

No. 671,508.

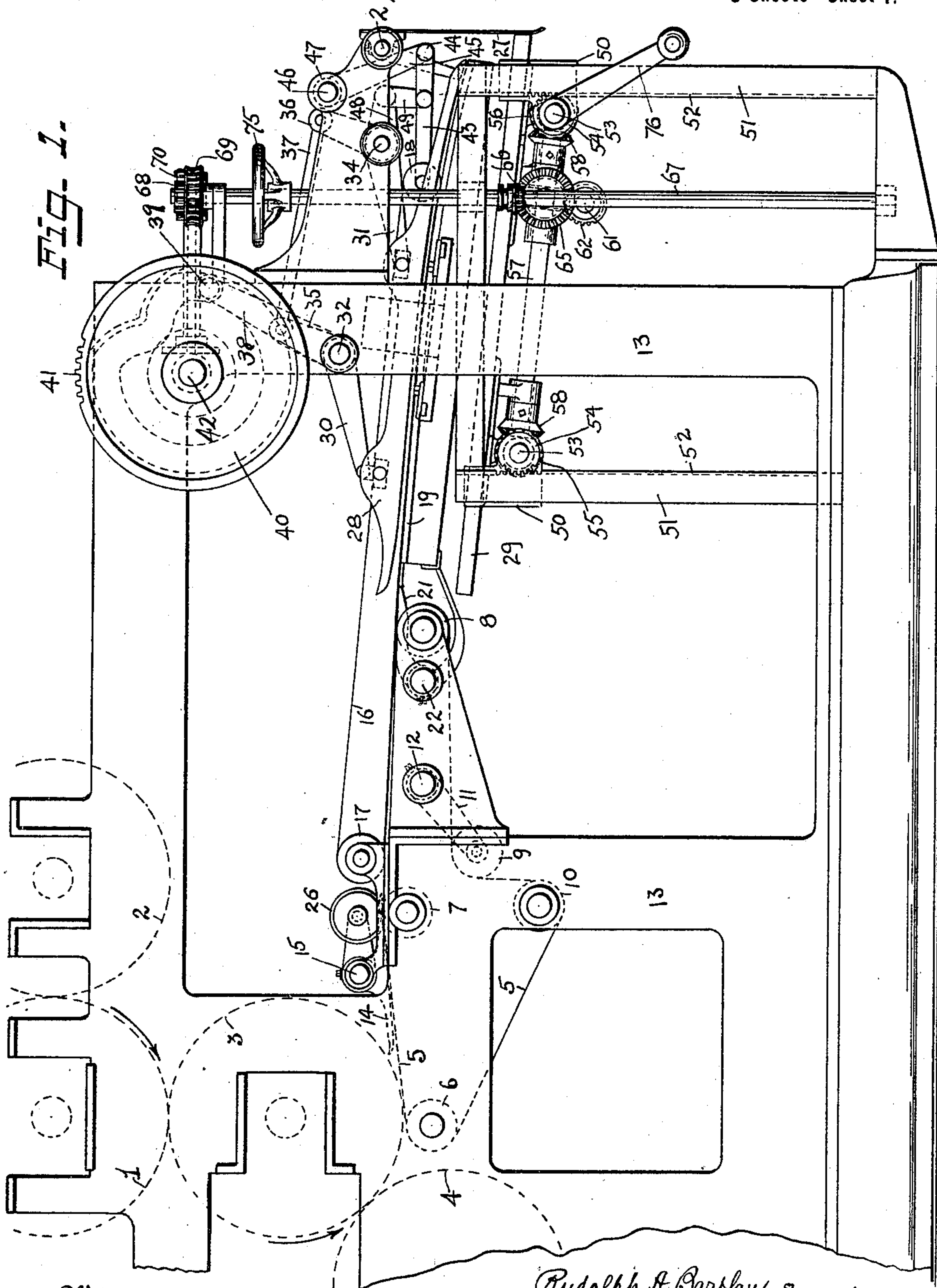
Patented Apr. 9, 1901.

R. A. BARTLAU.
SHEET DELIVERY APPARATUS.

(Application filed Sept. 26, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
Chas. W. Thomas.
Frank Ryall.

Rudolph A. Bartlau, Inventor,
By his Attorney Richard W. Parkley.

No. 671,508.

Patented Apr. 9, 1901.

R. A. BARTLAU.
SHEET DELIVERY APPARATUS.

(Application filed Sept. 28, 1899.)

(No Model.)

3 Sheets—Sheet 2.

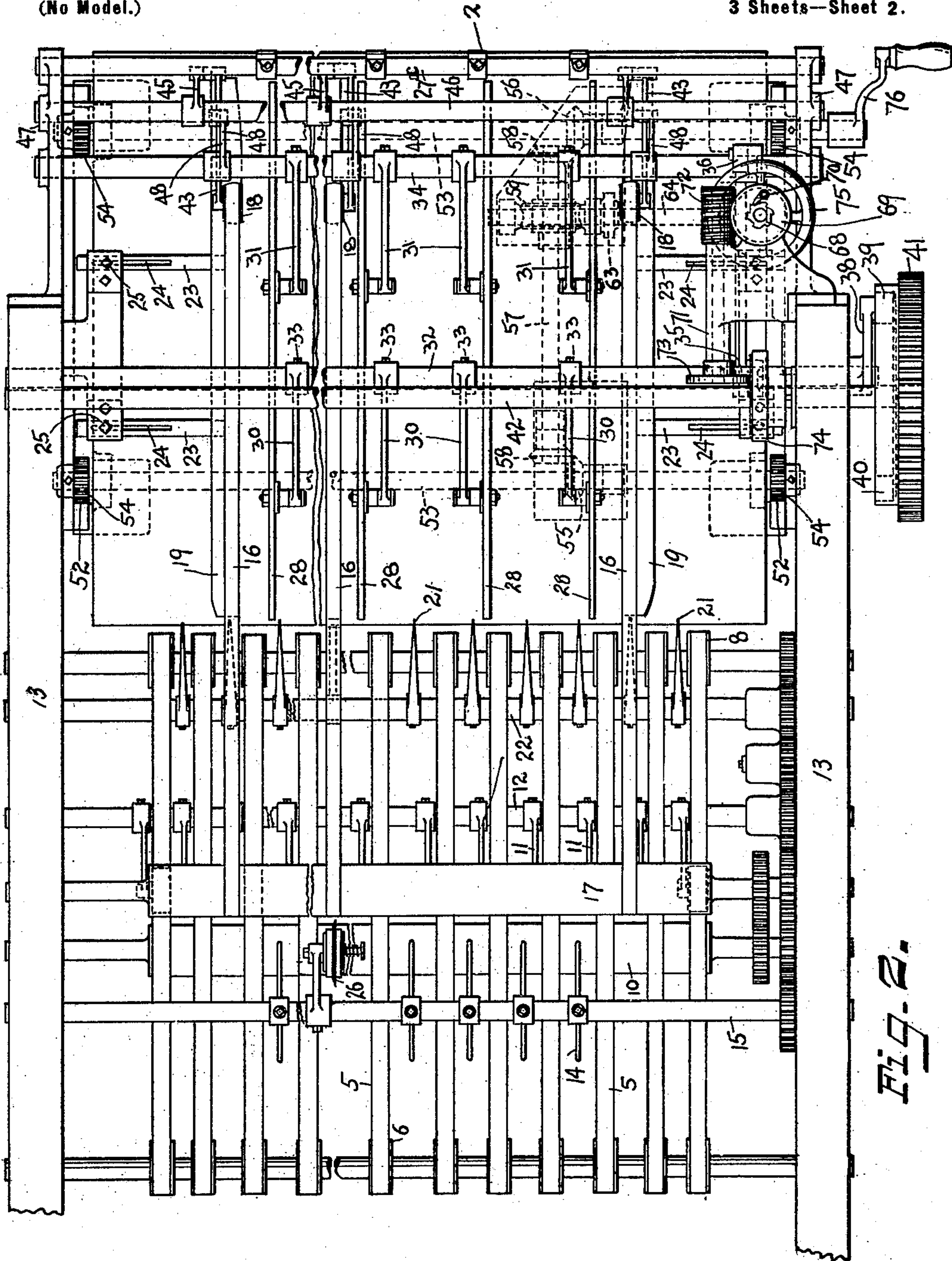


Fig. 2.

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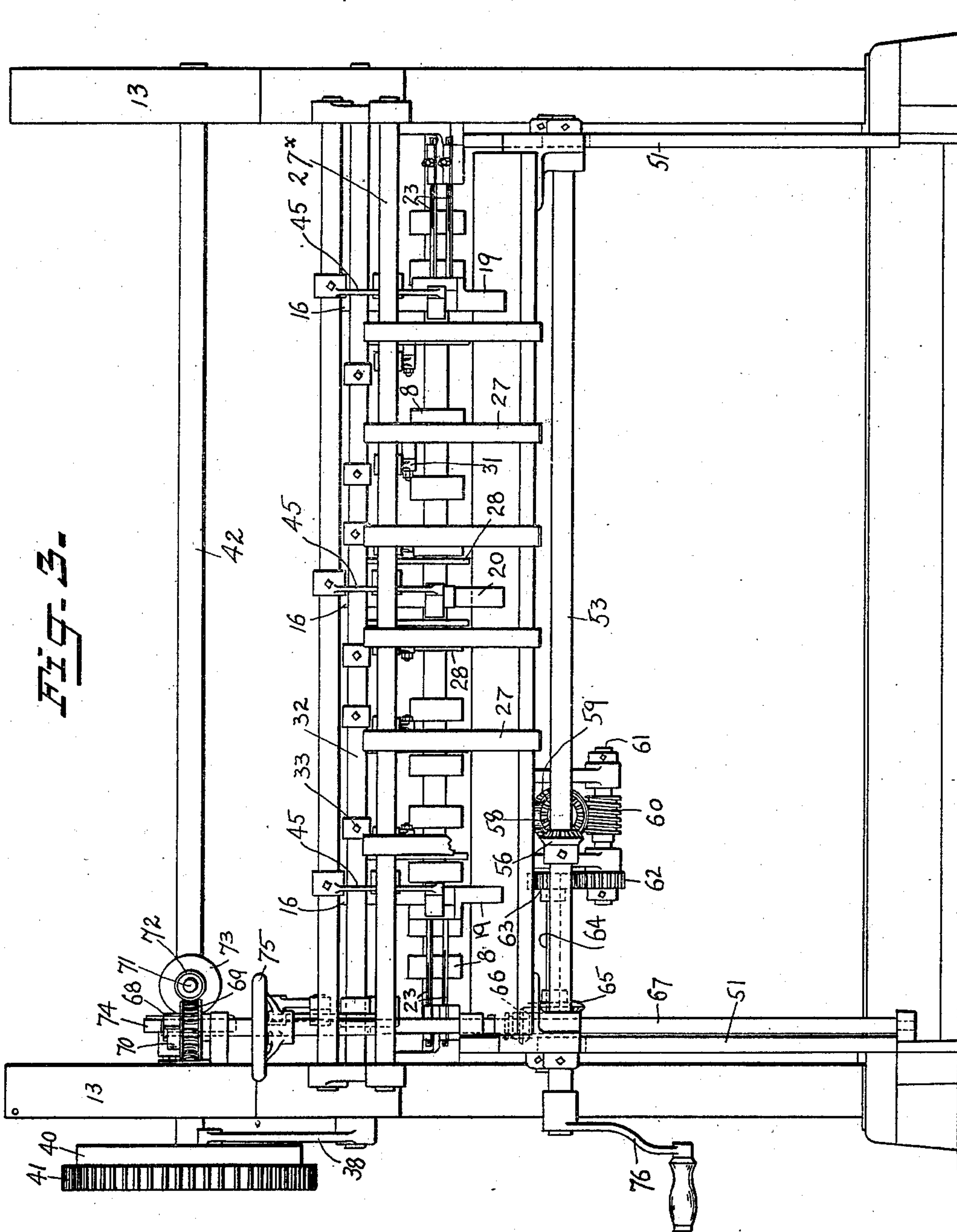
Patented Apr. 9, 1901.

R. A. BARTLAU.
SHEET DELIVERY APPARATUS.

(Application filed Sept. 26, 1899.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

RUDOLPH AUGUST BARTLAU, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO
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SHEET-DELIVERY APPARATUS.

SPECIFICATION forming part of Letters Patent No. 671,508, dated April 9, 1901.

Application filed September 26, 1899. Serial No. 731,717. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH AUGUST BARTLAU, a citizen of the United States, and a resident of Plainfield, in the county of Union and State of New Jersey, have invented a certain new and useful Improvement in Sheet-Delivery Apparatus, of which the following is a specification.

The present invention relates to mechanism for delivering sheets flatwise, and has for its object the improvement and simplification of the same.

The invention consists of features of construction and combinations of devices hereinafter described, and more particularly pointed out in the claims concluding this specification.

The preferred form of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of part of a printing-machine in which the invention is embodied. Fig. 2 is a plan view of the delivery apparatus shown in Fig. 1, and Fig. 3 is an end elevation of the said delivery apparatus.

The reference 1 marks the first impression-cylinder, and 2 the first plate-cylinder. The sheets are fed to grippers (not shown) on the cylinder 1 and receive an impression on one side from the plate-cylinder 2 and are then delivered to grippers on the second impression-cylinder 3 as their heads pass the line of tangency of the cylinders 1 and 3. (Grippers on cylinder 3 not shown.) As the sheets pass the second form-cylinder 4 they receive impressions on their other sides and are so perfected. The cylinder 3 delivers the sheets upon a set of tapes 5, which run on rollers or pulleys 6 7 8 9 10, the roller or set of pulleys 9 being carried by arms 11, which are pivoted at 12 to the framework 13 of the machine and acting as a tension-roller or take-up. The guides 14 above the set of tapes 5 coact therewith to retain the sheets thereon as they are run from the cylinder 3. The guides 14 are carried by a transverse shaft 15 fixed in the framework of the machine or parts attached thereto, and the guides or the shaft, or both, may be adjustable in order to get the guides at the proper angle. The guides 14 extend a

short way beyond the roller or pulleys 7, and beyond that the sheets are held down on the set of tapes 5 by a set of tapes 16, which run on rollers or pulleys 17 18. The tapes 16 extend beyond the pulleys 8 and over curved guide-bars 19 20, against which they bear. The sheets are held up and directed between the tapes 16 and the bars 19 20 by guides 21, carried by a shaft 22 fixed in the framework 13 and extending beyond the roller 8 and some of them abutting against the ends of the bars 19 20. The guides 21 are adjustable along the shaft 22. The guide-bars 19 are carried by arms 23, which are adjustably attached to the frame 13, as by slots 24 in the arms 23 and screw-bolts and clamps 25. The pulleys 18 of the corresponding tapes of set 16 are also adjustable along their respective shafts in order to always have them coact with the guide-bars 19. The sheets as they are run out by the tapes 5 and guides 14 pass under a splitter 26 and are cut in two thereby and by a groove in the roller 7, and the newly-severed edges pass beneath the middle tape of set 16 and over guide-bar 20 and are held thereby. From the described construction it will be seen that the outer or side margins and the central line where the sheets rest upon bar 20 are alone held by the bars 19 20 and set of tapes 16. As the heads of the sheets reach stop-fingers 27 on shaft 27^x, the sheets are pushed downward and drawn from under the tapes 16 by knockers or pushers 28 and fall upon a table 29. Shaft 27^x is journaled in the framework 13.

The knockers 28 preferably consist each of a blade having its lower edge curved to strike the sheets as they curve over the bars 19 20 at all points simultaneously, and each of said blades 28 is pivotally attached to two equal arms 30 31. The arms 30 are attached to a rock-shaft 32, which is journaled in the framework 13, set-screws 33 being used to secure the arms 30 adjustably on the shaft. The arms 31 are similarly attached to a rock-shaft 34, journaled in the framework 13. The shaft 32 is provided with an arm 35 and shaft 34 with an equal and parallel arm 36, and these two arms are connected by a link or rod 37, which is pivotally connected at its ends with them. Other means may be used to in-

sure that shafts 32 and 34 rock equally or in unison. The shaft 32 also has an arm 38 fast thereto, which is provided with a pin or anti-friction-roller 39 for engagement with a cam 40, which is attached to a gear 41 on a shaft 42, journaled in the frame 13. The gear 41 is driven in any suitable manner at a rate of speed such as will secure that the motions of the knockers 28 shall be properly timed to push the sheets from the bars 19 20, as above set forth.

In order to facilitate the operation of pushing the sheets downward, as above described, the tapes 16 may be lifted momentarily or during the descent of the knockers 28, as will now be described.

The pulleys or roller 18, on which the tapes 16 run, are borne by arms 43, which are pivoted at 44 to other arms 45, which are attached to a shaft 46, which is journaled in bearings 47 on the frame 13. The shaft 34 is provided with arms 48, equal in number to the number of arms 44, and arms 44 and 48 are connected by links 49, which are pivoted to each. The arms 31 are at one side, and arms 48 are at the other side, of the shaft 34, so that as the arms 31 descend the arms 48 are raised, thus lifting the arms 44 and pulleys 18 at the time the knockers go down to push the sheets from the bars 19 20, and so releasing the pressure between the tapes 16 and the bars 19 20. On the up motion of the arms 31 the arms 44 are moved downwardly, and the tapes 16 are again brought against the upwardly-curved guides 19 20 with a pressure sufficient to cause the sheets to be carried along on the guides by the tapes 16, the sheets slipping on the smooth bars.

In order to keep the top of the pile of sheets on the delivery-board 29 at about the same height notwithstanding any increase in the thickness of the pile, the table is made to descend automatically, as by the mechanism shown in the drawings and now to be described. As shown, the table 29 is carried by vertically-movable blocks 50, which are guided in their up-and-down motion by up-rights 51 of the framework of the machine.

The uprights 51 are provided with racks 52 on one edge thereof, and two shafts 53 are journaled in the blocks 50 and are provided with gears 54 for engagement with said racks 52. The shafts 53 are provided also with miter-gears 55 56, and a shaft 57 is journaled in bearings attached to the under side of the table 29 and is provided with miter-gears 58, which mesh with the gears 55 56. The shaft 57 is provided with a worm-gear 59, with which a worm 60 on a shaft 61, directly below and at right angles to shaft 57, meshes to drive it and shaft 57. The shaft 61 has a pinion 62 fast thereon, which meshes with a spur-pinion 63, fast on a shaft 64, which is journaled, as is shaft 61, in bearings attached to the under side of table 29. The shaft 64 extends to near the side of the table 29 and is there provided with a miter-gear 65, which meshes with a

similar gear 66 on a vertical shaft 67. The shaft 67 is journaled in suitable bearings in the frame 13, and the gear 66 is arranged to turn therewith and to slide therealong in order to remain in engagement with the gear 65 aforesaid as the table 29 rises and falls. The shaft 67 has a ratchet-wheel 68 fast thereon, and adjacent the wheel 68 is a worm-gear 69, loose on the shaft 67 and connected with the ratchet-wheel 67 by a spring-pressed pawl 70. Journaled in the frame 13 is a horizontal shaft 71, having a worm 72 thereon, which meshes with and drives the worm-gear 69. The shaft 71 has a friction-disk 73 fast thereon, which bears against the face of a disk 74, fast on the shaft 42 aforesaid. The shaft 42 and disk 74 drive the disk 73 and shaft 71, and the worm 72 drives the gear 69. The gear 69, through the pawl 70 and ratchet-wheel 68, drives the vertical shaft 67 in one direction only. The shaft 67 rotates the gear 66, which drives the gear 65 and the shaft 64. The pinion 63 drives the pinion 62, shaft 61, and worm 60, and the worm 60 drives the worm-gear 59 and shaft 57 and gears 58, and the last drive the gears 55 56, shafts 53, and gears 54 downwardly. The described mechanism therefore slowly lowers the table 29 as the sheets accumulate thereon. A hand-wheel 75 on shaft 67 provides means whereby the table 29 may be lowered more rapidly than is the case when it is operated through the medium of the described gearing from shaft 42, the pawl and ratchet permitting of such rotation of shaft 67 unhindered by the worm 72. In order to return the table 29—that is, to move it upwardly—with speed, the rear shaft 53 is provided with a crank 76 by rotating it and so rotating the front shaft 53 also. At such times the ratchet 70 slips to allow of the upward motion of the table 29.

The out and in adjustment of the bars 19, guides 21, and the tapes 16 provides for sheets of different widths being delivered by the apparatus with a minimum of adjustment of parts.

I do not limit myself to the precise form of the invention shown in the drawings and hereinbefore described, inasmuch as equivalent devices may be employed in lieu of those shown and described.

The operation of the apparatus hereinbefore described is apparent from the description made and need not be repeated.

The moving parts of the apparatus shown may be operated by any appropriate means, as will be understood.

I claim—

1. In a sheet-delivery mechanism, the combination of margin-guides for the sheets, tapes coacting therewith to feed the sheets along, means for relieving the pressure of the tapes on said guides as the sheets are pushed from therebetween, and vibratory knockers for pushing the sheets, with a receiving-table, substantially as described.

2. In a sheet-delivery mechanism, the com-

5 combination of margin-guides for the sheets, tapes coacting therewith to feed the sheets along, the pulleys or roller for one end of said tapes being vibratory for relieving the pressure of the tapes on said guides, vibratory knockers for pushing the sheets downward, and a receiving-table, substantially as described.

10 3. In a sheet-delivery mechanism, the combination of margin-guides for the sheets, tapes coacting therewith to feed the sheets along, vibratory pulleys or roller for one end of said tapes for relieving the pressure of the tapes on said guides, vibratory knockers for pushing the sheets downward, connections between said vibratory pulleys and knockers for causing the one to operate the other, and a receiving-table, substantially as described.

15 4. In a sheet-delivery apparatus, the combination of a vertically-movable sheet-receiving table, a friction-driver mounted on the fixed framework, a vertical shaft journaled in said framework, gearing between said driver and said shaft, and gearing interposed between and connecting said shaft and said table for controlling the up-and-down motion of the latter, said last-mentioned gearing having a member sliding along and turning with said shaft, substantially as described.

20 5. In a sheet-delivery mechanism, the combination of a receiving-table, shafts journaled thereon, pinions on said shafts, vertical racks with which said pinions mesh, a friction-driver, and gearing having a sliding member for connecting said driver with said shafts and operating the same, substantially as described.

25 6. In a sheet-delivery mechanism, the combination of a receiving-table, shafts journaled thereon, pinions on said shafts, vertical racks with which said pinions mesh, a friction-driver, a vertical shaft driven in one direction from said driver, a sliding gear on said shaft, and gearing connecting said sliding gear and said shafts to rotate the latter, substantially as described.

30 7. In a sheet-delivery mechanism, the combination of a receiving-table, shafts journaled thereon, pinions on said shafts, vertical racks with which said pinions mesh, gearing connecting said shafts to move in unison, a vertical shaft on the framework driven in one direction and provided with a sliding gear, connections between said sliding gear and said unison gearing for driving the latter and

35 said shafts on said table, and a friction-driver for said vertical shaft, substantially as described.

8. In a sheet-delivery mechanism, the combination of a receiving-table, vertical racks, pinions on said table meshing with said racks, and driving mechanism partly on said table and partly on the framework of the machine for operating said pinions to move the table downward, substantially as described.

60 9. In a sheet-delivery mechanism, the combination of upwardly-curved margin-guides for the sheets, tapes coacting with said guides to feed the sheets along, vibratory pulleys for one end of said tapes for relieving the pressure of the tapes on said guides, vibratory knockers for pushing the sheet from between said tapes and guides, and a receiver for the sheets, substantially as described.

65 10. In a sheet-delivery mechanism, the combination of upwardly-curved margin-guides, tapes coacting with said guides to feed the sheets along, means for relieving the pressure of the tapes on said guides as the sheets are pushed from therebetween, vibratory curved knockers for pushing the sheets, with an automatically-lowered table for receiving the sheets, substantially as described.

70 11. In a sheet-delivery mechanism, the combination of three parallel margin-guides, a tape for and coacting with each of said guides to feed the sheets along, means for supplying double-width sheets or those having a central margin which overruns said central guide, a splitter in line with the central guide, and vibratory knockers for pushing the sheets from between said guides and tapes, substantially as described.

75 12. In a sheet-delivery mechanism, the combination of three parallel margin-guides, a tape for and coacting with each of said guides to feed the sheets along, a splitter in line with the middle guide, means for relieving the pressure of the tapes on said guides as the sheets are pushed from therebetween, and vibratory knockers for pushing the sheets downwardly, substantially as described.

80 Signed at Plainfield, in the county of Union and State of New Jersey, this 23d day of September, A. D. 1899.

RUDOLPH AUGUST BARTLAU.

Witnesses:

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FRED J. VIEWEG.