

(No Model.)

2 Sheets—Sheet 1.

S. M. VAUCLAIR.

METHOD OF AND APPARATUS FOR COUNTERBALANCING WHEELS.

No. 531,487.

Patented Dec. 25, 1894.

FIG 2

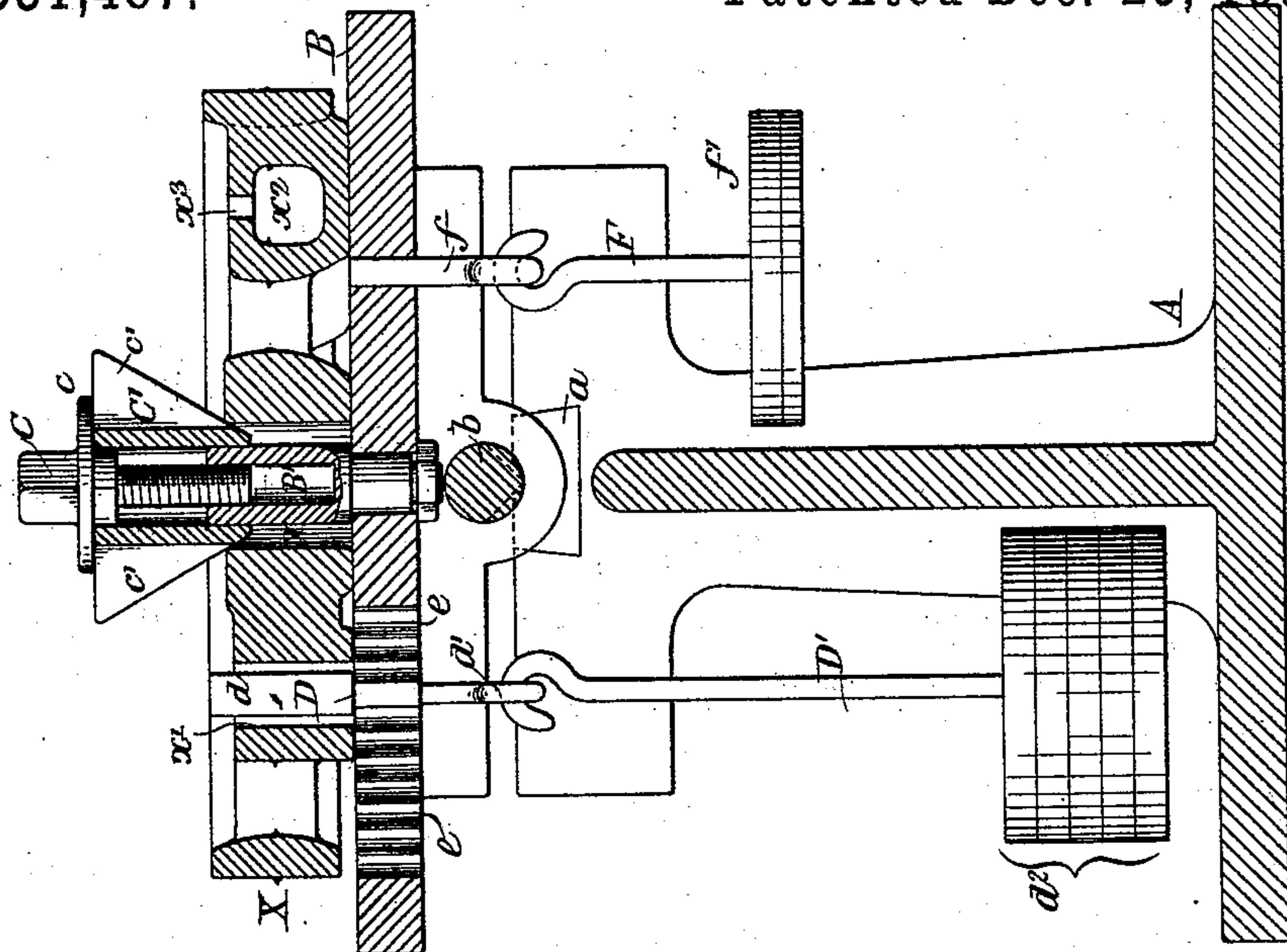
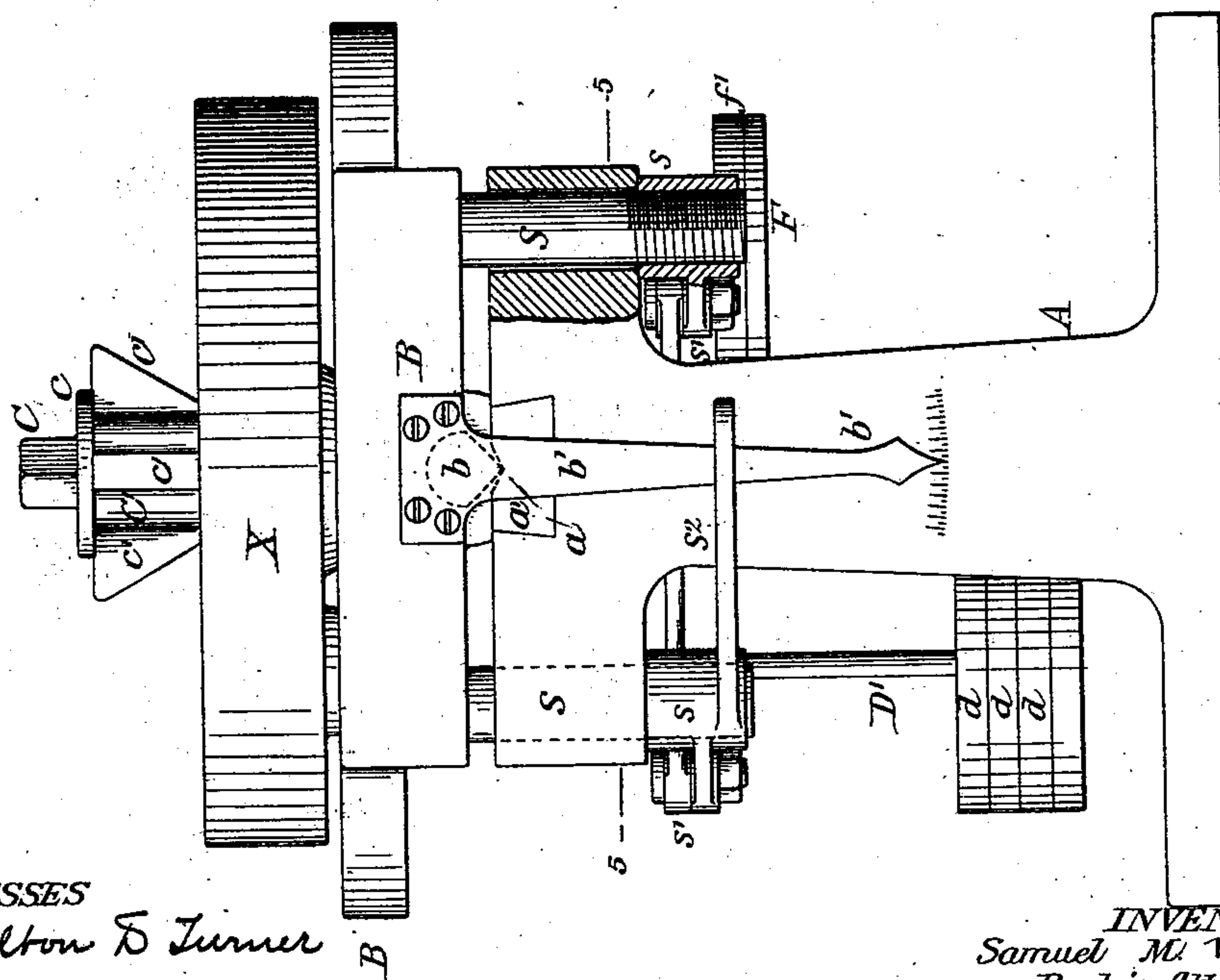


FIG 1



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FIG 4

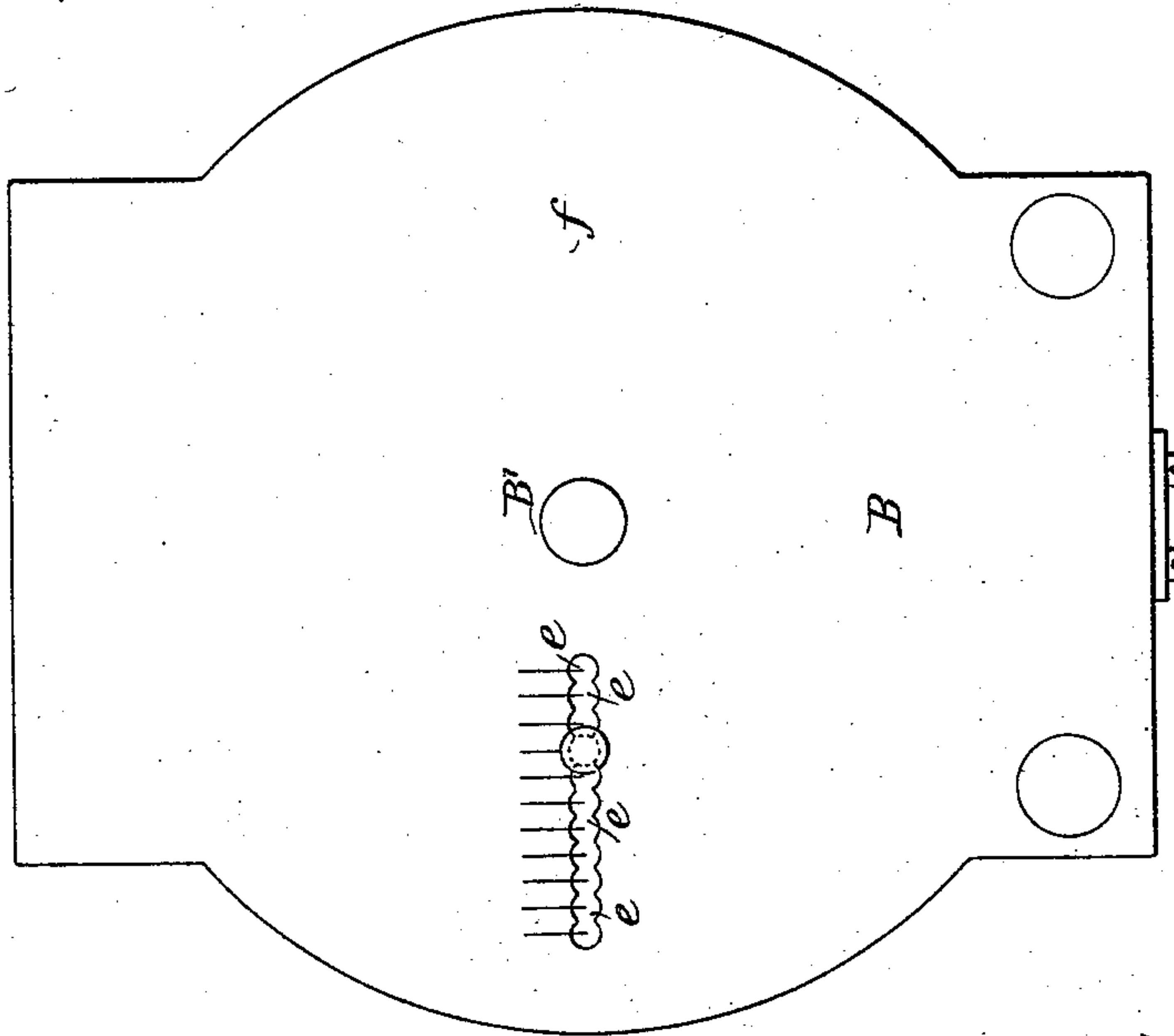


FIG 5

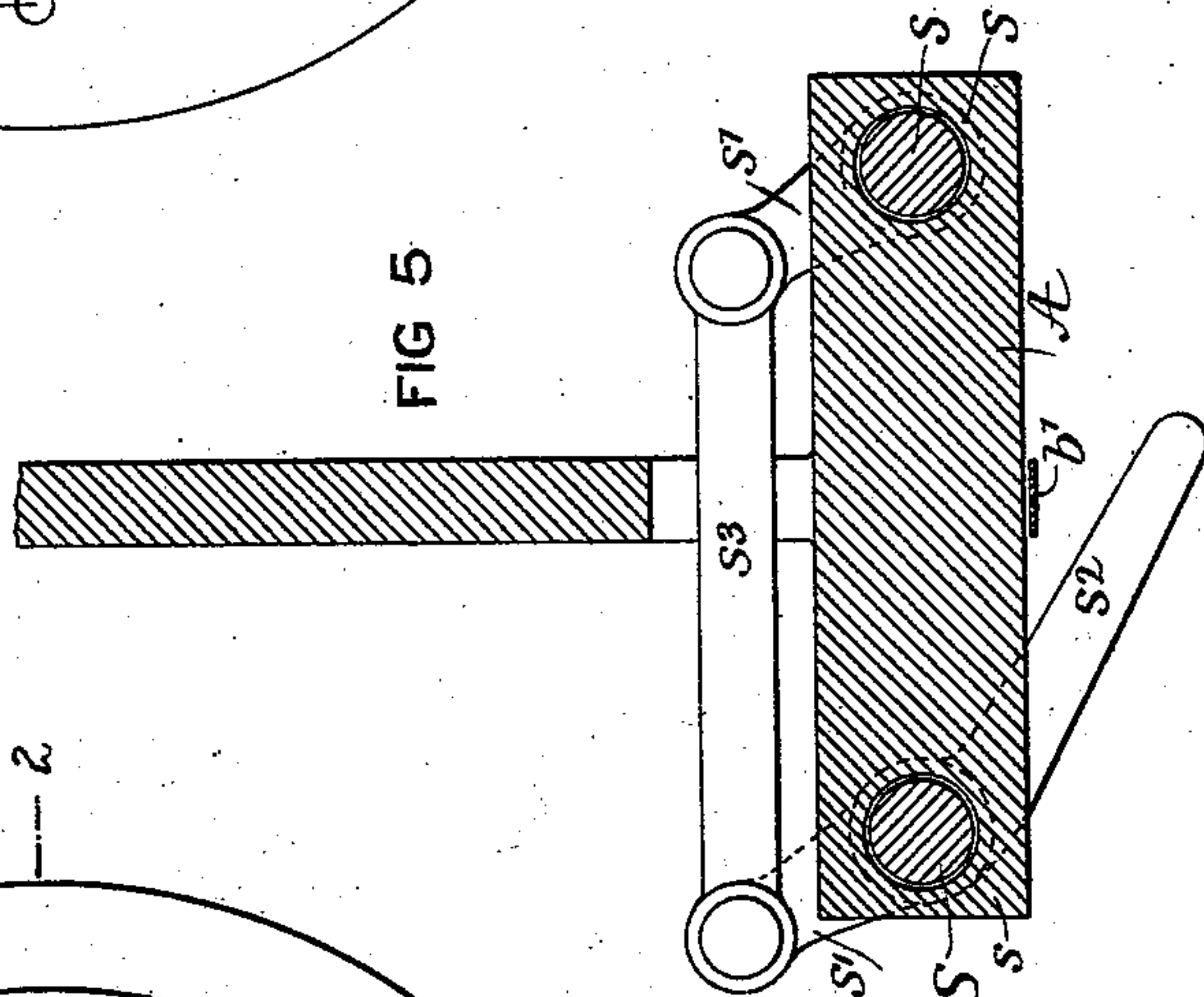
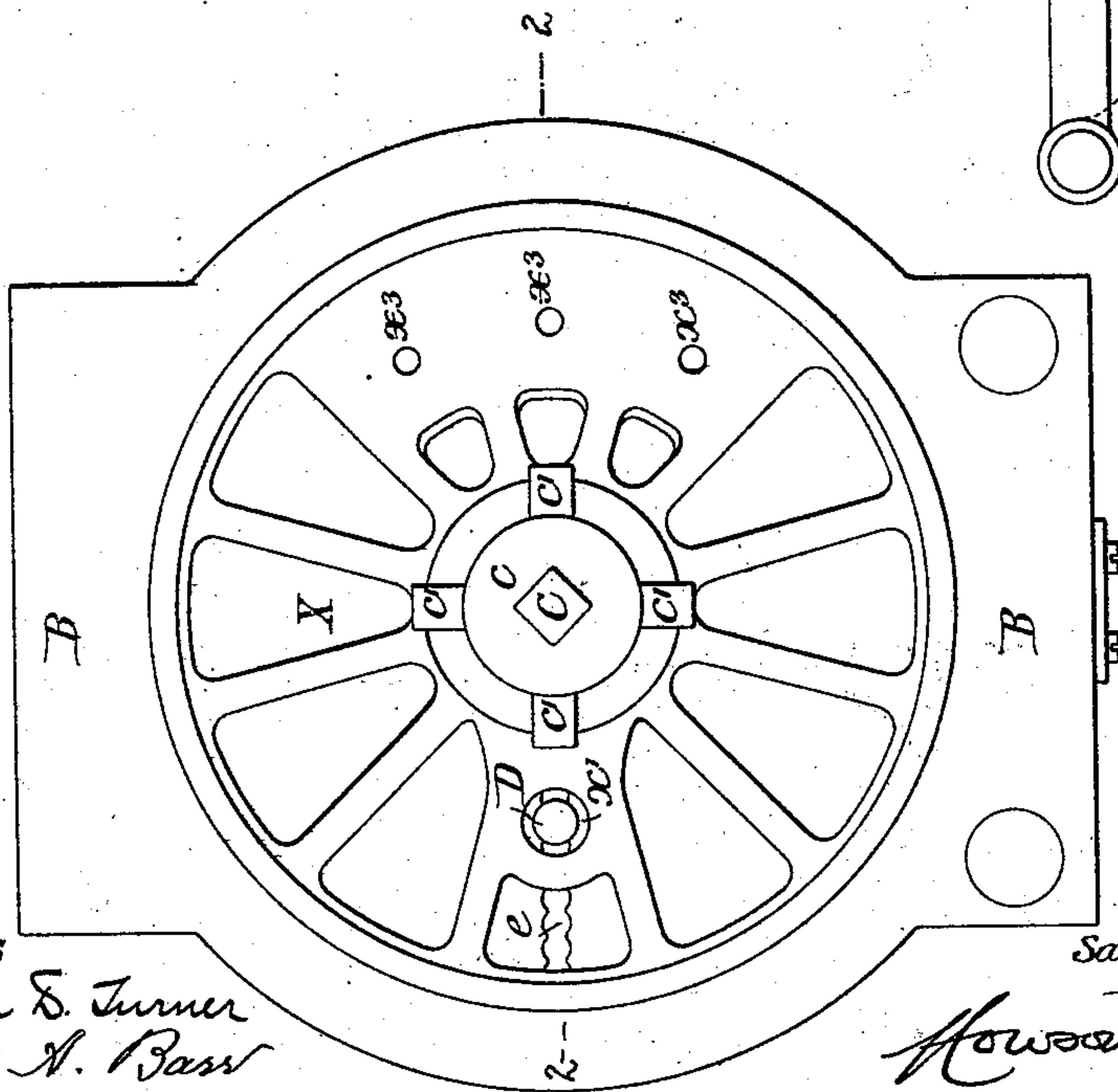


FIG 3



WITNESSES

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UNITED STATES PATENT OFFICE.

SAMUEL M. VAUCLAIN, OF PHILADELPHIA, PENNSYLVANIA.

METHOD OF AND APPARATUS FOR COUNTERBALANCING WHEELS.

SPECIFICATION forming part of Letters Patent No. 531,487, dated December 25, 1894.

Application filed May 19, 1894. Serial No. 511,859. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. VAUCLAIN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Methods of and Apparatus for Counterbalancing Wheels, of which the following is a specification.

The object of my invention is to balance the driving wheels of locomotives before the crank pins are set in position and before the wheels are finished, so that if a wheel is imperfect it can be discarded early in the process of manufacture. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1, is a side view partly in section of my improved machine for balancing wheels. Fig. 2, is a sectional view on the line 2—2, Fig. 3. Fig. 3, is a plan view showing the wheel in position. Fig. 4, is a plan view with the wheel removed. Fig. 5, is a sectional plan view on the line 5—5, Fig. 1.

In manufacturing counterbalance wheels, especially those used as driving wheels for locomotives, it is customary to finish the wheels, that is, to turn them down, place the tires in position, mount the crank pins and mount a pair of wheels on an axle, after which the axle is rolled upon balance rails and molten lead poured in the counterbalance cavities until the wheels are properly balanced. In many cases a wheel is not properly balanced owing to some defect and consequently it has to be discarded, after it was practically finished, but by my invention the wheel is balanced immediately after it is taken from the mold or forge and if it cannot be balanced or if there is some defect in the wheel it is immediately discarded before any expensive work is put upon it.

In the drawings I have shown one form of device for carrying out the process and I will now describe the construction of this machine.

A is the base of the machine, having in its upper surface at each end a hardened block a provided with a recess a' in which rests the V-shaped pivot bar b on the pivoted bed B. Projecting from the center of the bed is a post B' having a tapped hole for the reception of the clamp screw C and under the flange c on the clamp screw is a sleeve C' having tapered wings c' .

The sleeve passes into the central opening x of the wheel X to be balanced and by screwing down upon the screw C the wheel can be clamped to the bed B. In the wheel X is the axle opening x and the opening x' for the crank pin.

x^2 is the cavity in which the counterbalancing metal, preferably lead, is inserted.

x^3 are holes through which the metal is poured into the cavities x^2 , as I prefer to use the lead in the molten state.

In the bed at one side of the center is a slot e formed by drilling a series of holes, the holes in the present instance being drilled so near together that the partitions are cut away leaving only spurs projecting from each side. In some instances the holes may be drilled far enough apart so as to leave a partition. These holes indicate the distance between the center of the wheel and the center of the crank pin and adapted to any one of the holes is a pin D having a head d somewhat smaller than the opening x' in the wheel and suspended from an eye d' on this pin D is a weight hanger D' having a series of weights d^2 . On the opposite side of the center and depending from the under side of the bed B is an eye bolt f from which is hung a weight hanger F having one or more weights f' .

The bed B is balanced before either of the weight hangers is placed in position or before the pin D is placed in position and the weight hanger F is simply used to balance the pin D and its hanger, but the weights d^2 are placed on the hanger D' to balance the counterbalancing material poured into the cavities x^2 on the opposite side of the wheel.

The amount of weight necessary to balance wheels of different diameters and of different stroke is calculated in advance and the operator simply refers to his table of weights and finds that a wheel of a certain diameter and having a crank pin of a certain stroke requires a given weight and this weight is hung upon the hanger D' after the pin D has been set in the proper hole.

The wheel X can be adjusted and clamped in position either before or after the pin D is set. The molten metal is then poured into the cavity x^2 through the openings x^3 until the metal balances the weight and the indi-

cator b' comes to a central position. Thus the wheel is balanced accurately while on its side instead of vertically arranged on an axle.

In order to clamp the table or bed B to the frame A, I provide two screw studs S S, one on each side of the center. These screw studs depend from the bed and pass through holes in the frame A and adapted to the threaded portion of each stud is a nut s and each nut has an arm s' . The arms are connected by a rod s^3 . An operating lever s^2 projects from one of the nuts so that when this lever is moved in the direction of the arrow the screw nuts will be lowered thus freeing the bed from their control, but when it is wished to lock the bed, the lever s^2 is moved in the opposite direction thus elevating the nuts and locking the table. It will be understood that this locking mechanism may be dispensed with and blocks or wedges used to prevent the table from moving on its pivots and that the weights may be differently arranged without departing from the main features of my invention.

While I have illustrated my invention as especially applicable to locomotive driving wheels it will be understood that it can be applied to any wheel which requires counterbalancing.

I claim as my invention—

1. The process herein described of counterbalancing driving wheels, said process consisting in first mounting the wheels on their sides upon a pivoted table, with the holes for the counterbalance uppermost, second, placing a predetermined weight upon the crank pin side of the wheel, third pouring molten metal into the counterbalance section of the wheel until the molten metal balances the weight and finally removing the wheel from the table, substantially as described.

2. The combination of a pivoted table on which is mounted the wheel to be balanced, an adjustable pin adapted to openings in the table and to the crank pin opening of the wheel, a weight suspended from said pin, said weight being the equivalent of the counter-

balancing material of the wheel, substantially as described.

3. The combination of the base, the bed or table pivoted thereto, said bed having a series of openings at one side of the center, a pin adapted to said openings, a weight hanger hung to said pin, a balancing hanger on the opposite side of the pivot for balancing the pin and hanger, with weights adapted to balance the counterbalancing material of the wheel, substantially as described.

4. The combination of the base, the bed pivoted thereto, a pin on said bed, a clamp for the wheel, said pin adapted to the crank pin opening, with a weight on the crank pin side adapted to balance the counterbalancing material, substantially as described.

5. The combination of the base, the pivoted bed upon which the wheel is mounted, a central post adapted to pass through the hub of the wheel, a tapered sleeve, the clamp screw adapted to clamp the wheel to the bed, a detachable pin adapted to the crank pin opening of the wheel, a weight hung from said pin to balance the counterbalancing material, substantially as described.

6. The combination of the base, the pivoted bed upon which the wheel is mounted, an adjustable weight for balancing the counterbalancing material, with two screw studs one on each side of the pivoted bed, said studs being connected together, with means for raising and lowering the studs, substantially as and for the purpose set forth.

7. The combination of the base, the pivoted bed for the wheel to be balanced, screw studs depending from the bed, one on each side of the pivot, nuts, arms thereon, a rod connecting the arms, and a hand lever for raising or lowering the nuts, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL M. VAUCLAIN.

Witnesses:

WM. RHODES,
JAMES G. KEYS.