

No. 768,293.

PATENTED AUG. 23, 1904.

O. S. MILLS.

AUTOMATIC PAINTING OR LIQUID COATING MACHINE.

APPLICATION FILED OCT. 14, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

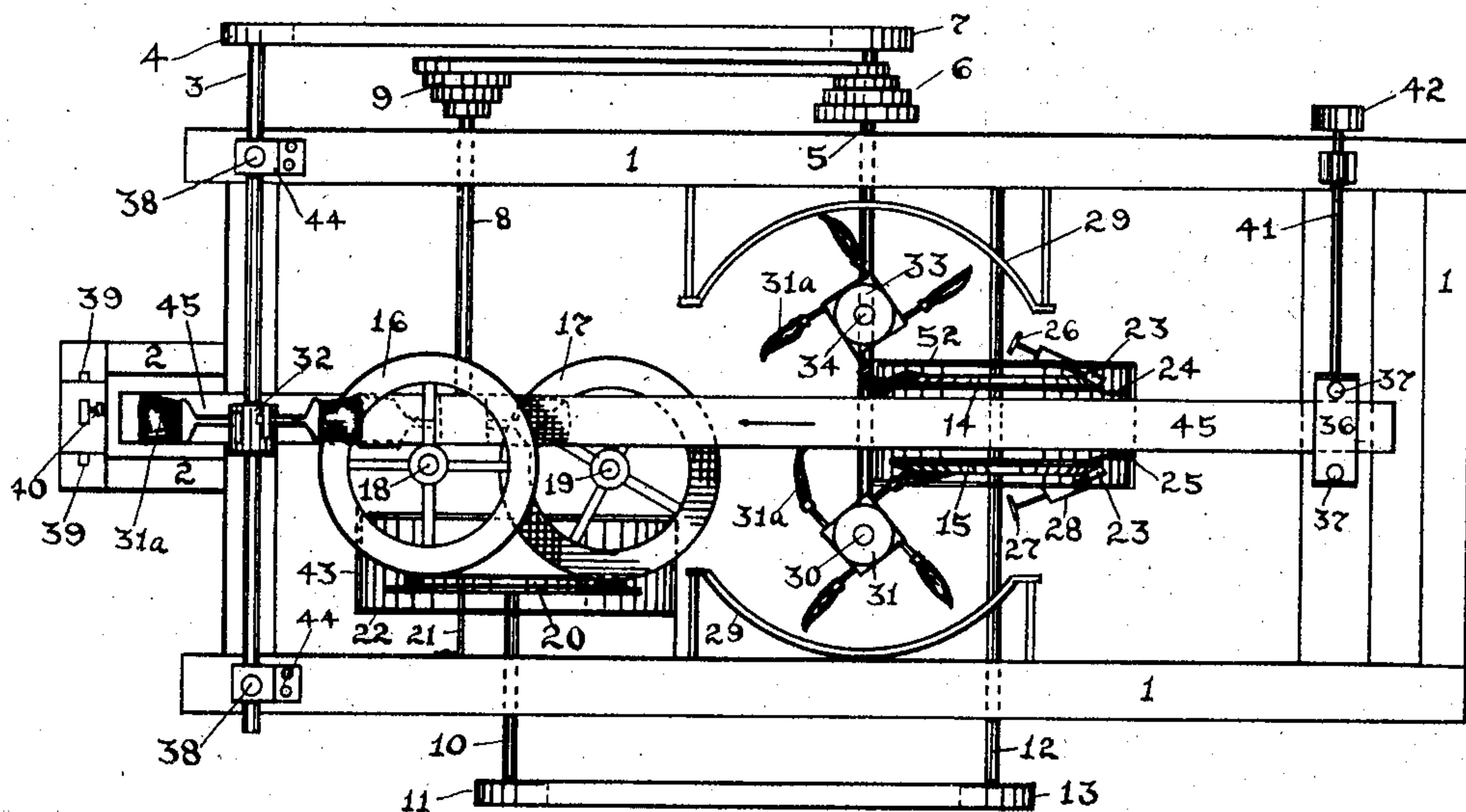


Fig 1

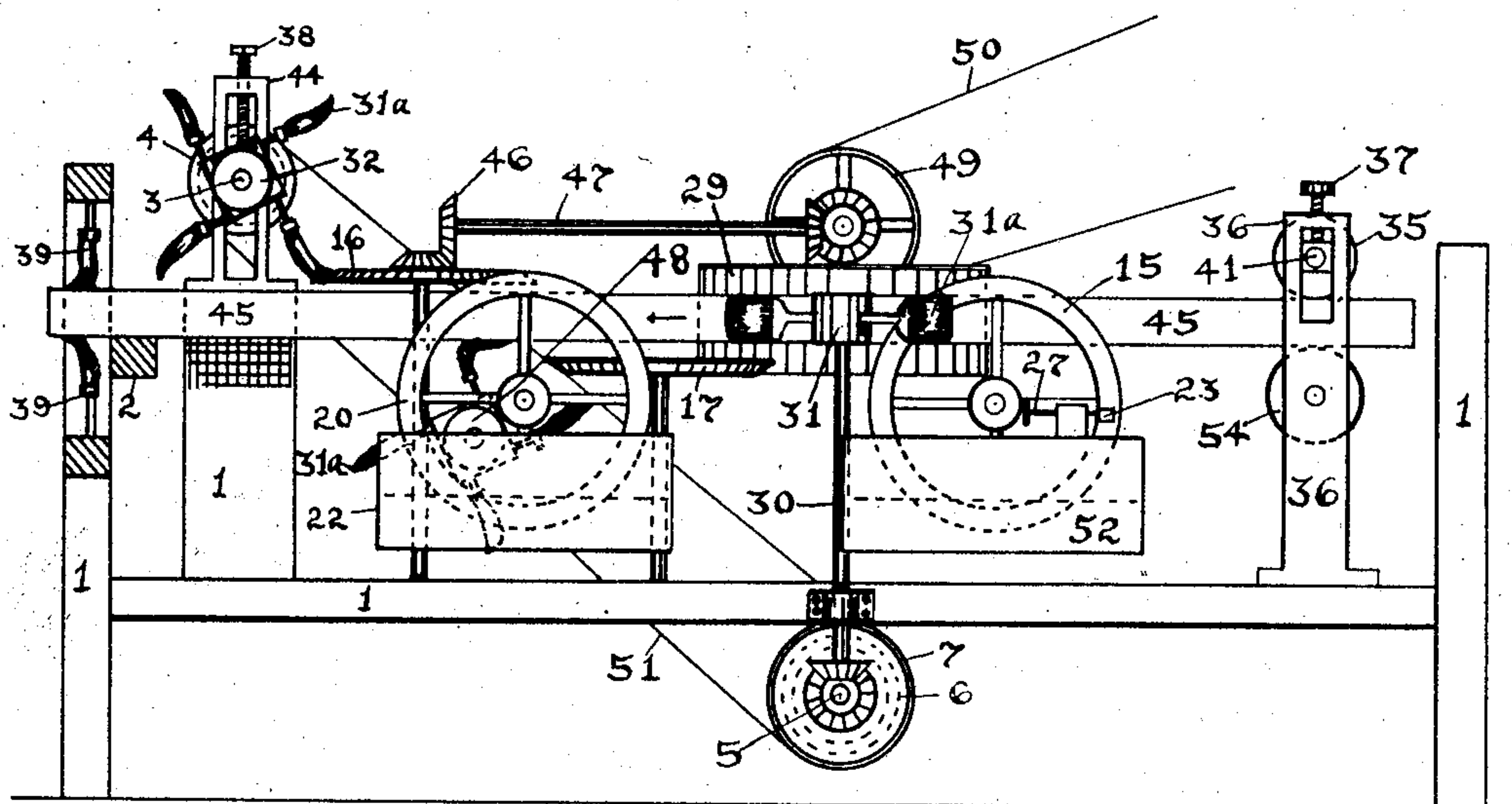


Fig 2

Oliver S. Mills Inventor

Witnesses

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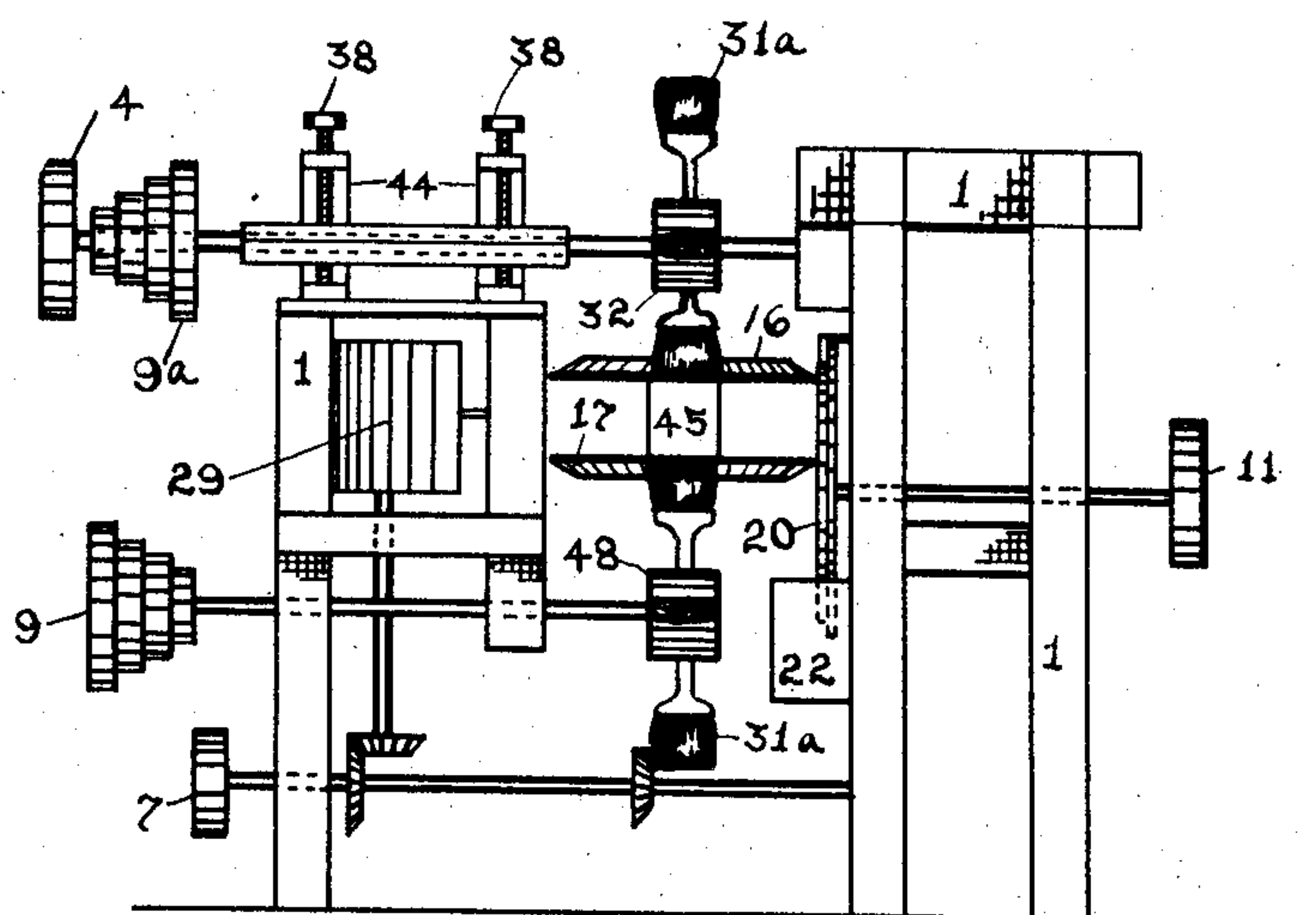


Fig 3

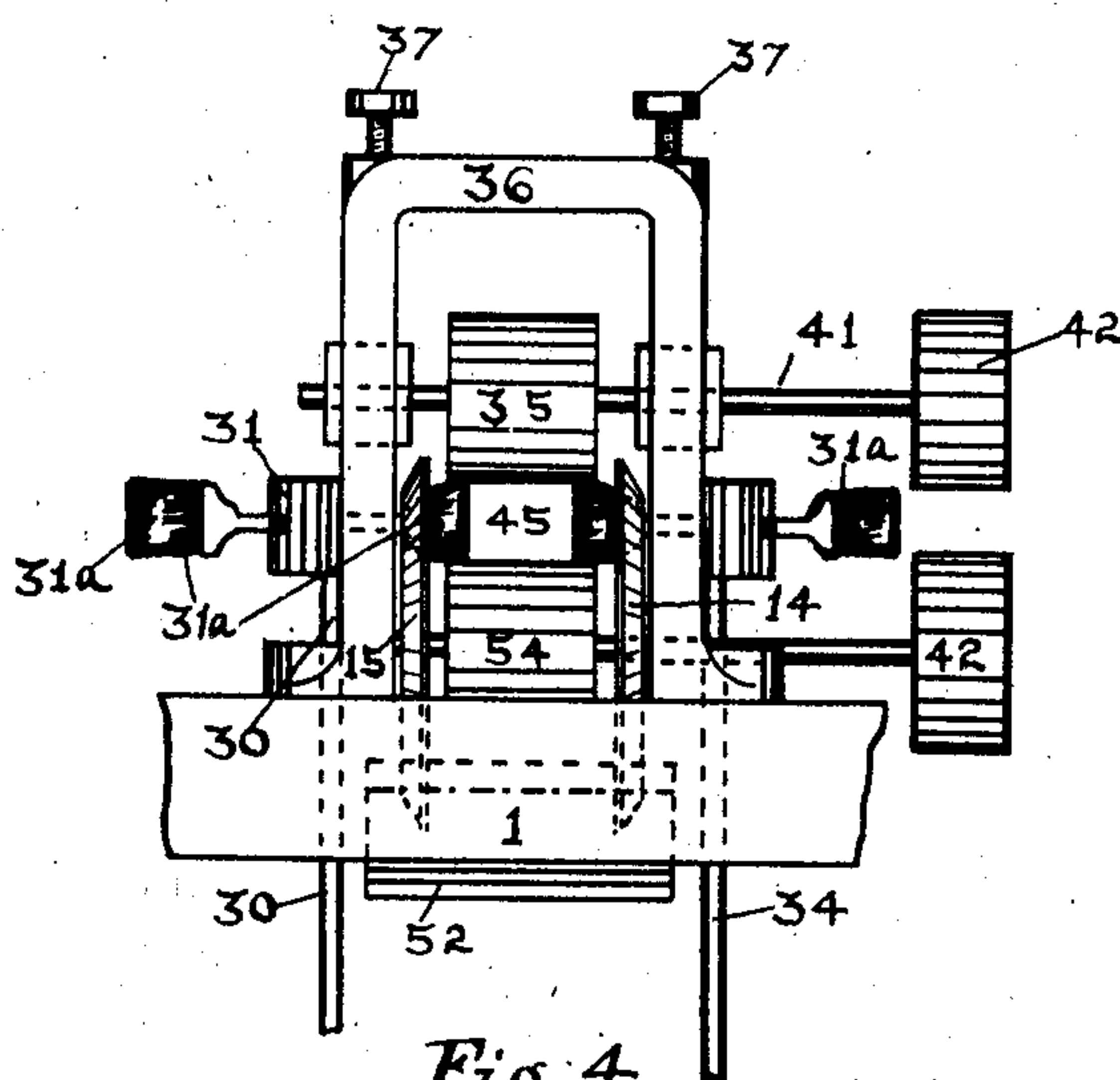


Fig 4

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3 SHEETS—SHEET 3.

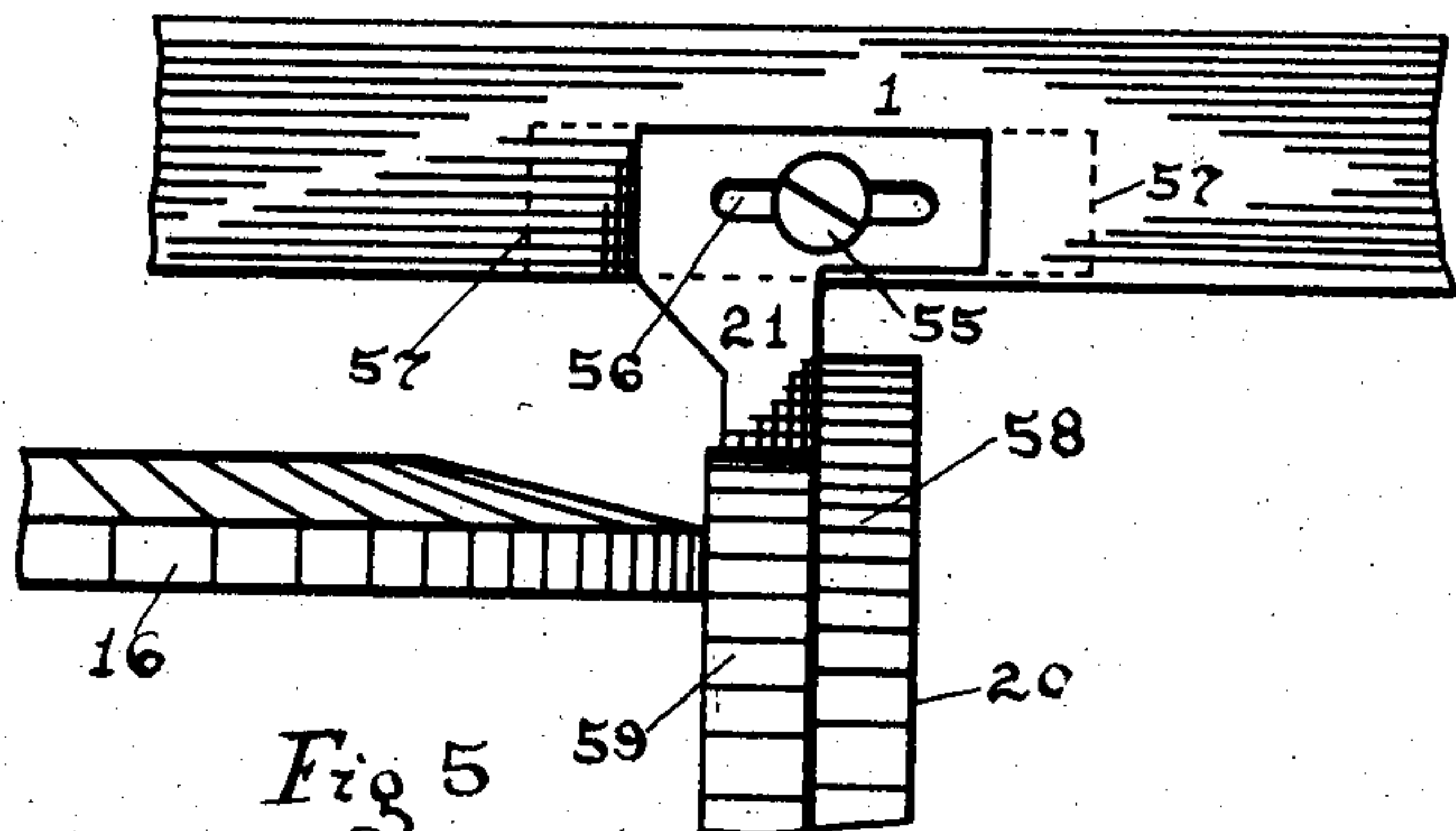


Fig 5

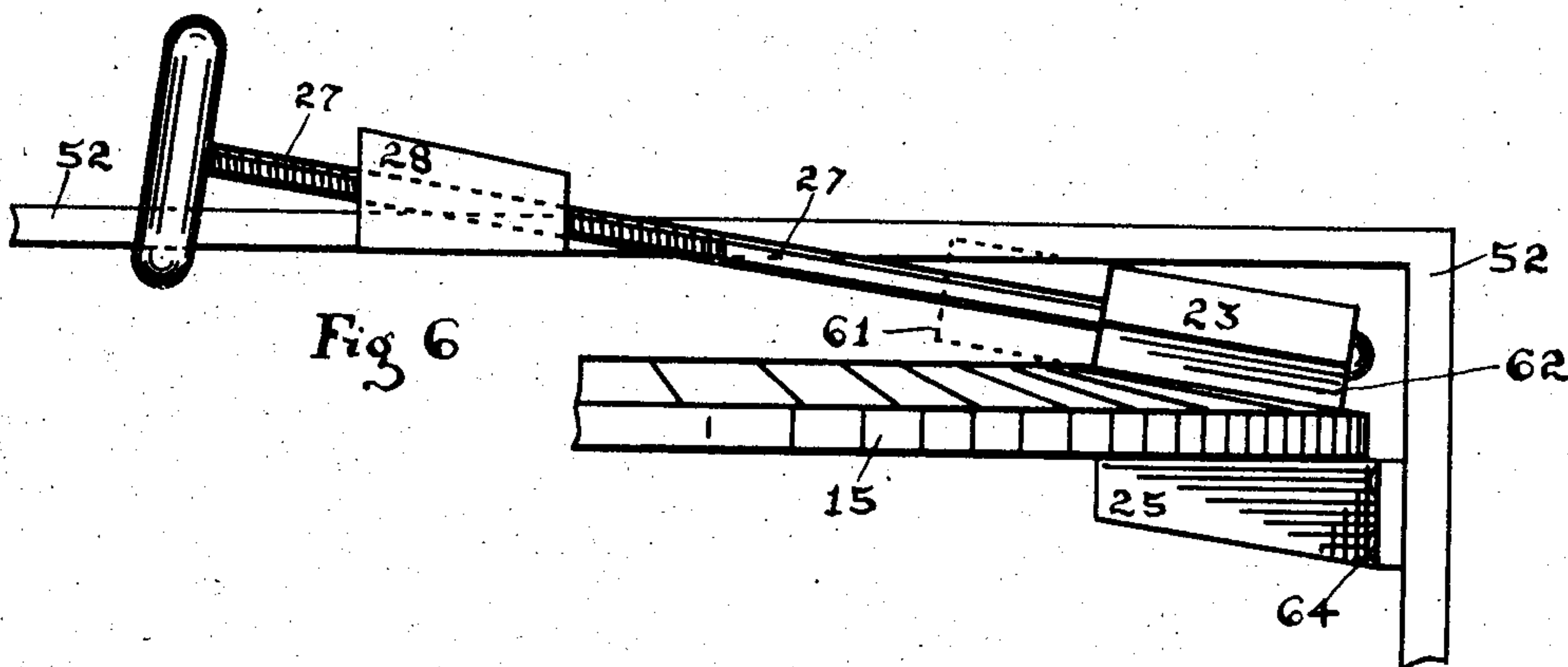


Fig 6

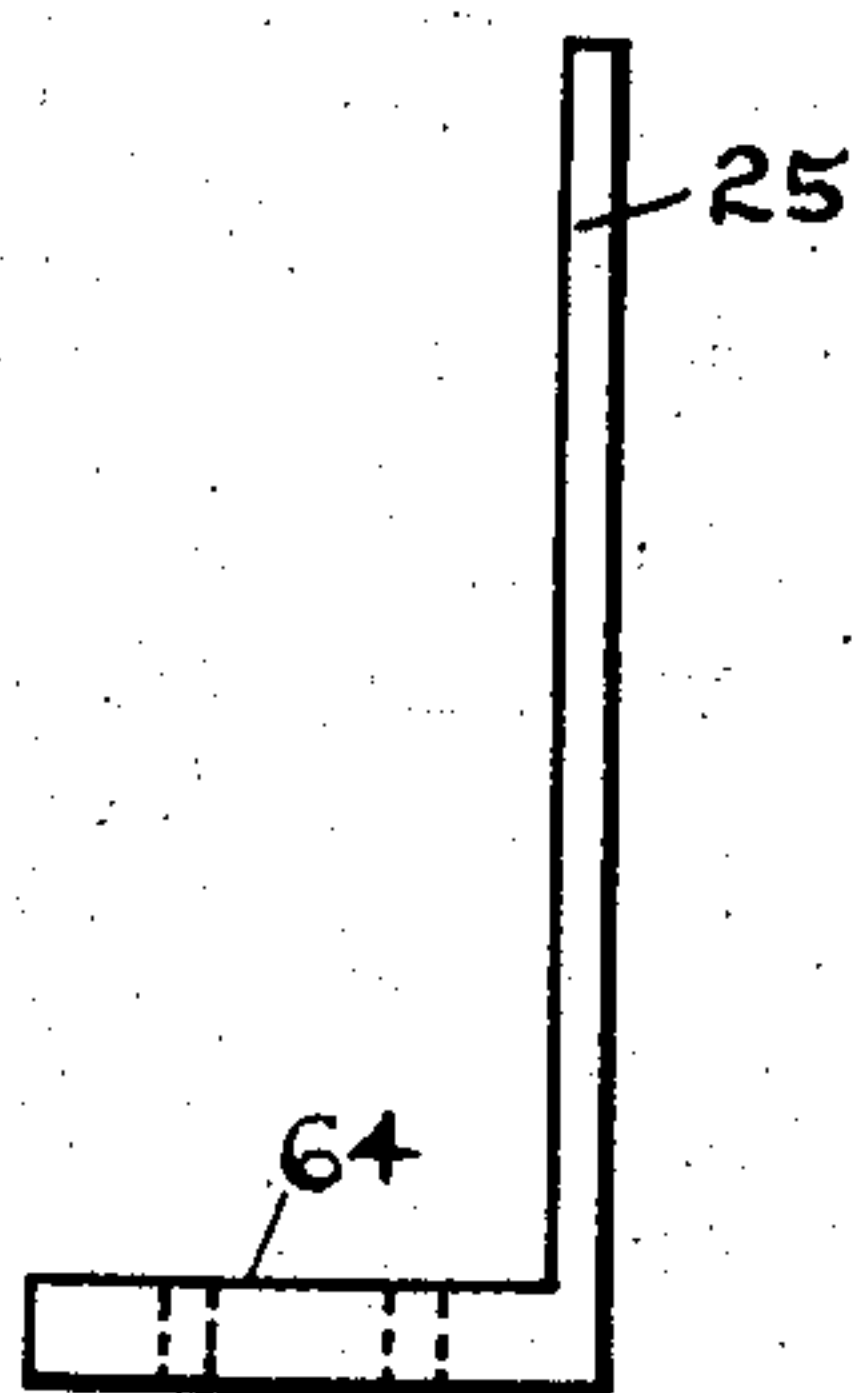


Fig 8

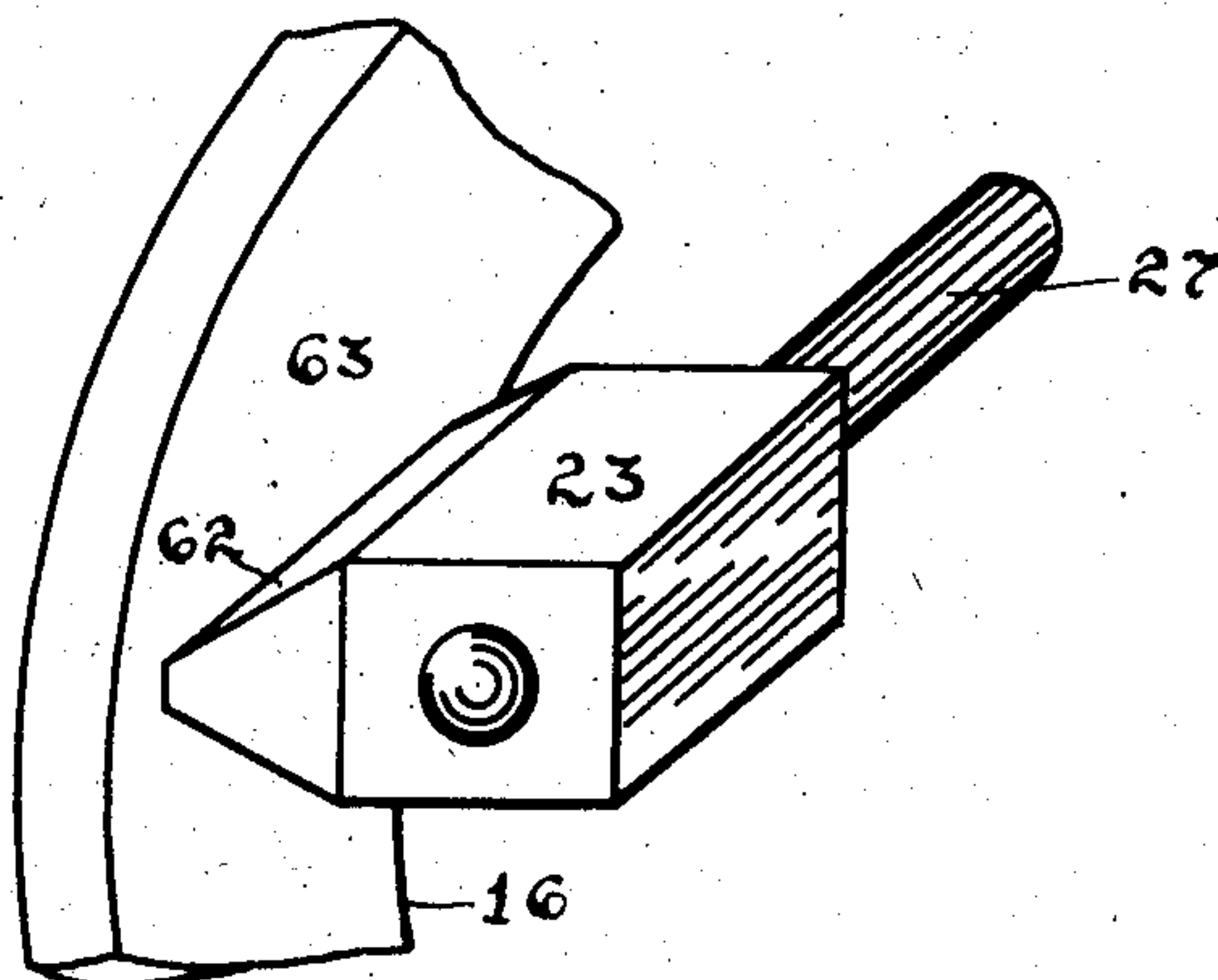


Fig 7

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UNITED STATES PATENT OFFICE.

OLIVER S. MILLS, OF BUELL, VIRGINIA, ASSIGNOR TO THE WALWORTH & NEVILLE MANUFACTURING COMPANY, OF BAY CITY, MICHIGAN, A CORPORATION.

AUTOMATIC PAINTING OR LIQUID-COATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 768,293, dated August 23, 1904.

Application filed October 14, 1903. Serial No. 177,074. (No model.)

To all whom it may concern:

Be it known that I, OLIVER S. MILLS, a citizen of the United States, residing at Buell, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Automatic Painting or Liquid-Coating Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machinery for automatically painting timber, more particularly to cross-arms for electric-light, telephone, and telegraph poles, though I am not confined to such uses, as my machine will paint any material and of a great many shapes by adjusting the width of the openings and the size and form of the brushes. In my machine I am enabled to correctly vary the amount of paint or liquid-coating composition, thereby regulating the thickness of the coat. I am also enabled to prevent waste of paint by removing the excess and returning it to reservoirs or tanks from which the brushes get their supply, as will be hereinafter described.

Referring to the drawings, Figure 1 is a plan in which the driving shafts and gears shown in Fig. 2 are omitted. Fig. 2 is a side elevation of the machine, in which a part of the framework is removed. Fig. 3 is an end elevation of the front or discharging end of the apparatus. Fig. 4 is a part end elevation showing the receiving end for the work to be painted, which is fed into the machine by means of live rolls, as will be hereinafter described. Fig. 5 is an elevation of a scraping or paint-regulating device. Fig. 6 is another form of a scraping device. Fig. 7 is a view in perspective, showing the scraping device, which is like that shown in Fig. 6. Fig. 8 is a side elevation of an auxiliary or cleaning scraper shown in plan in Fig. 6.

In the drawings, in which like figures of reference indicate similar parts in all the views, 1 is the framework supporting the working parts of the machine.

2 is a table for carrying the wiping-brushes 39.

3 is a shaft driving the brush-wheel 32 by means of the pulley 4.

5 is a shaft driving the brush-wheels 31 and 33 by means of the stepped or cone pulley 6 and the vertical shafts 30 and 34. The shaft 5 also drives the cone-pulleys 9 and 9^a and with them the shaft 8, which in turn drives the brush-wheel 48, Figs. 2 and 3. The shaft 5 also has another pulley (shown in Fig. 2 at 49) connected to a source of power by the belt 50 and drives the pulley 7 and shafts 5, 30, and 34, which turn the brush-wheels 31 and 33. The pulley 49 also drives bevel-wheels 16 and 17 at the front or discharging end of the machine by means of the shaft 47 and gears 46.

10 is a shaft driven by the pulley 11, Fig. 1, which rotates the flanged vertical wheel 20.

12 is a shaft driving the two bevel or angular wheels 14 and 15 at the rear or receiving end of the machine by means of the pulley 13. 16 and 17 are bevel-face wheels like those at 14 and 15 and have angular faces or edges. (Shown in an enlarged scale in Fig. 6 at 63.) These bevel-wheels are placed both vertically and horizontally, as shown in Fig. 1, one of which is placed on each side of the piece of timber or other material, as shown at 45, Figs. 1, 2, 3, and 4, which passes between them and the brush-wheels. I place the bevel-wheels and their angular portion outside, as shown, the flat sides of which are next to the work to be painted, as indicated in Figs. 1, 2, 3, and 4. The bevel of the wheels form an incline from their outside surface to the piece to be coated, so as to more easily transfer the paint adhering to the wheels to the beam 45 by means of the brushes 31^a on the wheels 31, 32, 33, and 48, which wipe the paint off the bevels and apply the paint to the surface to be coated. The bevel-wheels are either more or less submerged in paint reservoirs or tanks, as at 52, or get the necessary amount of paint by contact with the vertical flanged wheels, one of which is shown at 20 and upon a large scale in Fig. 5. In Fig. 5 the bevel or angular wheel 16 either touches the wheel 20 or is a very small fraction of an inch from it. In this manner the paint or liquid-coating composition adhering to the face or edge 59 of the

wheel 20 is transferred to the bevel 63 of the angular wheel 16 by means of the scraper or paint-regulating device 21. The lower bevel-wheel 17 is supplied from the face of the flange 58 in a similar manner. The brush-wheels 31, 32, 33, and 48 supply their brushes 31^a by rotating and wiping the paint from the bevel edges of the wheels 14, 15, 16, and 17 as they turn and having more or less paint adhering to them. I cause the brush-wheels 31, 32, 33, and 48 to revolve faster than the bevel-wheels in order to more properly regulate the quantity of paint transferred to the brushes and to prevent an unequal distribution by the bevel-wheels. I accomplish this by means of the cone-pulleys 6 and 9, by which I am enabled to vary the speed by shifting the belt on one of the steps of the pulleys to make the shaft run faster or slower. The variation in speed of the brush and bevel wheels and the proper regulation of same depends on the size of the article to be painted.

In order to regulate the amount of paint to the bevel-wheels, and consequently the thickness of the coat, I provide adjustable scrapers or regulators 23 and 25, as shown in plan in Fig. 1, also an enlarged view in Figs. 6, 7, and 8. Fig. 6 is a plan of the scrapers on the bevel-wheels. The scraper or lug 23 has a rod 27 passing loosely through it, provided with a screw-thread working in a block or fixed nut with 28, placed upon the reservoir or tank 52 or other convenient point. The paint adhering to the revolving wheels is varied by moving the scraper 23 in or out between the limits shown by the full lines at 23 and the dotted lines 61. By turning the hand-wheel 60 the scraper is thrown in or out, exposing more or less of the bevel, and consequently the paint-surface, of the wheel. In Fig. 6 the full lines at 23 show only a small unscraped surface, while by moving the scraper or regulator 23 in, as shown by the dotted lines, it is increased. Hence the brushes receive a greater quantity of the liquid-coating composition than they do when the scraper is nearer the edge of the wheel. Fig. 7 is a front view of Fig. 6 in perspective, showing the scraper on the angular surface of the bevel-wheel. The scrapers 24 and 25 in Fig. 1 are shown on an enlarged scale in Figs. 6 and 8. These scrapers are for the purpose of preventing an accumulation of paint on the shafts of the wheels and the backs of the bevel-wheels, the clogging of which would prevent an easy passage of the piece to be coated between them, as shown at 45 in Figs. 3 and 4.

20 is a flanged wheel supplying the bevel-wheels with paint when they are not partly submerged in the composition contained in the reservoirs or tanks 22 and 52, Figs. 1 and 2. Fig. 5 shows a part edge view of the flanged wheel 20, also the bevel-wheel 16, the flanged wheel 20 extending a short distance above the angular surface of the wheel 16, as shown.

The paint is removed from the flanged wheel by means of the scraper 21 on the tread or smallest diameter of the wheel 20, as at 59. The flange or larger diameter 58 of the wheel supplies the lower bevel-wheel 17, Fig. 1, by a similar arrangement. The scraper 21 is adjusted by means of slots, as at 56 in Fig. 5, and is secured in the proper position by the screw 55. The dotted lines 57 show the scraper elevated to its highest point when not in use.

21, Fig. 1, shows a modification, the scraper being projected over the wheel by an arm, as shown.

22 and 52 are paint reservoirs or tanks, the paint-level line being approximately shown at 52 in Fig. 2. These tanks can be raised or lowered to admit of submerging the wheels 14, 15, 16, 17, and 20 to a more or less extent.

26 and 27 in Fig. 1 are the scraper-adjusting screws. (Shown on a larger scale in Fig. 6.)

29 represents hoods placed over the brush-wheels in order to prevent the paint from being wasted or thrown off by centrifugal force. The drippings of the paint are returned to the reservoirs or tanks by suitable means. The hoods cover all the brush-wheels; but in the drawings two only are shown.

31, 32, 33, and 48 in Figs. 1, 2, 3, and 4 are rotary brush-wheels. The brushes 31^a are secured to the body by means of screws and are placed tangent to the cylindrical centers or wheels. The brushes may be of any convenient number and can be extended in or out to suit the size of the piece to be coated or entirely removed, as desired. The brush-wheels 31, 32, 33, and 48 can be raised or lowered by means of the screws 38, carrying a block through which the shaft 3 passes, the whole working in a slot in the frame 44. By this means the strokes of the brushes and also the amount of paint applied can be regulated when the machine is in operation.

35 and 54 are feed or live rolls in the frame or yoke 36 at the back or receiving end of the machine for passing the beam 45 to be painted between the wheels and brushes in the direction of the arrow in Figs. 1 and 2. The size of the opening between the rolls 35 and 54 is adjusted by the screws 37. The rolls are rotated by means of the pulley 42 on shaft 41.

39 represents adjustable wiping-brushes at the extreme front end of the machine and are for the purpose of removing an excess of paint adhering to the piece to be coated and returning same to the reservoirs or tanks by suitable means.

43 is the framework of the reservoirs or tank 22 in Fig. 1.

64 is the base of the scraper 25 in Figs. 6 and 8.

As shown and as already described, there are one or more brush-wheels for each side of the piece to be painted if it is of a square cross-section, as shown at 45 in Figs. 3 and 4. If

the work to be coated is of any other shape, I can alter the form and the extent of contact of the brushes, so that the paint is applied upon all sides at once. I prefer the angle of the bevel-wheels 14, 15, 16, and 17 to be about fifteen degrees, though it may vary according to circumstances. I generally cause the bevel-wheels to turn at forty and the brush-wheels at one hundred revolutions per minute.

10 I am not confined to the precise construction as indicated in the drawings, as I can modify the form to suit the shape and size of the piece to be painted without departing from the matter herein described and claimed. I am not also confined to the painting of timber such as cross-arms for telegraph-poles and the like, as my machine is equally adapted for painting and coating metal work, such as structural iron, pipe, cornices, sheet metal, and other material.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a painting or liquid-coating machine, the combination of a plurality of horizontal and vertical bevel or angular edge paint-feeding wheels, and rotary detachable brushes receiving the paint from the angular surface of the bevel-wheels, the said wheels being partly immersed in and supplying varying quantities of adhering paint to the rotary brushes, as described.

2. In a paint-coating machine, the combination of bevel-edge paint-carrying wheels, and flanged partly-submerged wheels at right angles to the said bevel-wheels, for supplying the liquid-coating composition thereto, as they rotate, the said bevel-wheels being above and below the axis of the flanged wheels, as described.

3. In a painting-machine comprising a series of vertical and horizontal bevel-face paint-carrying and brush feeding-wheels surrounding the piece to be coated, and vertical and partly-submerged flanged wheels for supplying the said bevel-wheels with the paint, and detachable movable reservoirs or tanks for partly submerging and feeding the said bevel and flanged wheels, as they rotate therein, as described.

4. In a machine for liquid-coating or painting, the combination of bevel-face brush feeding-wheels, and flanged wheels partly submerged in and supplying the paint thereto near their edge or face, the said flange-wheels being at right angles to and touching the bevel-wheels, the said wheels surrounding the work to be painted or coated, and detachable paint reservoirs or tanks for partly submerging the said wheels, as described.

5. In a paint-coating machine the combination of bevel-edge brush feeding-wheels surrounding the work to be painted and vertical flanged wheels partly submerged and feeding the said bevel-wheels above and below its axis

and near the faces thereof, and paint reservoirs or tanks in which the said wheels rotate, and horizontal and vertical adjustable rotary brushes receiving the paint from the angular surface of the said bevel-wheels and transferring it to the said brushes as they rotate, as described.

6. In a painting-machine the combination of bevel-edge brush feeding-wheels, and flange-wheels joining the said bevel-wheels and supplying them with the paint as they rotate when partly submerged in the liquid-coating composition, a tank for supplying the said composition to the wheels while immersed therein, and horizontal and vertical adjustable rotary brush-wheels, and detachable and adjustable brushes in the said brush-wheels receiving the paint from the face or angle edge of the said bevel-wheels and applying the paint to the material to be coated, and means for increasing and decreasing the rotative speed of the said brush and bevel wheels to regulate the paint-supply, as described.

7. In a paint-coating machine, the combination of horizontal and vertical abutting bevel and flanged wheels surrounding all sides of the work to be painted or coated, a tank or reservoir for submerging a part of one or more of the said wheels and adjustable detachable brush-wheels carrying the adhering paint from the angular portion of the bevel-wheels to the material to be painted as they rotate, means for varying the speed of the rotary brushes and the wheels to regulate the paint applied to the said brush-wheels, and adjustable scrapers or lugs on the angular face or of the bevel-wheels and scrapers on the face of the flanged wheels to vary the amount of paint-surface of the said wheels and brushes, as described.

8. In a painting-machine the combination of bevel-face brush feeding-wheels and vertical flanged wheels rotating with and supplying the said bevel-wheels with the paint, means for more or less submerging the said flanged wheels in the paint, and reservoirs or tanks for supplying the said paint to the wheels when immersed, and adjustable brushes for applying the paint, means for rotating the said brushes against the angular part of the bevel-wheels and coating the material, on all sides with the paint, means for causing a difference of rotative speed of the brushes and bevel-wheels for varying the paint adhering thereto, and adjustable scrapers or knives on the angular face of the bevel-wheels and on the edges of the flanged wheels for regulating the thickness of the coat to the material to be painted, and means for automatically feeding the work to be painted between the said wheels and the brushes, as described.

9. In a painting or liquid-coating machine, the combination of vertical and horizontal bevel-edge brush feeding-wheels, and flanged

wheels for supplying paint to the said angular or bevel wheels, and detachable movable reservoirs or tanks for holding the paint-supply, and partly submerging the rotating wheels
5 therein, and rotary adjustable and detachable brushes for wiping the paint from the angular face or edge of the bevel-wheels and applying the paint on all sides of the material to be coated, means for variably rotating the said
10 wheels upon the said work to be painted, means for increasing and decreasing the speed of the bevel-wheels and rotary brushes, and scrapers or knives on the edges or sides of the bevel-wheels to regulate the amount of adhering

paint and the thickness of the coat, means of 15 adjusting the said brush and bevel wheels to the shape of the work to be painted, and means for removing the excess of paint from the wheels and material to be painted and returning the same to the reservoirs or tanks, substantially as described. 20

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

OLIVER S. MILLS.

Witnesses:

GEO. B. MACCUBBIN,
JAS. S. HALL.