

L. A. CLINTON.

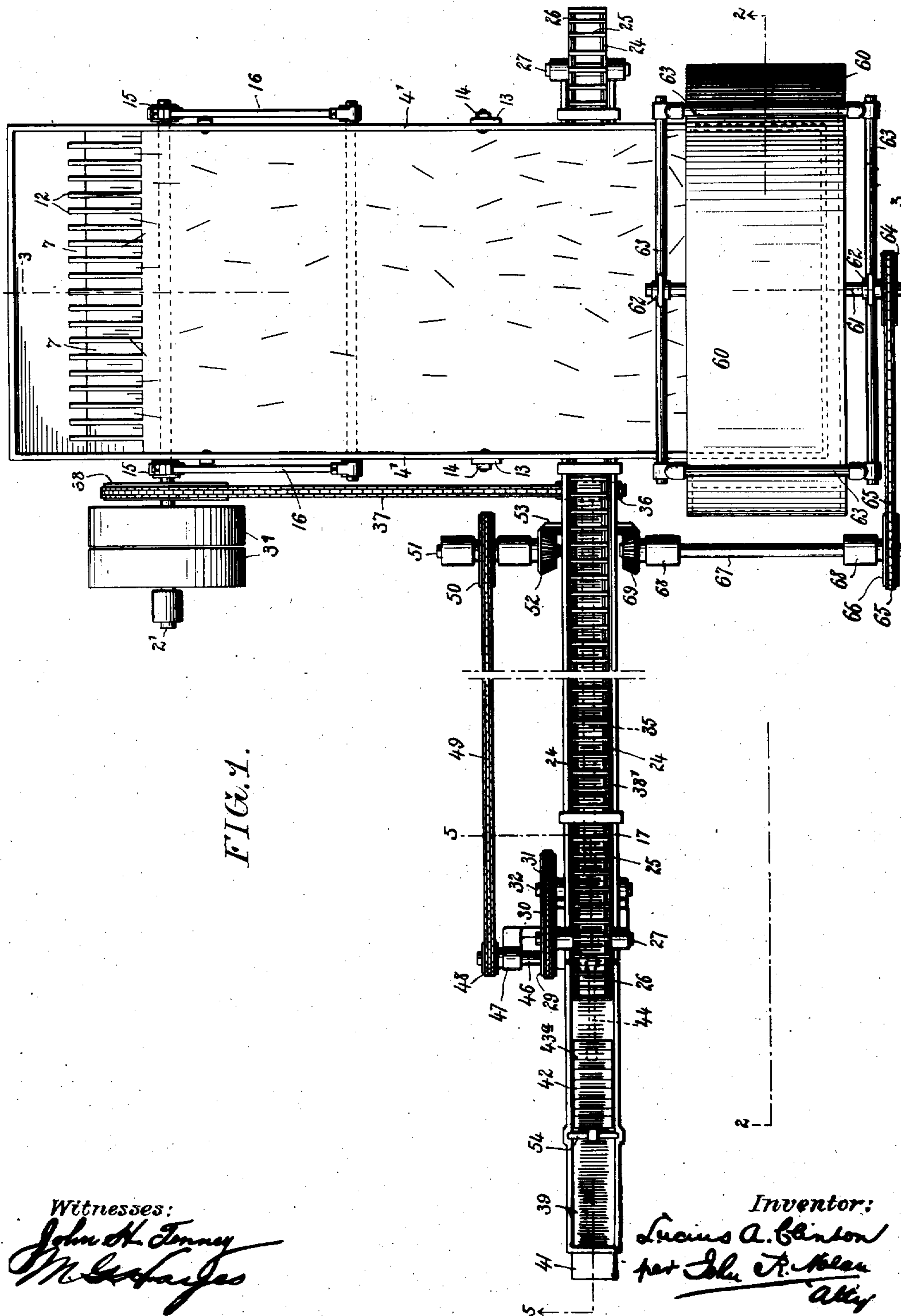
MACHINE FOR ASSEMBLING AND SCREENING SPLINTS.

APPLICATION FILED JULY 21, 1904.

Patented Mar. 22, 1910.

952,512.

5 SHEETS—SHEET 1.



Witnesses:
John H. Tenney
M. L. Hayes

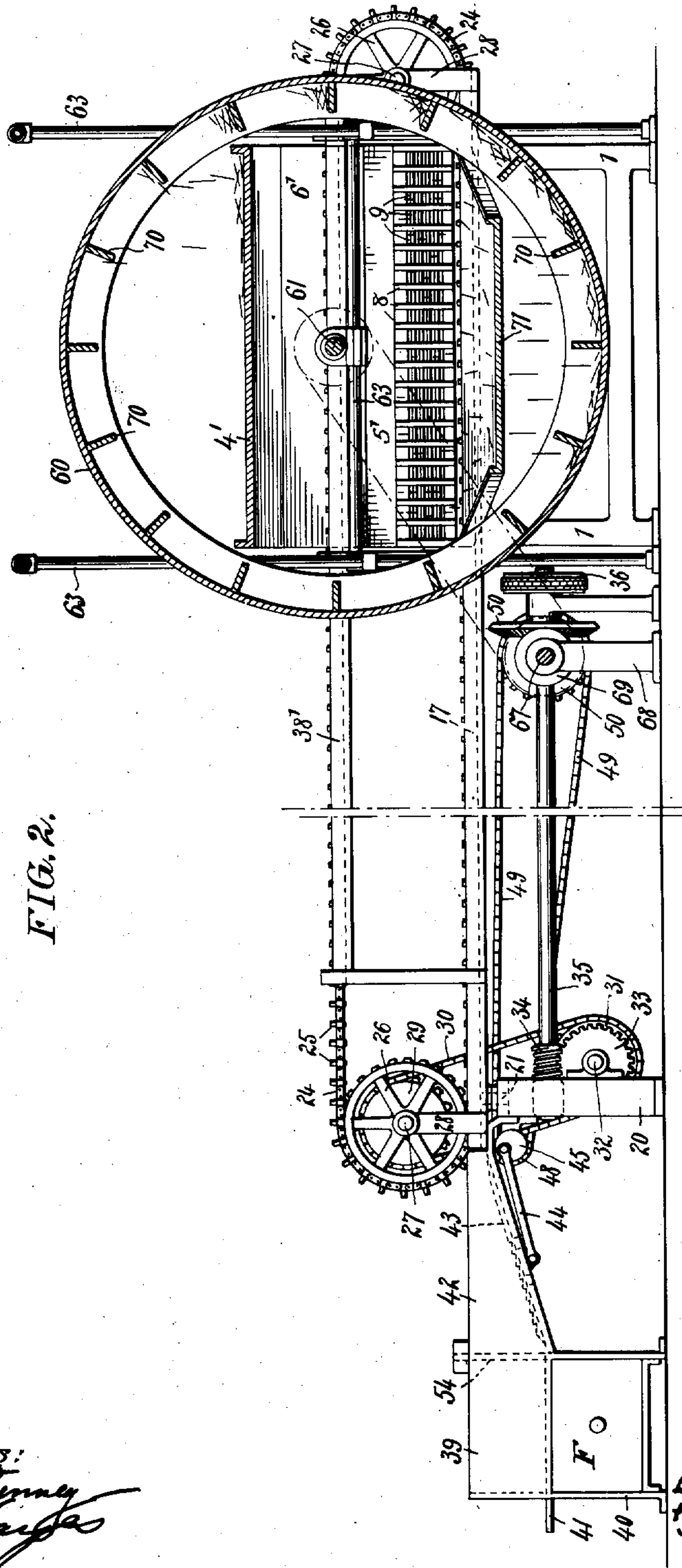
Inventor:
Lucius A. Clinton
per *John R. Nolan*
Att'y

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5 SHEETS—SHEET 2.



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Inventor:
Lucius A. Clinton
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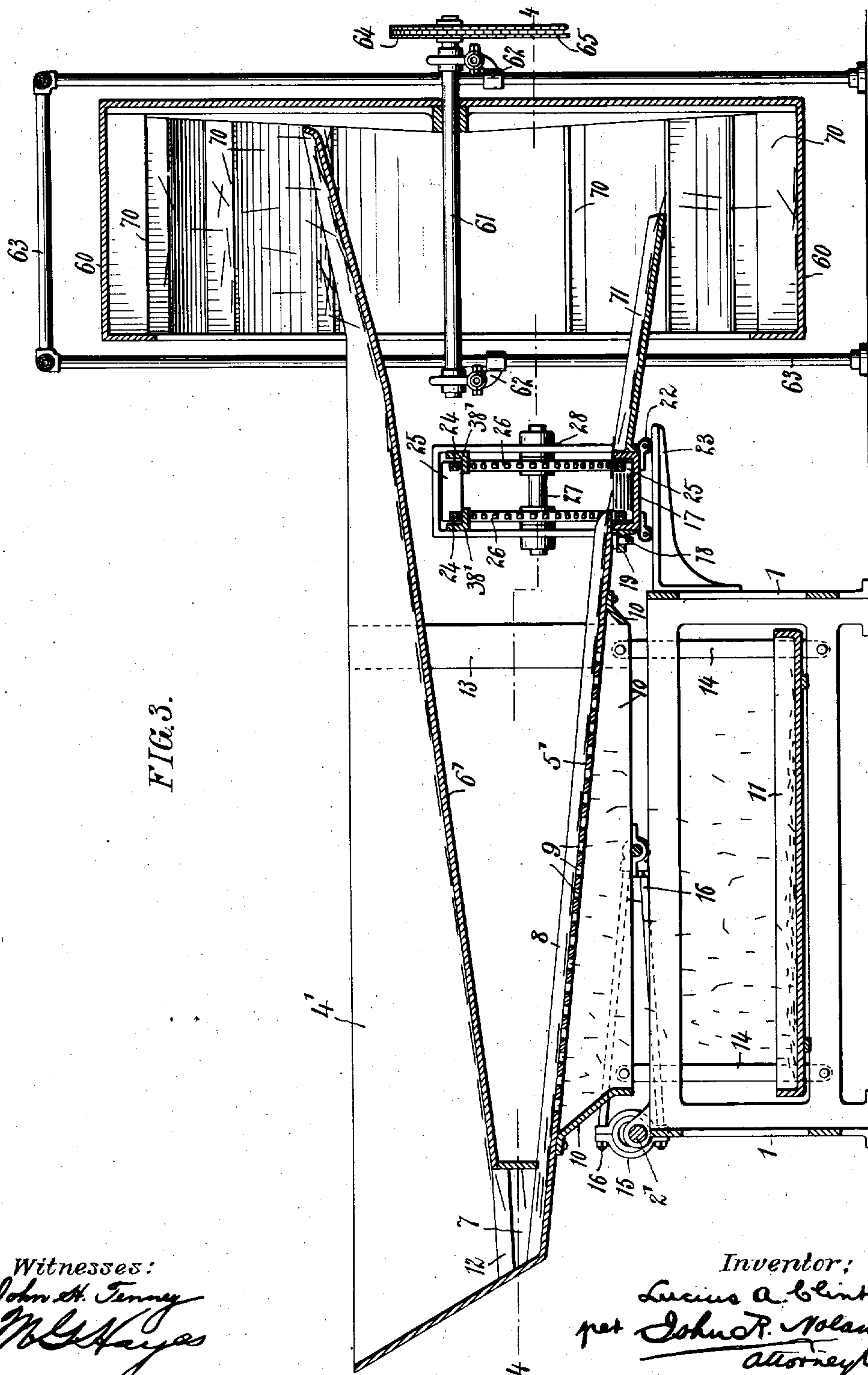


FIG. 3.

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5 SHEETS—SHEET 4.

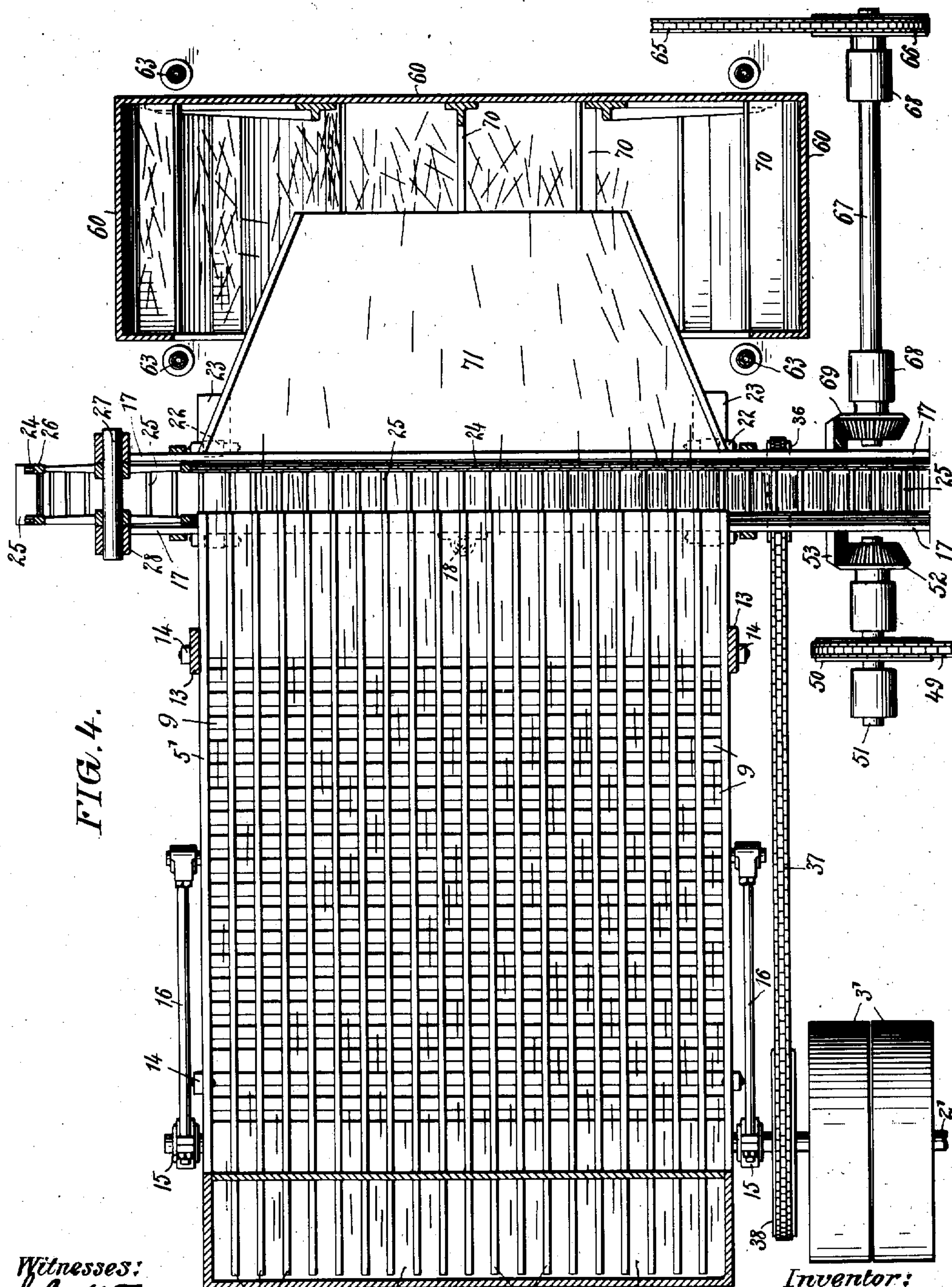


FIG. 4.

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5 SHEETS—SHEET 6.

FIG. 5.

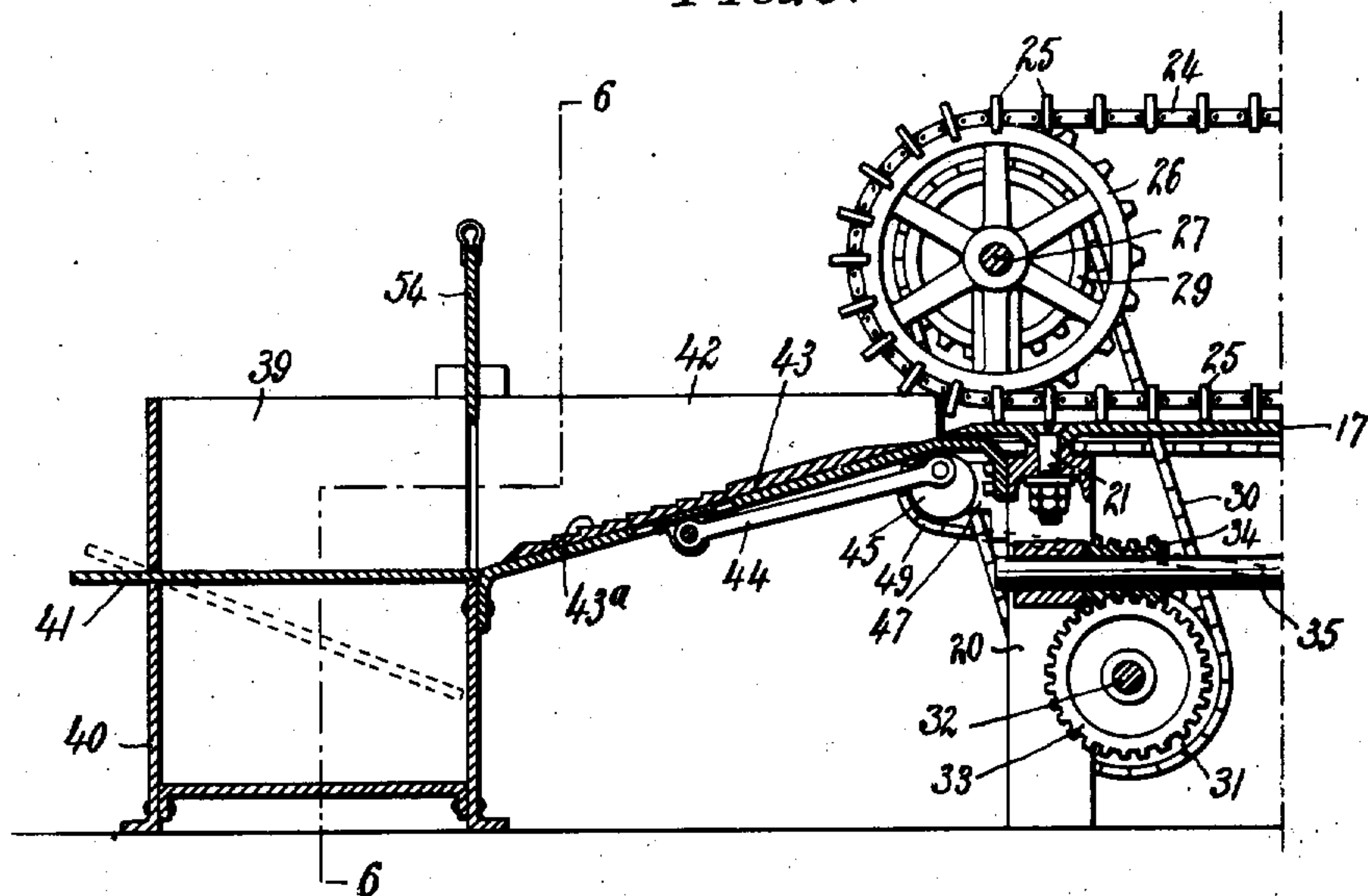


FIG. 6.

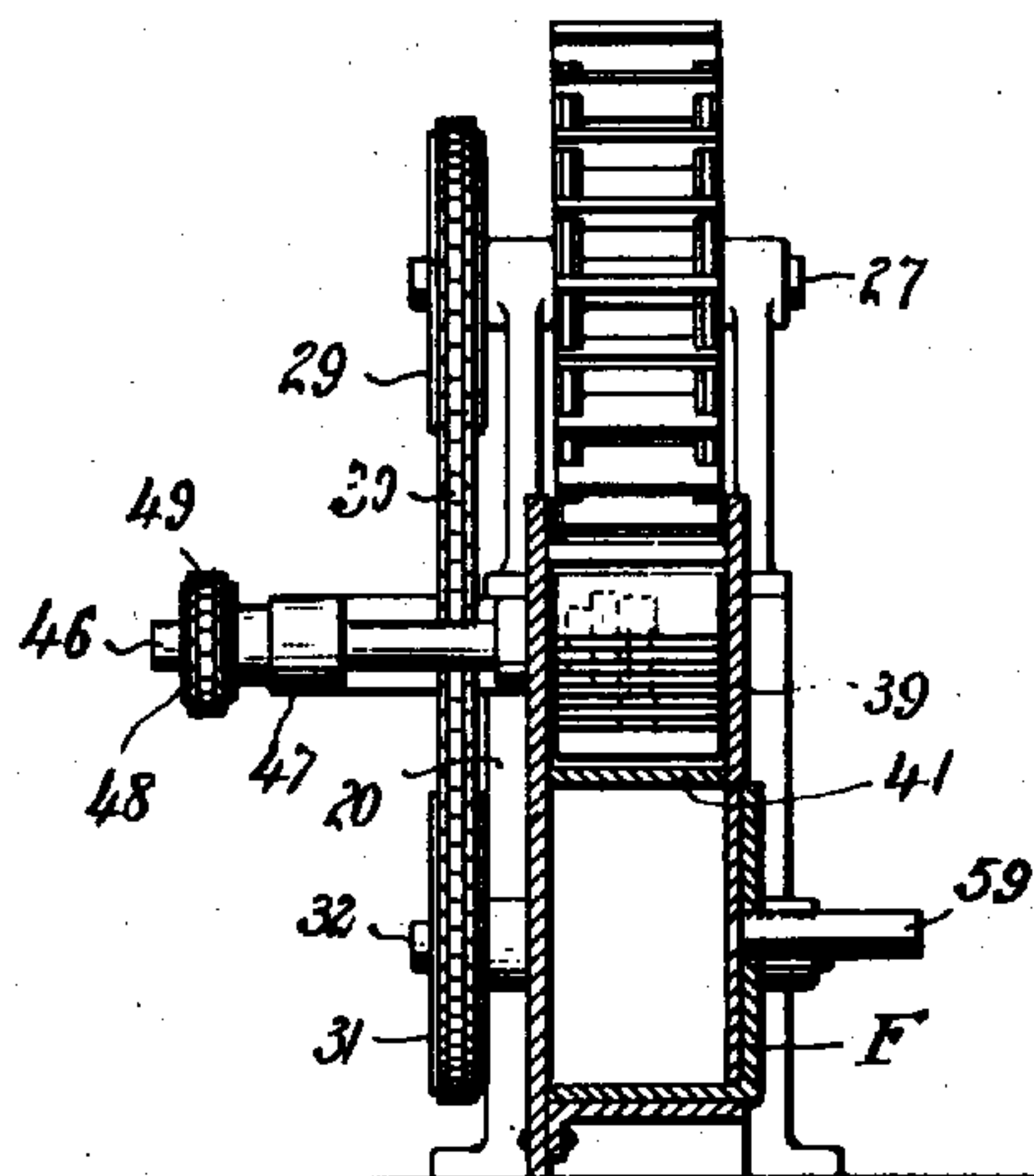
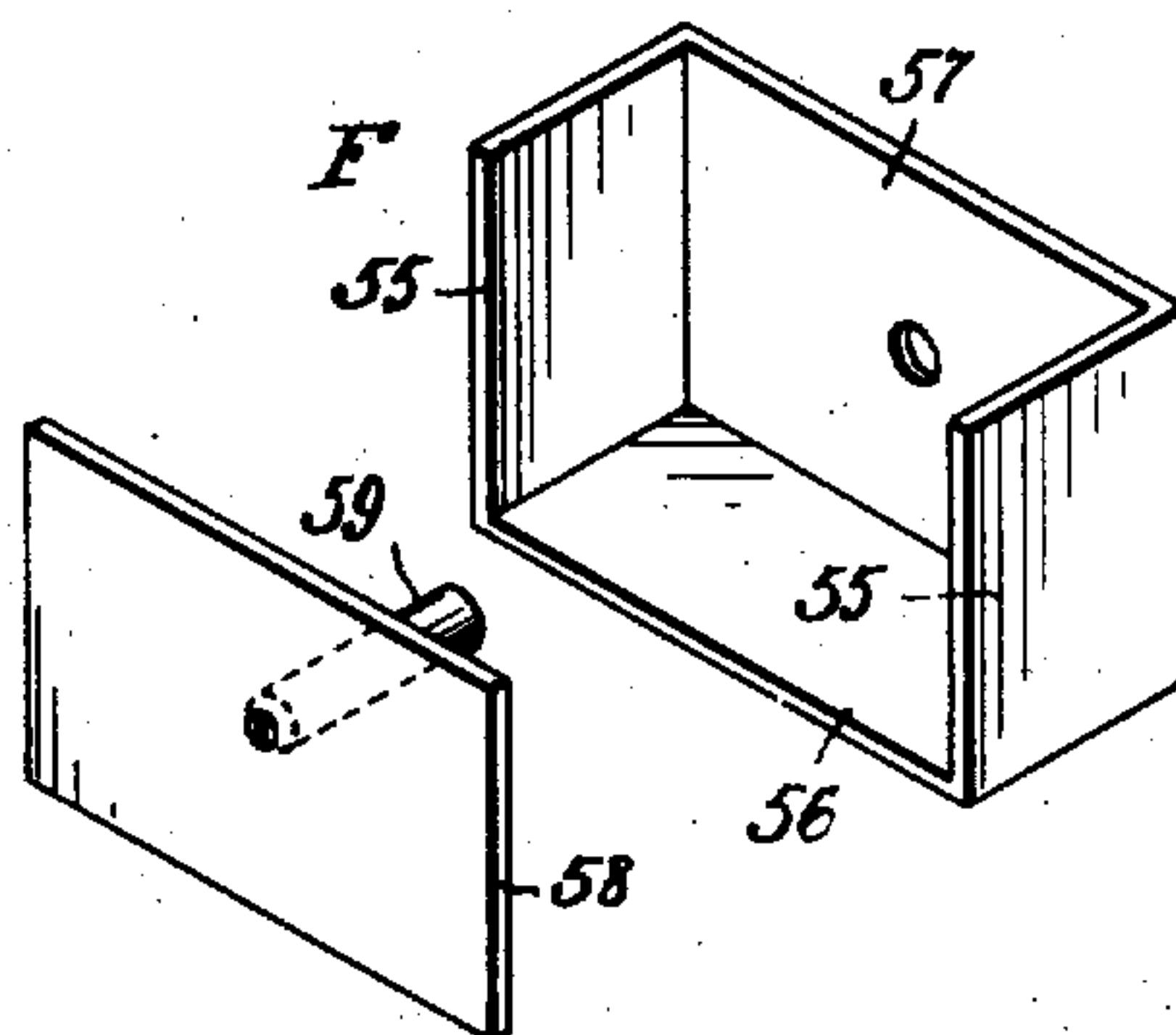


FIG. 7.



Witnesses:
John H. Tenney
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UNITED STATES PATENT OFFICE.

LUCIUS A. CLINTON, OF DETROIT, MICHIGAN, ASSIGNOR TO THE DIAMOND MATCH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF ILLINOIS.

MACHINE FOR ASSEMBLING AND SCREENING SPLINTS.

952,512.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed July 21, 1904. Serial No. 217,461.

To all whom it may concern:

Be it known that I, LUCIUS ARTHUR CLINTON, a citizen of the United States, and resident of the city of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Machines for Screening and Assembling Splints, &c., of which the following is a specification.

This invention relates to a machine of novel construction for effectually and economically screening and assembling match or other splints.

In the present embodiment of my invention match splints are cleaned, sorted and straightened and then assembled in parallelism in a suitable frame or holder, by means of which they are subsequently transferred to the feed hopper of a match making machine, that is to say, a machine in which the splints are taken from the hopper row by row and inserted in a suitable carrier by means of which they are transported to the various devices and appliances for completing the matches.

I have herein shown and described my invention in an efficient and desirable form, but it is to be understood, of course, that the invention is not limited to the precise construction and organization of mechanism set forth.

In the drawings—Figure 1 is a plan view of a machine embodying my invention; Fig. 2 is a vertical section, as on the line 2—2 of Fig. 1; Fig. 3 is a vertical section, as on the line 3—3 of Fig. 1, on a larger scale; Fig. 4 is a horizontal section, as on the line 4—4 of Fig. 3; Fig. 5 is a vertical section, as on the line 5—5 of Fig. 1, on a larger scale; Fig. 6 is a transverse vertical section as on the line 6—6 of Fig. 5; Fig. 7 is a perspective view of the splint transfer frame showing the parts detached.

The numeral 1, represents a suitable supporting frame; 2' a main driving shaft journaled in boxes on the frame, and 3' driving pulleys on the shaft. Supported upon the frame is a vibratory structure, comprising in its preferred form, an elongated shallow hopper 4', into which the splints to be treated are promiscuously thrown, and a lower sorting, cleaning and straightening frame 5', into which such splints are deliv-

ered by the hopper. The bottom 6' of the hopper is inclined throughout its length, terminating at its deeper end in an opening or throat 7, leading to the frame 5'. This frame comprises an open or perforated body, which extends in an inclined plane from beneath the throat of the hopper, and is provided on its upper surface with a series of parallel partitions 8, which extend from one end to the other of the frame, such partitions being spaced apart sufficiently to afford longitudinal paths or ways for the passage of splints lengthwise only. The perforations or openings 9, in the frame, are of such size as to permit simply the ingress therethrough of broken splints, slivers, &c. Preferably the underside of the frame is provided with depending side and end walls 10, by means of which the broken splints, &c., during their discharge, are directed downward to a suitable receptacle 11. Preferably also, the throat of the hopper is provided above the partitions of the frame, with a corresponding series of spaced strips 12, which aid in straightening the splints preparatory to their passage to the ways in said frame. The two parts of the vibratory structure are rigidly secured together at the throat of the hopper, and also at other points by suitable bars, as 13; and the structure is bodily supported upon the upper ends of parallel arms or links 14, which are pivoted at their lower ends to the framework. On the main shaft 2', is a pair of eccentrics 15, which are connected with the side walls 10, of the said structure, by means of rods 16, whereby the structure is rapidly vibrated in a manner to agitate the splints within the hopper and cause them to pass freely down the same to and upon the perforated frame, thence along the latter to the lower or discharging end thereof. Consequently the splints, as they descend the frame, are screened, sorted and arranged in parallelism thereby.

At the lower or discharging end of the perforated frame, is a comparatively long, horizontally-disposed trough 17, which extends transversely of, and receives the splints discharged from, said frame. The width of the trough is slightly greater than the length of the splints, and the latter lie within the trough transversely thereof. The end of the

trough adjoining the frame is pivotally connected with the latter, the connection in the present instance comprising a pin 18, on the frame extending loosely through a perforated lug 19, on the side of the trough. The opposite end of the trough is loosely connected with a supporting post 20, by means of a pintle 21, and hence, during the oscillation of the frame, the trough is agitated transversely thereby to cause the splints to settle down within the trough. The end of the trough adjacent the frame is preferably provided with suitable anti-friction rollers 22, which bear upon a bracket 23, projecting from the frame-work 1. Extending within and throughout the length of this trough, is an endless conveyer comprising parallel chains 24, connected at intervals throughout their length by transverse blades, or wings 25, which extend above the links, and which blades or wings, during the travel of the conveyer, pass from the receiving to the discharging end of the trough and back again. This conveyer is supported at its respective ends by means of sprocket wheel 26, the shafts 27 of which have their bearings in brackets 28, rising from the trough, whereby the conveyer is agitated by and through the trough. One of the shafts 27 is provided with a sprocket wheel 29 which is geared by means of a chain 30, with a similar wheel 31 on a lower shaft 32. The latter shaft carries a worm wheel 33 with which co-acts a worm 34 on a shaft 35 extending longitudinally of the trough, said shaft 35 being provided with a sprocket wheel 36 which is geared, by means of a chain 37, with a similar wheel 38 on the main driving shaft. Thus the motion is transmitted from the main shaft to the endless conveyer. The upper or return portion of the conveyer is preferably guided and supported by a pair of rails 38, sustained by standards rising from the sides of the trough. During the continuous travel of the conveyer within the trough, the splints are progressively carried along the latter to its discharging end and thereby delivered into a suitable receptacle. This receptacle, in the present instance, comprises upper and lower chambers 39—40, respectively, with an interposed removable partition 41. The lower chamber is open at one side to permit the insertion therein of the usual splint transfer frame F, by means of which the splints when delivered thereto, may be carried by an attendant to the hopper of a match making machine. The upper chamber is provided with a spout-like extension 42, which extends adjacent the discharging end of the trough 17, and receives the splints therefrom. The bottom of the extension is inclined downwardly from the trough to the floor of the chamber 39, and is provided on its inner side with a similarly-inclined section 43, which is connected by means

of a pitman 44 with a crank disk 45 on a transverse shaft 46 which has its bearing in a bracket 47 on the post 20. This shaft is provided with a small sprocket wheel 48, which is geared by means of a chain 49 with a larger sprocket wheel 50 on a suitably-mounted shaft 51, the latter shaft carrying a bevel wheel 52, which coacts with a similar wheel 53 on the shaft 35 above referred to. By this arrangement the section is rapidly vibrated longitudinally in respect to the extension. The lower end of the section is toothed or serrated transversely, as at 43^a, and hence, during the vibration of the section, the splints delivered thereto from the trough are caused to pack and fill the chamber 39. The sides of this chamber, adjacent the extension, are provided with suitable guides for a gate or slide 54. This gate or slide is applied when the chamber 39 has been filled with splints. The transfer frame F, is then inserted in the lower chamber as illustrated in Fig. 6, and the movable partition 41, is partially withdrawn and its inner end depressed until it impinges against the bottom of said frame, whereupon the partition is slowly withdrawn from the receptacle to permit the splints to be uniformly deposited within the transfer frame. This transfer frame, as will be observed, comprises two end walls 55, a bottom 56, and a side 57, together with a movable plate 58, which fits loosely within the body of the frame. This plate is provided with a boss or extension 59, which extends loosely through an orifice in the side 57. When the frame has been filled with splints as above described, it is carried to a match machine hopper, and the splints are then transferred to the latter by the act of pushing the boss or extension of the plate in the usual manner. The receiving end of the hopper 4', extends into a large revolving drum 60 which is mounted on a shaft 61, having its bearings in brackets 62 on a supporting frame 63. On this shaft is a sprocket wheel 64 which is connected by means of a sprocket chain 65, with a wheel 66 on a shaft 67, which has its bearings in suitable boxes on pedestals 68. The shaft 67 is provided with a bevel gear 69, which co-acts with the gear 53, on the driven shaft 35 hereinbefore described. Thus the drum is continuously rotated. This drum, as herein illustrated, comprises a rim and side portions, the rim being provided with internally-projecting blades 70, at intervals. One side of the drum is open for the passage therein of the hopper end, and also for the entrance of a chute 71, leading from the receiving portion of the trough. Thus it will be seen that any splints that may not be dropped securely between the links of the traveling conveyer, or which may overflow the trough at its receiving portion, will pass into the chute and

be delivered within the drum, which drum, in its rotation, will carry such splints upward and discharge them into the hopper, in which case they will pass down the same to and along the sorting, cleaning and straightening frame, as hereinbefore described.

I claim—

1. The combination of a splint hopper, an underlying inclined frame provided with longitudinal ways down which the splints are endwise directed, means for agitating said hopper and frame, a trough extending along the lower end of said frame, means including an endless conveyer with transverse blades for progressively feeding along the said trough, and in close parallel relation, the splints delivered thereto from the frame, and a splint receptacle arranged at the discharging end of the trough and adapted to receive progressively therefrom the compacted and parallelized splints, said receptacle comprising two chambers with an interposed removable partition.

2. The combination of a splint hopper, an underlying inclined frame provided with longitudinal ways down which the splints are endwise directed, means for agitating said hopper and frame, a trough extending along the lower end of said frame, means loosely supporting said trough at a point beyond the frame, a pivotal connection between said trough and frame, whereby the trough is transversely vibrated by the agitation of the frame, means including an endless conveyer with transverse blades for progressively feeding along the said trough and in close parallel relation, the splints delivered thereto from the frame, and a splint-receptacle arranged at the discharging end of the trough and adapted to receive progressively therefrom the compacted and parallelized splints, said receptacle comprising two chambers with an interposed removable partition.

3. The combination of a splint hopper, an underlying frame provided with longitudinal ways down which the splints are endwise directed, means for agitating said hopper and frame, a trough extending along the lower end of said frame, means loosely supporting said trough at a point beyond the frame, a pivotal connection between said trough and frame, whereby the trough is transversely vibrated by the agitation of the frame, means for progressively feeding along the said trough and in close parallel relation, the splints delivered thereto from the frame, and a splint-receptacle at the discharging end of the trough provided with an extension and with a gate.

4. The combination of a splint hopper, an underlying inclined frame provided with longitudinal ways down which the splints are endwise directed, means for agitating

said hopper and frame, a trough extending along the lower end of said frame, means for progressively feeding along the said trough and in close parallel relation, the splints delivered thereto from the frame, a receptacle to which the compacted and parallelized splints are discharged from one end of said trough, and means for returning to the hopper, splints that may overflow the trough.

5. The combination of an inclined frame provided with longitudinal ways down which splints are endwise directed, means for longitudinally vibrating said frame, a horizontally disposed trough extending along and beyond the lower end of said frame and adapted to receive the splints therefrom, means loosely supporting said trough at a point beyond the frame, a pivotal connection between said trough and frame, whereby the trough is transversely vibrated by the frame, means including an endless conveyer with transverse blades for feeding along the trough the splints delivered thereto, and a splint receptacle arranged at the discharging end of the trough and adapted to receive progressively therefrom the compacted and parallelized splints, said receptacle comprising two chambers with an interposed removable partition.

6. The combination of a hopper, an inclined frame below the same comprising a perforated body, connections between said hopper and frame, means for pivotally supporting said hopper and frame, a horizontally disposed trough at the lower or discharging end of said frame, and means for moving the contents of said trough along the same, together with means for receiving the splints that may overflow the trough and returning them to the hopper.

7. The combination of a hopper, an inclined frame below the same comprising a perforated body, connections between said hopper and frame, means for pivotally supporting said hopper and frame, means for vibrating the same, a horizontally disposed trough at the lower or discharging end of said frame, and means for moving the contents of said trough along the same, together with means for receiving the splints that may overflow the trough and returning them to the hopper.

8. The combination of a hopper, an inclined frame below the same comprising a perforated body having longitudinal ways, connections between said hopper and frame, means for pivotally supporting said hopper and frame, a horizontally disposed trough at the lower or discharging end of said frame, and means for moving the contents of said trough along the same, together with means for receiving the splints that may overflow the trough and returning them to the hopper.

9. The combination of a hopper, an inclined frame below the same comprising a perforated body having longitudinal ways, connections between said hopper and frame, means for pivotally supporting said hopper and frame, means for vibrating the same, a horizontally disposed trough at the lower or discharging end of said frame, and means for moving the contents of said trough along the same, together with means for receiving the splints that may overflow the trough and returning them to the hopper.

10. The combination of a hopper, an inclined frame below the same provided with longitudinal ways, connections between said hopper and frame, means for pivotally supporting said hopper and frame, a horizontally disposed trough at the lower or discharging end of said frame, and means for moving the contents of said trough along the same, together with means for receiving the splints that may overflow the trough and returning them to the hopper.

11. The combination of a hopper, an inclined frame below the same provided with longitudinal ways, connections between said hopper and frame, means for pivotally supporting said hopper and frame, means for vibrating the same, a horizontally disposed trough at the lower or discharging end of said frame, and means for moving the contents of said trough along the same, together with means for receiving the splints that may overflow the trough and returning them to the hopper.

12. The combination with an inclined frame provided with longitudinal ways for splints, and means for agitating the said frame, of a horizontally extending trough at the lower or discharging end of said frame adapted to receive the splints therefrom, means loosely supporting said trough at a point beyond the frame, a pivotal connection between said trough and frame, whereby the trough is transversely vibrated by the frame, and means including an endless conveyer with transverse blades for moving the splints along the trough, said last-named means being supported on and carried by the trough so as to partake of its vibration.

13. The combination with an inclined frame provided with longitudinal ways for splints, of a horizontally extending trough at the lower or discharging end of said frame and into which trough the splints are delivered directly from the frame, an endless conveyer extending through said trough and provided at intervals with transverse blades, supports on said trough for the conveyer, and means for bodily agitating said trough and conveyer.

14. The combination with an inclined frame provided with longitudinal ways for splints, of a trough at the lower or discharg-

ing end of said frame, sprocket wheels carried by said frame, an endless conveyer supported by said wheels, means for actuating one of said wheels, and means for agitating the frame and trough.

15. The combination with a hopper, and a frame below the same provided with longitudinal ways to which splints are delivered from said hopper, of a trough at the lower or discharging end of said frame, means for moving splints along said trough, and means for returning to the hopper, splints that may overflow the trough.

16. The combination with a trough into which splints are delivered in parallelism, and the spout or way, a vibratory member splints along said trough, of a receptacle at the discharging end of the trough having a spout or way, a gate between said receptacle and the spout or way, a vibratory member in said spout or way, and means for vibrating said member lengthwise of said spout or way.

17. The combination with a trough into which splints are delivered in parallelism, and means for continuously moving the splints along said trough, of a receptacle at the discharging end of the trough having an inclined spout or way, a gate between said receptacle and the spout or way, a vibratory member in said spout or way, and means for vibrating said member lengthwise of said spout or way.

18. The combination with a trough into which splints are delivered in parallelism, and means for continuously moving the splints along said trough, of a receptacle at the discharging end of the trough having a spout or way, a gate between said receptacle and the spout or way, a vibratory member in said spout or way having a toothed or serrated surface, and means for vibrating said member lengthwise of said spout or way.

19. The combination with a trough into which the splints are delivered in parallelism, and means for continuously moving the splints along said trough, of a receptacle at the discharging end of the trough having an inclined spout or way, a gate between said receptacle and the spout or way, a vibratory member in said spout or way having a toothed or serrated surface, and means for vibrating said member lengthwise of said spout or way.

20. The combination with a trough into which splints are delivered in parallelism, and means for moving splints along said trough, of a receptacle provided with an extension leading to the discharging end of said trough, vibratory means in said extension for feeding the matches to the receptacle, and a removable gate between said receptacle and its extension.

21. The combination with a splint screening member, of a trough to which the splints

are delivered thereby in position to lie transversely of the trough, means for feeding the splints thus disposed along the trough and means for returning to the said member
5 splints that may overflow said trough, a receptacle to which the splints are delivered in parallelism from the trough.

22. The combination with a splint screening member, of a trough to which the splints
10 are delivered thereby in position to lie transversely of the trough, means for feeding the splints thus disposed along the trough, a drum having means to receive the splints that may overflow said trough, a receptacle
15 to which the splints are delivered in parallelism from the trough and means for revolving said drum whereby the overflowing splints shall be returned to the said member.

23. The combination of a hopper, an inclined perforated frame below the same,
20 means at the lower end of said frame to receive the splints and transport them in parallelism, a receptacle to which said splints are thereby transported, and means for returning to the said hopper any splints that
25 may overflow said transporting means.

24. The combination with an inclined frame, means for supplying splints thereto, and means for longitudinally vibrating said
30 frame, of means at the lower end of said frame for receiving and transporting splints in parallelism, a receptacle to which such splints are thereby transported, and means for returning overflowing splints to the
35 means first named.

25. The combination with an inclined frame, means for supplying splints thereto, and means for vibrating said frame, of a
40 trough at the lower or discharging end of said frame, means for moving splints along said trough, a chute extending from said trough, and a splint-return device to which such chute extends.

26. The combination of a splint hopper,
45 an inclined frame below the same, means for vibrating said frame and hopper, a trough at the lower end of said frame, a conveyer in said trough, a receptacle at the discharging end of the trough, and means whereby
50 splints overflowing the trough are returned to the hopper.

27. The combination of a splint hopper, an inclined frame below the same comprising a perforated body having longitudinal
55 ways, means for vibrating said hopper and frame, a trough at the lower or discharging end of said frame loosely connected therewith, a conveyer in said trough, means for actuating the conveyer, a receptacle into
60 which the contents of the trough are discharged, a drum for returning to the hopper splints that overflow the trough, and means for actuating said drum.

28. The combination with a receptacle, a
65 spout or way leading thereto, a gate be-

tween said receptacle and the spout or way, and means for feeding splints to said spout or way, of a vibratory member in said spout or way, and means for vibrating said member lengthwise of said spout. 70

29. The combination with a receptacle, an inclined spout or way leading thereto, a gate between said receptacle and the spout or way and means for feeding splints to said
75 spout or way, of a vibratory member in said spout or way, and means for vibrating said member lengthwise of said spout.

30. The combination with a receptacle, a spout or way leading thereto, a gate between said receptacle and the spout or way and
80 means for feeding splints to said spout or way, of a vibratory member in said spout or way, having its upper surface toothed or serrated transversely, and means for vibrating said member lengthwise of said spout. 85

31. The combination with a receptacle, an inclined spout or way leading thereto, a gate between said receptacle and the spout or way and means for feeding splints to said
90 spout or way, of a vibratory member in said spout or way having its upper surface toothed or serrated transversely, and means for vibrating said member lengthwise of said spout.

32. The combination with a receptacle
95 having an inclined portion separated therefrom by a movable gate, of means for supplying splints to said portion, a feed member in said inclined portion, and means for vibrating said feed member lengthwise of
100 such portion.

33. The combination with a receptacle having an inclined extension, separated therefrom by a movable gate, of means for
105 supplying splints to said extension, a transversely toothed or serrated member in said extension, and means for vibrating said member lengthwise of such extension.

34. The combination with a receptacle having an inclined extension, separated
110 therefrom by a movable gate, of a trough leading to said extension, a traveling conveyer for moving splints along said trough to the extension, a transversely toothed or serrated member in said extension, and
115 means for reciprocating said member lengthwise of such extension.

35. The combination with a receptacle, of a trough, means for moving splints along
120 said trough, a splint feeder between the trough and the receptacle, and means for longitudinally reciprocating the said feeder together with a movable gate on the side of said receptacle adjacent the splint feeder.

36. The combination of a splint hopper,
125 an inclined frame below the same, means for vibrating said hopper and frame, a pivoted trough at the lower end of said frame, a connection between said frame and trough, a conveyer in said trough, means for actu- 130

ating said conveyer, a receptacle provided with an inclined extension adjacent the discharging end of the trough, a feed member in said extension, means for actuating said member, a drum for returning to the chamber splints that may overflow the trough, and means for actuating said drum.

Signed at Detroit in the county of Wayne and State of Michigan this 16th day of July A. D. 1904.

L. A. CLINTON.

Witnesses:

J. C. DONNELLY,
C. W. SMITH.

Correction in Letters Patent No. 952,512.

It is hereby certified that in Letters Patent No. 952,512, granted March 22, 1910, upon the application of Lucius A. Clinton, of Detroit, Michigan, for an improvement in "Machines for Assembling and Screening Splints," an error appears in the printed specification requiring correction as follows: Page 4, line 81, strike out the words "and the spout or way, a vibratory member" and insert the words *and means for continuously moving the;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of December, A. D., 1911.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

ating said conveyer, a receptacle provided with an inclined extension adjacent the discharging end of the trough, a feed member in said extension, means for actuating said member, a drum for returning to the chamber splints that may overflow the trough, and means for actuating said drum.

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