the articles at the discharge point, mechanism for receiving articles from said conveyor at the discharge point, and operating means therefor controlled through said driving and disengaging means.

21. A supply point, a discharge point, a conveyor provided with automatically operated article holding devices traversing said points, intermittently actuated mechanism for receiving articles from said conveyor at the discharge point, and a system of control for said conveyor and mechanism controlled by the delivery of the articles to the supply point.

22. A supply point, a discharge point, a conveyor traversing said points, driving means for moving said conveyor ahead one step each time an article is delivered thereto, mechanism for receiving articles from said conveyor at the discharge point, operating means for intermittently actuating said mechanism, and a system of control through which said driving means controls said operating means and including means actuated by the articles as they are supplied to the supply point.

23. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with the articles at the supply point, means for driving said conveyor ahead one step each time an article is engaged therewith, means for disengaging said devices from the articles at the discharge point, mechanism for receiving the articles from said conveyor at the discharge point, operating means therefor, and a system of control for all of said means controlled by the delivery of articles to the supply point.

24. A supply point, a drier including a carrier for moving the articles therethrough, a transfer mechanism receiving articles from the supply point and delivering them to said carrier, means for driving said carrier, and a system of control through which said driving means is controlled by the operation of said transfer mechanism.

25. A supply point, a drier including a carrier for moving the articles therethrough, a transfer mechanism for delivering articles from said supply point to said carrier, driving means for said carrier, and an electrical system of control through which said driving means is controlled by the operation of said transfer mechanism.

26. A supply point, a drier including a

carrier for moving articles therethrough, transfer mechanism receiving articles from said supply point and delivering them to said carrier, operating mechanisms for said transfer mechanism and said carrier, and a system of control through which said operating mechanisms are controlled by the delivery of the articles to the supply point.

27. A supply point, a drier including a carrier and means for periodically moving the same, a transfer conveyor for receiving articles from said supply point and delivering them to said carrier, means for periodically driving said transfer conveyor, and a system of control for said moving means and driving means controlled by the delivery of the articles to said supply point.

28. A supply point, a drier having a carrier for moving the articles therethrough, a transfer mechanism for receiving the articles from the supply point and delivering them to said carrier, operating mechanism for said transfer mechanism, driving means for said carrier, and a system of control through which said operating mechanism is controlled by the delivery of the articles to the supply point and said driving means is controlled by the operation of said transfer mechanism.

29. A supply point, a discharge point, a conveyor traversing said points, mechanism for receiving articles from the discharge point, and means for moving said mechanism into position to receive an article and then advance the same after the article is delivered thereto.

30. A supply point, a discharge point, a conveyor traversing said points, a pivoted receiving arm at the discharge point, and means for moving said arm rearwardly into position to receive an article from the conveyor and then move it forwardly after the article is received thereby.

31. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with the articles at the supply point, means for disengaging said devices from the articles at the discharge point, mechanism adjacent the discharge point for receiving the articles therefrom, and means for moving said mechanism into position to receive an article from the conveyor and then advance it after the article is delivered thereto.

32. A supply point, a discharge point, a conveyor traversing said points, receiving mechanism at the discharge point, operating means therefor for moving the same into position to receive an article from the conveyor and then advance it after the article is delivered thereto, and a system of control through which the operation of said conveyor controls said operating means.

33. A supply point, a discharge point, a conveyor traversing said points, means for periodically driving said conveyor, shifting mechanism at the discharge point, operating means therefor for moving the same into position to receive an article from the conveyor and then advance it, and a system of control through which said driving means controls said operating means.

34. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with the articles at the supply point, means for periodically driving said conveyor, means for disengaging said devices from the articles at the discharge point, shifting mechanism adjacent the discharge point, operating means for moving said mechanism into receiving position and then advancing the same after an article is delivered thereto, and a system of control through which said engaging means controls said driving means and said driving means and disengaging means control said operating means.

35. A supply point, a carrier, a transfer mechanism including a conveyor receiving articles from said supply point, and shifting mechanism to move the articles from the discharge point of said conveyor to said carrier, means for periodically operating said transfer mechanism, and means for periodically driving said carrier.

36. A supply point, a drier having a carrier, transfer mechanism including a conveyor receiving articles from said supply point and shifting mechanism to move the articles from the discharge point of said conveyor to said carrier, means for periodically operating said transfer mechanism, means for driving said carrier, and a system of control through which said operating means controls said driving means.

37. A supply point, a carrier, transfer mechanism including a conveyor receiving articles from said supply point and shifting mechanism to move the articles from the discharge point of said conveyor to said carrier, means for periodically driving said conveyor, operating means for said shifting mechanism and carrier, and a system of control through which said driving means controls said operating means.

38. A supply point, a carrier, a transfer mechanism including a conveyor provided with article holding devices traversing said supply point and shifting mechanism for moving the articles from the discharge point of said conveyor to the carrier, means for engaging said devices with the articles at the supply point, means for driving said conveyor ahead one step each time an article is engaged therewith, means for disengaging said devices from the articles at the discharge point, and means for moving said shifting mechanism into position beneath

the descending article and then moving said mechanism forwardly after the article has been disengaged from said holding devices and received by said mechanism.

39. A supply point, a carrier; transfer mechanism including a conveyor receiving articles from said supply point and shifting mechanism to move the articles from the discharge point of said conveyor to said carrier; means for actuating said conveyor, shifting mechanism and carrier; and a system of control for said means controlled by the delivery of articles to the supply point.

40. A supply point, a plurality of definitely positioned discharge points, and a transfer mechanism receiving articles one by one at the supply point and delivering a plurality of them simultaneously one at each discharge point.

41. A supply point, a plurality of definitely positioned discharge points, a conveyor traversing said supply and discharge points, and means for simultaneously discharging articles from said conveyor one at each discharge point each time a predetermined number of articles have been delivered to said conveyor.

42. A supply point, a plurality of discharge points, a conveyor having pairs of alined article holding devices traversing said points, and means at the discharge points for simultaneously disengaging said devices from the articles.

43. A supply point, a plurality of discharge points, a conveyor having pairs of alined article holding devices traversing said points, means for engaging said devices with articles at the supply point, means for disengaging said holding devices from the articles at each discharge point, and means for simultaneously actuating said last mentioned means.

44. A conveyor having a pair of parallel runs moving in opposite directions, a supply point on one of said runs, a plurality of discharge points on the other of said runs, and means for discharging the articles simultaneously one from each discharge point.

45. A supply point, a plurality of definitely positioned discharge points, a conveyor traversing said supply and discharge points, means for moving said conveyor forward one step each time an article is delivered thereto, and means for simultaneously disengaging the articles, one at each discharge point, after a predetermined number of articles have been delivered to the conveyor.

46. A supply point, a plurality of discharge points, a conveyor having alined article holding devices traversing said points, means for stepping said conveyor ahead each time an article is delivered thereto, and means for disengaging said holding devices from the articles simultaneously, one at the discharge point, each time a predetermined number of articles has been delivered to said conveyor.

47. A supply point, a plurality of discharge points, a conveyor having pairs of alined article engaging devices traversing said points, means for automatically engaging said holding devices with the articles at the supply point, means for stepping said conveyor ahead each time an article is engaged therewith, means adjacent each discharge point for disengaging said devices from the articles, and means for simultaneously actuating said disengaging means each time a predetermined number of articles has been engaged with said conveyor.

48. A plurality of discharge points, a conveyor provided with pairs of alined article holding chuck bars successively traversing said discharge points, each of said bars being supported for longitudinal movement and having a head on its outer end, a pair of alined longitudinally movable plungers at each discharge point and each having a head on one end adapted to engage behind the heads on said bars, and means for reciprocating said plungers in unison.

49. A supply point, a plurality of discharge points, a conveyor mechanism including a conveyor traversing said supply and discharge points and means for periodically driving said conveyor, means for simultaneously discharging articles from said conveyor, one at each discharge point, each time a predetermined number of articles have been supplied to said conveyor, and a system of control through which the operation of said conveyor mechanism controls said last mentioned means.

50. A supply point, a plurality of discharge points, a conveyor traversing said supply and discharge points, means for driving said conveyor ahead one step each time an article is supplied thereto, means for simultaneously discharging articles from said conveyor, one at each discharge point, each time a predetermined number of articles have been supplied to said conveyor, and a system of control through which said driving means controls said last mentioned means.

51. A supply point, a plurality of discharge points, a conveyor provided with article holding devices traversing supply and discharge points, means for driving said conveyor ahead one step each time an article is supplied thereto, means for simultaneously actuating said holding devices to disengage them from the articles, one at each discharge point, each time a predetermined number of articles have been supplied to said conveyor, and a system of control through which said driving means controls said last mentioned means.

52. A supply point, a plurality of dis-

charge points, a conveyor provided with article holding devices traversing said supply and discharge points, means for engaging said devices with the articles at the supply point, means for driving said conveyor ahead one step each time an article is engaged therewith, means for simultaneously disengaging said devices from the articles, one at each discharge point, and a system of control through which said engaging means controls said driving means and said driving means controls said disengaging means.

53. A supply point, a plurality of definitely positioned discharge points, arranged one above the other, a transfer mechanism receiving articles one by one at the supply point and delivering a plurality of them simultaneously one at each discharge point, and a system of control for said transfer mechanism controlled by the delivery of articles to the supply point.

54. A supply point, a plurality of discharge points, a conveyor traversing said supply and discharge points, means for driving said conveyor ahead one step each time an article is engaged therewith, means for simultaneously disengaging the articles one at each discharge point after a predetermined number of articles have been delivered to said conveyor, and a system of control through which the delivery of articles to the supply point controls said driving means and said driving means controls said disengaging means.

55. A supply point, a plurality of discharge points, a conveyor provided with article holding devices traversing said points, means for engaging said devices with the articles at the supply point, means for driving said conveyor ahead one step each time an article is engaged therewith, means for simultaneously disengaging said holding devices from the articles, one at each discharge point, after a predetermined number of articles have been supplied to said conveyor, and an electrical system of control through which actuation of all of said means is automatically effected.

56. A supply point, a plurality of receiving mechanisms, a transfer conveyor receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each receiving mechanism.

57. A supply point, a plurality of receiving mechanisms, a transfer conveyor receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each receiving mechanism, and means for driving said conveyor ahead one step each time an article is supplied thereto, the delivery of articles to said receiving mechanisms occurring every time the number of articles received by the transfer conveyor corresponds to the number of receiving mechanisms.

58. A supply point, a plurality of receiving mechanisms, a transfer conveyor interposed therebetween to receive articles from the supply point and convey them to said receiving mechanisms, means for stepping said conveyor ahead each time an article is received thereby, and means for simultaneously delivering articles to said receiving mechanisms operable each time a predetermined number of articles have been delivered to said transfer conveyor.

59. A supply point, a plurality of receiving mechanisms, a transfer conveyor receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each receiving mechanism, means for driving said transfer conveyor ahead one step each time an article is received thereby, and means for moving said receiving mechanisms each time articles are delivered thereto.

60. A supply point, a plurality of receiving mechanisms, a transfer conveyor receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each receiving mechanism, and operating means controlled by the operation of said conveyor mechanism for periodically moving said receiving mechanisms.

61. A supply point, a plurality of receiving mechanisms, a transfer conveyor receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each receiving mechanism, driving means for stepping said conveyor ahead one step each time an article is supplied thereto, operating means for periodically moving said receiving mechanisms, and a system of control through which said driving means controls said operating means.

62. A supply point, a plurality of discharge points, a transfer conveyor provided with article holding devices traversing said points, driving means for stepping said conveyor ahead one step each time an article is engaged therewith, means operable each time a predetermined number of articles have been delivered to said transfer conveyor for disengaging said devices from the articles simultaneously one at each discharge point, a plurality of receiving mechanisms, one adjacent each discharge point, for simultaneously receiving articles therefrom, operating means for moving said receiving mechanisms each time articles are delivered thereto, and a system of control through which said driving means and disengaging means control said operating means.

63. A supply point, a plurality of discharge points, a transfer conveyor provided with article holding devices traversing said points, driving means for stepping said con-

veyor ahead one step each time an article is engaged therewith, means for engaging said devices with the articles at the supply point, means operable each time a predetermined number of articles have been deliverd to said transfer conveyor for simultaneously disengaging said devices from the articles one at each discharge point, a plurality of receiving mechanisms one adjacent each discharge point for simultaneously receiving articles therefrom, operating means for moving said receiving mechanisms each time articles are delivered thereto, and a system of control through which said engaging means controls said driving means, and said driving means controls said disengaging means and said operating means.

64. A supply point, a plurality of receiving mechanisms, a transfer mechanism receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each receiving mechanism, and operating means for said transfer mechanism and said receiving mechanisms controlled by the delivery of articles to said supply point.

65. A supply point, a plurality of receiving mechanisms, a transfer conveyor receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each receivng mechanism, operating means for said conveyor and said receiving mechanisms, and an electrical system of control for said operating means controlled by the delivery of the articles to the supply point.

66. A supply point, a plurality of receiving mechanisms, a transfer conveyor for receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each receivng mechanism, means for driving said conveyor ahead one step each time an article is supplied thereto, operating means for moving said receiving mechanisms each time articles are delivered thereto and a system of control for said driving means and operating means controlled by the delivery of articles to the supply point.

67. A supply point, a plurality of discharge points, a conveyor provided with article holding devices traversing said supply and discharge points, means for engaging said devices with the articles at the supply point, means for driving said conveyor one step each time an article is engaged therewith, means for simultaneously disengaging said holding devices from the articles one at each discharge point after a predetermined number of articles have been supplied to said conveyor, a plurality of receiving mechanisms one at each discharge point for receiving articles therefrom, means for moving said receiving mechanisms each time articles are delivered thereto, and an electrical system of control for automatically controlling the actuation of all of said means in proper sequence.

68. A supply point, a plurality of discharge points, a transfer conveyor traversing said supply and discharge points, shifting mechanism adjacent each discharge point, and operating means for simultaneously moving said mechanisms into the path of the articles as they are brought by said conveyor into position at the discharge points and then advancing said mechanisms after the articles have been delivered thereto.

69. A supply point, a plurality of discharge points, a shifting mechanism adjacent each discharge point, a transfer conveyor receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each shifting mechanism, and means for actuating said shifting mechanisms each time the number of articles delivered to said conveyor corresponds to the number of discharge points.

70. A supply point, a plurality of discharge points, a conveyor traversing said supply and discharge points, a plurality of shifting mechanisms one adjacent each discharge point, and operating means for simultaneously moving said mechanisms rearwardly beneath the articles as they are brought into position at the discharge points and then advancing said mechanisms after the articles are delivered thereto.

71. A supply point, a plurality of discharge points, a conveyor traversing said points, a pivoted receiving arm one adjacent each discharge point, and means for simultaneously moving said arms rearwardly into position to receive articles from said conveyor and then advance said arms after the articles are received thereby.

72. A supply point, a plurality of discharge points, a conveyor provided with article holding devices traversing said supply and discharge points, a plurality of shifting mechanisms, one adjacent each discharge point, means for simultaneously moving said shifting mechanisms into position to receive articles from said conveyor and then advance said mechanisms, and means for simultaneously disengaging said holding devices one at each discharge point after said shifting mechanisms have been moved into receiving position.

73. A supply point, a plurality of discharge points, a conveyor provided with article holding devices traversing said supply and discharge points, means for engaging said devices with the articles at the supply point, means for driving said conveyor ahead one step each time an article is delivered thereto, a plurality of pairs of pivoted arms, one pair adjacent each discharge point, operating means for simultaneously moving said pairs of arms into position be-

neath the articles after a predetermined number of articles have been supplied to said conveyor, and means for disengaging said devices from the articles at said discharge points after said arms have been moved into receiving positions, said operating means being again operable to advance said arms after the articles are delivered thereto.

74. A supply point, a plurality of discharge points, a conveyor provided with article holding devices traversing said supply and discharge points, means for driving said conveyor forward one step each time an article is supplied thereto, a plurality of shifting mechanisms one adjacent each discharge point, means for simultaneously operating said shifting mechanisms, means for disengaging said devices from the articles at the discharge points, and a system of control through which said driving means actuates said operating means to move said mechanisms into receiving position after a predetermined number of articles have been supplied to the conveyor and said disengaging means again actuates said operating means to advance the mechanisms after said disengaging means are operated.

75. A supply point, a plurality of discharge points, a conveyor provided with article holding devices traversing said supply and discharge points, means for engaging said devices with the articles at the supply point, means for driving said conveyor forward one step each time an article is engaged therewith, means for disengaging said holding devices from the articles at the discharge points, a plurality of shifting mechanisms one adjacent each discharge point, operating means for shifting mechanisms; and a system of control including a switch controlling said driving means and actuated by said engaging means, a switch controlling said operating means and actuated by said driving means, a switch controlling said disengaging means and actuated by said conveyor, and a switch also controlling said operating means and actuated by said disengaging means.

76. A supply point, a plurality of superposed carriers, and a transfer mechanism receiving articles one by one from said supply point and discharging a plurality of them simultaneously one to each carrier.

77. A supply point, a drier having a plurality of stages each including a carrier, transfer mechanism receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each carrier, the delivery of said articles to the carriers of said drier occurring every time the number of articles received by the transfer mechanism corresponds to the number of stages of the drier.

78. A supply point, a plurality of carriers, a conveyor receiving articles one by one from said supply point and discharging a plurality of them simultaneously one to each carrier, means for stepping said transfer conveyor ahead one step each time an article is delivered thereto, and means for stepping said carriers forward each time articles are delivered thereto from said conveyor.

79. A supply point, a plurality of carriers, a transfer mechanism receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each carrier, and operating means for said transfer mechanism and said carriers controlled by the delivery of articles to the supply point.

80. A supply point, a drier having a plurality of stages each including a carrier, a transfer mechanism for receiving articles from said supply point and delivering a plurality of them simultaneously one to each carrier, means for periodically actuating said transfer mechanism, and means controlled by the operation of said transfer mechanism for periodically driving said carriers.

81. A supply point, a plurality of carriers, a transfer mechanism including a conveyor receiving articles from said supply point and shifting mechanisms to move the articles from said conveyor to said carriers, means for moving said conveyor ahead one step each time an article is delivered thereto, and means for simultaneously actuating said shifting mechanisms each time a predetermined number of articles have been received by said conveyor.

82. A plurality of horizontally disposed carriers one above the other, a conveyor having a run movable downwardly in front of said carriers, and mechanisms one in front of each carrier for shifting the articles from said conveyor to said carriers.

83. A plurality of carriers one above the other, a conveyor having a run movable downwardly in front of said carriers, and a shifting mechanism in front of each carrier, each of said shifting mechanisms being movable rearwardly into the path of said conveyor to receive an article therefrom and movable forwardly to deliver the article to its respective carrier.

84. A supply point, a plurality of carriers, transfer mechanism including a conveyor receiving articles from said supply point and shifting mechanisms to move the articles from said conveyor to said carriers, means for moving said transfer conveyor each time an article is delivered thereto, means for actuating said shifting mechanisms each time

the number of articles delivered to said conveyor corresponds to the number of carriers, and means for moving said carriers each time articles are delivered thereto.

85. A supply point, a plurality of discharge points, a plurality of carriers one adjacent each discharge point, a transfer conveyor provided with article holding devices traversing said supply and discharge points, means for engaging said holding devices with the articles at the supply point, means for driving said conveyor each time an article is engaged therewith, means for disengaging said holding devices from the articles simultaneously one at each discharge point, mechanisms one adjacent each discharge point for shifting the articles from the conveyor to said carriers, and means for simultaneously operating said mechanisms.

86. A supply point, a plurality of discharge points, a plurality of carriers one adjacent each discharge point, a transfer conveyor provided with article holding devices traversing said point, mechanisms for shifting the articles from said discharge points to said carriers, means for engaging said holding devices with the articles at the supply point, means for driving said conveyor ahead one step each time an article is engaged therewith, operating means for moving said shifting mechanisms into receiving positions after as many articles have been supplied to said conveyor as there are carriers, and means for disengaging said devices from the articles at the discharge points after said shifting mechanisms have been moved into receiving positions, said operating means for said shifting mechanisms being then operable to advance the latter.

87. A supply point, a plurality of receiving mechanisms, a conveyor receiving articles one by one from said supply point and delivering a plurality of them simultaneously one to each receiving mechanism, and means for adjusting said conveyor relative to said receiving mechanisms.

88. An endless conveyor, a supporting frame therefor, a supply point at the receiving side of said conveyor, a plurality of receiving mechanisms at the delivery side of said conveyor, and means for adjusting said frame to vary the relation of the delivery side of said conveyor to said mechanisms.

89. A supply point, a conveyor provided with article holding devices traversing said supply point, means for engaging said holding devices with articles supplied thereto, operating means therefor, and means electrically controlled by said operating means for moving said conveyor ahead step by step.

90. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means controlled by the delivery of the articles to the supply point for engaging said holding devices with the articles at the supply point, means controlled by said engaging means for periodically driving said conveyor, and means controlled by the operation of said conveyor for disengaging said devices from the articles at the discharge point.

91. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said holding devices with the articles at the supply point, means electrically controlled by said engaging means for periodically driving said conveyor, and means electrically controlled by the operation of said conveyor for disengaging said devices from the articles at the discharge point.

92. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with articles supplied thereto, means for driving said conveyor ahead one step each time an article is engaged therewith, means for disengaging said devices from the articles at the discharge point, and a system of control through which said engaging means, driving means and disengaging means are automatically actuated in sequence.

93. A discharge point, a conveyor mechanism including a conveyor provided with article holding devices traversing said point and means for driving said conveyor, means for disengaging said devices from the articles at the discharge point, and controlling means for said disengaging means periodically actuated by the operation of said conveyor mechanism.

94. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for actuating said devices, intermittently actuated mechanism for receiving articles from said conveyor at the discharge point, and a system of control through which said mechanism is controlled by the operation of said conveyor.

95. A supply point, a discharge point, a conveyor provided with automatically operated article holding devices traversing said points, driving means for moving said conveyor ahead one step each time an article is delivered thereto, mechanism for receiving articles from said conveyor at the discharge point, operating means for intermittently actuating said mechanism, and a system of control through which said driving means controls said operating means.

96. A supply point, a discharge point, a conveyor mechanism including a conveyor provided with article holding devices traversing said points and means for driving said conveyor each time an article is engaged therewith, means for engaging said

devices with the articles at the supply point, said driving means being controlled by said engaging means, means controlled by the operation of said conveyor mechanism for disengaging said devices from the articles at the discharge point, mechanism at the discharge point, and operating means therefor controlled by the operation of said conveyor mechanism.

97. In an apparatus for handling tubes or similar articles, a supply point, a drier including a carrier for moving the articles therethrough, a transfer mechanism receiving articles from the supply point and delivering them to said carrier, said transfer mechanism including article holding devices adapted to engage the articles at their opposite ends, means for driving said carrier, and a system of control through which said driving means is controlled by the operation of said transfer mechanism.

98. A supply point, a drier including a carrier for moving articles therethrough, a transfer mechanism for delivering articles from the supply point to said carrier, said mechanism including a conveyor adapted to pick up and bodily carry said articles from the supply point, driving means for said carrier, and a system of control through which said driving means and transfer mechanism are automatically controlled.

99. A supply point, a drier having a carrier for moving the articles therethrough, a transfer mechanism for receiving the articles from the supply point and delivering them to said carrier, said transfer mechanism including a conveyor provided with article holding devices, operating mechanism for said transfer mechanism, driving means for said carrier, and a system of control through which said driving means is controlled by the operation of said transfer mechanism.

100. A supply point, a discharge point, a conveyor traversing said points, a receiving mechanism at said discharge point, and means for moving said mechanism rearwardly into position to receive an article from the conveyor and then move it forwardly after the article is received thereby.

101. A supply point, a discharge point, a conveyor provided with article holding devices traversing said points, means for engaging said devices with the articles at the supply point, means for disengaging said devices from the articles at the discharge point, mechanism adjacent the discharge point for receiving the articles therefrom, means for moving said mechanism into position to receive an article from the conveyor and then advance it after the article is delivered thereto, and a system of control through which the operation of said conveyor controls said last mentioned means.

102. A supply point, a discharge point, a conveyor mechanism including a conveyor provided with article holding devices traversing said points and means for periodically driving said conveyor, means for engaging said devices with the articles at the supply point, means for disengaging said devices from the articles at the discharge point, shifting mechanism adjacent the discharge point, operating means for moving said mechanism into receiving position and then advancing the same after an article is delivered thereto, and a system of control through which said engaging means controls said driving means and said conveyor mechanism controls said operating means.

103. A supply point, a carrier, a transfer mechanism including a conveyor provided with article holding devices traversing said supply point and shifting mechanism for moving the articles from the discharge point of said conveyor to the carrier, means for engaging said devices with the articles at the supply point, means for driving said conveyor ahead one step each time an article is engaged therewith, means for disengaging said devices from the articles at the discharge point, means for moving said shifting mechanism into position beneath the descending article and then moving said mechanism forwardly after the article has been disengaged from said holding devices and received by said mechanism, means for periodically driving said conveyor, and a system of automatic control for said engaging means, driving means, disengaging means and moving means.

104. A supply point, a plurality of definitely positioned discharge points one above the other, and a transfer mechanism receiving articles one by one at the supply point and delivering a plurality of them simultaneously one at each discharge point.

105. A supply point, a plurality of discharge points, a conveyor having article holding devices traversing said points, and means at the discharge points for simultaneously disengaging said devices from the articles.

106. A conveyor having a pair of vertical runs moving in opposite directions, a supply point on one of said runs, a plurality of discharge points on the other of said runs disposed one above the other, means for stepping said conveyor forwardly each time an article is supplied thereto, and means for discharging the articles simultaneously one from each discharge point.

107. A supply point, a plurality of discharge points, a conveyor provided with

article holding devices traversing said points, means for engaging said devices with the articles at the supply point, means for driving said conveyor ahead one step each time an article is engaged therewith, means for simultaneously disengaging said holding devices from the articles one at each discharge point after a predetermined number of articles have been supplied to said conveyor, and a system of control for all of said means controlled by the delivery of articles to said supply point.

108. A supply point, a plurality of discharge points, a transfer conveyor provided with article holding devices traversing said points, driving means for stepping said conveyor ahead one step each time an article is engaged therewith, means operable each time a predetermined number of articles have been delivered to said transfer conveyor for disengaging said devices from the articles simultaneously one at each discharge point, a plurality of receiving mechanisms, one adjacent each discharge point, for simultaneously receiving articles therefrom, operating means for moving said receiving mechanisms each time articles are delivered thereto, and a system of control through which all of said means are automatically controlled in proper sequence.

109. A supply point, a plurality of discharge points, a conveyor mechanism including a conveyor provided with article holding devices traversing said supply and discharge points and means for driving said conveyor, a plurality of shifting mechanisms one adjacent each discharge point, means for simultaneously moving said shifting mechanisms into position to receive articles from said conveyor and then advance said mechanisms, means for simultaneously disengaging said holding devices one at each discharge point after said shifting mechanisms have been moved into receiving position, and a system of control through which all of said means are automatically controlled.

HOWARD PARKER.

Witnesses:
R. A. SMITH,
E. F. BAILEY.