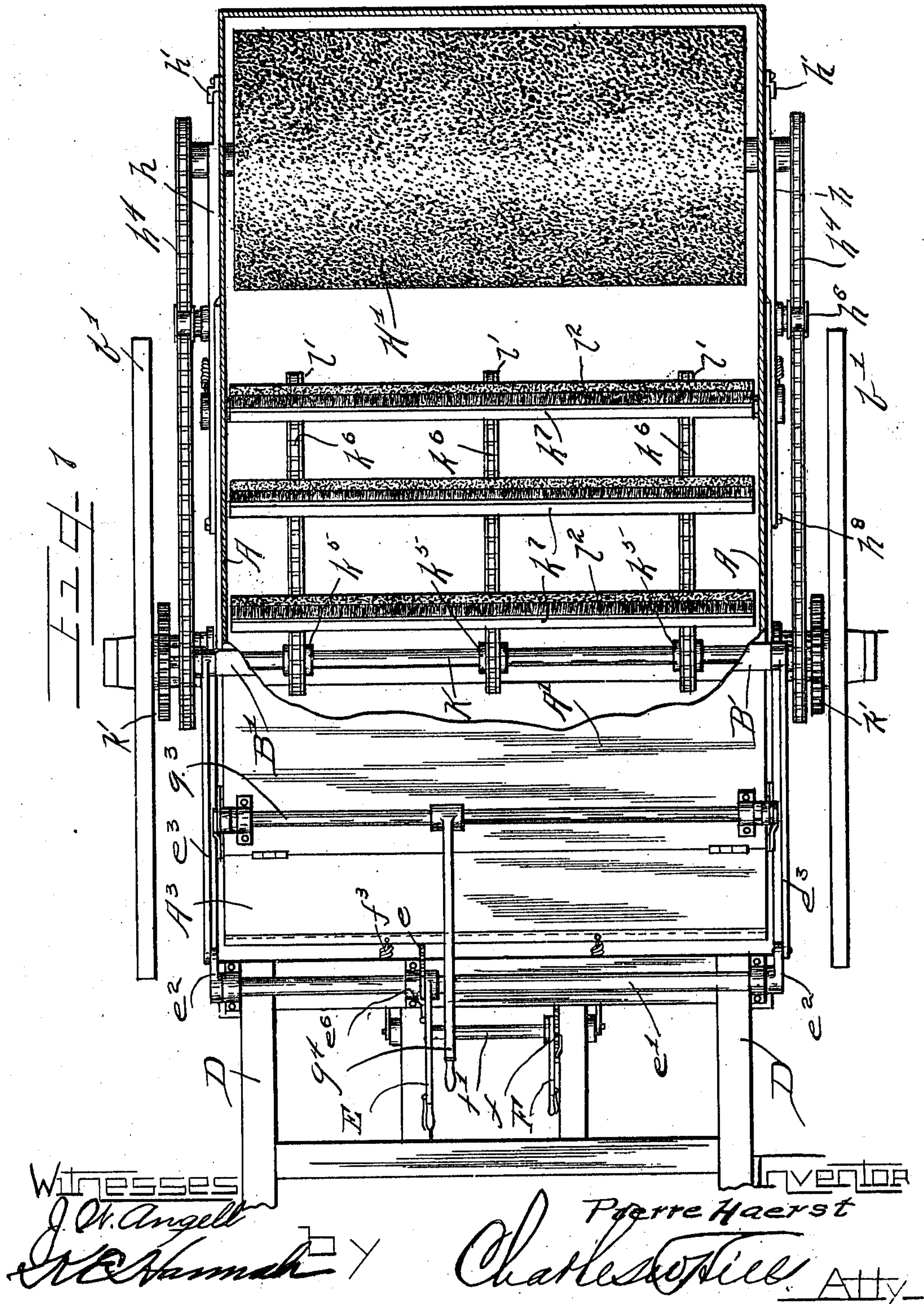


990,128.

P. HAERST.
SWEEPING MACHINE.
APPLICATION FILED DEC. 29, 1906.

Patented Apr. 18, 1911.

4 SHEETS—SHEET 1.

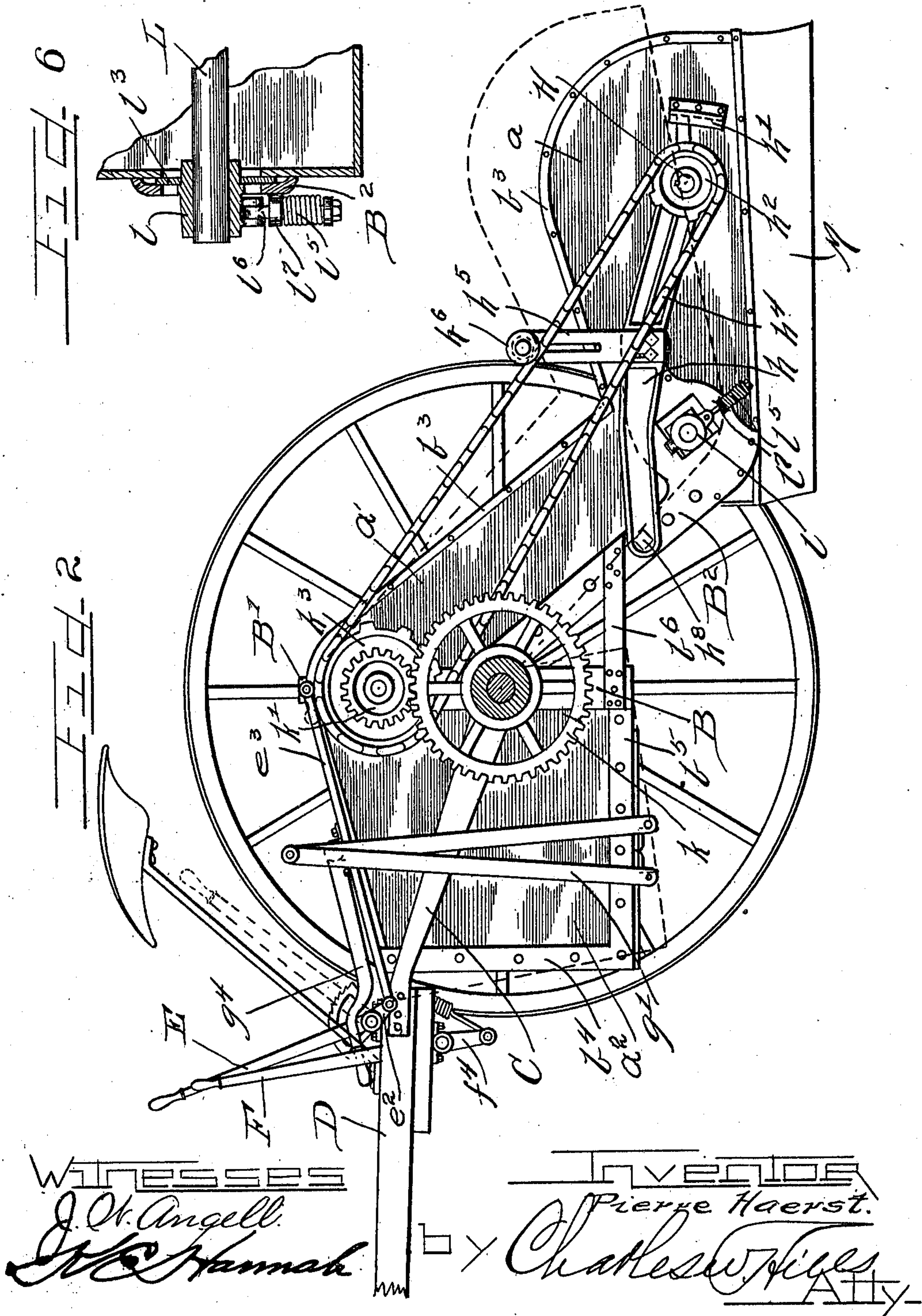


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4 SHEETS-SHEET 2.

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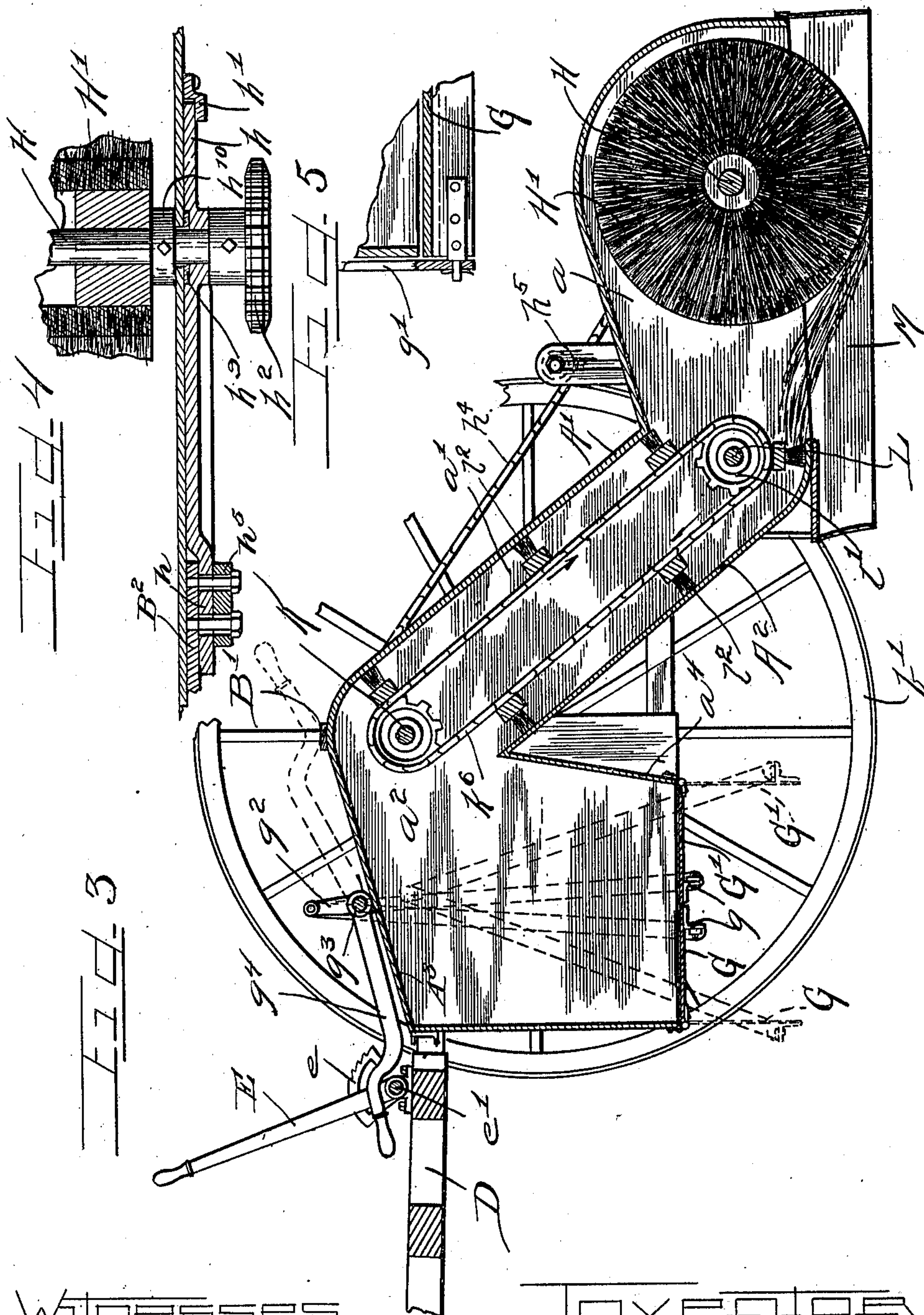


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Patented Apr. 18, 1911.

4 SHEETS-SHEET 4.

990,128.

FIG 7

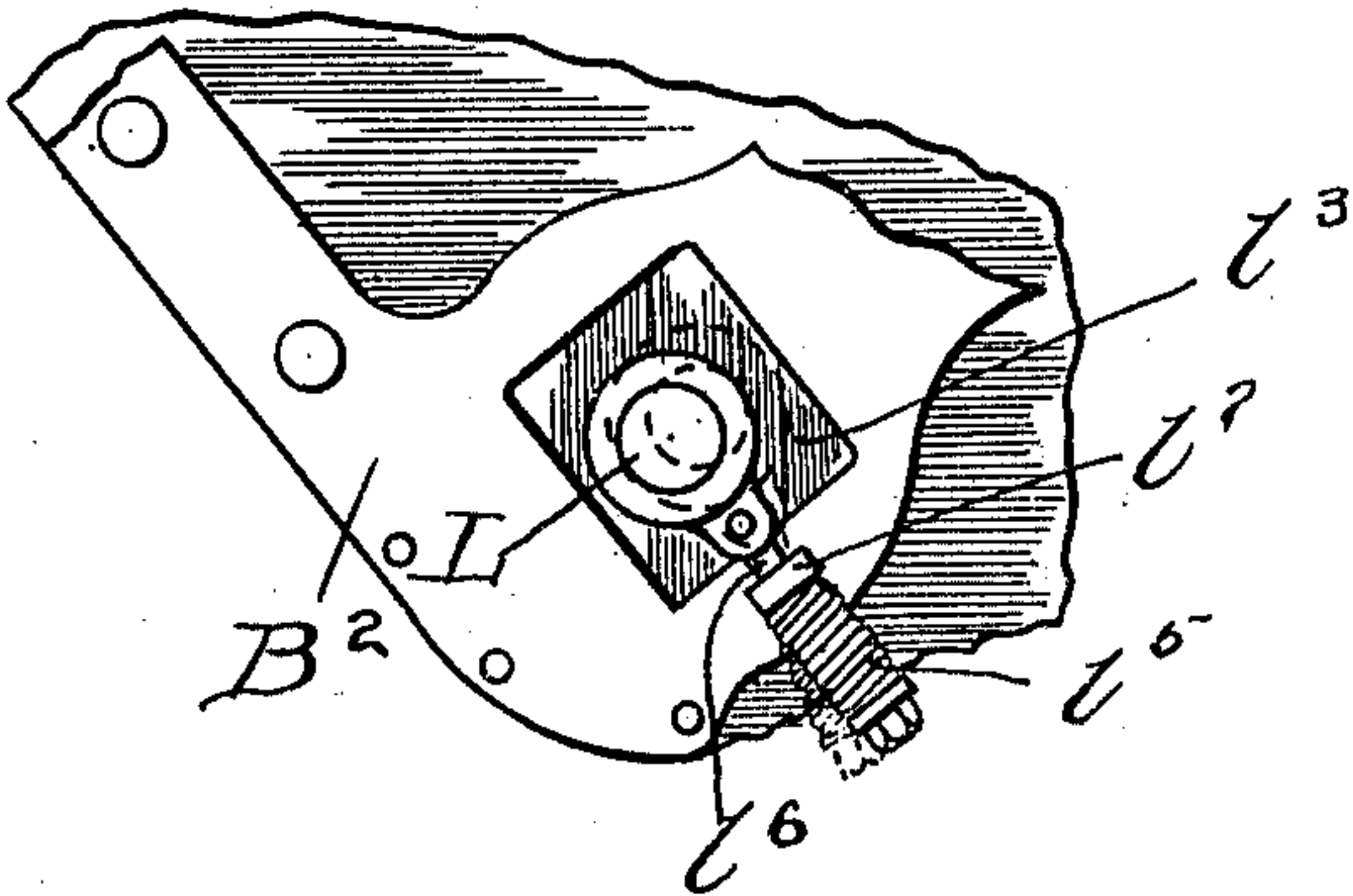


FIG 10

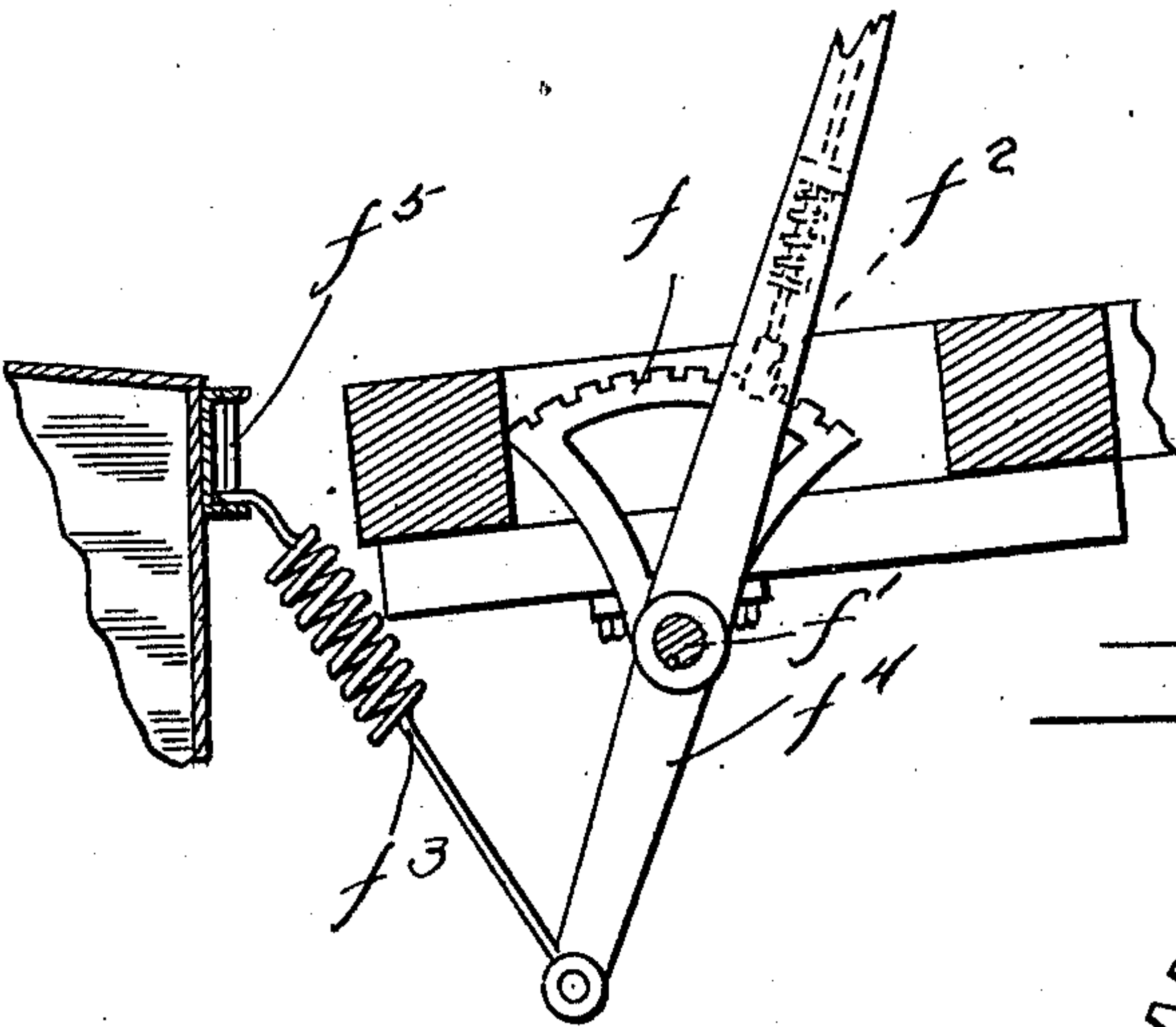
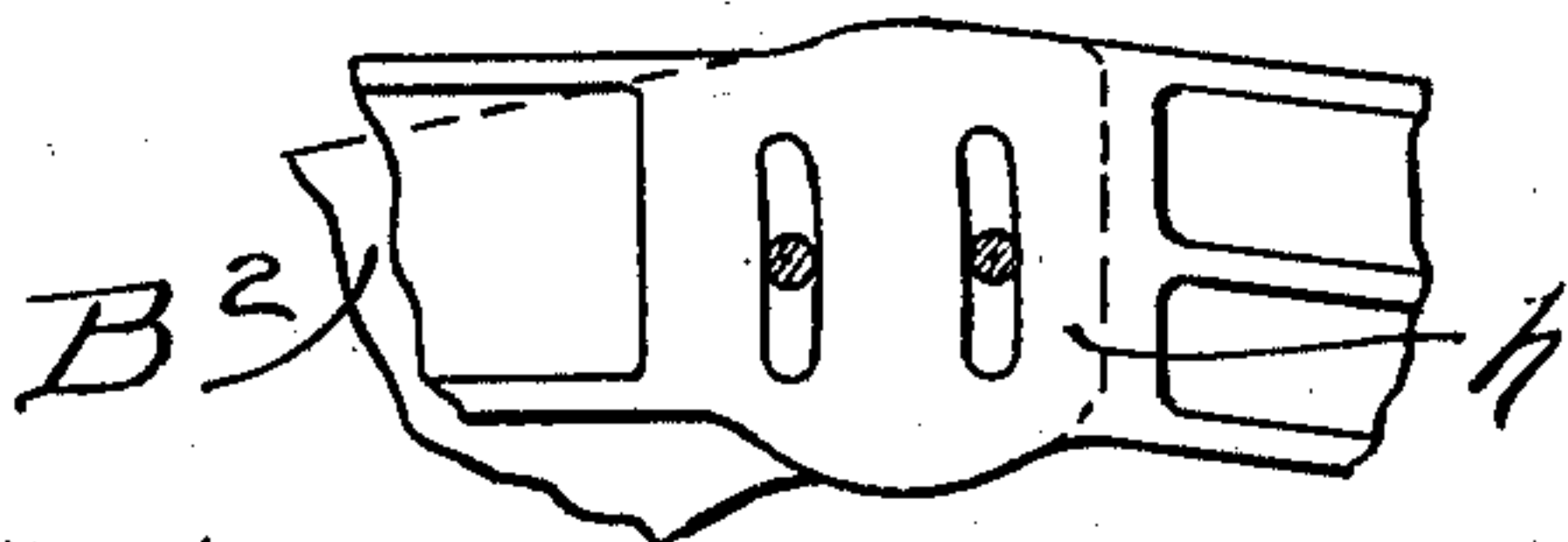


FIG 11



WITNESSES

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FIG 8

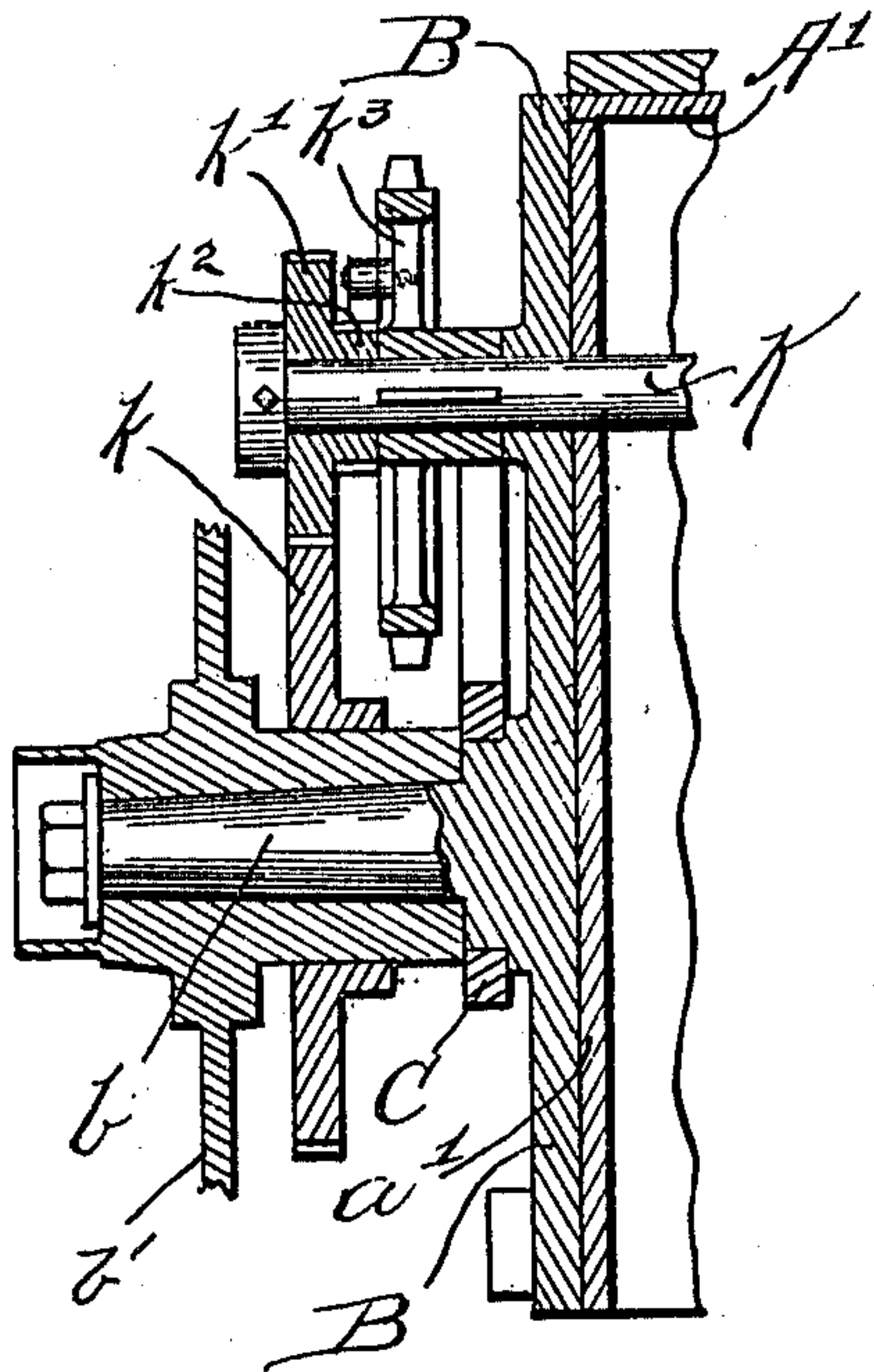
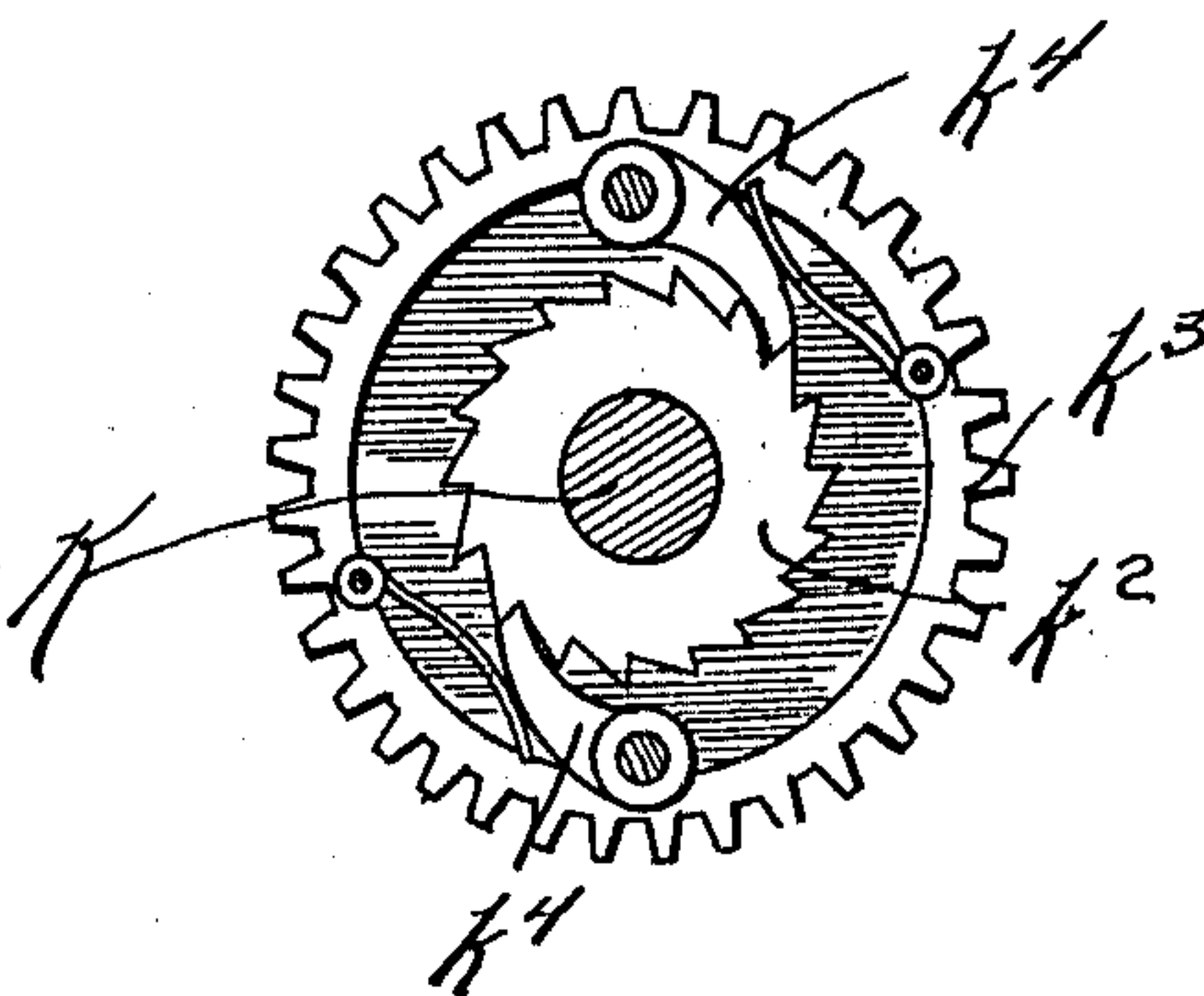


FIG 9



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UNITED STATES PATENT OFFICE.

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SWEEPING-MACHINE.

990,128.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed December 29, 1906. Serial No. 350,055.

To all whom it may concern:

Be it known that I, PIERRE HAERST, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sweeping-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in sweeping machines of that class in which the dirt is picked up and delivered into a receptacle carried on the sweeper and which may be dumped at will.

The object of this invention is to provide a sweeper capable of operating on pavements or surfaces that are not uniform and also to provide a dumping receptacle adapted in part to counterbalance the brush and elevator and provided with positively acting, but simple dumping mechanism.

It is also an object of the invention to provide a positively driven elevator adapted to receive the material from the brush, the two conjointly sweeping the surface clean and delivering the dirt upwardly and forwardly to the receptacle.

It is a further object of the invention to afford simple mechanism for varying the pressure of the brush on the surface.

It is also an object of the invention to afford means whereby objects of considerable size may be picked up and delivered into the receptacle without clogging the elevator.

Finally it is an object of the invention to afford a machine of the class described of great flexibility, strength and durability and yet of such simple construction and so easily operated as not to require skilled labor for that purpose.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

Figure 1 is a fragmentary top plan view of a device embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a longitudinal section of the same. Fig. 4 is an enlarged longitudinal section of the side wall of the hood, and of the brush showing the sprocket and shaft in elevation. Fig. 5

is an enlarged detail in transverse section of the hinged bottom leaves for the receptacle and the link supporting the same. Fig. 6 is an enlarged transverse section illustrating the bearing and the spring tension for the lower end of the elevator. Fig. 7 is an enlarged side elevation of the same. Fig. 8 is an enlarged vertical section through the gears. Fig. 9 is an enlarged face view of the driving sprocket. Fig. 10 is an enlarged fragmentary detail of one of the operating levers. Fig. 11 is an enlarged fragmentary detail of one of the oscillating bars supporting the ends of the rotative brush shaft.

As shown in the drawings, the sides of the sweeper hood, the elevator casing, and receptacle may be constructed of a single piece or of one or more sheets of metal, affording the side wall a of the hood, a' of the elevator casing, and a^2 of the receptacle, as shown in Fig. 3, and a sheet or plate of metal A' , is rigidly secured at its front edge to the top of said receptacle and extends therefrom rearwardly and downwardly affording the top for the receptacle and elevator and the top and rear wall for the hood. The rear wall a^1 of the receptacle inclines at its top somewhat rearwardly as shown in Fig. 3, and is connected at its top with the downwardly inclined floor A^2 , for the elevator, also of sheet metal, which is substantially parallel with the top of the elevator casing. At its lower end said floor inclines rearwardly and slightly upwardly to nearly a horizontal position.

Rigidly bolted on the sides of the casing are bars of metal B , which may be flat or any structural shape and of either cast or wrought metal, and integrally connected therewith, one on each side of the machine, is the axle b on which the wheels b' on which the machine is supported, are rotatively engaged. A rigid rib or brace beam B' , extends across the top of the machine above said bars B , to which the same are engaged. Rigidly riveted or otherwise firmly secured to the lower edge of said side walls a' of the elevator and along its bottom, is a plate or bar B^2 , which extends from near the axle b , and the bar B , downwardly and rearwardly, to the hood, or to the point of junction between the hood and elevator casing, at which point said bar is

relatively broad and extends rearwardly and upwardly on said hood at the front end thereof.

Extending around the angle formed by the meeting of the top with the side plates, are angle bars b^3 , which are riveted to each. Extending downwardly at the front side and corners of the receptacle are heavier angle bars b^4 , and extending rearwardly along the bottom of the receptacle are plates or bars b^5 , the ends of which are rigidly secured to the bar B, on the side of the machine. Riveted to the bar B, and to the rearwardly and downwardly extending bar B^2 , on the casing is a bar b^6 , as shown in Fig. 2.

This construction obviously affords an exceedingly rigid frame, enabling relatively thin sheet metal to be used for the walls and top thereof. Extending forwardly from and pivoted at its rear end on the axles b , are bars C, one on each side of the machine, as shown in Figs. 2 and 8. The forward end of each bar is rigidly engaged by bolting or other suitable means one on each side of the thills D, and as the rear ends of said bars C, are secured on the axle to permit the same to rotate slightly therein, the machine can thus swing upon the wheels to elevate the hood, as shown in dotted lines in Fig. 2, or to depress the same, as shown in full lines in said figure. This is accomplished by a lever E, pivotally secured on the thills, and provided with a detent e^6 engaging segment e , as shown in Fig. 3. Said lever is rigidly secured on the shaft e' , at the ends of which are provided cranks e^2 , which normally are directed rearwardly, and pivotally engaged on said cranks are connecting rods e^3 , one on each side of the machine, the rear ends of which are pivotally engaged upon the ends of the transverse beam or bar B' , which forms the back bone of the machine. When said lever is drawn rearwardly the hood is elevated and the receptacle at the front end of the machine is depressed.

As shown, said machine is yieldingly supported in operating position by means of a lever F, secured upon a shaft f' , journaled transversely on the thills. A segment f , as shown in Fig. 10, is secured in operative relation to said lever and a detent f^2 , adapted to hold the lever in adjusted position, engages said segment. Strong springs f^3 , connect downwardly directed arms f^4 , secured on the ends of the shaft f' , with suitable connections f^5 on the front edge of the receptacle and act to hold the machine balanced upon its axles. This enables the operator by adjustment of the lever F to balance the machine so as to vary the pressure of the brush upon the surface to be swept.

Doors G—G' are provided for the bottom of the receptacle which are hinged on

the front and rear walls thereof, as shown in Figs. 2 and 3. Said doors, as shown, are each provided at their meeting edges with angle bars g , rigidly secured thereon transverse the machine, and pivotally engaged on suitable trunnions at the ends of said angle bars are links g' , shown in full lines in Fig. 2, and in dotted lines in Fig. 3. Said links are pivotally engaged at their upper ends on cranks g^2 , rigidly secured upon a shaft g^3 , extending transversely the top of the machine and centrally the receptacle, as shown in Fig. 1. Rigidly engaged on said shaft, is a lever g^4 , which when thrown forwardly acts to lift the doors, as shown in Figs. 2 and 3, and when thrown rearwardly, as shown in dotted lines in Fig. 3, permits the doors to swing straight down to dump the load.

Journaled transversely in the hood at the rear end of the machine is a shaft H, having rigidly secured thereon the cylindric brush H' , which may be of any suitable material and diameter, and is of a length to fit somewhat closely in the hood. As shown, a bar h of suitable shape is bolted at its forward end to the bar B^2 , by means of a single bolt h^8 affording a slight pivotal movement. Said bar h at its rear end affords a bearing for the shaft H, which extends through holes in the sides of the hood of larger diameter to permit a limited vertical movement and a plate h^9 is closely fitted to the shaft and extends vertically between said bar h and the side of the hood and is seated in a recess in the inner side of said bar, as shown in Fig. 4.

The rear end of the bar h is engaged by a guide h' bolted or riveted to the side of the hood and in which it may have a slight vertical movement. Rigidly secured on the shaft H between the end of the brush and the hood are collars h^{10} and on the outer end of said shaft are sprocket wheels h^2 . Trained about the said sprocket wheels and corresponding sprocket wheels k^3 , on a shaft K, journaled transversely at the upper end of the elevator casing, and above the axle are the driving sprocket chains h^4 . Adjustably, but rigidly secured on each bar h , through slotted bolt holes, and projecting upwardly is a standard h^5 , one on each side of the machine. On the upper end of each is secured an idler or pulley h^6 , which idlers serve to tighten said sprocket chains. Said shaft K as shown, is driven from the hub of the wheels, by means of a gear k , rigidly secured on each hub, and which meshes with a gear k' , rotatably secured on the outer end of said shaft K, and provided on its inner side with an integral ratchet k^2 , adjacent the driving gear k^3 . Pivotally secured on the face of the gear k^3 on the shaft K are spring pressed pawls k^4 , which engage said ratchet wheels as the machine is moved for-

wardly, thereby rotating the shaft and in consequence driving the brush continuously, while the machine is moving ahead or turning either to right or left, but, however, instantly stopping the brush should the machine be backed.

Rigidly secured on the shaft K, as shown, are sprocket wheels k^5 , as shown three in number, secured at the middle of said shaft and adjacent each of the side walls, of the machine. A corresponding shaft L is journaled parallel therewith in suitable bearings l , at the bottom of said elevator casing and is provided with corresponding sprocket wheels l' , as shown in Fig. 3. Trained around these sprocket wheels, are sprocket chains k^6 secured on which are transverse outwardly facing brushes l^2 , six in number though the number may of course vary. In length said brushes approximate the interior width of the machine and are of a size that they sweep the floor of the elevator casing upwardly from the bottom, as shown in Fig. 3.

Frequently sticks, stones and various objects of considerable size are encountered and these are thrown by the rotary brush forwardly and engaged by the elevator brushes. The brush engaging the same against the bottom might jam and stop the machine or endanger breakage of the machine. To obviate this, the bearings l at the ends of the shaft L, are yieldingly secured in relatively large apertures through the side wall of the machine and through the bar B^2 , as shown in Fig. 2, and secured on said bearings l and bearing against the outer side of the casing is a plate l^3 , which engages within a recess between the inner side of the bar B^2 , and the side wall, as shown in Fig. 6, permitting considerable amplitude of movement upwardly and rearwardly of the ends of the shaft. The shaft is normally held downwardly and forwardly against the draft of the chains, by the draft on the lower brushes and by means of a strong spiral pulling spring l^5 , which engages around a suitable bolt l^6 , pivotally engaged on the bearing l , and passing through an eye l^7 , on the bar B^2 , and against which the end of said spring bears so that when the shaft is pushed upwardly and rearwardly by an obstruction, said spring acts immediately after the passage of the obstruction to draw the shaft downwardly into its most effective operative position.

The operation is as follows: The machine being perfectly balanced upon the axles, the necessity of carrying a portion of the weight upon the horse or draft animal is avoided, and by means of a lever F and spring f^3 , the pressure of the revolving brush H' upon the surface to be swept is easily graduated. The bottom of the receptacle is of course, closed and has a door A^3 , hinged at the top

of the receptacle and the machine is adjusted, as shown in full lines in Fig. 2, to exert the desired pressure upon the brush. As the machine is drawn forwardly the pawls k^4 , shown in Figs. 8 and 9, engage and revolve the ratchet wheel on the shaft K, rotating said shaft and of necessity the brush, the bottom of said brush rotating forwardly and upwardly. Inasmuch as the drive of said brush is from the relatively large gear k , to the smaller gear k' , on the same shaft with the larger sprocket wheel k^3 , which in turn drives to a smaller sprocket wheel k^2 , on the shaft H, the brush rotates at a relatively high rate of speed, and in consequence the dirt and refuse is thrown forwardly and upwardly, as shown in full lines in Fig. 3, and into the elevator casing and upon the rearwardly and approximately horizontally extended portion of the bottom of the elevator casing.

The shaft K, drives the elevator brushes to sweep upwardly and inwardly along the bottom so that said brushes engage the dirt thrown upwardly by the brush H' , and carry it upwardly along the inclined bottom A^2 , and deliver it into the receptacle. This operation will continue until the receptacle is full or a sufficient quantity is contained therein to warrant dumping. When this occurs the operator, who sits upon a suitable seat supported on the thills and which is shown in Fig. 2, engages the lever g^4 , throwing the same rearwardly, as shown in dotted lines in Fig. 3, thereby immediately dropping the doors $G-G'$, and depositing the contents of the receptacle. The lever E is then actuated to oscillate the casing on its wheels thereby elevating the hood and rotative brush to clear the dirt emptied from the receptacle after which the hood and brush are returned to sweeping position by a return movement of the lever. This operation may be repeated indefinitely thus accumulating all the refuse material from the roadway, or street at convenient points from which it may then be taken up by wagons and removed. As shown, a depending apron M of canvas or any suitable material is secured on the bottom of the hood, on all four sides, and confines the dirt disturbed to the width of the machine and prevents all dust escaping.

Obviously the machines may be made of any suitable size dependent upon the tractive force to be applied. The length of the brush, the pressure at which applied and of course, the width of the machine is in part dependent upon whether one or more horses are to be used for propelling the machine. Of course, the machine may, if desired, be propelled manually and details of construction may be varied without departing from the principles of this invention.

I claim as my invention:

1. A sweeping machine, embracing a hous-

ing pivotally supported intermediate its length, a rotative brush inclosed thereby, an elevator in the housing for the dirt swept up by the rotative brush, and yielding means
5 for adjusting the housing on its pivot to vary the pressure of the rotative brush on the surface swept.

2. A sweeping machine, embodying a pivotally supported housing, a rotative brush
10 inclosed thereby, an elevator in the housing for the dirt swept up by the brush, means for adjusting the housing on its pivot to vary the pressure of the rotative brush on the surface swept, and independent means for
15 swinging said housing and brush on said pivot to raise said brush from contact with the surface.

3. A machine of the class described, embracing a receptacle, a rear hood, and an inclined elevator casing all rigidly connected,
20 means pivotally supporting all of said parts in operative position, a shaft journaled adjacent to said receptacle, spring connections between said shaft and the receptacle, hood
25 and elevator casing, and a lever for actuating said shaft thereby varying the tension of the springs to adjust the receptacle, hood and elevator casing upon its pivot.

4. A machine of the class described, embracing a receptacle and a rear hood, an elevator casing rigidly connecting the two,
30 wheels on which the same are carried, shafts at the bottom and top of the elevator casing, endless chains movable around said shafts, transverse brushes thereon sweeping the bottom of the elevator casing, a rotative brush
35 in the hood to throw the material collected upwardly and forwardly into the elevator casing, means for operating the shafts and brushes from the wheels, means for oscillating the elevator casing to raise and lower the
40 hood, and means for varying the tension of the oscillating casing.

5. In a street sweeping machine, the combination with the carrying wheels and axles,
45 of a rotary brush, an elevator, means for actuating both the brush and elevator from said carrying wheels, a housing inclosing said brush and elevator, a lever connected
50 with said housing adapted to oscillate said housing to raise and lower said rotary brush, and means yieldingly holding said brush in any position.

6. In a street sweeping machine, the combination with supporting axles, of a rigid
55 housing comprising a hood, an elevator casing and a dirt receptacle pivotally supported on the axles and affording a balanced structure, carrying wheels journaled on said axles, a rotary brush in said hood, an elevator for
60 delivering dirt to the receptacle, a shaft journaled transversely of but outside of the housing, means affording connection between the shaft and housing, a lever secured to the
65 shaft for actuating the same thereby swing-

ing the housing on the axles to raise or lower the rotary brush into operative relation with the surface swept, and yielding means for varying the pressure of the rotary brush upon the surface swept. 70

7. In a sweeper, the combination with the supporting wheels, of axles secured therein, a housing secured thereto comprising a hood and elevator casing extending on one side thereof and a counterbalancing receptacle
75 extending on the opposite side of the axles, all of said parts being rigidly united, a rotative brush in the hood adapted to throw the dirt into the elevator casing, endless rotating chains, brushes thereon moving the
80 dirt thrown into the elevator casing to the receptacle, means engaged to the rotative brush adapting the same for vertical adjustment independent of the hood, guides for said means, and means for elevating the hood
85 and rotative brush.

8. In a street sweeping machine, a housing comprising a hood, elevator casing and receptacle, wheels pivotally supporting the housing, a rotative brush in the hood automatically adjustable to sweep uneven surfaces,
90 mechanism for varying the pressure of the rotative brush on the surface swept, mechanism for swinging the housing on the wheels to depress the receptacle and elevate the hood and rotary brush, a shaft journaled
95 at each end of the elevator casing, chains operated by the shafts, and brushes secured to the chains.

9. In a device of the class described, the combination with supporting wheels, of a housing pivoted thereon affording a receptacle, elevator casing and hood, resilient means holding the housing in operative position on
100 said pivot, means for varying the tension of the resilient means for adjusting the housing on said pivot, a bar pivoted at each side of the elevator-casing, a shaft extending through the hood and engaged at its ends to
110 said bars whereby each end is independently and automatically adjustable in a vertical plane and without actuating the hood, a brush on said shaft, a shaft journaled in each end of the elevator, and an endless conveyor carried thereby. 115

10. In a device of the class described, the combination with supporting wheels, of a housing affording a hood, elevator casing and receptacle, of brushes adapted to sweep the bottom of said elevator casing, a rotative brush adapted to throw material upon the elevator casing, means affording an independent automatic adjustment for each end of the rotative brush, means adapted by
120 actuation thereof to swing said housing on said wheels to throw said rotative brush into and out of operative position, and variable tension means adapted to yieldingly secure the housing on said supporting wheels in any adjustment. 125 130

11. In a sweeping machine, the combination with a pivotally supported housing comprising a hood and elevator casing extending on one side of the pivot and a counterbalancing receptacle extending on the opposite side of the pivot, a rotative brush in the hood adapted to throw the material into the elevator casing, means conveying the material thus thrown into the casing into the receptacle, means connected to the receptacle for yieldingly supporting the hood, casing and receptacle upon said pivot, and means swinging the housing on its pivot to elevate the hood and brush.

12. In a device of the class described, the combination with supporting wheels, of a metallic housing pivoted thereon affording a hood and receptacle and an inclined elevator casing connecting the same, said receptacle acting as a counterbalance for the hood and capable of being dumped, a rotative brush journaled in the hood, an oscillatable bar supporting each end of said brush adapted to permit independent movement of either end of the brush to sweep unequal surfaces, a guide for the free end of each bar, means operated from the driver's seat for actuating the housing on its pivot to vary the pressure of the brush on the surface swept, and an elevator for elevating the material swept into the conveyer casing into the receptacle.

13. In a sweeping machine, the combination with a hood and elevator casing, of means supporting the same, a receptacle integral therewith acting as a counterbalance therefor, a rotative brush journaled in the hood, means affording an independent and simultaneous adjustment for each end of the brush for sweeping uneven surfaces, means elevating the material as picked up by the brush to the receptacle, and means yieldingly controlling the position of the elevator casing and hood and varying the pressure of the rotating brush on the surface swept.

14. In a device of the class described, the combination with an elevator casing, of axles rigidly secured thereto, supporting wheels therefor, a hood integral with the casing on one side of the axle, a substantially counterbalancing receptacle integral with the opposite end of the casing on the opposite side of the axle and capable of being dumped, a horizontal shelf integral with the casing, a

rotative brush in the hood adapted to deliver the material upon said shelf, means for delivering the material therefrom to the receptacle, means for tilting the casing for varying the pressure of the rotative brush against the surface swept, and means for raising the hood and brush as the receptacle is dumped to prevent scattering the material.

15. In a device of the class described, the combination with a pivotally supported housing affording a hood, elevator floor and receptacle, a brush in the hood adapted to deliver material upon the elevator floor, means adjustably supporting said brush therein, brushes sweeping the elevator floor upwardly toward the receptacle, means connecting and supporting the elevator brushes, a brace bar rigidly secured to the top of the casing, a lever operatively connected therewith to move the brush into or out of contact with the surface swept, and means pivotally supporting the lever.

16. In a device of the class described, the combination with a housing comprising a hood, receptacle and elevator casing, of means pivotally supporting the same to afford a balanced structure, a rotatable brush journaled in the hood, automatically adjustable to sweep uneven surfaces, a horizontal shelf upon which the material is deposited, conveyer brushes sweeping the material therefrom into the receptacle, means connecting and advancing the conveyer brushes, a lever for moving the housing to elevate the brush, a second lever, resilient connections between said second lever and the housing for varying the pressure of the brush upon the surface swept, and a frame for supporting the levers.

17. In a sweeping machine, the combination with a rotative brush, means supporting the ends thereof adapting each end to independently and automatically descend to sweep hollow and uneven surfaces, a conveyer adapted to receive the dirt from the brush, and means for yieldingly varying the pressure of the brush on the surface swept.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

PIERRE HAERST.

Witnesses:

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K. E. HANNAH.