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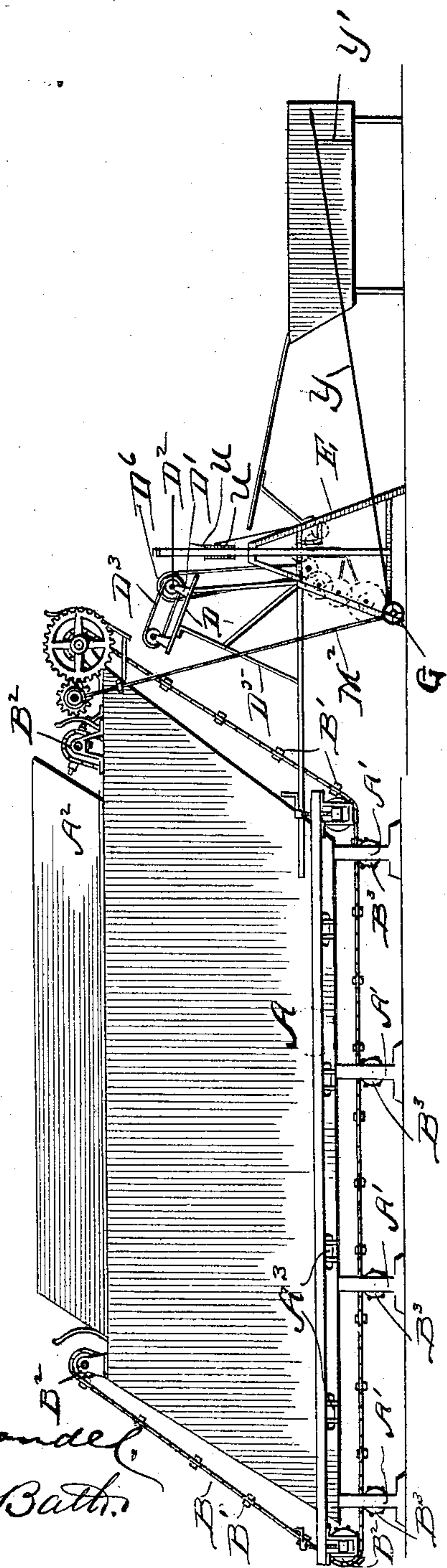
PATENTED SEPT. 8, 1908.

A. S. OTTO.
BOTTLE WASHING MACHINE.

APPLICATION FILED JAN. 24, 1905.

7 SHEETS--SHEET 1.

Fig. 1.



Witnesses
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Fig. 10.

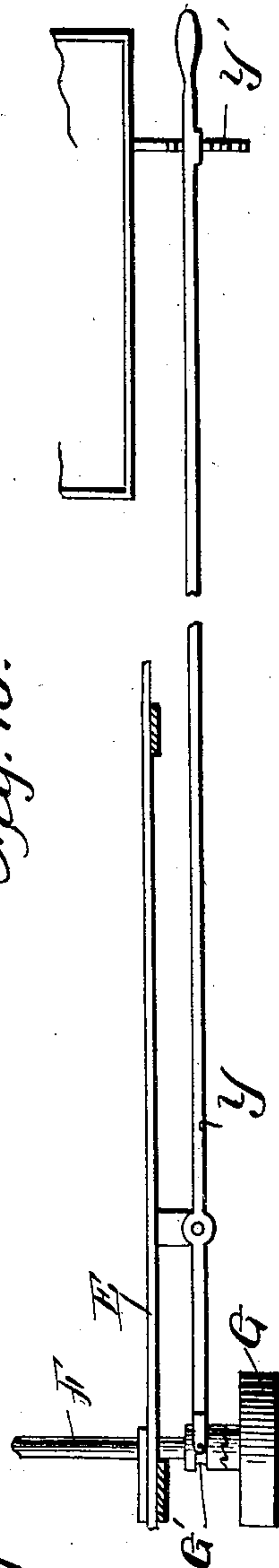
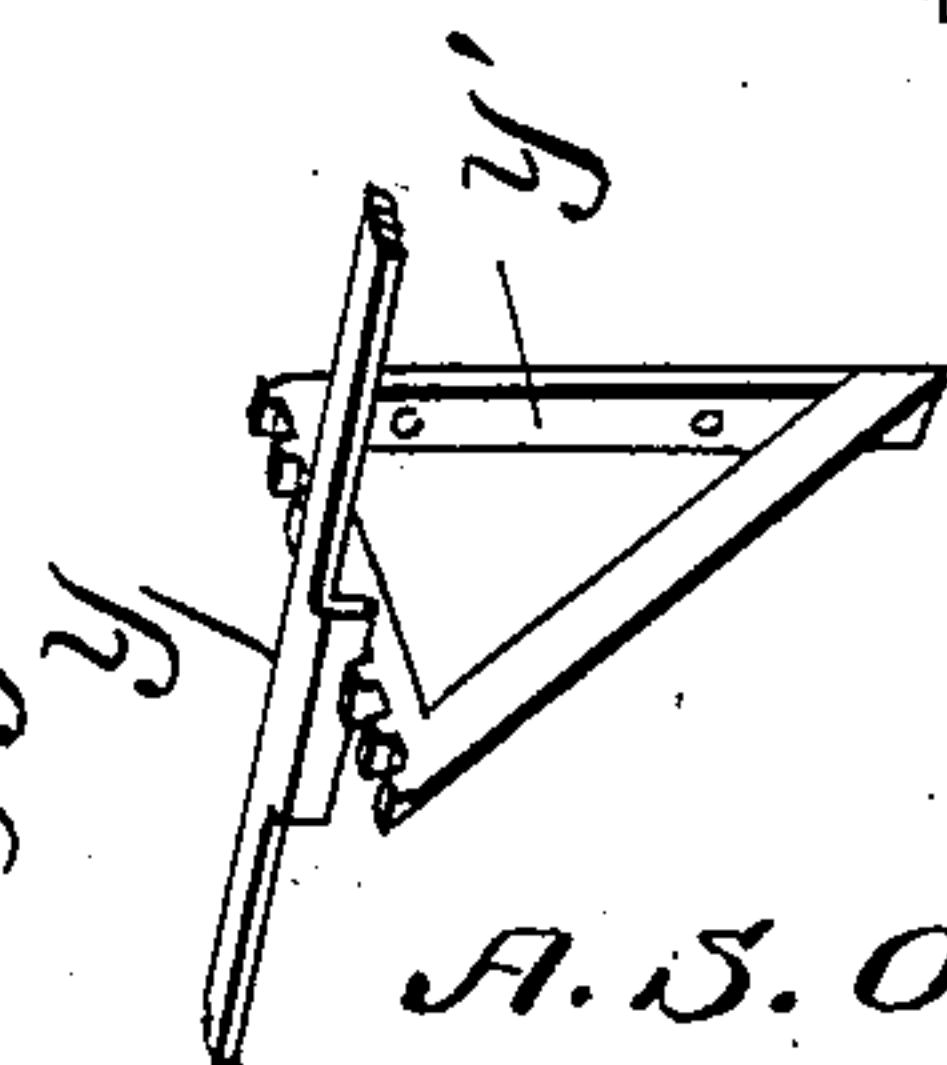


Fig. 9.



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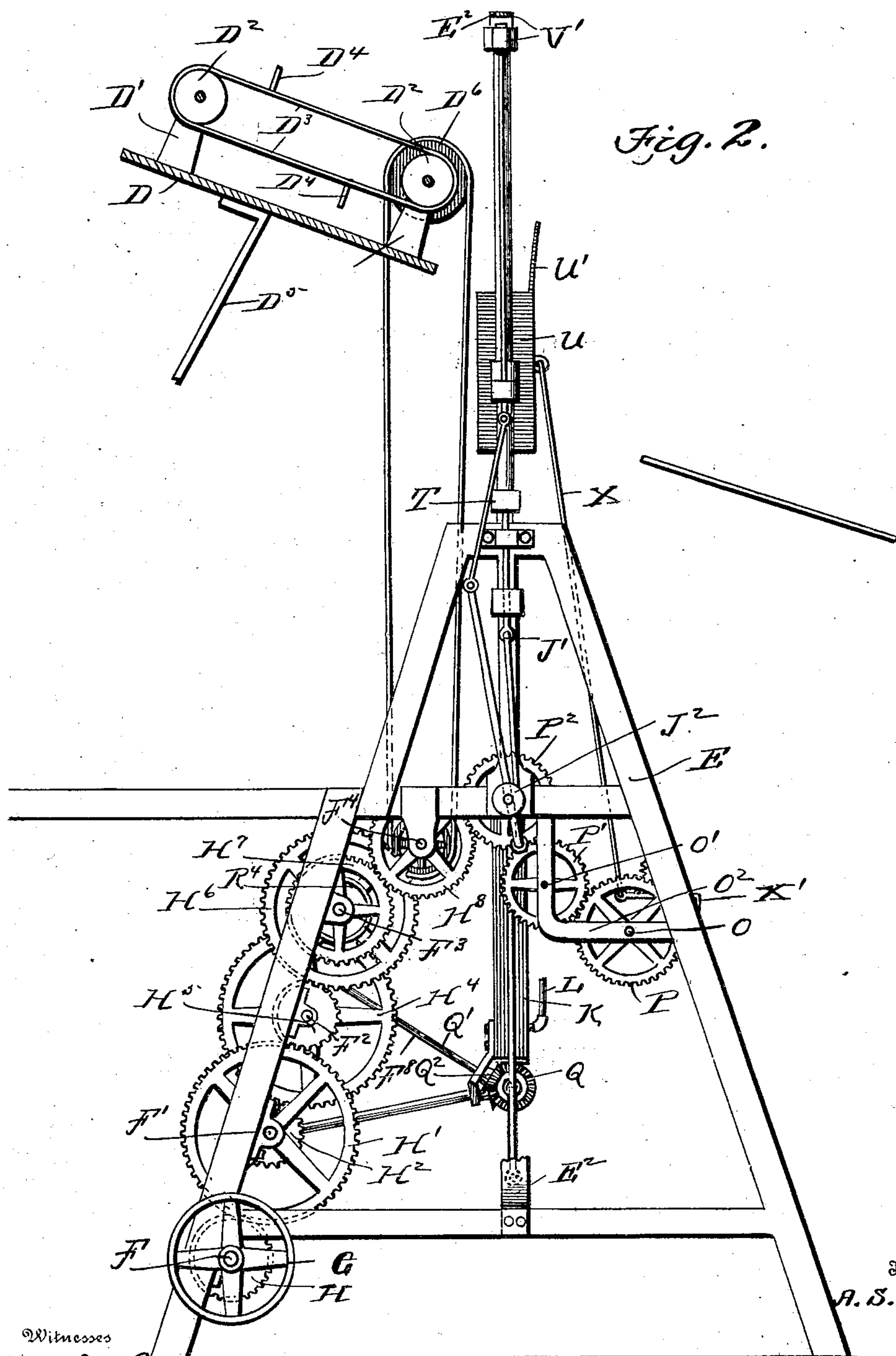
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7 SHEETS—SHEET 2.



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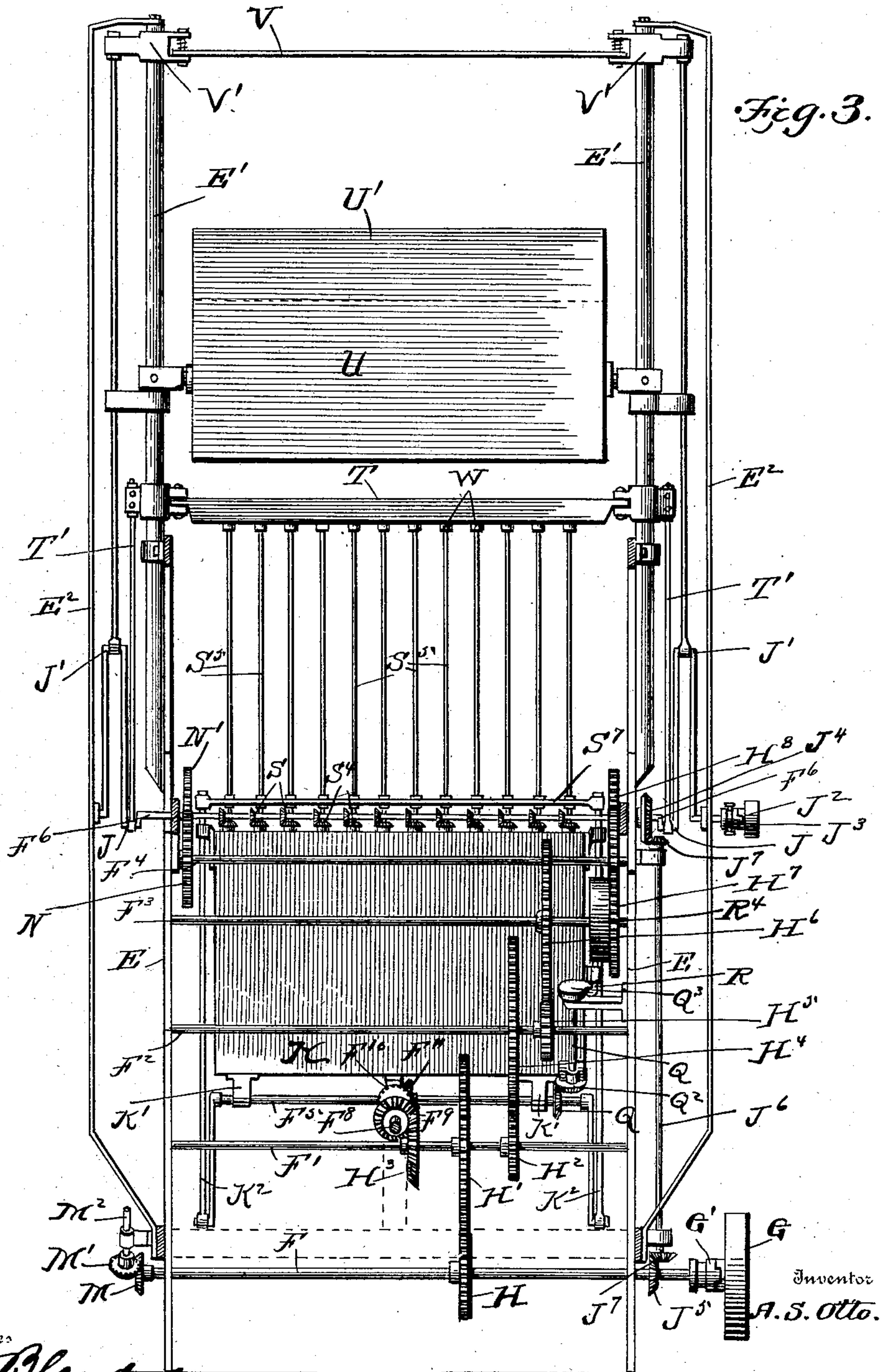
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7 SHEETS—SHEET 3.



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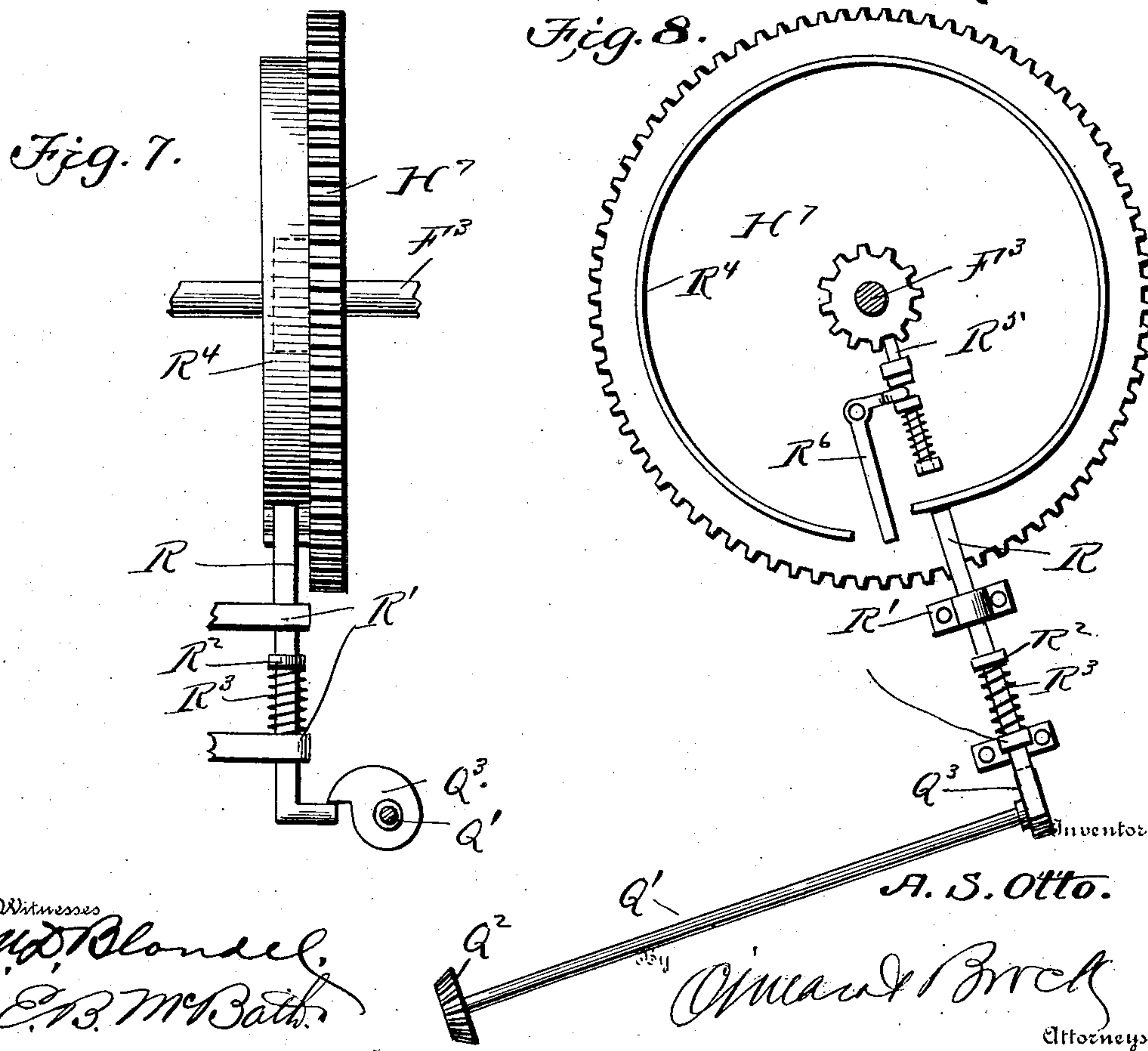
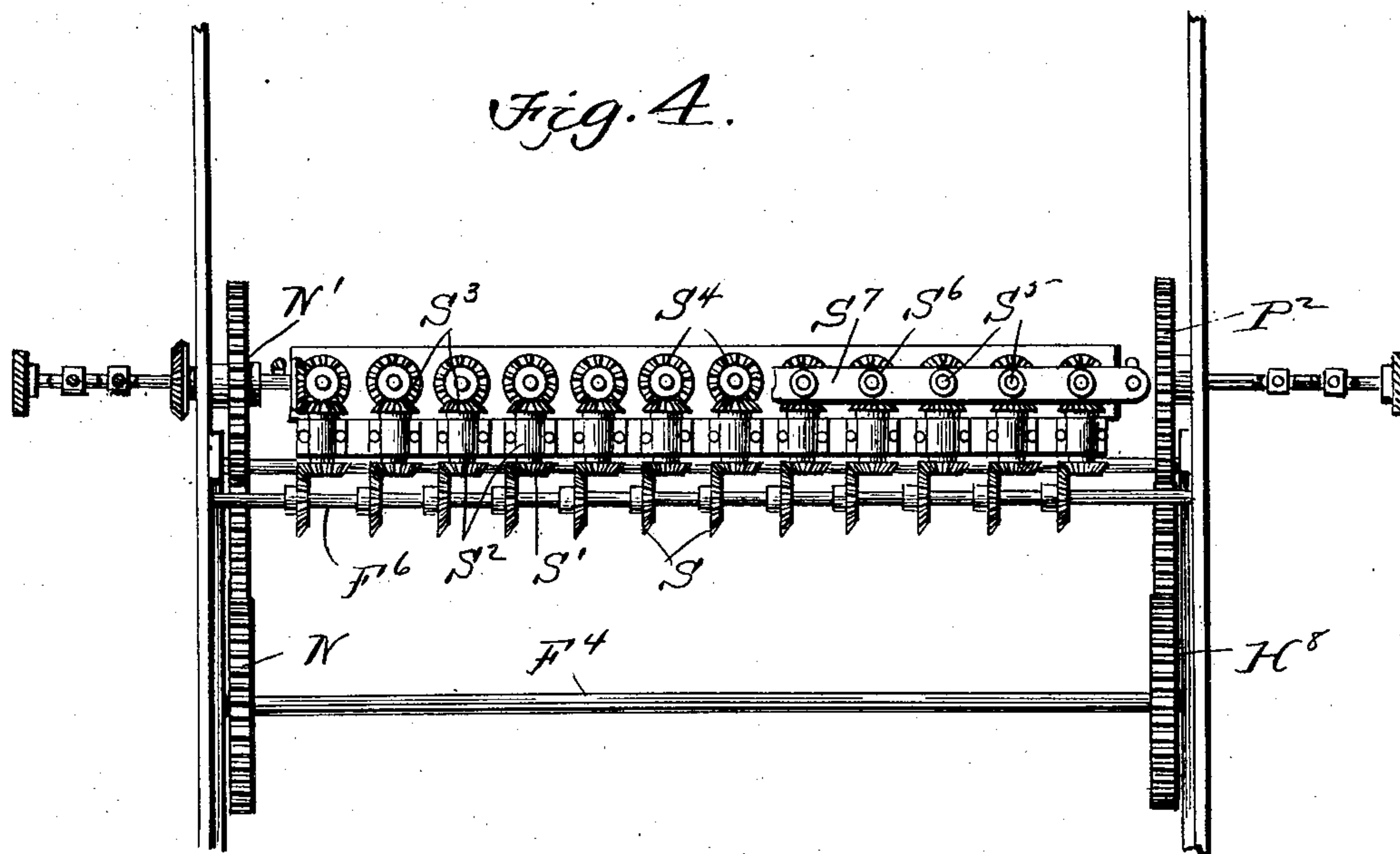
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7 SHEETS—SHEET 4.



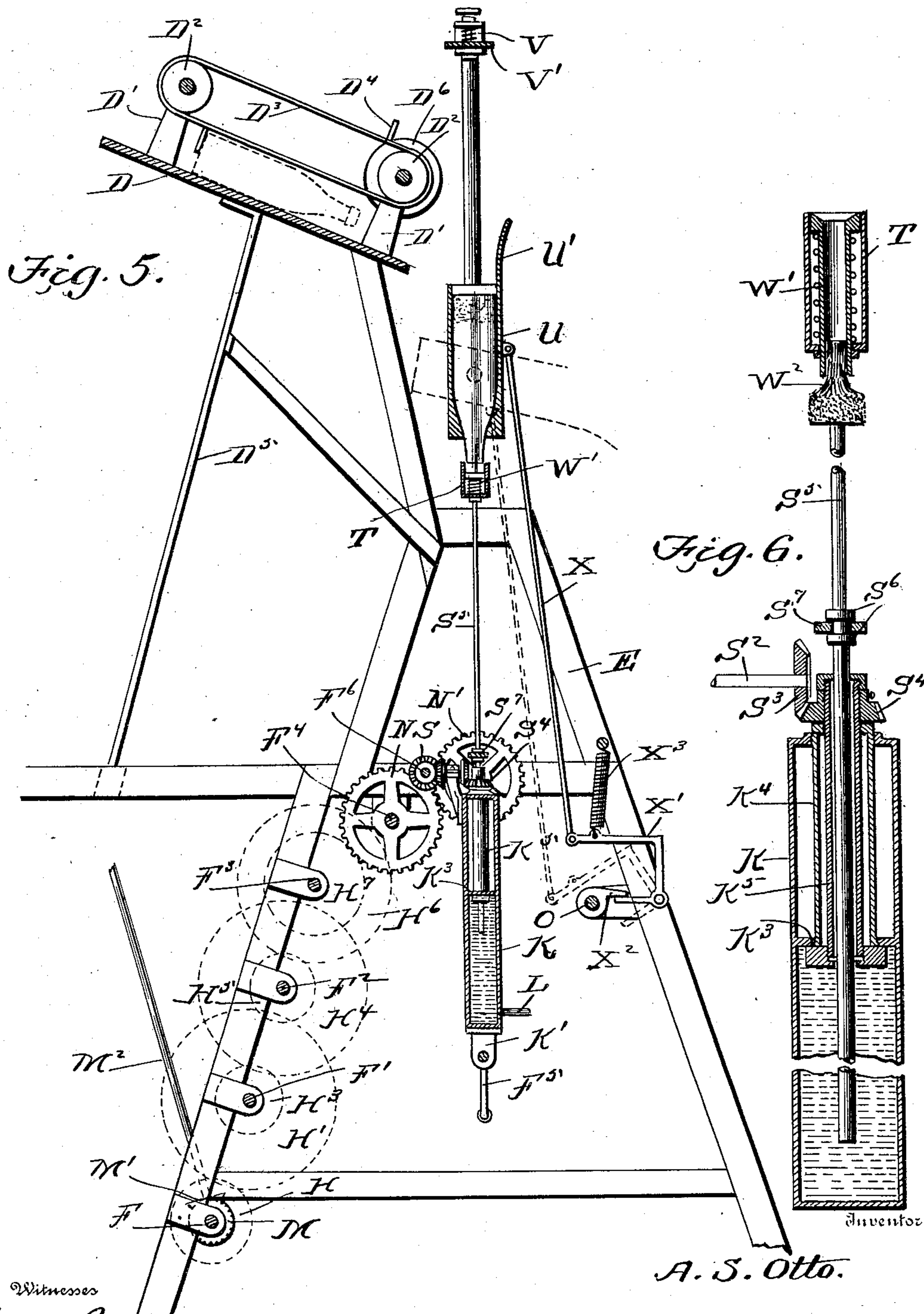
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7 SHEETS—SHEET 5.



Witnesses
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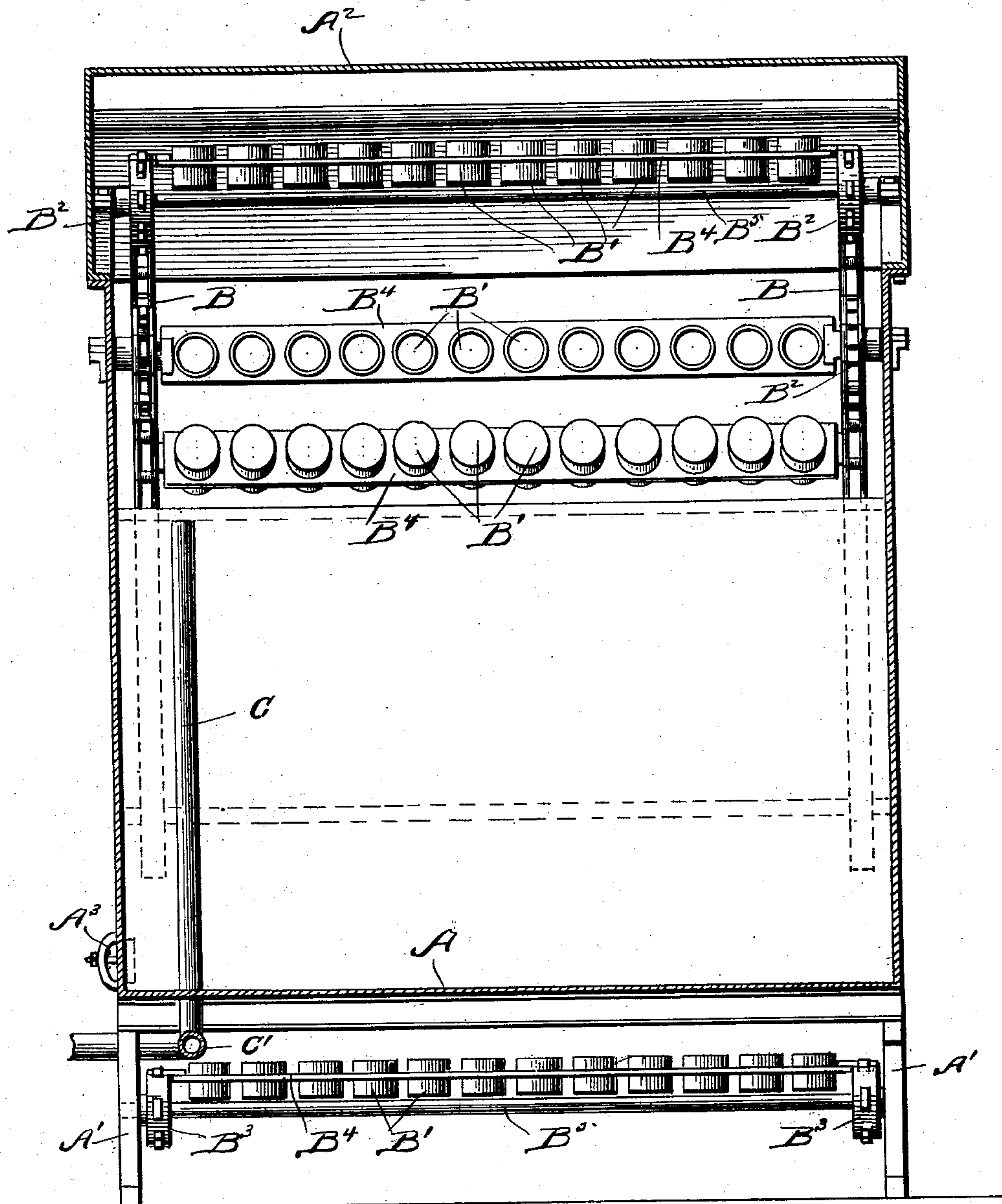
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APPLICATION FILED JAN. 24, 1905.

7 SHEETS—SHEET 7.

Fig. 12.



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UNITED STATES PATENT OFFICE.

ALEXANDER S. OTTO, OF ST. LOUIS, MISSOURI.

BOTTLE-WASHING MACHINE.

No. 897,998.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed January 24, 1905. Serial No. 242,474.

To all whom it may concern:

Be it known that I, ALEXANDER S. OTTO, a citizen of the United States, residing in St. Louis, and in the State of Missouri, have invented a new and useful Improvement in Bottle-Washing Machines, of which the following is a specification.

This invention relates to a device for washing and cleaning bottles, the object of the device being to clean a large number of bottles in a short space of time and at a low cost, which object is accomplished by making the machine as nearly automatic as possible, and providing it with means for handling a number of bottles simultaneously.

With this object in view the invention consists in the novel features of construction and combination of parts hereinafter described, particularly pointed out in the claims and shown in the accompanying drawings, in which:—

Figure 1 is a side elevation of the device. Fig. 2 is an enlarged side elevation of the bottle brushing means, parts being in section. Fig. 3 is an end elevation of the parts shown in Fig. 2, parts being shown in section, and parts being removed to more clearly show the gearing. Fig. 4 is a detail view, partly in section and partly broken away, showing in plan gearing shown in elevation in Fig. 3. Fig. 5 is a detail side elevation, parts being removed and a portion of the gearing being shown in dotted lines, of the bottle brushing mechanism, a bottle being shown in position. Fig. 6 is a detail section view of the bottle brushing means. Fig. 7 is a detail view of a cam locking and tripping mechanism, the cam lock and gear wheel being shown edge on. Fig. 8 is a face elevation of the gear wheel and cam shown in Fig. 7. Fig. 9 is a detail view of the outer end of a clutch lever and the rack bar for holding the lever. Fig. 10 is a plan view of the clutch mechanism and lever. Fig. 11 is a vertical longitudinal section through the washing tank. Fig. 12 is a vertical section on the line 12—12 of Fig. 11.

In these drawings A represents a casing having the legs or supports A', and provided with a supplemental upper section or top A². The casing A is divided into four compartments, *a*, *b*, *c*, and *d*, by means of vertically inclined partitions A⁴ which terminate short of the top of the casing. Each compartment is provided with a hand hold A³, and the compartments are further subdivided by

partitions A⁵ and A⁶, parallel to the partitions A⁴ and which extend upwardly into the top A². The partitions A⁵ terminate intermediate the upper and lower edges of the partitions A⁴, and the partitions A⁶ terminate at their lower edges considerably above the upper edges of the partition A⁴. Endless conveyer chains B, parallel to each other run through the casing A in one direction and back under the casing in the opposite direction, passing through the compartments and over or under the various partitions. These chains carry bottle holders B' and run over sprocket wheels B² arranged at the ends of the casing and also carried by shafts B⁵ arranged transversely within the casing. Guide sprocket wheels B³ are carried by shafts B⁶ under the casing A and serve to support the chains and bottle holders on their return to the front of the casing. The bottle holders B' are cylindrical in form, but may be of any desired size and shape. They are carried by a strip B⁴ extending from one chain B to the other, each strip having a plurality of holders B' carried thereby, in the drawings I have shown twelve holders to the strip. In each compartment of the casing A is arranged a drain pipe C the upper end of which is open and which terminates slightly below the plane of the upper edges of the partitions A⁴, so that none of the compartments will become filled to overflowing. The drain pipes C terminate at their lower ends in a common drain pipe C'.

In practice I fill the compartment *a* to the water line with luke warm water, the compartment *b* with hot water, the compartment *c* with boiling water and lye, and the compartment *d* with luke warm water. As the conveyer chains B travel over the sprockets B² and B³ the holders B' with the bottles, will be carried successively through each of the compartments, and each strip B⁴ with its holders B' and bottles will pass down under the partitions A⁵ and will then pass upwardly into the top portion A², after passing each partition A⁵, and will be given ample opportunity to drain before being again dipped into the water of a compartment.

Arranged adjacent the rear end of the casing A is an inclined platform D adapted to receive the bottles from the holders B' and on the incline are arranged brackets D' in which are journaled the ends of rollers D². An endless belt D³ travels over the rollers D³, and above the platform D, and carries cleats D⁴

which are adapted to engage the bottles as they fall upon the platform and deliver them to the bottle holder in the bushing device, which will be hereafter described. The platform D is supported by a suitable bracket D⁵.

The mechanism for receiving the bottles from the platform D and brushing them is carried by a frame work E which comprises parallel tubular standards E' and also vertical, parallel bars E² connected at their lower ends to the frame work E and at their upper ends to the tops of the standards E'.

In the frame work E, and parallel with each other and transversely with respect to the frame E, are journaled shafts F, F', F², F⁴ and F⁶, arranged in an ascending step like series in the order named. The shaft F projects upon each side of the frame E and at one end carries a pulley G and clutch G'. A gear wheel H carried by the shaft F meshes with a gear wheel H' carried by the shaft F', and a pinion H² carried by the shaft F' meshes with the gear wheel H⁴ carried by the shaft F². A pinion H⁵ carried on the last mentioned shaft meshes with a gear wheel H⁶ carried by the shaft F³, and a gear wheel H⁷, which will be described in detail hereinafter meshes with a gear wheel H⁸ carried by the uppermost shaft F⁶, which also extends upon each side of the frame E, and is double cranked adjacent each end as shown at J and J', the end portion of the shaft F⁶, being journaled in the bars E², and the shaft is equipped at one end with a pulley J², and clutch J³. The shaft F⁶ also carries a bevel gear wheel J⁴ and the shaft H carries a bevel gear wheel J⁵. A vertical shaft J⁶ carries at each end bevel pinions J⁷ which mesh respectively bevel gears J⁴ and J⁵. Within the frame E is arranged a fluid containing tank K having at its lower ends brackets K' in which are journaled a crank shaft F⁵, the ends of the shaft being pivotally connected to rods K² which work through guide brackets K³ carried by the tank K. A suitable feed pipe L leads to the tank.

On the shaft F opposite the pulley G is arranged a bevel pinion M and a pinion M' meshes with the same, and is carried by a shaft M², which shaft extends to gearing, to be hereafter described, mounted on the casing A. The shaft F⁴ carries also a gear wheel N which meshes with a gear wheel N' carried by the shaft F⁶. On the side of the tank K opposite the shafts F, F' etc. are shafts O and O' journaled in supplemental brackets O², and carrying a gear train comprising the gears P and P', the latter meshing with an idler P² which meshes with the gear wheel H⁸. The shaft F⁶ carries also a bevel pinion Q and held in suitable brackets is a stub shaft Q' which carries a bevel gear wheel or pinion Q² meshing with the pinion Q. The opposite end of the shaft Q' carries a cam Q³ which has a cam point or nose Q⁴

adapted to engage an angled bar R. The bar R is adapted to slide in guide brackets R', and is provided with a collar R² and a spring R³ adapted to hold the bar in engagement, normally with a cam carried by the gear wheel H⁷. This cam, R⁴, shown in detail in Figs. 7 and 8, is in the form of a split ring, one end being bent inwardly and offset with respect to the opposite end. Within the cam and arranged on the shaft F³ is a fixed pinion engaged normally by a locking bolt R⁵ held in place by a spring pressed bell-crank lever R⁶ whose outer end extends outwardly between the ends of the cam ring R⁴.

On the cranked shaft F⁶ is arranged a plurality of bevel pinions S meshing with pinions S' carried by stub shafts S² which at their opposite ends carry pinions S³, meshing with bevel pinions S⁴. These latter rotate vertically arranged rods S⁵ which support at their upper ends a vertically movable box or tray T which slides on the rods or standards E', and is actuated by the pitmen T' connected to the crank portions J of the shaft F⁶. Also supported by the standards E' is a bottle holding receptacle U and one side U' of the receptacle extends above the opposite side and is curved slightly outwardly. A bar V is adjustably held in brackets V' adapted to slide on the standards E', the said brackets being connected by suitable connecting rods V² to the cranked portion J' of the shaft F⁶.

Referring to the details of construction of these parts it will be noted that the receptacle or tank K is divided by a partition K³ into an upper and lower portion, the lower portion containing the liquid. In the upper portion are arranged a plurality of cylinders K⁴ connecting with the top of the tank and communicating with the lower portion. A sleeve K⁵ extends through each cylinder and the tubular rods S⁵ extend through the sleeves K⁵ and downwardly into the liquid. Each of the tubular rods, or pipes S⁵ have collars S⁶ arranged on them and a cross piece S⁷ is supported by the pipes and held in place by the collars, the ends of the cross piece S⁷ being connected to the upper ends of the reciprocating rods K². The pipes S⁵ carry at their upper ends the box or tray in which are arranged movable, spring pressed sleeves W' arranged at their upper ends to receive the mouth of the bottle to be cleaned, a suitable brush W² carried by the pipes or tubular rods extending upwardly into the sleeves W' and being adapted to be projected upwardly into the bottles being cleaned. The receptacle U is reciprocated by a lever X connected to a bell crank X' engaged by a cam X² carried on the shaft O, being returned to its normal position by means of a coil spring X³. The shaft F⁵ is rotated by means of a gear train comprising a stub shaft F⁸ and bevel gears F⁹, F¹⁰, and F¹¹, the first meshing with

the bevel gear H^3 and the latter being carried on the shaft F^5 and meshing with the bevel gear F^{10} . The shaft M^2 is driven by a gear train comprising the gears M^3 , M^4 and the pinion M^5 , all driven from the rearmost shaft B^5 . The clutch G' is operated by a lever Y , pivoted intermediate its ends and engaging a rack Y' . The bottles after being passed by the conveyer B through the washer are passed down the incline D and fed into the receptacle U and by means of the systems of gearing heretofore described the brushes W^2 are rotated and reciprocated in the bottles and water constantly fed thereto through the pipes S^5 . The brushes move at a regular speed moving upwardly and downwardly in about one half a minute. The bottles are held in place about twenty-five seconds and dumped during the remaining five seconds of the time occupied in the reciprocation of the brushes.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A device of the kind described comprising a bottle washing device, an endless conveyer adapted to convey the bottles from the said device, a pivoted receptacle adapted to receive the bottles in an inverted position,

said receptacle being upwardly and downwardly open, a tubular, rotatable pipe carrying a brush adapted to engage the mouth of the bottle while in the receptacle, means for rotating the pipe, means for supplying a liquid to the pipe, and means for dumping the pivoted receptacle.

2. A bottle washing machine comprising a receptacle adapted to receive and support a plurality of bottles in an inverted position, said receptacle being upwardly and downwardly open, a reciprocating tray arranged below the receptacle, a plurality of vertically movable pipes supporting said tray, sleeves carried by the tray and opening upwardly and downwardly through the tray, said sleeves alining with the pipes, brushes carried by the pipes and projecting into the sleeves, said sleeves being adapted to receive the necks of bottles held by the receptacle, means for forcing a stream of water through the pipes, means for reciprocating the tray and pipes, means for rotating the pipes, and means for manually dumping the receptacle.

ALEXANDER S. OTTO.

Witnesses:

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H. J. OTTO.