

No. 760,020.

PATENTED MAY 17, 1904.

W. A. SANDERS.  
COATING MACHINE.

APPLICATION FILED JAN. 11, 1904.

NO MODEL.

4 SHEETS—SHEET 1.

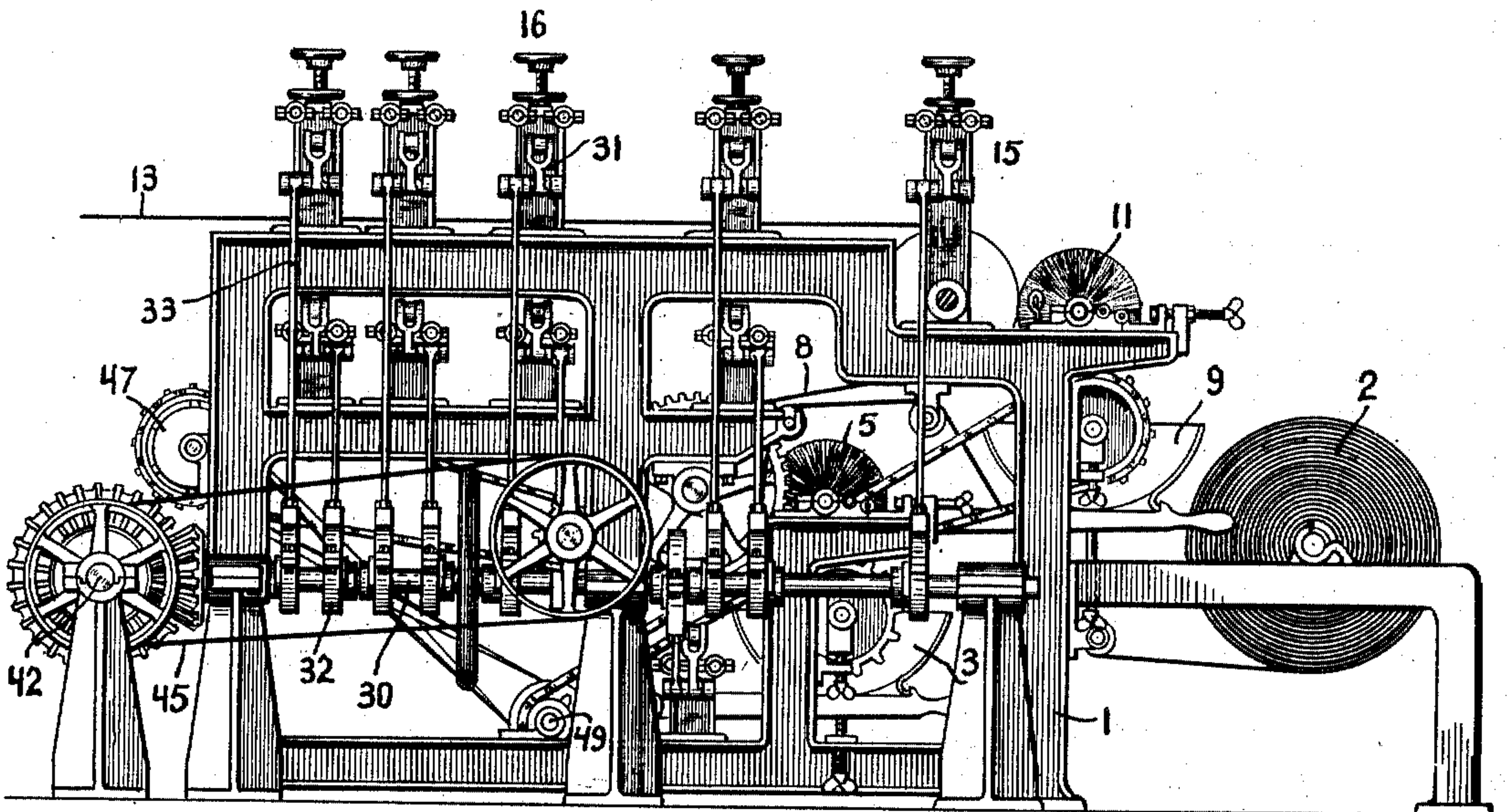


Fig. 1.

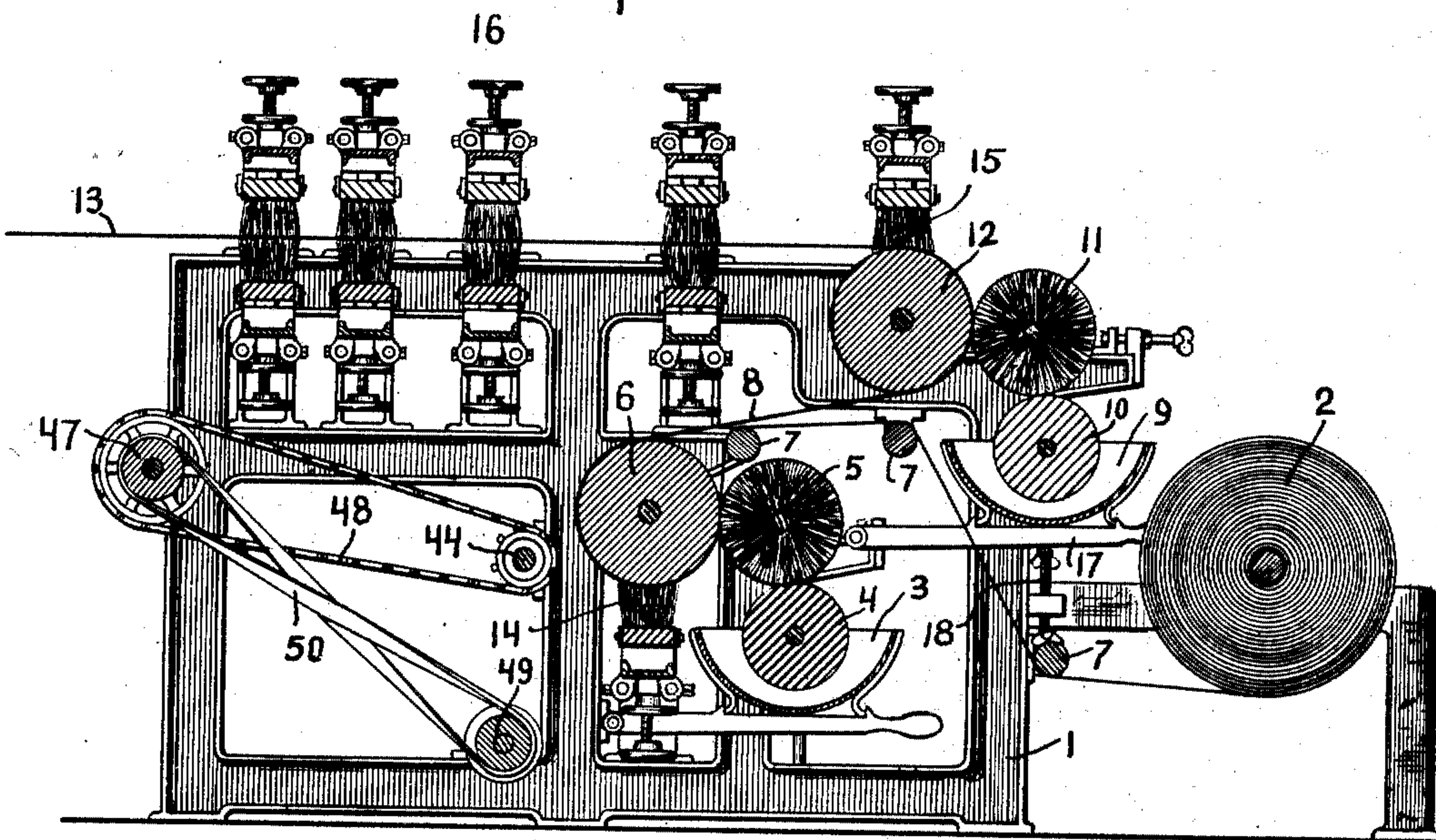


Fig. 2.

Witnesses:  
Elmer R. Shipley  
M. S. Belden.

Warren A. Sanders  
Inventor  
by James W. See.  
Attorney

No. 760,020.

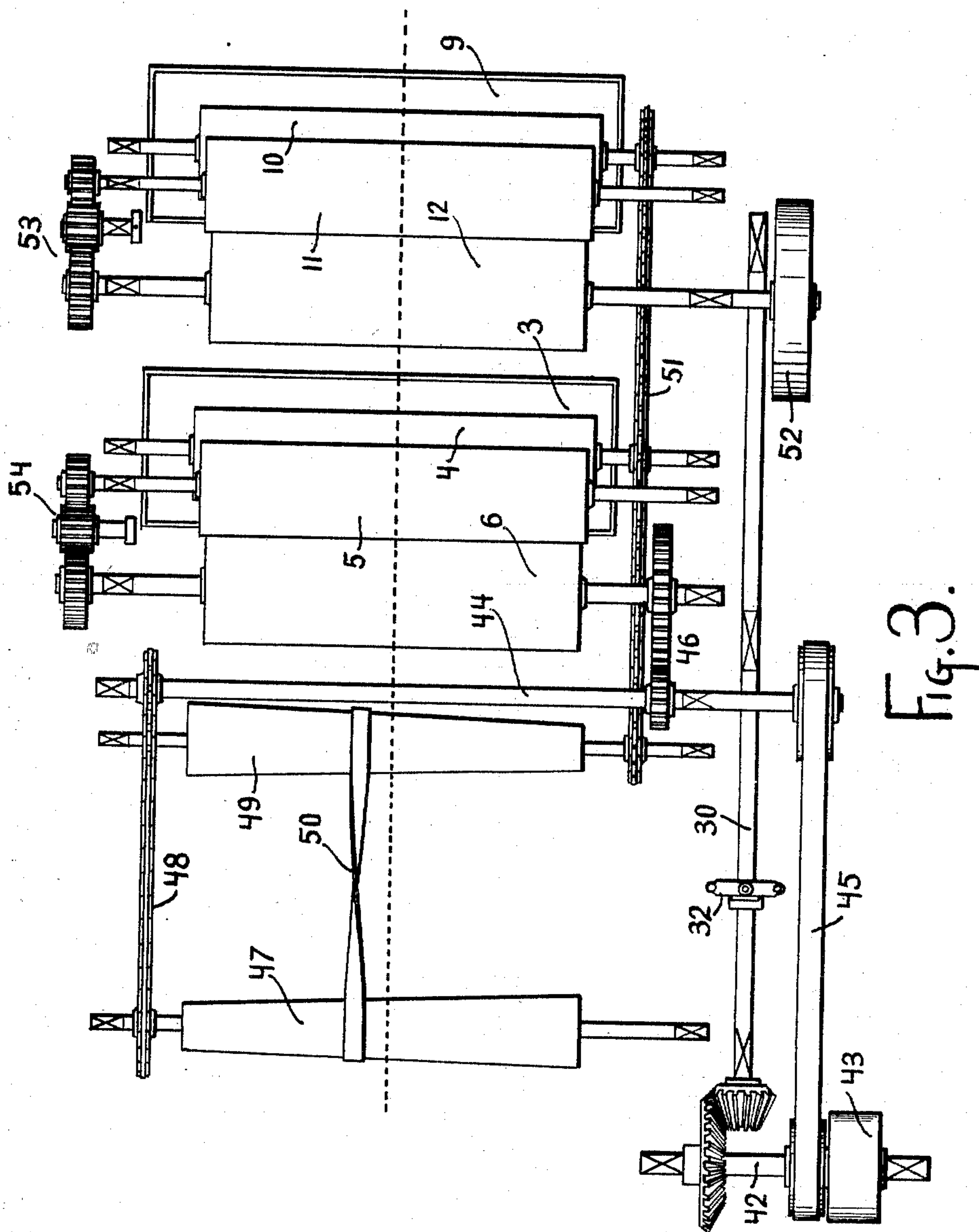
PATENTED MAY 17, 1904.

W. A. SANDERS.  
COATING MACHINE.

APPLICATION FILED JAN. 11, 1904.

NO MODEL.

4 SHEETS—SHEET 2.



Warren A. Sanders

Witnesses:  
Elmer R. Shipley.  
M. S. Belden.

Inventor  
by James W. See.  
Attorney



No. 760,020.

PATENTED MAY 17, 1904.

W. A. SANDERS.  
COATING MACHINE.  
APPLICATION FILED JAN. 11, 1904.

NO MODEL.

4 SHEETS—SHEET 3.

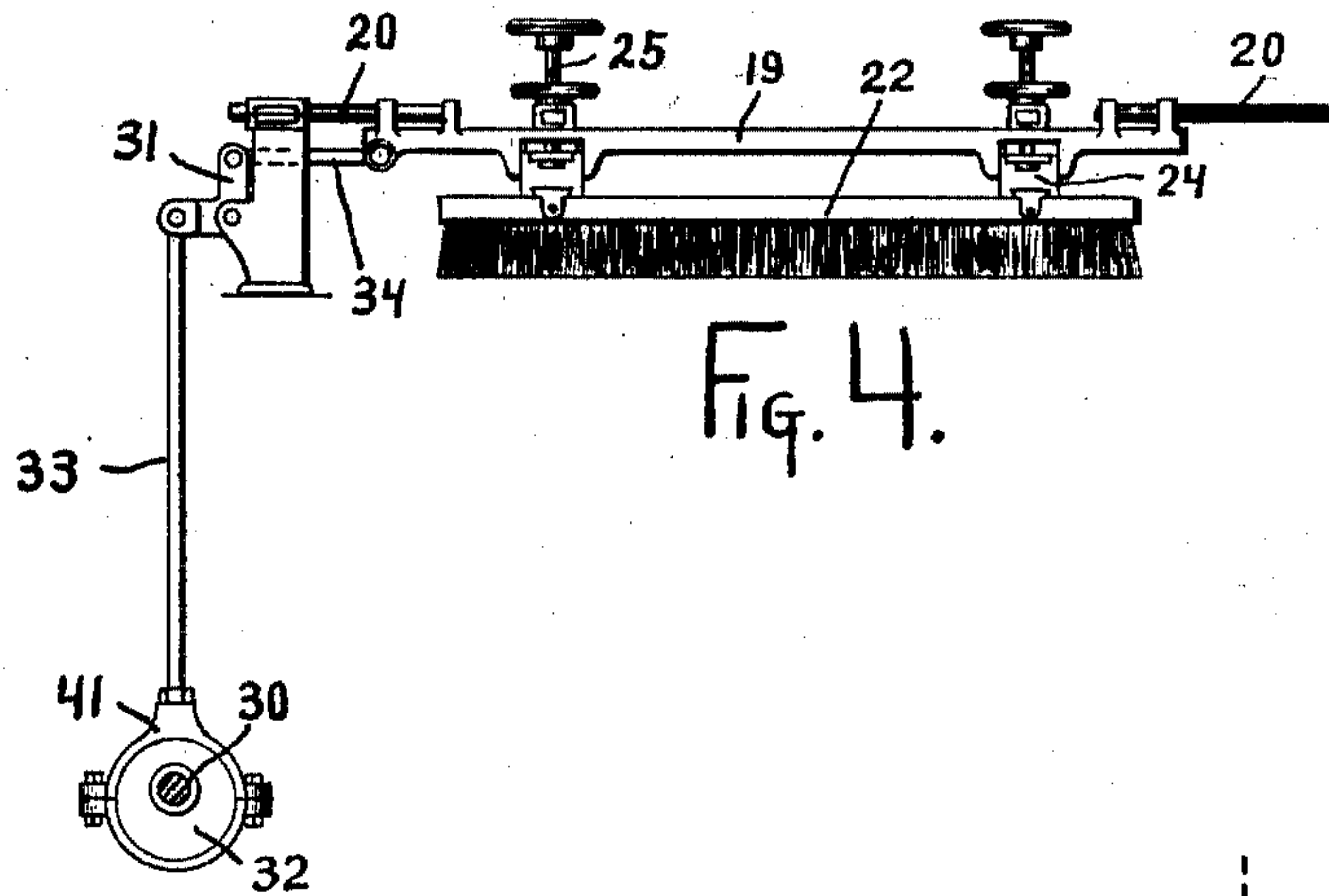


Fig. 4.

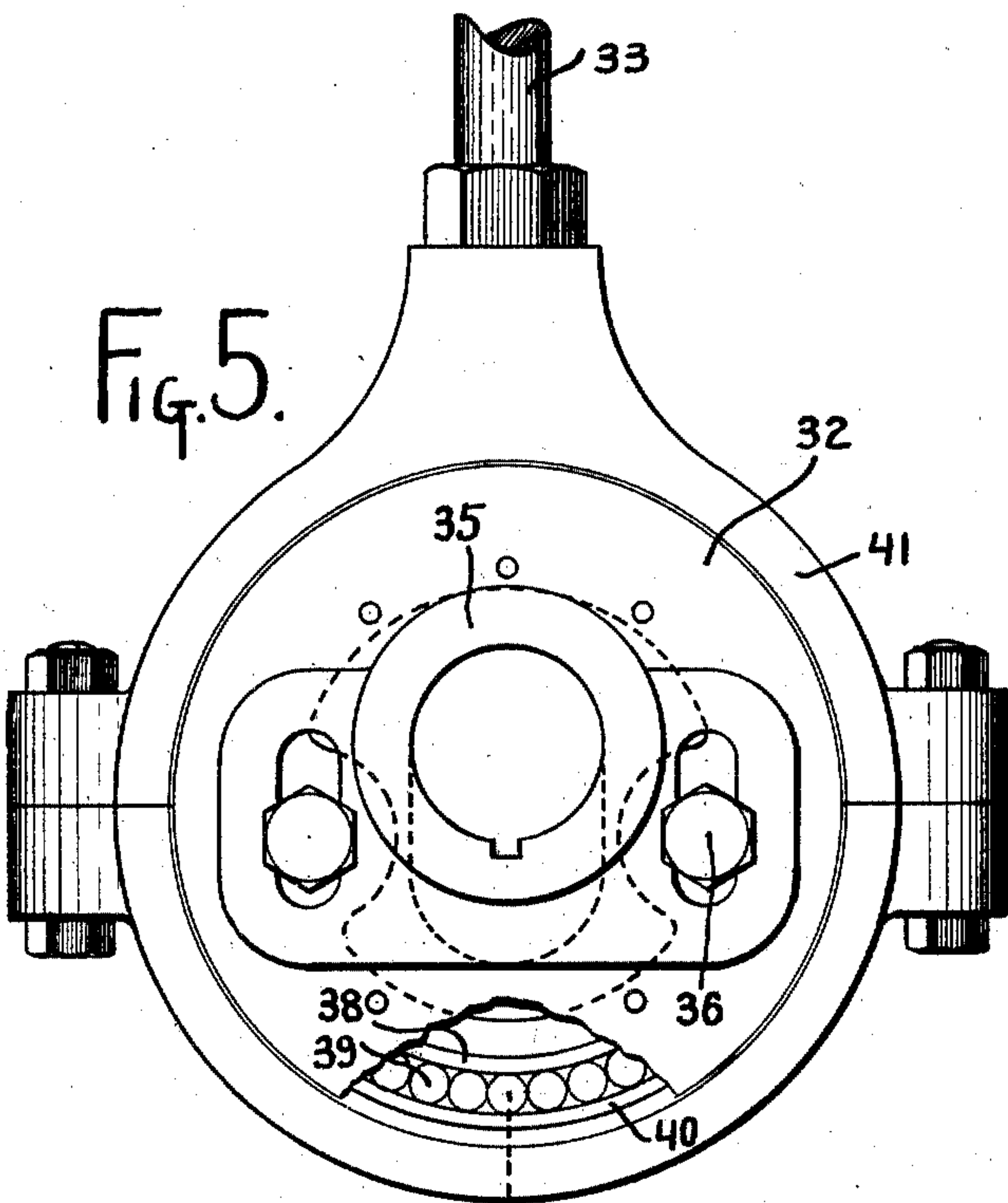


Fig. 5.

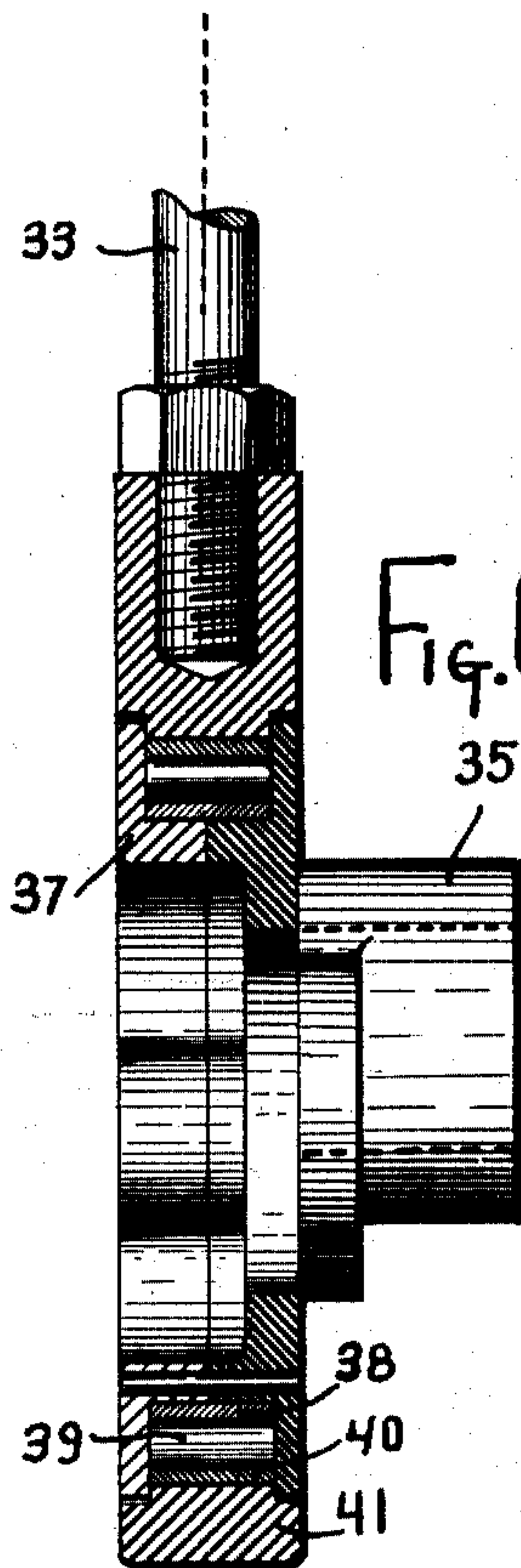


Fig. 6.

Witnesses:  
Elmer R. Shipley.  
Mr. S. Belden.

Warren A. Sanders Inventor  
by James W. See  
Attorney

No. 760,020.

PATENTED MAY 17, 1904.

W. A. SANDERS.  
COATING MACHINE.  
APPLICATION FILED JAN. 11, 1904.

NO MODEL.

4 SHEETS—SHEET 4.

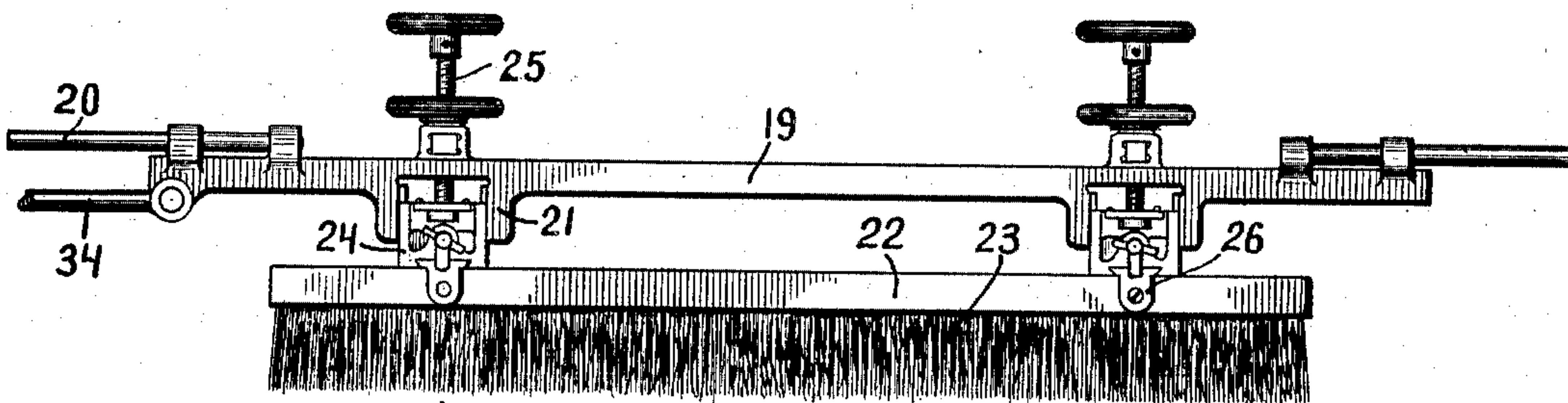


Fig. 7.

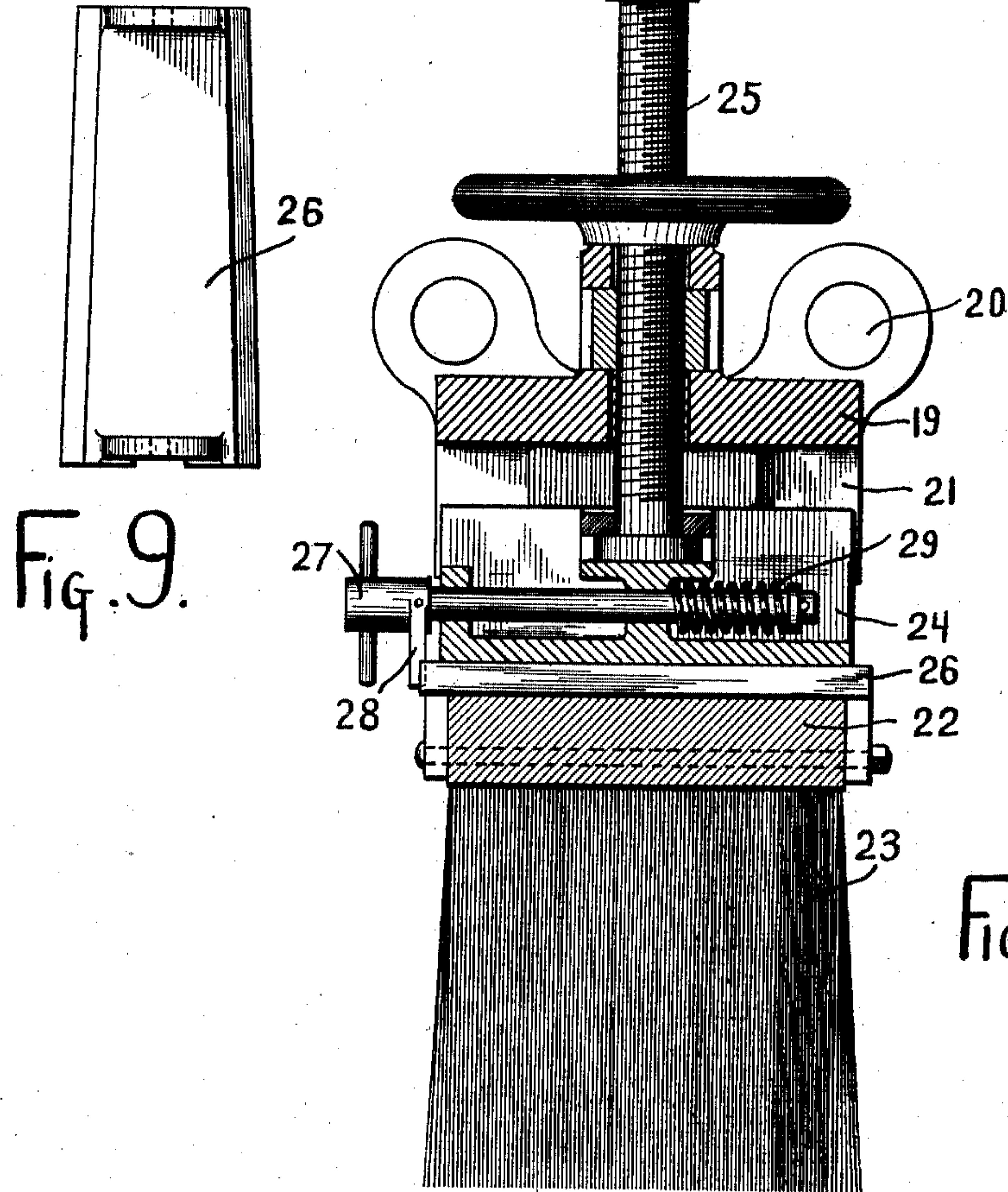


Fig. 9.

Fig. 8.

Witnesses:  
Elmer R. Shipley.  
M. S. Belden.

Warren A. Sanders Inventor  
by James W. See  
Attorney



# UNITED STATES PATENT OFFICE.

WARREN A. SANDERS, OF HAMILTON, OHIO.

## COATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 760,020, dated May 17, 1904.

Application filed January 11, 1904. Serial No. 188,473. (No model.)

*To all whom it may concern:*

Be it known that I, WARREN A. SANDERS, a citizen of the United States, residing at Hamilton, Butler county, Ohio, (post-office address  
5 No. 303 Ross street, Hamilton, Ohio,) have invented certain new and useful Improvements in Coating-Machines, of which the following is a specification.

This invention pertains to improvements in  
10 coating-machines designed particularly with reference to the coating of paper, and the improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

15 Figure 1 is a side elevation of a machine embodying my improvements; Fig. 2, a vertical longitudinal section of the same; Fig. 3, a diagrammatic plan of the main parts of the coating devices and their driving mechanism;  
20 Fig. 4, a side elevation of one of the reciprocating brushes and its actuating mechanism; Fig. 5, a side view of one of the eccentrics; Fig. 6, a vertical transverse section of one of the eccentrics; Fig. 7, a side view of one of  
25 the reciprocating brushes and its immediate accessories; Fig. 8, a vertical transverse section of the same, and Fig. 9 a view of the under side of one of the brush-ribs.

In the drawings, 1 indicates fixed frame  
30 parts seated for the support of the various moving and other lighter parts of the machine, the frame consisting, generally speaking, of two side housings disposed parallel with each other; 2, the roll of paper to be  
35 coated; 3, a first vat of coating material; 4, a first fountain-roll dipping therein; 5, a first coating-roll having preferably a brush-surface, this coating-roll being disposed over and running in contact with fountain-roll 4;  
40 6, a first drum disposed alongside of and parallel with coating-roll 5; 7, bearing or guide rolls disposed in the cores of the paper on its way from the paper-roll 2 to the space between rolls 5 and 6, down through which the  
45 paper passes; 8, the paper after having passed between rolls 5 and 6 and turned over roll 6 and then forwardly on its way to other parts of the machine; 9, 10, 11, and 12, respectively, the second-vat fountain-roll, coating-  
50 roll, and drum to deal with the second sur-

face of the paper, the paper passing upwardly between rolls 11 and 12; 13, the paper after it has passed from the second coating apparatus and been subjected to the action of reciprocating brushes; 14, a long brush device, 55 generally considered, longitudinally reciprocating in contact with the paper turning over drum 6 and distributing and otherwise improving the condition of the coating delivered thereon by the first coating-roll; 15, a similar brush device cooperating with the second drum 12 to deal with the coating material delivered by the second coating-roll 11, and 16 several pairs of long brush devices, three 65 pairs being illustrated, each pair comprising two brushes, one reciprocating longitudinally over and the other under the paper after leaving brush 15, the two brushes of a pair being opposed to each other upon the paper passing between them. 70

The proper motion being given to the various rolls and brush devices, the paper becomes coated and the coating distributed and polished on both sides of the paper without the necessity for passing the paper through 75 any bath of coating material.

Proceeding with the drawings, 17 indicates a pair of arms having their heels pivoted to the framing, these arms being disposed across under each end of second vat 9, which vat 80 has feet engaging claws on the arms, whereby the vat is removably supported in the arms; 18, adjusting-screws supported by the framing below these arms to serve in adjusting the vat vertically with reference to its 85 fountain-roll, the first vat being provided with a similar supporting and adjusting device; 19, the reciprocating brush-carrier of one of the brush devices, this carrier being in the form of a long bar extending across the 90 machine; 20, a pair of guide-studs projecting outwardly from each end of the brush-carrier and sliding in guiding-eyes formed in appropriate portions of the framing, whereby the brush carried by the brush-carrier may be 95 reciprocated accurately with reference to the surface of the paper; 21, downwardly-open jaws carried by the brush-carrier, one pair of jaws near each end of the brush-carrier or near each end of the brush which it is to 100



carry; 22, the back of the brush; 23, the  
bristles of the brush; 24, a block sliding ver-  
tically in each of the two jaws of the brush-  
carrier; 25, a screw arranged vertically in the  
5 brush-carrier over each of these blocks, the  
thread of the screw engaging a nut carried by  
the brush-carrier, the screw having its lower  
end swiveled to the block and having its up-  
per end provided with a hand-wheel, a second  
10 hand-wheel upon the screw forming a lock-  
nut to bind the screw to adjusted position;  
26, a tapering dovetailed rib secured upon the  
back of the brush at each of the two blocks  
24, its dovetailed portion engaging a tapering  
15 dovetailed recess in the lower face of the ap-  
propriate block 24; 27, a spindle journaled  
across each of blocks 24 over the dovetailed  
rib and capable of turning and of moving end-  
wise; 28, a latch projecting downwardly from  
20 the spindle and engaging a notch in one end  
of the appropriate dovetailed rib, and 29 a  
spring upon the inner end of the latch-spindle  
tending to draw the spindle inwardly.

A description of the working of one of the  
25 brush devices will answer for all. The brush-  
carrier reciprocates in its guides and the  
brush is delicately adjusted to and from it to  
produce the proper brushing pressure on the  
paper, this adjustment being accomplished by  
30 means of the screws 25. The brushes become  
united firmly to the brush-blocks 28 by the  
dovetailed arrangement, firmness being se-  
cured by the taper of the dovetailing. The  
springs urge the dovetailed ribs tightly into  
35 their recesses; but by pulling the latch-spin-  
dle endwise and turning their latches up out  
of engagement with the ribs the brushes can  
be readily removed from the blocks and from  
the machine. When the latches are in action,  
40 the springs not only serve to draw the brushes  
firmly to place in the blocks, but serve to hold  
the latches seated in their notches.

Proceeding with the drawings and giving  
consideration to the mechanism for imparting  
45 motion to the various parts, 30 indicates a  
cam-shaft mounted alongside the machine; 31,  
a bell-crank mounted on the framing over the  
cam-shaft, one bell-crank at the end of each  
brush device; 32, an eccentric mounted on the  
50 cam-shaft in the plane of each of the bell-  
cranks; 33, the eccentric-rods extending from  
the eccentrics to the horizontal arms of the  
appropriate bell-cranks; 34, links connecting  
the vertical arms of the bell-cranks with the  
55 appropriate brush-carriers, the construction  
being manifestly such that the rotation of the  
cam-shaft produces reciprocations of the  
brush-carriers and brushes; 35, a false hub  
secured to the cam-shaft alongside each of the  
60 eccentrics, the eccentrics themselves having  
open centers free of the cam-shaft; 36, bolts  
engaging the eccentrics and slots in wings of  
the false hubs, the construction permitting  
the eccentric to be shifted transverse to the  
65 cam-shaft, so as to adjust the stroke of the

eccentric and of the brush operated by it; 37,  
a separable face-half for the eccentric secured  
to the other half of the eccentric by rivets,  
the periphery of the eccentric being very  
deeply grooved; 38, phosphor-bronze tire dis- 70  
posed in the bottom of the groove of the ec-  
centric; 39, a series of antifriction-rolls dis-  
posed in the groove of the eccentric around  
this tire; 40, a phosphor-bronze bushing for  
the eccentric-strap encircling the series of 75  
antifriction-rolls, and 41 the eccentric-strap,  
divided and bolted as usual with eccentric-  
straps, its bore engaging the bushing 40.

The stroke of the eccentrics can be readily  
adjusted by the bolts of the false hubs, and 80  
the eccentric-rods are screwed into the straps,  
so as to permit their adjustment of length.  
The splitting of the eccentrics by providing  
them with separable front faces permits of  
the tires and bushings and antifriction-rollers 85  
and straps being gotten into the grooves of  
the eccentrics.

Proceeding with the drawings and giving  
consideration to the transmitting mechanism  
for driving the rotary parts, 42 indicates a 90  
driving-shaft bevel-gear to the cam-shaft;  
43, a pulley on the driving-shaft by which  
power is brought to it by belt; 44, a counter-  
shaft disposed across the machine; 45, a belt  
engaging pulleys on the driving-shaft and the 95  
counter-shaft; 46, gearing connecting the coun-  
ter-shaft and the first drum 6, whereby mo-  
tion derived from the driving-shaft becomes  
transmitted to that drum; 47, one cone of a  
speed-changer on a shaft disposed across the 100  
machine; 48, a sprocket-chain transmitting  
motion to this cone from the counter-shaft;  
49, the second cone of the speed-changer;  
50, the transmitting-belt of the speed-changer  
engaging both cones; 51, a sprocket-chain 105  
transmitting motion from the second cone of  
the speed-changer to each of the two fountain-  
rolls; 52, a pulley on the shaft of the second  
drum, serving as a means by which motion  
may be transmitted by belt from any suitable 110  
overhead shaft to the second coating appara-  
tus; 53, gearing connecting the second drum  
with the second coating-roll, and 54 gearing  
similarly connecting the first drum with the  
first coating-roll. 115

The drum and coating-roll of the second  
coating apparatus are driven by power de-  
rived through pulley 52, while the drum and  
coating-roll of the first coating apparatus 120  
are driven by power derived through pulley  
43. Power derived through pulley 43 is em-  
ployed for turning the fountain-rolls of both  
of the coating apparatuses, and the speed of  
these fountain-rolls relative to that of the  
drums and coating-rolls can be adjusted by 125  
means of the speed-changer.

I claim as my invention—

1. In a coating-machine, the combination,  
substantially as set forth, of a first coating  
apparatus comprising a vat fountain-roll coat- 130



ing-roll and drum adapted to deliver coating material to one side of a web of paper passing between the drum and the coating-roll, a second similar coating apparatus adapted to deliver coating to the opposite side of a web of paper passing between its drum and coating-roller after leaving the first coating apparatus, reciprocating brushes cooperating with each of the drums, and opposed reciprocating brushes arranged to operate upon opposite sides of the web of paper after leaving the second coating apparatus.

2. In a coating-machine, the combination, substantially as set forth, of a fountain-roll, a coating-roll, a drum, a vat in which the coating-roll runs, feet upon the vat, arms supported by pivots at their heels and having jaws engaging the feet of the vat, and screws engaging under the arms and serving for the vertical adjustment of the arms and vat.

3. The combination of a frame, a coating apparatus supported thereby, a reciprocating brush device mounted across the frame, a cam-shaft disposed at right angles to the brush device, an eccentric on the cam-shaft, means for varying the throw of the eccentric, a bell-crank lever pivoted to the framing on a horizontal pivot, a connection from the eccentric to one arm of the bell-crank lever, and a connection from the brush device to the other arm of the bell-crank lever.

4. The combination of a framing, a brush-carrier in bar form disposed across the framing, a long brush adjustably secured to the brush-carrier, a pair of guide-studs secured to each end of the brush-carrier and engaging the guiding-eyes in the frame, means for reciprocating the brush and means for varying the degree of reciprocation of the brush.

5. In a coating-machine, the combination, substantially as set forth, of a brush-carrier

having downwardly-open jaws disposed at right angles to the length thereof, a block arranged for inward and outward motion in said jaws, a screw connecting said block and carrier and serving for the adjustment of the block inwardly and outwardly in said jaws, and a brush secured to said block.

6. In a coating-machine, the combination, substantially as set forth, of a brush-carrier, a block carried thereby and having a tapering dovetailed recess in its face, a brush-back, a tapering dovetailed rib secured to the brush-back and engaging the recess in the block, and means for holding said rib in said recess.

7. In a coating-machine, the combination, substantially as set forth, of a brush-carrier, a block carried thereby and having a tapering dovetailed recess in its face, a brush-back, a tapering dovetailed rib secured to the brush-back and engaging the recess in the block, a spindle mounted in the block parallel with said rib and capable of rotary and endwise motion, a latch carried by the spindle and adapted to engage one end of said rib and hold the rib into its recess, and a spring upon the spindle urging the latch against the end of the rib.

8. In a coating-machine, the combination, substantially as set forth, of a first coating apparatus comprising a coating-roll drum and fountain-roll, a second similar coating apparatus, a shaft arranged to give motion to one coating-roll and drum and to both fountain-rolls, a speed-changer disposed between said shaft and the fountain-rolls, and independent means for giving motion to the other drum and coating-roll.

WARREN A. SANDERS.

Witnesses:

M. S. BELDEN,  
ELMER R. SHIPLEY.