

F. RENDER.
CARTRIDGE LOADING MACHINE.

(Application filed Aug. 8, 1898.)

(No Model.)

6 Sheets—Sheet 1.

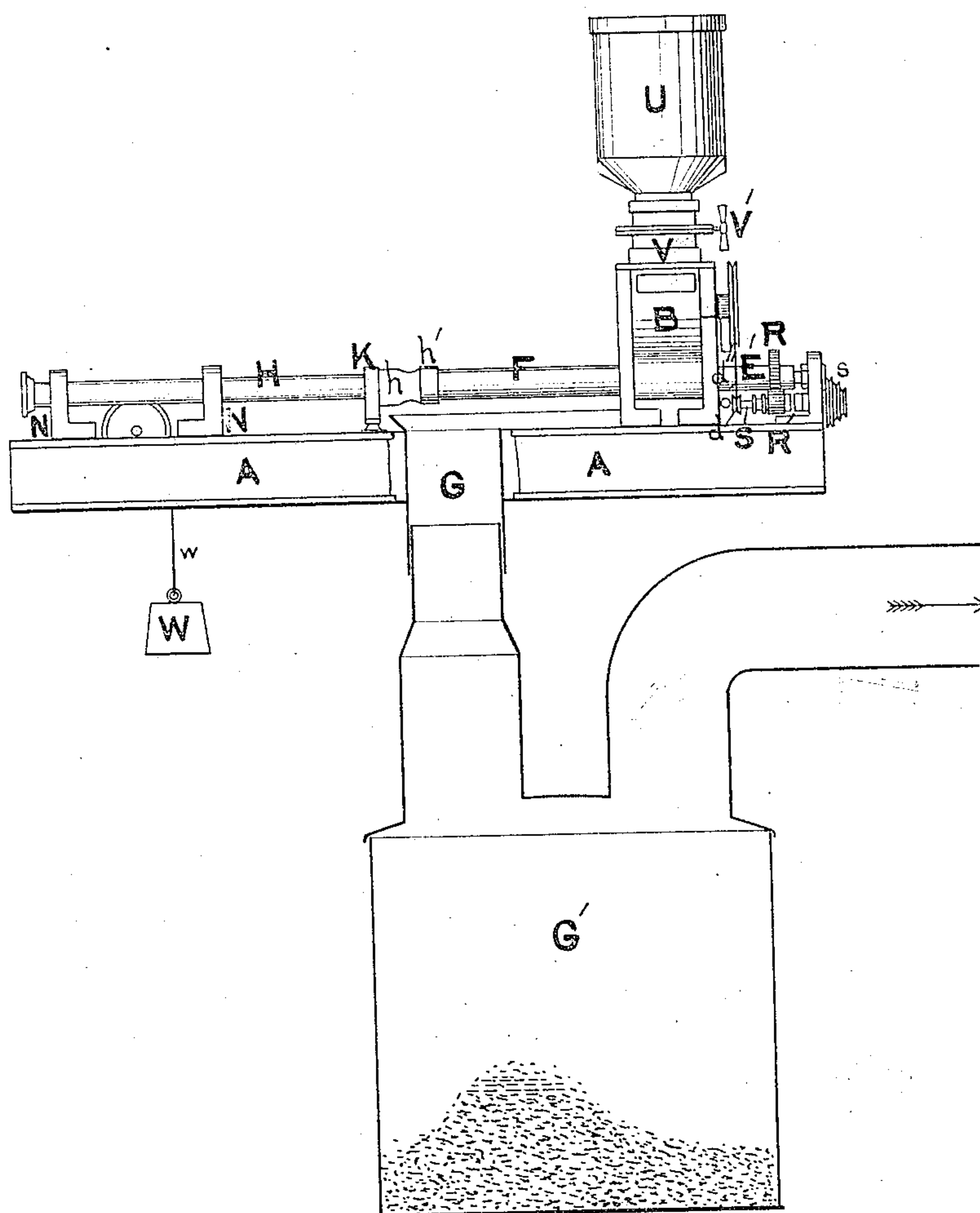


FIG. 1.

WITNESSES.

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INVENTOR

F. Render
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No. 622,711.

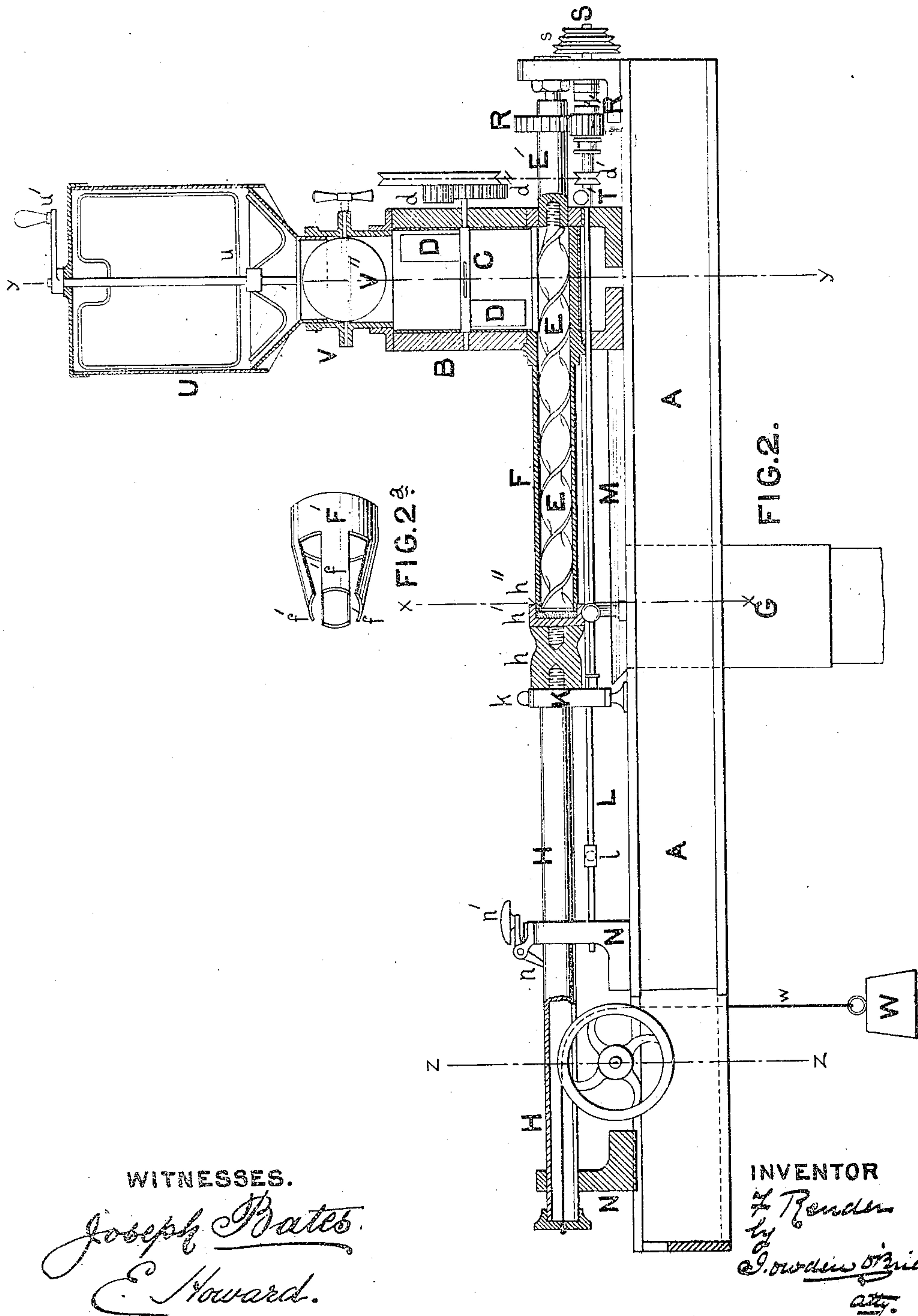
Patented Apr. 11, 1899.

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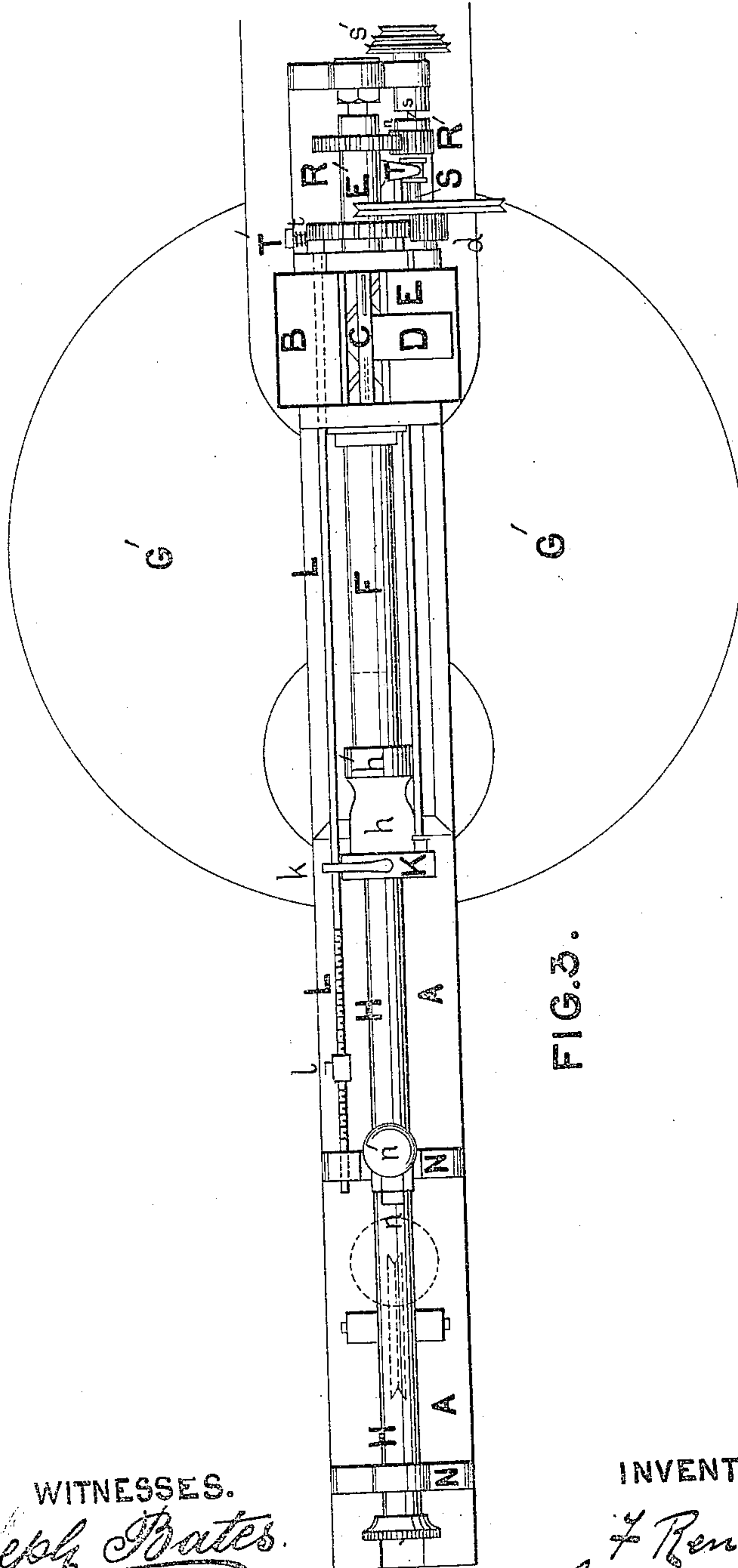


FIG. 3.

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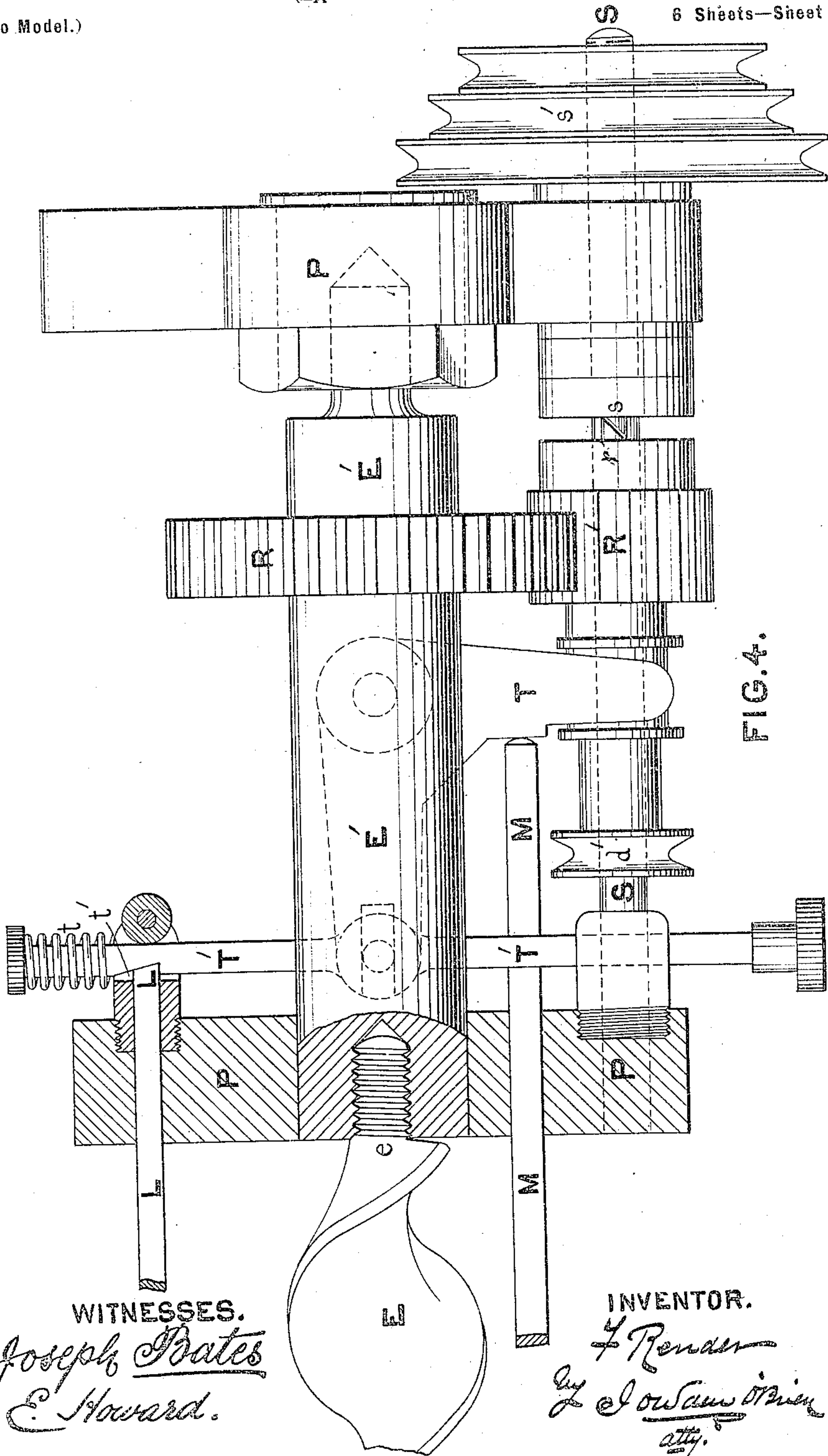
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6 Sheets—Sheet 4.



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(Application filed Aug. 8, 1898.)

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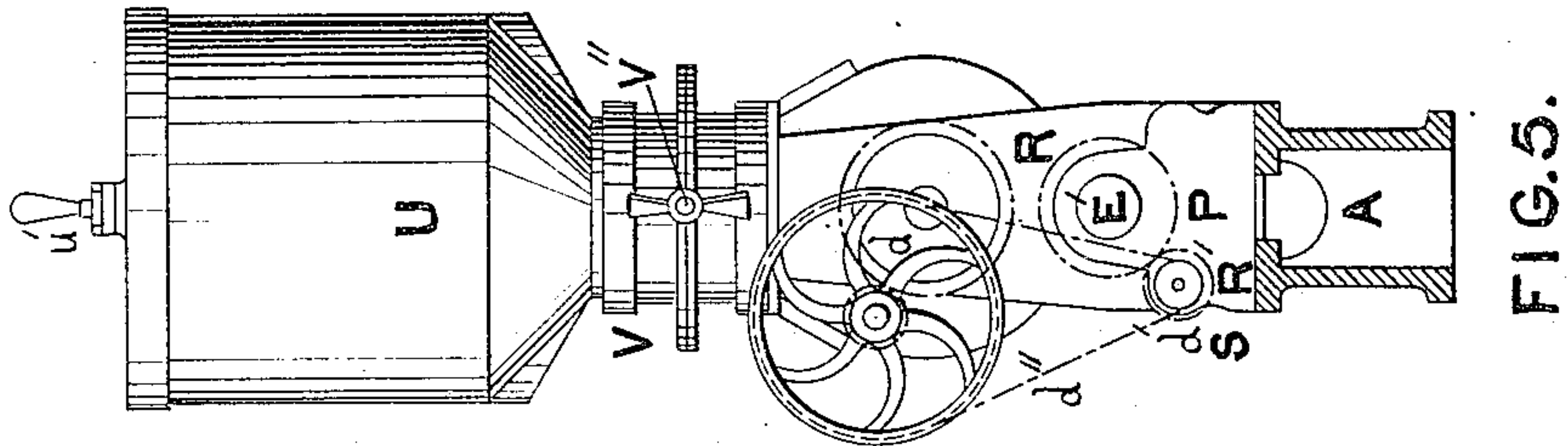


FIG. 5.

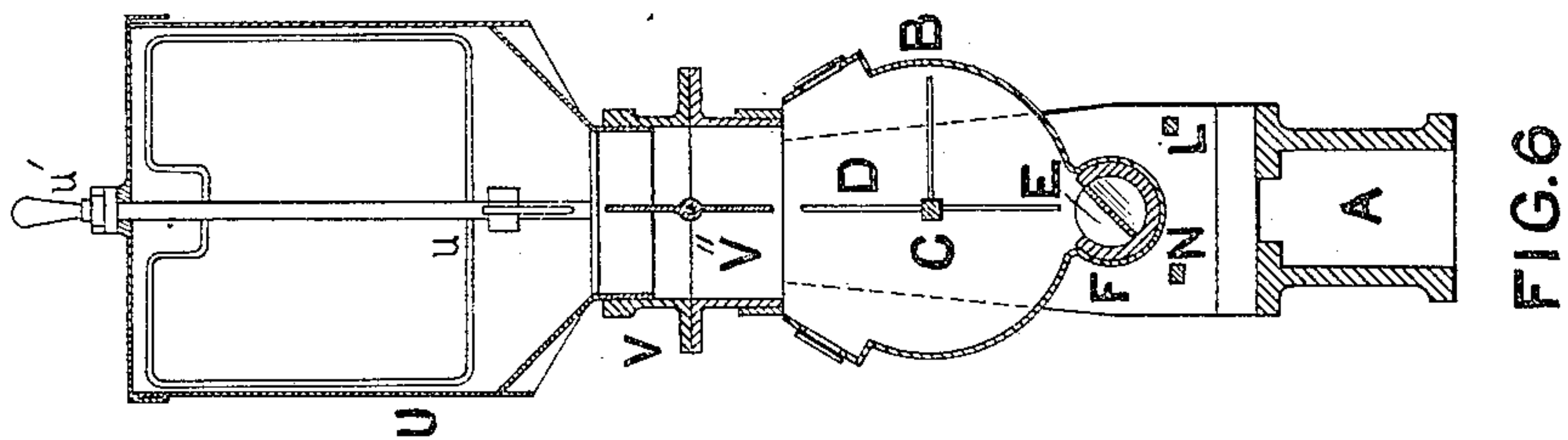


FIG. 6.

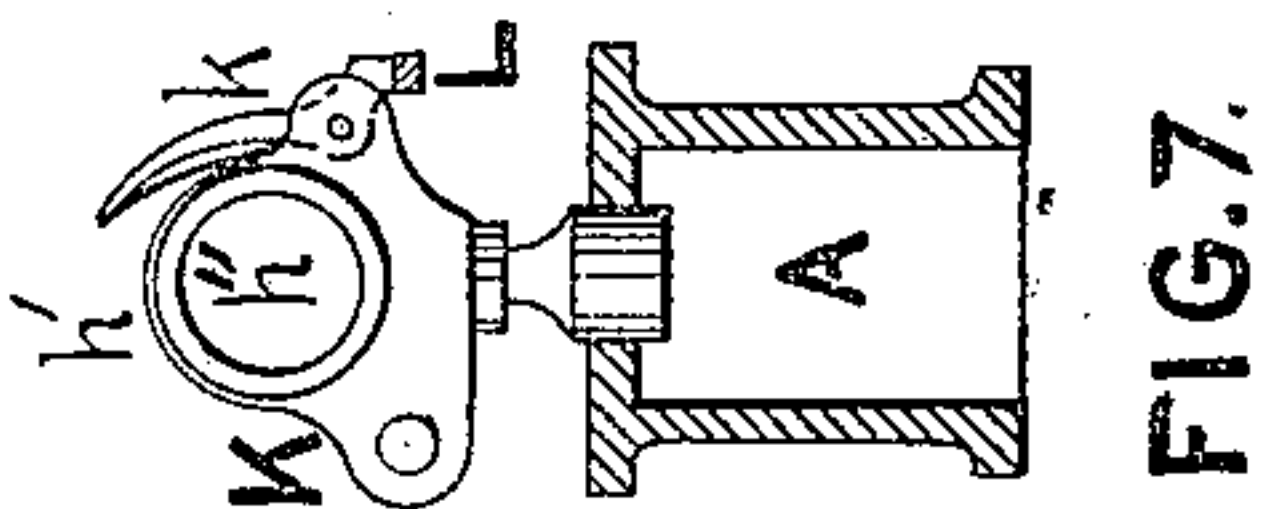


FIG. 7.

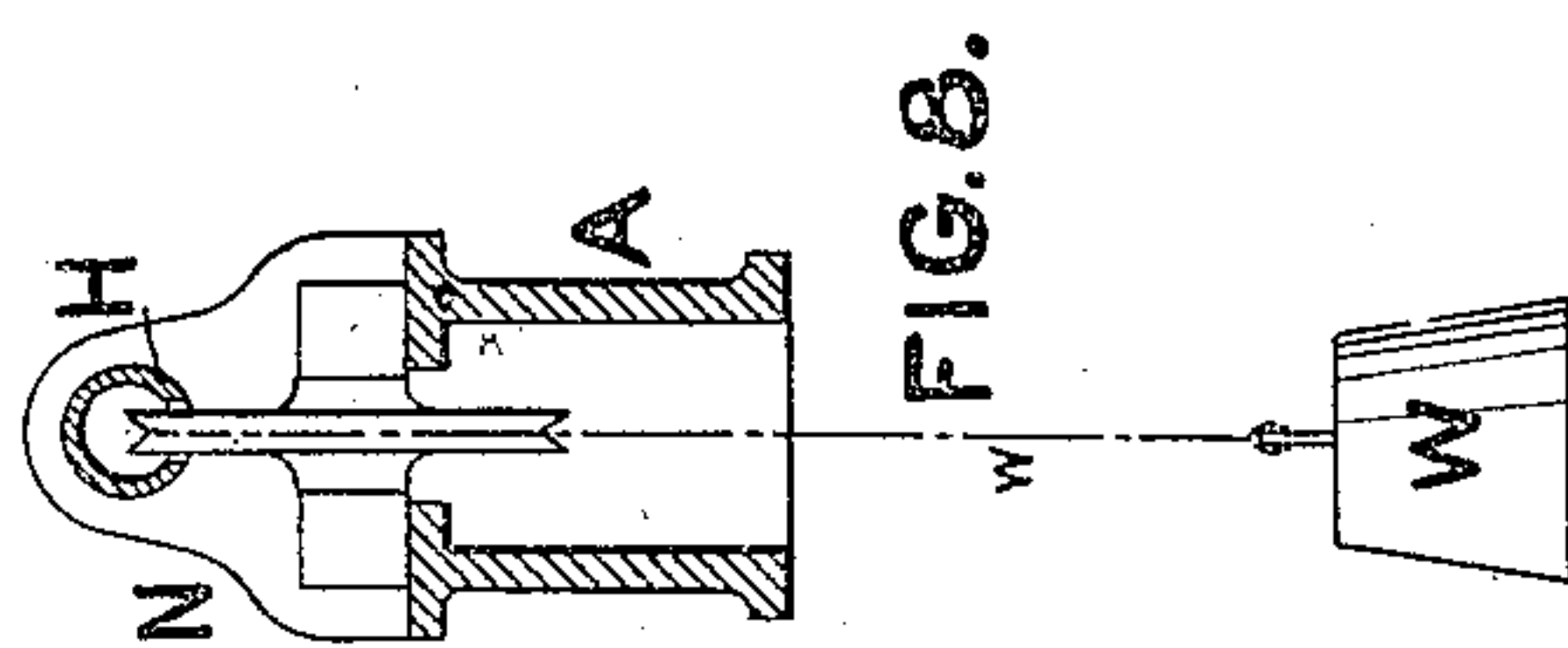


FIG. 8.

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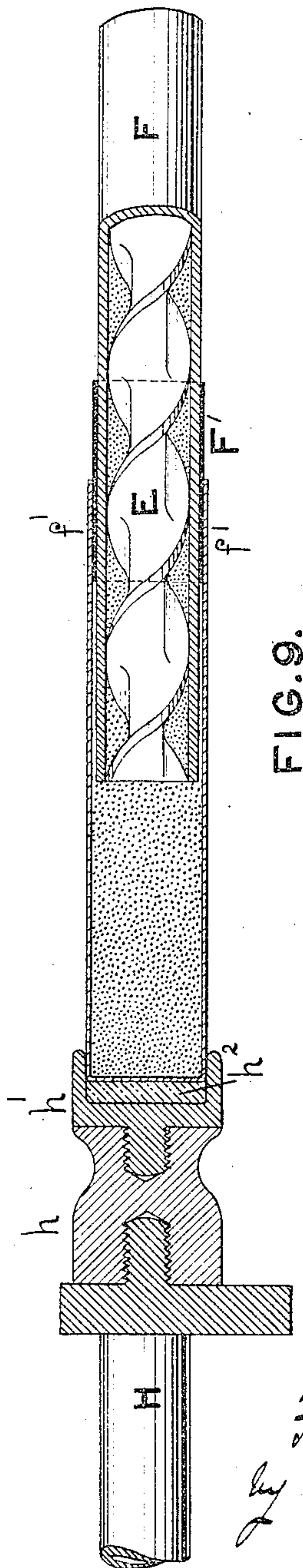
Patented Apr. 11, 1899.

F. RENDER.
CARTRIDGE LOADING MACHINE

(Application filed Aug. 8, 1898.)

(No Model.)

6 Sheets—Sheet 6.



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INVENTOR

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UNITED STATES PATENT OFFICE.

FREDERICK RENDER, OF MANCHESTER, ENGLAND.

CARTRIDGE-LOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 622,711, dated April 11, 1899.

Application filed August 8, 1898. Serial No. 628,134. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK RENDER, of Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Apparatus for Filling Explosive Cartridges, of which the following is a specification.

This invention relates to an improved arrangement on construction of machine for filling explosive cartridges, (for blasting or other purposes,) preferably worked by power, and is designed to render the apparatus exceedingly expeditious and to preserve the attendant from ill effects when working compounds containing deleterious substances, such as dinitrobenzol, the machine being so arranged as to prevent any fumes that may arise from the material or dust or particles thereof coming into contact with the operator while working.

It will be fully described with reference to the accompanying drawings.

Figure 1 is a side elevation; Fig. 2, a side elevation, partly in section, drawn to larger scale than Fig. 1; Fig. 2^a, a perspective view of nozzle F' for fixing cartridge-case in position for filling; Fig. 3, a plan of Fig. 2; Fig. 4, a plan of driving mechanism, enlarged; Fig. 5, an end elevation; Fig. 6, a transverse sectional elevation on line y y, Fig. 2; Fig. 7, a transverse section on line x x, Fig. 2, with funnel-shaped hopper G removed; Fig. 8, a transverse section on line z z, Fig. 2; Fig. 9, a longitudinal section of end of filling-tube F and nozzle F' with cartridge-case partially filled.

The machine is constructed with a bed A, of iron or wood, upon which is mounted a cylindrical hopper or receiver B for the explosive material (in a state of fine powder) which is to be filled into the cartridges. In the interior of the hopper B is placed a shaft C, provided with a number of vanes, arms, or paddles D, which are caused to revolve to keep the material loose, so that it may readily fall or descend upon the forcing-screw E. The shaft C and vanes D are rotated by the wheels d, driven by a band d' from the pulley d' on the driving-shaft.

The forcing-screw E is placed in a horizontal steel tube F, through which it carries the material and the external surface of which serves to receive the wrapper or case in which

the cartridge is formed. The end of the tube F terminates over a small funnel-shaped hopper G in the bed A, leading to a receiver or receptacle G', through which a strong current of air is drawn by a fan or exhauster, so that any of the explosive material falling or escaping from the end of the tube F or any fumes escaping therefrom are carried down into the receiver G', and the particles of material are collected therein, while any fumes are carried away by the fan and escape. This is of very great advantage to the workman, and it also avoids or prevents any loss of material.

On the axial line of the screw E and tube F and in the same horizontal plane is mounted a plunger or pressure-resister H, fitted with a head h, finished with a cup h' on the end adjoining the screw. The cup h' may be fitted with a rubber pad or washer h''. The horizontal plunger or presser H is operated by a weight W and presses against the end of the cartridge while it is being made, the rubber pad h'' effectually preventing the rotation of the cartridge during the operation. The weight W is connected by a cord w to the presser H, holding it against the cartridge end, and as the cartridge is filled by the screw the wrapping or case is drawn off the exterior of the steel tube F and the presser H gradually recedes, the density of the cartridge being determined by the weight of the weight W and the pressure exerted by the presser H. A spring may be employed instead of the weight W.

To the head h of the presser H is attached a sliding piece K, which moves to and fro with the presser. At one side it carries a trigger or spring-catch k, which engages a stop l on the stop-rod L, and it also engages the setting on rod M to set the machine in motion. The bar or rod L disengages the machinery when the cartridge is of the proper length and is graduated with a scale in fractions of an inch from zero to various lengths, according to the capacity of the machine, and upon the bar is placed a movable stop l, capable of being set or locked by a screw in any position thereon, according to the length of cartridge required. When the length is attained, the trigger or catch k comes in contact with the stop l, which draws the bar out of its place and so stops

the machine. By pressing the upper end of the trigger or catch *k* the lower end can be raised free of the stop *l* or the rod *L* to permit of the plunger or presser *H* being drawn back sufficiently far to take away the filled cartridge and place upon the cartridge-tube *F* another wrapper or case.

The plunger is supported by two brackets *N*, and upon one of these is placed a pawl or eccentric lever *n*, which holds the plunger or presser *H* at whatever point it happens to be pushed for the convenience of the workman, although the weight or spring is always pressing it toward the cartridge-tube. When the empty case has been placed on the cartridge-tube *F*, a knob *n'* on the pawl or lever *n* is depressed, which releases the plunger and permits it to move forward by the operation of the weight *W* until the sliding piece *K* strikes the setting on rod *M* and so restarts the machine to refill the case.

The filling-screw *E* is attached to a spindle or short-shaft *E'*, mounted in housings or bearings *P* on the bed or frame *A*. (See enlarged plan, Fig. 4.) The filling-screw is attached by a screw *e* or otherwise, so as to be easily removed and replaced by another of different diameter or length. The cartridge-tube *F* is also removable and replaceable by another of different size to correspond with the size of the filling-screw employed.

The filling-screw *E* is driven by the pinion *R* on the shaft *E'*, which gears with a second pinion *R'* on the driving-shaft *S*. The second pinion *R'* is loose on the driving-shaft and capable of sliding to and fro thereon. It is provided at one face with clutch-teeth *r*, which engage with a driving-clutch *s*, keyed to the shaft *S*, which is driven by the band-pulley *s'*. The clutch *r* is thrown out of engagement with the clutch *s* to stop the machine by the bell-crank lever *T*, which is drawn over by the spring *t* on the spindle *T'* when the end of the stop-rod *L* is withdrawn from the notch *t'* and is moved back again into gear by the setting on rod *M* pressing against the other member of the bell-crank lever *T* when the presser *H* is brought up again against the end of the feed-screw *E*.

To make good tightly-packed cartridges it is essential that the cases, whether of paper or metal or otherwise, should fit very closely to the tube. I prefer about a thirty-second of an inch only of play, which makes it very tedious to put the case on in position for filling. This I overcome by a sliding piece of tube *F'*, to which is fastened a number of very thin pieces *f'* of steel spring, which project over

the end of the tube and converge toward the center (see Fig. 2^a) and so present a point, as it were, to the paper case, which is then easily drawn upon the tube and is again ready for filling.

The cylindrical receptacle *B* for the explosive is charged and recharged by aid of cans or canisters *U*, provided with an internal agitator *u*, operated from outside by a key or handle *u'*, fitting upon the shaft projecting through a stuffing-box in the bottom. These cans have their lids removed and immediately closed by a movable brass box or valve-casing *V*, with valve *V''*, which when inserted as shown fits the mouth of the cylindrical hopper *B*, so that the material can be transferred from can to hopper without the escape of dust or fumes.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. Apparatus for filling explosive cartridges comprising in its construction a cylindrical receiver fitted with rotating vanes, a horizontal feeding-screw and tube a sliding piece thereon a horizontal sliding presser to engage the end of the cartridge as it issues from the feeding-screw, a weight and pulley to apply the desired pressure, an exhaust-chamber to receive any particles of the material, a stop-rod with which the presser engages to throw the screw out of gear, a setting-on rod to place the screw in gear again and clutch-gearing for operating the feed-screw, substantially as described.

2. In apparatus for filling explosive cartridges the combination with the cylindrical receiver *B*, vanes *D* rotating therein, horizontal feed-screw and tube in which the screw is placed of the horizontal presser *H* to engage the end of the cartridge and give the desired density thereto, the weight *W* attached to the presser and the exhaust-chamber placed below the end of the screw to collect any loose particles or fumes, substantially as described.

3. In apparatus for filling explosive cartridges the combination with the cylindrical receiver *B* vanes *D* rotating therein, horizontal feed-screw and tube in which the screw is placed and sliding piece *F'* to more expeditiously place the cartridge-case in position for filling, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FREDERICK RENDER.

Witnesses:

R. OVENDALE,
O. THOMPSON.