

E. C. PORTER.

ELEVATOR.

APPLICATION FILED JUNE 8, 1908.

930,224.

Patented Aug. 3, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

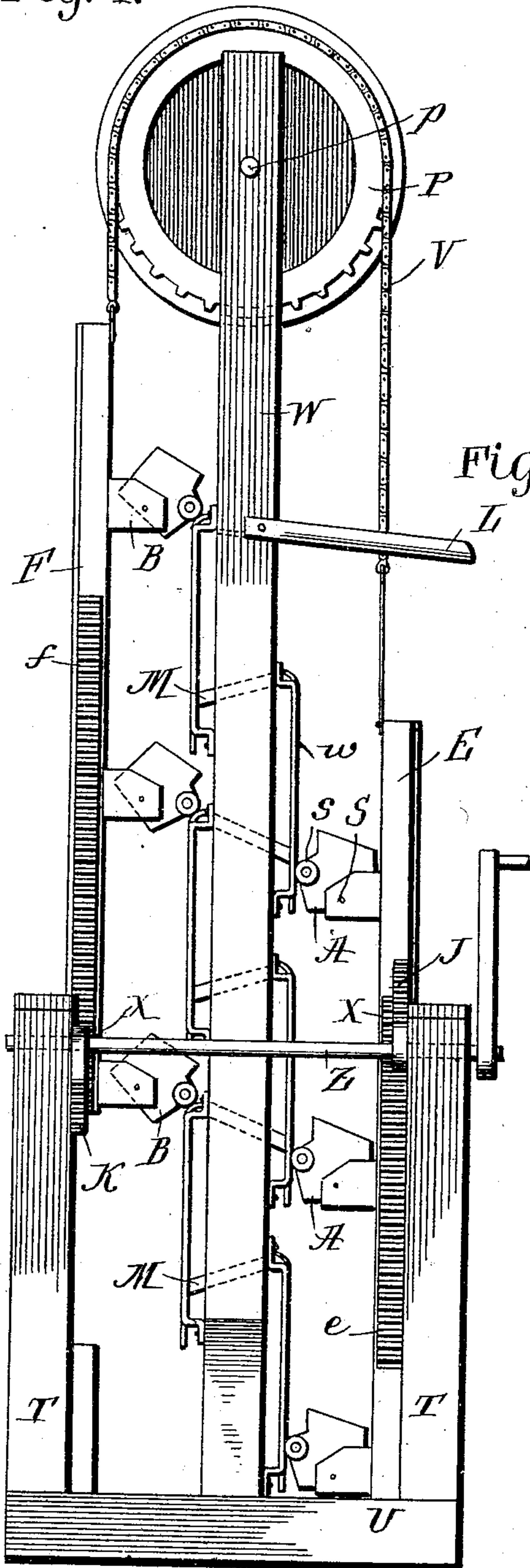
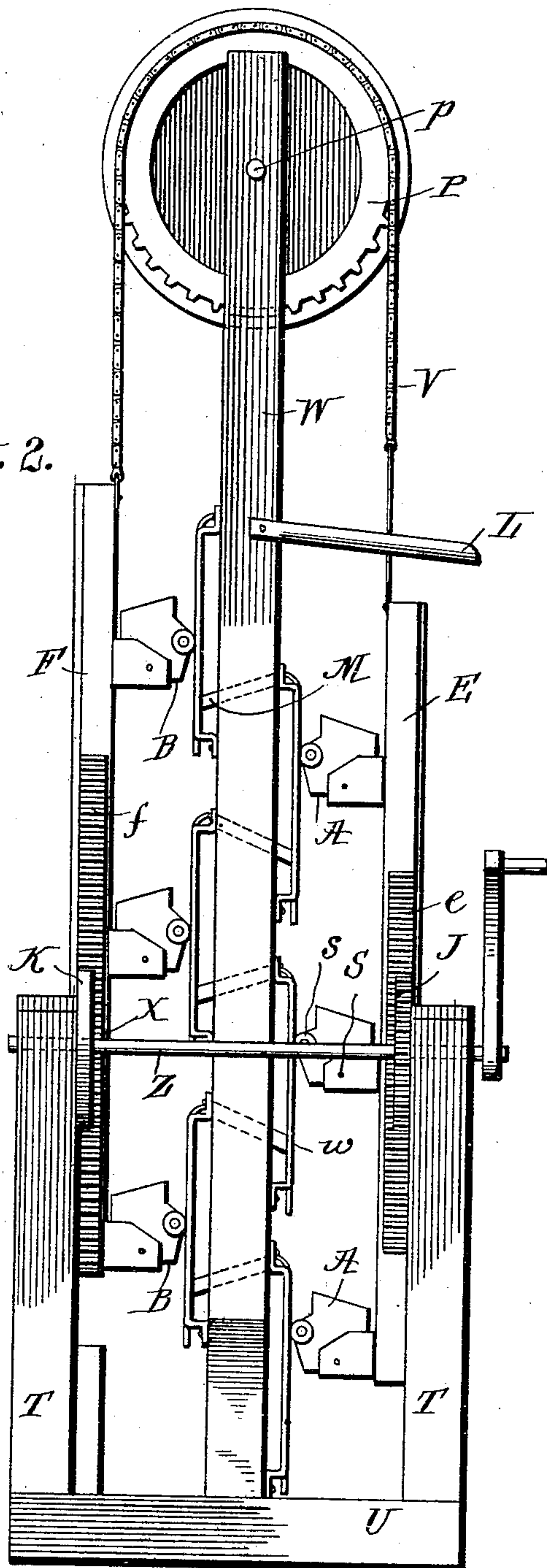


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

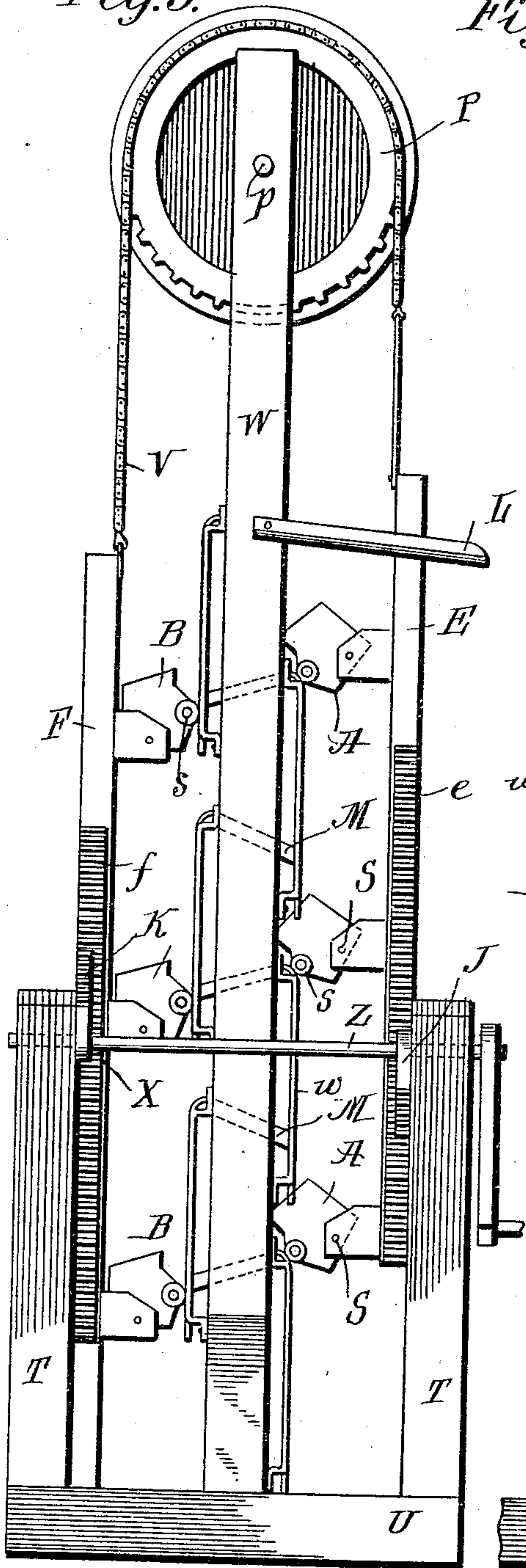
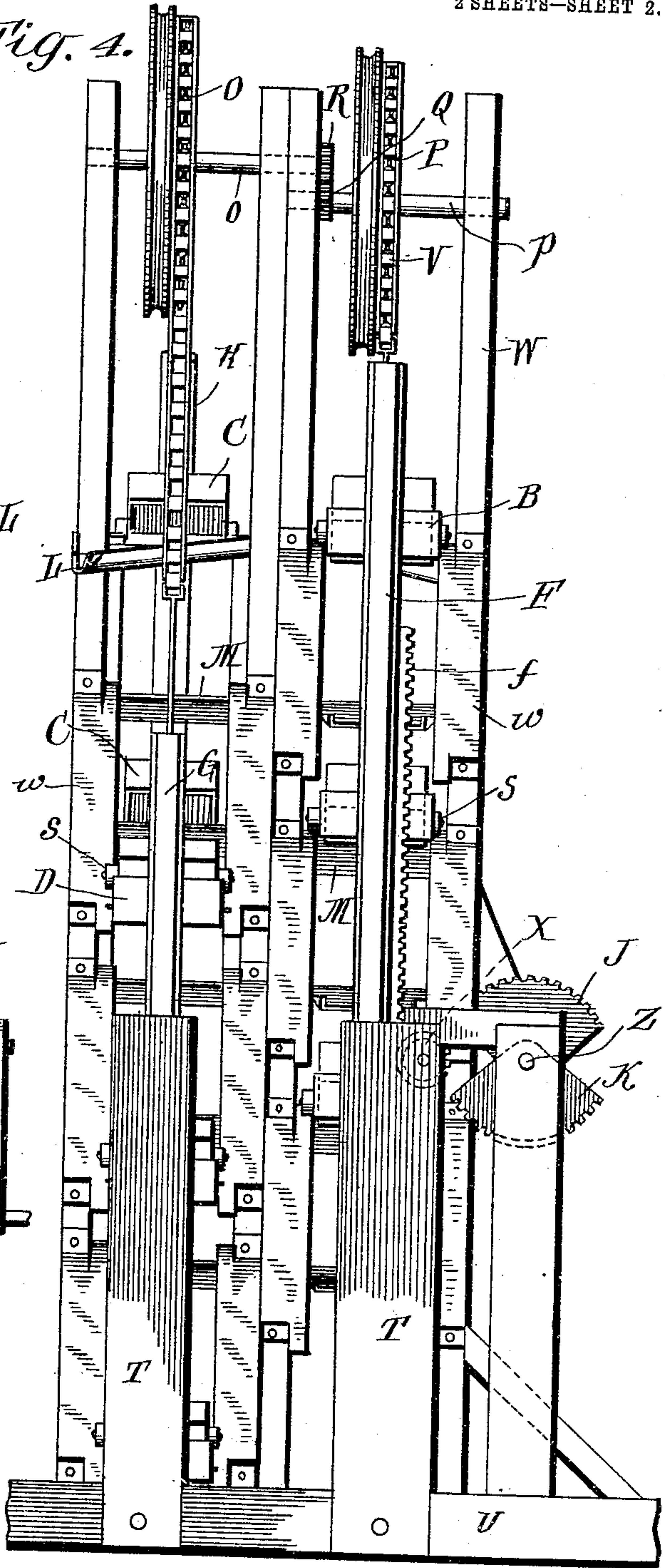


Fig. 4.



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UNITED STATES PATENT OFFICE

EDWARD CARPENTER PORTER, OF TELLURIDE, COLORADO.

ELEVATOR.

No. 930,224.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed June 8, 1908. Serial No. 437,386.

To all whom it may concern:

Be it known that I, EDWARD CARPENTER PORTER, a citizen of the United States, and resident of Telluride, in the county of San Miguel and State of Colorado, have invented an Improvement in Elevators, of which the following is a specification.

This invention is an elevator for water, slimes, grain and other fluid matter, and has for its object to provide an improved machine which will do a large amount of work with comparatively small power and which contains no valves or other parts apt to wear out or get out of order, and which is capable of use at any inclination from the vertical to the horizontal.

The machine comprises sets of pairs of buckets which work up and down and which transfer the material from one to the other and lift the same step by step to the top where it is discharged.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation with the buckets in one position. Fig. 2 is a similar view with the buckets on one side lifted part way. Fig. 3 is a similar view with the buckets on the same side at the top of the stroke. Fig. 4 is a side elevation at a right angle to the other figures.

The machine may be made any height desired and the length of stroke varied as desired. As shown, there are four sets of buckets A, B, C, and D, each set consisting of three buckets arranged one above the other and pivoted respectively on reciprocating rods E, F, G and H, which slide in guides T erected on a base U. The four sets of buckets are connected in pairs by chains V attached to the upper ends of the rods and running over sprocket wheels P and O on shafts *p* and *o* at the top of an upright frame W on the base. The respective buckets A and B form one set of pairs, and the buckets C and D form a second set, these sets being arranged beside each other in the frame. The buckets of each pair are alternately raised and lowered by means of racks *e* *f* on the corresponding rods, pinions X engaging the racks *e* and *f* and segmental gears J and K on crank shaft Z engaging the pinions. This operates the rods E and F. The rods G and H are operated by spur gears Q and R between the shafts *p* and *o*, the latter being driven by the former and thus raising and

lowering the sets of buckets C and D carried by said rods. The buckets D are pivoted to the rods as at S, so that they will dump if unsupported, but they are held in upright position by means of rollers *s* which run on guides *w* mounted on the frame W; but the buckets dump when they reach and run off the upper ends of the guides. Cross chutes M are arranged in and supported by the frame, in position to convey the material from the buckets on one side to the corresponding buckets of the pairs on the other side.

The following operation will now be understood: In Fig. 1, the lower bucket A is at the bottom in position for filling from the dump, with the segmental gear J about to engage its pinion. The buckets D, at the back, are in similar position. On turning the crank shaft the gear engages the pinion which engages the rack *e* and raises the rod E and its buckets A, to the position shown in Fig. 3. As rod E ascends, rod F, with buckets B, descends. When the buckets A reach the top of the stroke they dump as shown in Fig. 3, and discharge their loads into the opposite buckets B, over the chutes M. Gear J then disengages and gear K engages, and the buckets B rise and buckets A descend, and at the end of the stroke the buckets are again in the position shown in Fig. 1, with the top bucket B discharging into the overflow trough L and the lower buckets B discharging into the upper buckets A; and on repeated operations the matter is discharged back and forth from buckets on one side to those on the other and elevated at each stroke and finally discharged at the top. At the same time the rear sets of buckets C and D are performing the same cycle of operations, the sets B and C working in unison and sets A and D working together. Obviously the number of sets may be increased or decreased to vary the capacity, and the number of buckets in each set increased to increase the lift. The buckets and operating devices balance each other, so there is no power lost in lifting the same.

The driving or operating devices may be varied as desired, as by applying the power to the top shaft by alternating gearing.

The buckets are preferably partly covered to prevent splash when they dump.

The machine is capable of various modifications in its details within the scope of the

invention, and no limitation is implied by reason of the particular construction shown and described.

I claim:

5 1. The combination of a frame having guides, a pair of reciprocating rods in the frame, connected together to move in opposite directions, a series of buckets mounted on each of the rods and arranged one above
10 the other and supported in carrying position by the guides, the buckets being pivoted to dump on reaching the upper ends of the guides, and means to deliver material
15 dumped from the buckets of one series into the buckets of the other series.

2. The combination of a pair of reciprocating rods, a series of buckets carried by each of the rods, and arranged one above the other, means to cause a discharge of material
20 back and forth from buckets of one series to relatively lower buckets of the other, racks on the rods, a gearing meshing alternately with the racks for reciprocating the rods in opposite directions.

25 3. The combination of a pair of reciprocating rods, connected together to balance

each other and move in opposite directions, a series of buckets carried by each of the rods and arranged one above the other, means to
30 cause a discharge of material back and forth from the buckets of one series to the relatively lower buckets of the other, racks on the rods, a power shaft having opposite segmental gears thereon, and pinions engaging
35 the respective racks and engageable alternately by the said gears, to lift the rods alternately.

4. The combination of a frame having guides, a pair of reciprocating rods in the frame connected together to move in opposite di-
40 rections, a series of buckets mounted on each of the rods and supported in non-dumping position by the guides said guides being of lesser length than the length of travel of the
45 buckets, and chutes for delivering the material dumped from one series into the buckets of the other series.

EDWARD CARPENTER PORTER.

Witnesses:

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