

No. 707,765.

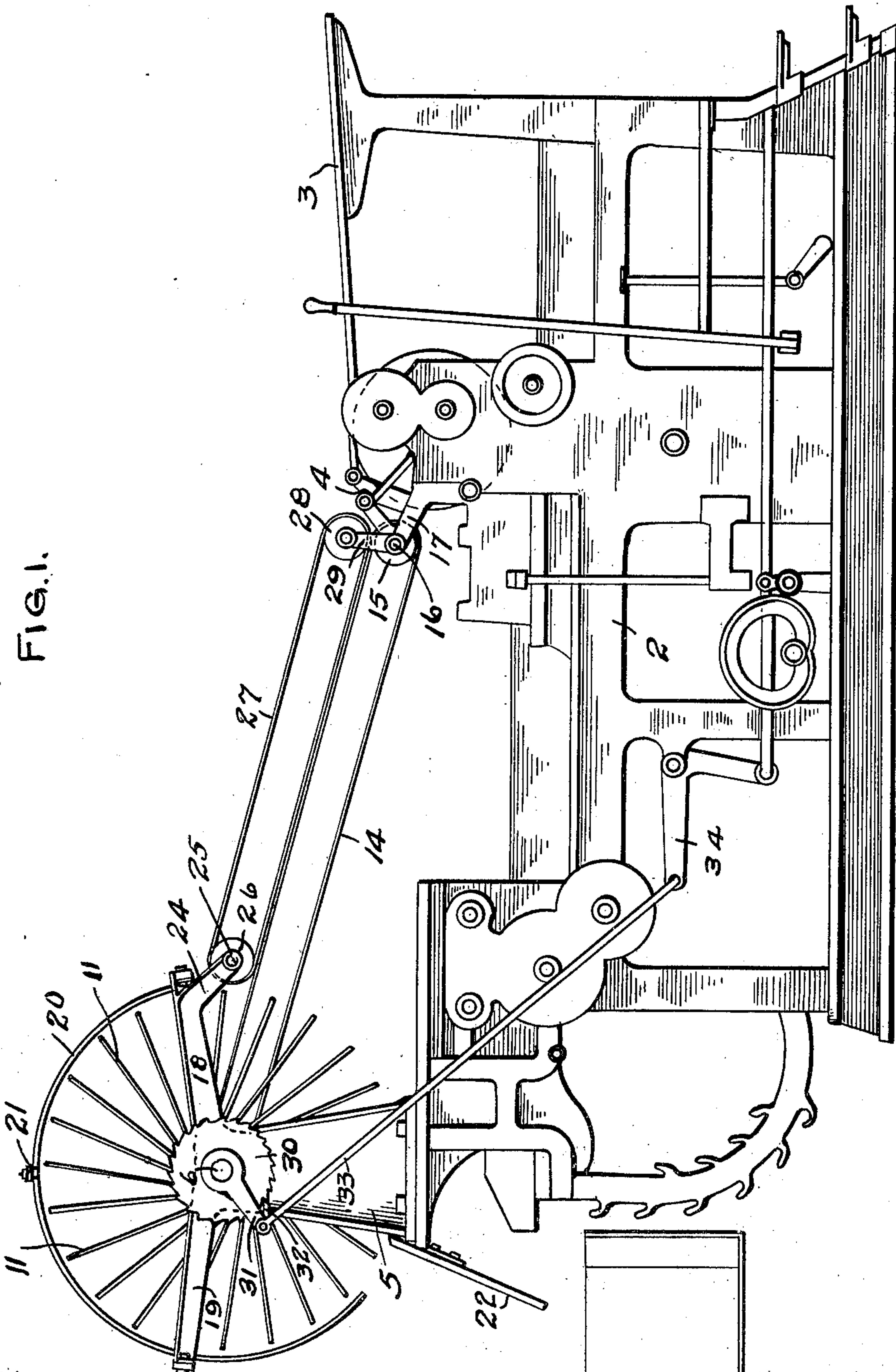
Patented Aug. 26, 1902.

D. W. ELLIOT.
DRIER.

(Application filed Aug. 22, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES
E. G. Standa
Richard Paul

INVENTOR
D. W. ELLIOT
By Paul & Hawley
HIS ATTORNEYS

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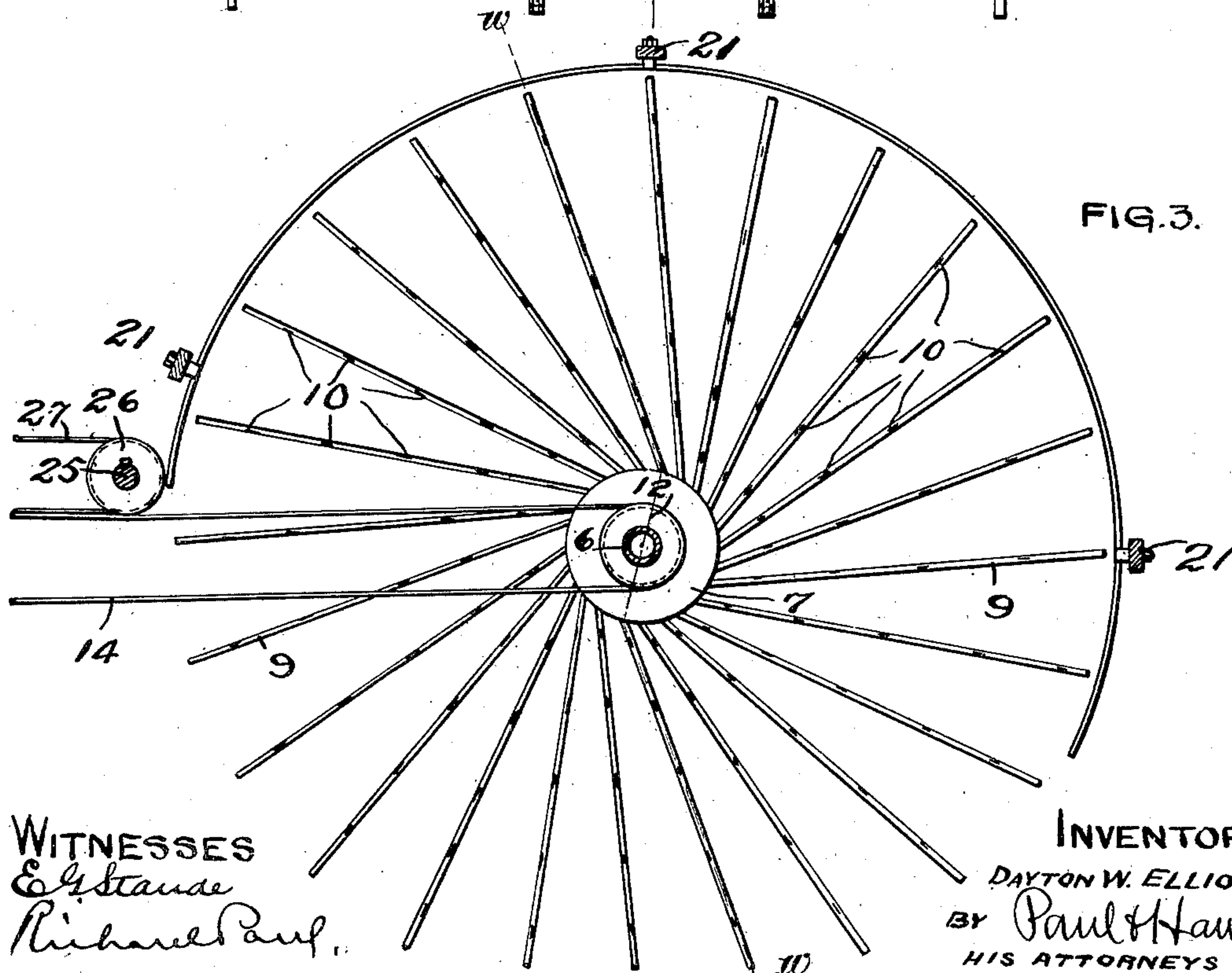
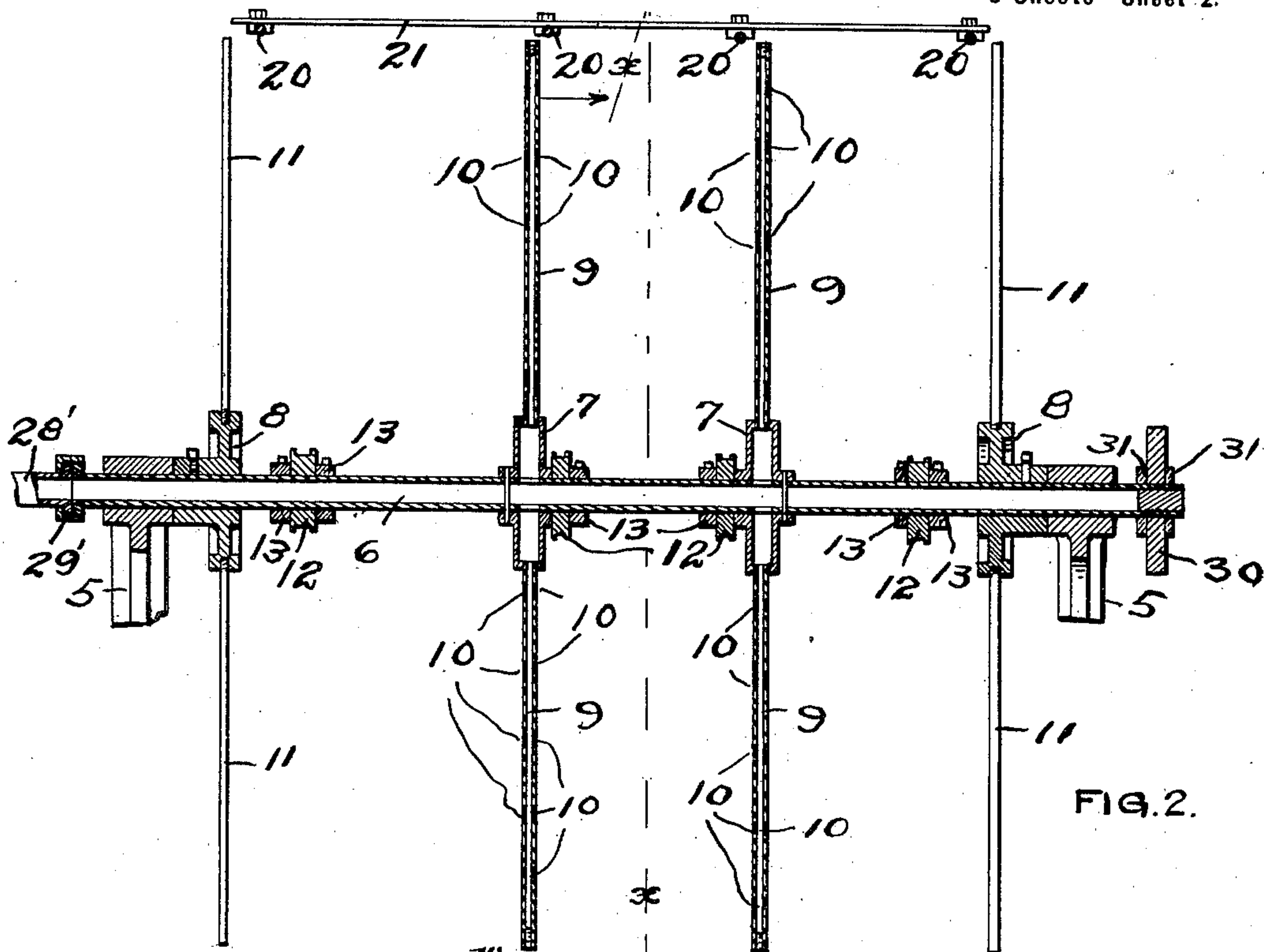
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D. W. ELLIOT.
DRIER.

(Application filed Aug. 22, 1901.)

(No Model.)

3 Sheets—Sheet 2.



WITNESSES
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(No Model.)

3 Sheets—Sheet 3.

FIG. 4.

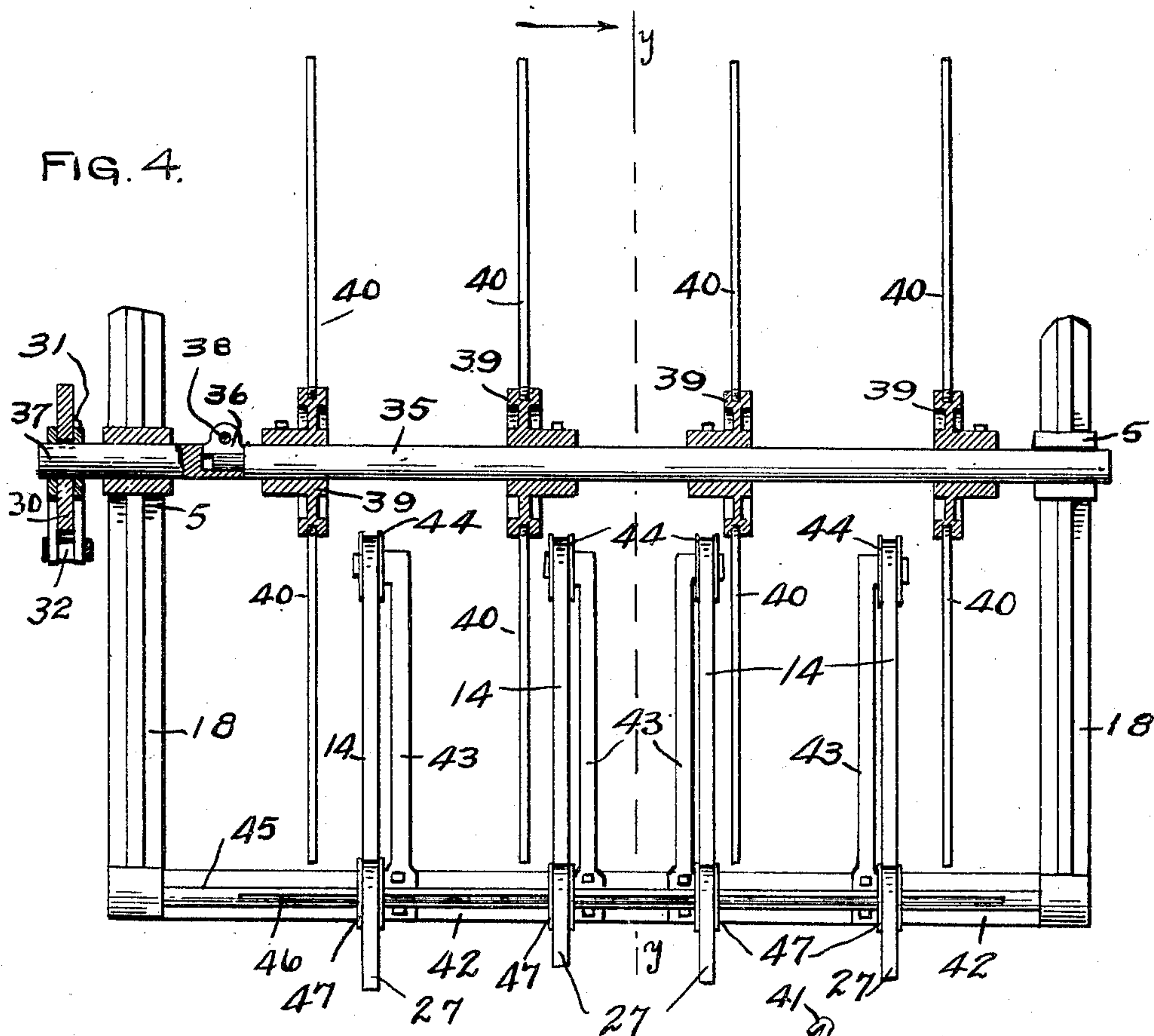
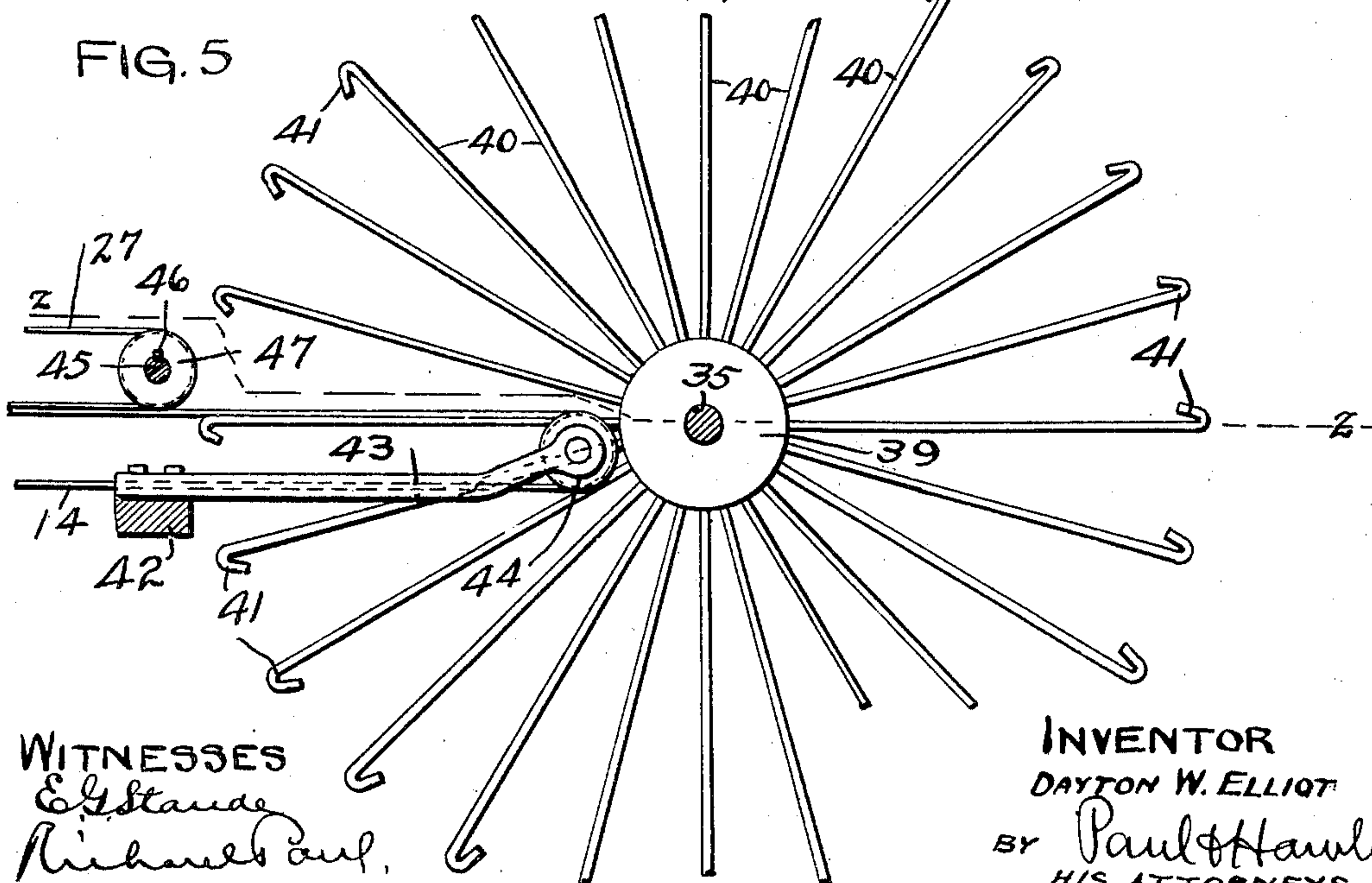


FIG. 5



WITNESSES

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INVENTOR

DAYTON W. ELLIOT

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UNITED STATES PATENT OFFICE.

DAYTON W. ELLIOT, OF MINNEAPOLIS, MINNESOTA.

DRIER.

SPECIFICATION forming part of Letters Patent No. 707,765, dated August 26, 1902.

Application filed August 22, 1901. Serial No. 72,896. (No model.)

To all whom it may concern:

Be it known that I, DAYTON W. ELLIOT, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Driers, of which the following is a specification.

My invention relates to attachments for printing or lithographing presses.

In printing or lithographing calendered or finely-finished paper, such as is usually employed in catalogues or work of similar character where there are numerous cuts, designs, or heavy-faced lettering, it has been necessary to place loose slips or sheets of paper between the printed sheets as fast as they come from the press when one side is printed and repeat the operation after printing the other side. The use of slip-sheets renders the services of an attendant necessary and increases considerably the cost of operating a press.

The object of my invention is to provide means for drying the sheets whereby the services of an attendant and the use of slip-sheets may be avoided.

A further object is to provide means for drying the sheets more quickly than by the methods heretofore employed.

The invention consists generally in a slowly-revolving reel whereto the printed sheets are delivered.

Further, the invention consists in improved means for automatically feeding or delivering the sheets to the reel.

Further, the invention consists in providing an artificial drying means in connection with the reel.

Further, the invention consists in various constructions and combinations, all as herein-after described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a printing-press with my invention applied thereto. Fig. 2 is a longitudinal section of the reel. Fig. 3 is a section on line $x x$ of Fig. 2. Fig. 4 is a section on line $z z$ of Fig. 5. Fig. 5 is a section on line $y y$ of Fig. 4.

In the drawings, 2 represents a printing-press of the cylinder type, having a feed-table 3 and grippers 4. At the end of the press

opposite the feed-table I provide standards 5, whereon a hollow shaft 6 is supported and provided with a series of hubs 7 and 8, suitably secured at intervals thereon. I have shown four of these hubs; but a greater or less number may be provided, if preferred. The hubs 7 are hollow and provided with a series of hollow radiating fingers 9, that are closed at their outer ends and communicate at their inner ends with the interior of said hubs. Each finger is preferably provided with a series of slots 10 in its walls for the purpose hereinafter described.

The hubs 8 are solid and arranged on the shaft near its ends, while the hubs 7 occupy a position intermediate thereto. The hubs 8 and their fingers may be hollow also, if preferred. Each hub 8 is provided with a series of fingers 11, which, with the fingers 9, enter their hubs tangentially, as shown in Fig. 3, for the purpose hereinafter described. The shaft hubs and fingers form a reel, and there may be any number of fingers therein, according to the size of the hubs; but I prefer to employ enough to contain about one hundred printed sheets.

Upon the shaft 6 I provide a series of pulleys 12, adjustably held by collars 13, which permit the position of the pulleys and feed-belt to be changed with respect to the printed sheet. Belts 14 connect said pulleys with corresponding pulleys 15 on a shaft 16, that is supported in arms 17 on the press. The belts operate between the fingers, and the upper section of each belt as it travels through the reel is on a level at the point of delivery with the adjacent finger, owing to their tangential position with respect to the hubs, so that the sheet will be picked off the feed-belts evenly and smoothly without being bent or crumpled by the operation. A guard for the reel is provided, partially inclosing the same and supported on arms 18 and 19, that are carried by or form a part of the standards 5. This guard, consisting of the curved bars 20 and the cross-connecting rods 21, prevents the printed sheets from being thrown by centrifugal force out of the reel. On the under side the guard is cut away to allow the sheets to slide off the fingers down upon the board 22 and into a receptacle 23. The arms 18 have extensions 24, carrying a shaft 25, where-

on pulleys 26 are mounted and connected by belts 27 with corresponding pulleys 28, that are supported by arms 29 on the arms 17 above the pulleys 16. The belts 27 travel near the belts 14 and prevent the printed sheets from being accidentally blown off while traveling toward the reel. Hot air is conveyed to the hollow shaft of the reel and the hollow fingers through a pipe 28, that has a swivel connection by means of a sleeve 29 with said shaft. To drive the reel, I provide a ratchet-wheel 30 on one end of the shaft and loosely mount a crank 31 on the shaft near said ratchet, said crank having dogs 32 to engage the teeth of the ratchet and being connected by a pitman 33 with an oscillating bell-crank 34, that is operated by any suitable mechanism on the press, which will slowly rock the bell-crank and impart a step-by-step movement to the reel. As the sheets are printed they will be carried up to the reel and caught up by the fingers and slowly swung through the air until discharged on the down side of the reel. If the sheets contain only ordinary type-printed matter, it will probably be sufficient to merely feed the sheets into the reel on one side and let them fall out on the other; but should there be illustrations or heavy-faced type or should the cuts be varnished I may prefer to force blasts of hot air into the hollow shaft from any suitable source and allow it to pass out through the perforations in the hollow fingers to more rapidly dry the ink or varnish.

In Figs. 4 and 5 I have shown a modification of the reel which consists in providing a shaft 35, supported at one end in the standard 5 and squared at its other end to enter a clamp 36, provided in one end of a stub-shaft 37 and operated by a set-screw 38. A series of hubs 39 are provided on the shaft, each having a series of fingers 40 radiating from the center and provided with hooked outer ends 41, which engage the outer edges of the sheets and prevent them from slipping out of the reel. This reel does not discharge the sheets, but is revolved until filled and then removed from the standards and another substituted in place of it. The standards are connected by a bar 42, on which, extending toward the shaft 35, I arrange at intervals a series of arms 43, carrying pulleys 44, connected by the belts 14 with the pulleys 15, as heretofore described with reference to the other construction. Above the bar 42 and also supported by the standards 5 is a rod 45, having a keyway 46 and provided with pulleys 47, slidable thereon, to permit their adjustment to prevent their belts, which correspond to those shown in Fig. 1, from coming in contact with the varnished cuts on the sheets.

The reel shown in Figs. 4 and 5 may be quickly discharged of its contents by simply reversing its direction of revolution, when the outer edges of the sheets will become disengaged from the hooked ends of the fingers on

the down side of the reel and the sheets will slide out into the receptacle, as described with reference to the reel of Fig. 1. I do not wish to confine myself to the position of the reel with respect to the press, as it may be located at the end instead of on top of the same, and in place of the reel I may employ an apron or belt provided with fingers and operating in substantially the same manner as the reel.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a press, of a reel having a series of fingers, means for revolving said reel step by step, carrier-belts extending between the fingers for automatically conveying the printed sheets therein where they are picked up by said fingers, one row being appropriated for each sheet, substantially as described.

2. The combination, with a press, of a reel having a series of fingers, means extending between the fingers for revolving said reel step by step, means for automatically conveying the printed sheets therein to be picked up one at a time by the moving fingers, one row being appropriated for each sheet, and means for preventing the premature discharge of the sheets from said reel.

3. The combination with a press, of a reel having hollow fingers, means for revolving said reel step by step, means for delivering the printed sheets to said fingers, one row of fingers being appropriated for each sheet, means for delivering hot air to said hollow fingers, and means for holding the sheets thereon, substantially as described.

4. The combination with a press, of a reel comprising a shaft, provided with a series of hubs arranged at intervals thereon and having fingers substantially tangential with respect to their hubs and said shaft, means for revolving said reel step by step, feed-belts extending between said hubs, the upper sections of said belts at their points of delivery being substantially parallel with the adjacent horizontal row of fingers, substantially as described and for the purpose specified.

5. The combination with a press, of a reel having a series of fingers, means for revolving said reel step by step, carrier-belts extending between the vertical rows of fingers and wherefrom the sheets are picked up one at a time by said fingers as the reel revolves, guide-belts provided above said carrier-belts, and means for preventing the premature discharge of the sheets from said reel, substantially as described.

6. The combination with a press, of a reel having a hollow shaft and hollow fingers communicating therewith and provided with perforations, means for delivering hot air to said shaft, means for slowly revolving said reel, means for delivering the printed sheets to said fingers, one row being appropriated for each sheet, and a suitable guard inclosing

the upper portion of said reel and having a discharge-opening for the sheets in its lower side, substantially as described.

5 7. The combination with a press, of a reel mounted thereon and comprising a shaft provided with a series of hubs arranged at intervals and having a series of fingers, means for revolving said shaft step by step, pulleys provided on said shaft between said hubs and
10 on the press-frame, and feed-belts connecting the opposite pulleys, substantially as described.

8. The combination with a press, of a reel mounted thereon and comprising a shaft pro-
15 vided with a series of hubs arranged at intervals and having a series of fingers, means for revolving said shaft step by step, pulleys provided on said shaft between said hubs and on the press-frame, feed-belts connecting the
20 opposite pulleys, and guiding-belts provided above said feed-belts, substantially as described.

9. The combination with a press, of a shaft
6 mounted thereon, means for revolving said
25 shaft step by step, hubs secured on said shaft, a series of fingers for each hub, a guard extending above said fingers and having a discharge-opening in its down side, pulleys adjustably arranged on said shaft between said
30 hubs, corresponding pulleys provided on the

press-frame, and feed-belts connecting the opposite pulleys and adapted to carry the printed sheets from the press in between the horizontal rows of fingers to be gathered up thereby, substantially as described. 35

10. The combination, with a press, of a revolving paper-drier having a series of paper-supports, moving carriers projecting into the space between the fingers for automatically conveying the freshly-printed sheets therein
40 to be lifted up thereby, one row being appropriated for each sheet and each sheet being out of contact with the other sheets.

11. The combination, with a press, of a revolving drier having a series of paper-sup-
45 ports, means extending into the space between said supports for conveying the freshly-printed sheets therein to be picked up as said supports pass said means, each sheet being kept out of contact with the others, and means
50 for preventing the premature discharge of the sheets from said supports.

In testimony whereof I have hereunto set my hand, this 19th day of August, 1901, at Minneapolis, Minnesota.

DAYTON W. ELLIOT.

In presence of—

RICHARD PAUL,
M. E. GOOLEY.