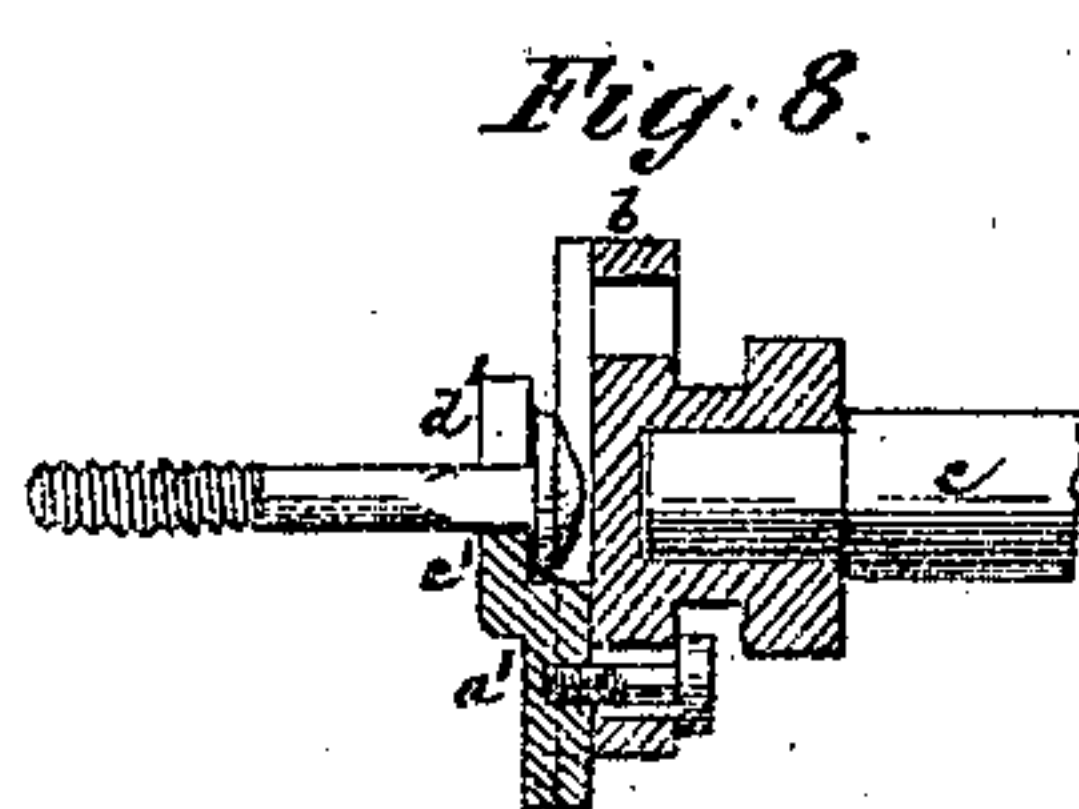
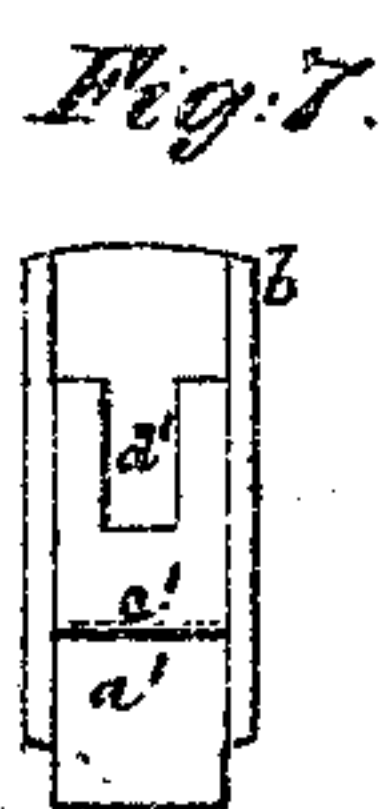
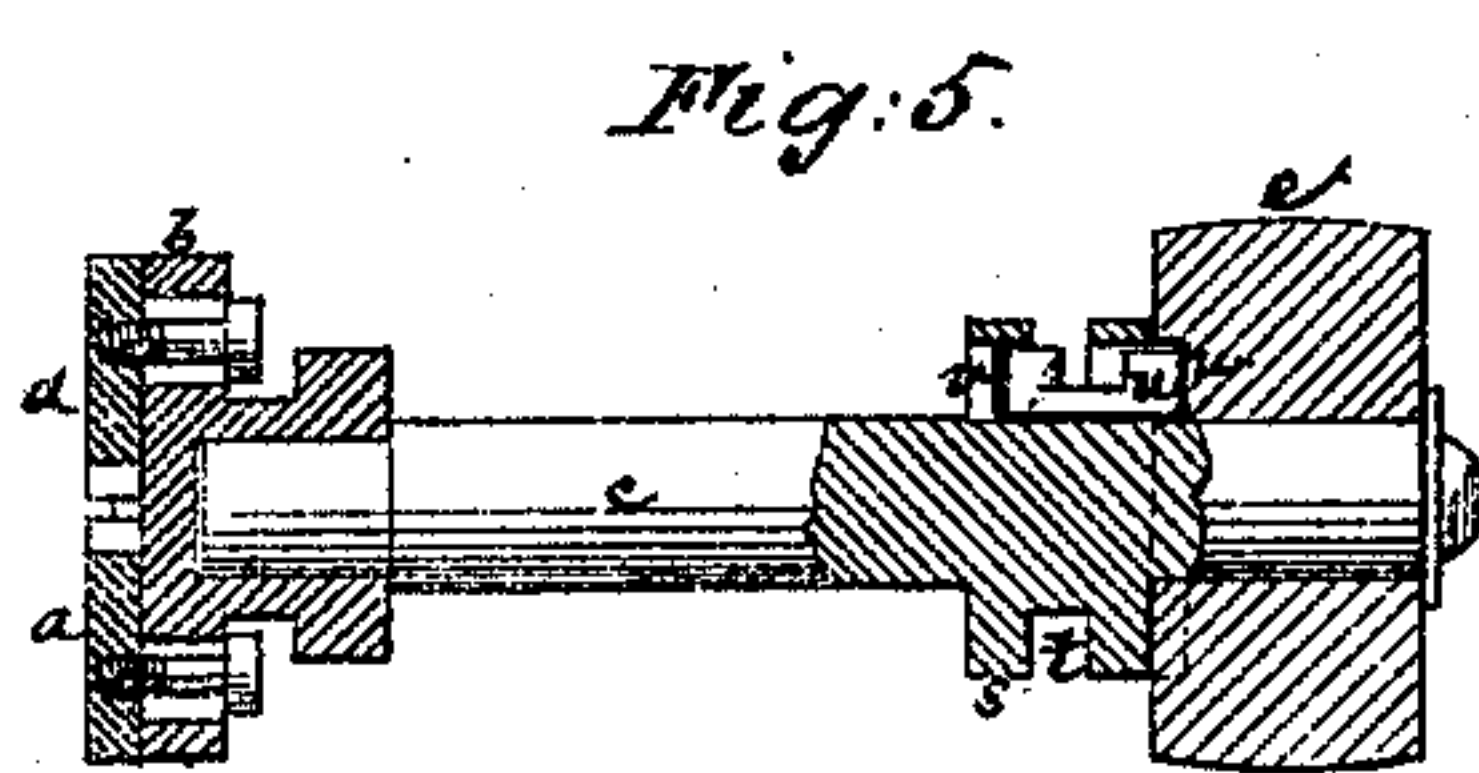
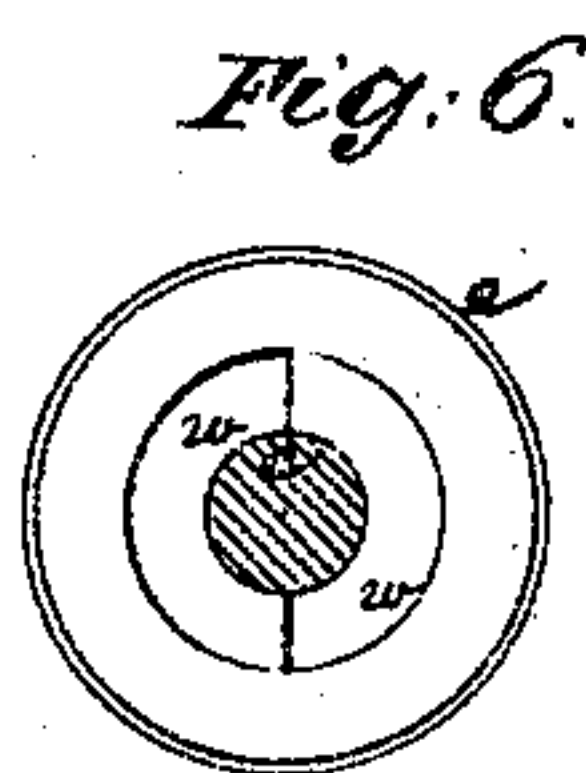
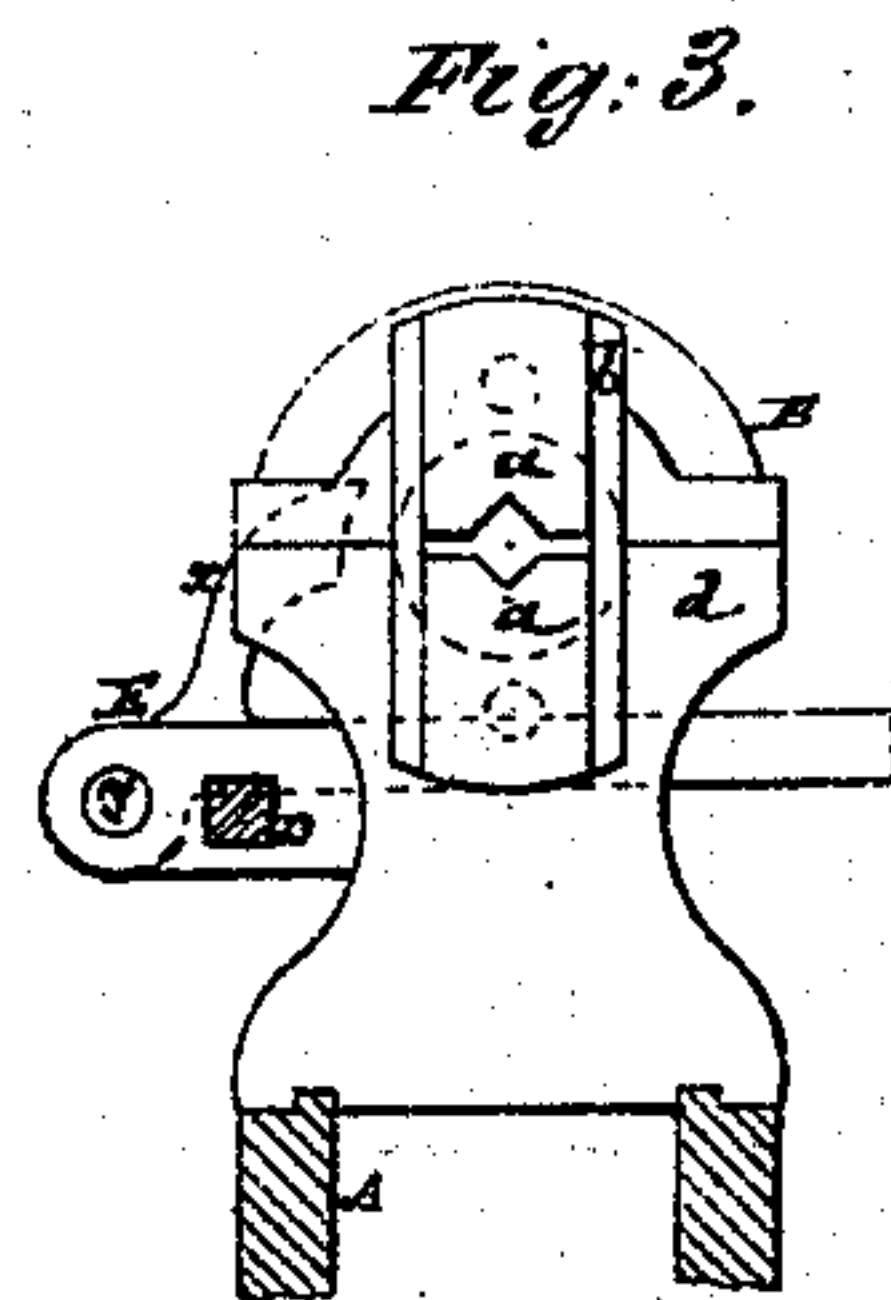
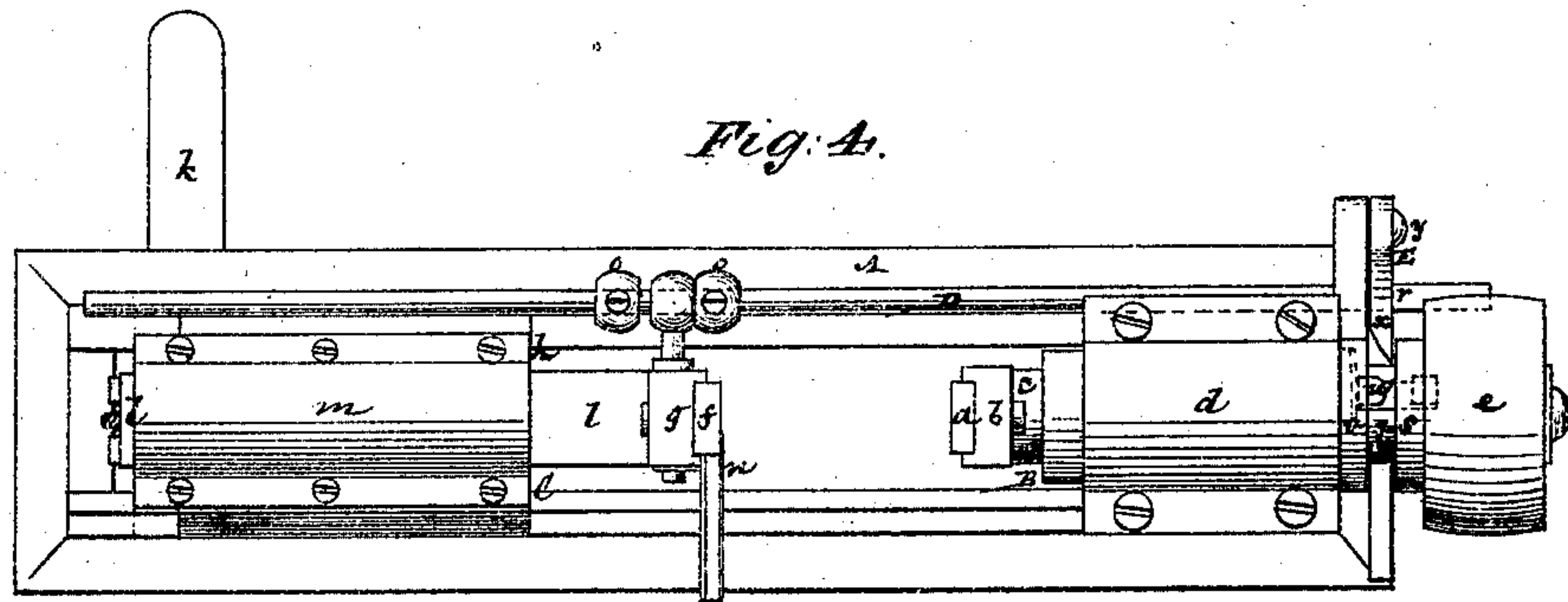
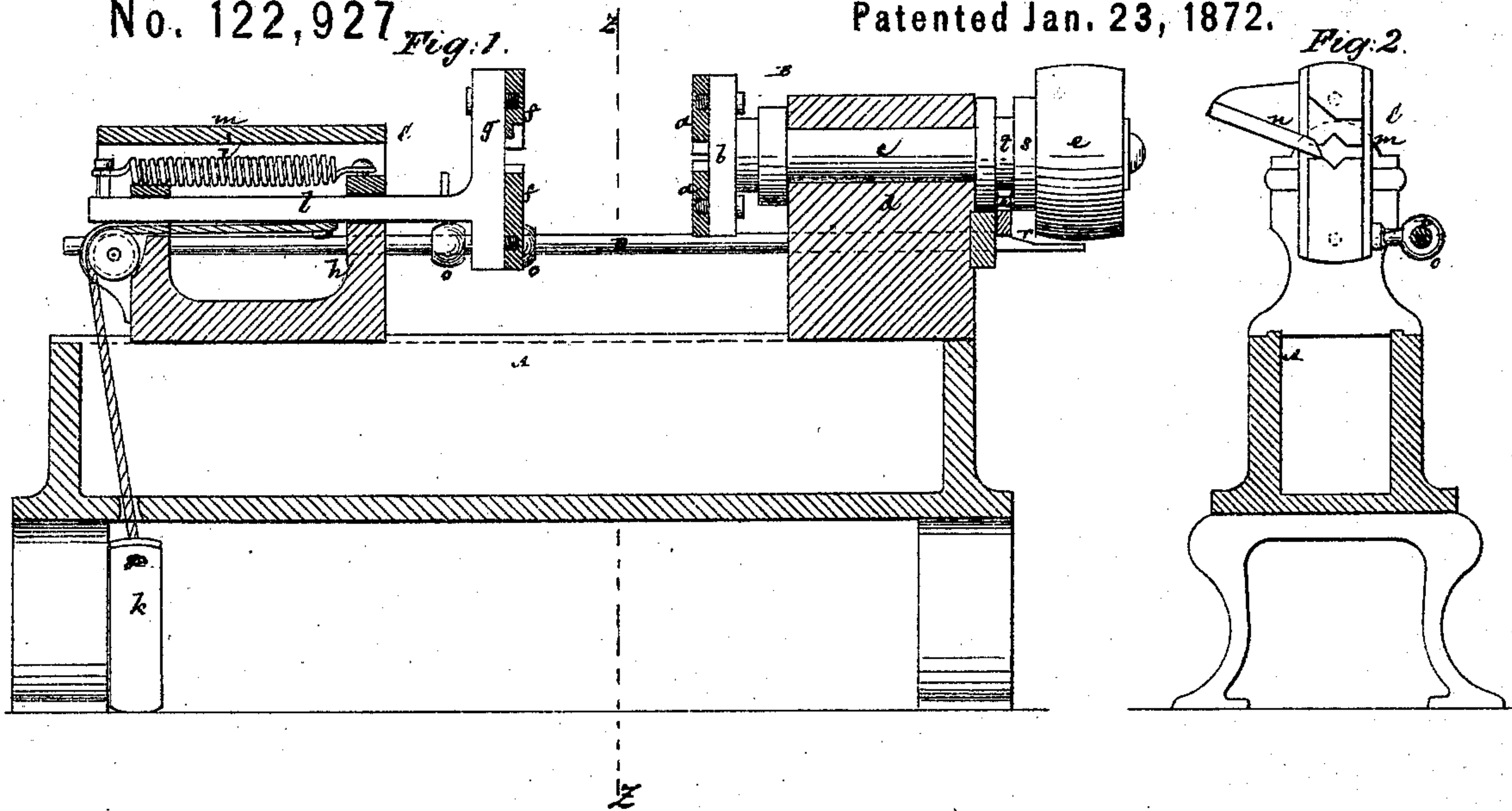


Benjamin L. Walker's Machine for Putting Nuts on Bolts.

No. 122,927

Patented Jan. 23, 1872.



Witnesses:
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UNITED STATES PATENT OFFICE.

BENJAMIN L. WALKER, OF SING SING, NEW YORK.

IMPROVEMENT IN MACHINES FOR PUTTING NUTS ON BOLTS.

Specification forming part of Letters Patent No. 122,927, dated January 23, 1872; antedated January 5, 1872.

To all whom it may concern:

Be it known that I, BENJAMIN L. WALKER, of Sing Sing, in the county of Westchester and State of New York, have invented a new and useful Machine for Putting Nuts on Bolts; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing which forms part of this specification, and in which—

Figure 1 represents a longitudinal sectional elevation of the machine; Fig. 2, a transverse section through the line *z z* in Fig. 1, looking toward the nut-holder; Fig. 3, a similar section, in part, looking in the reverse direction, or toward the bolt-carrier. Fig. 4 is a plan of the machine; Fig. 5, a longitudinal section through the bolt-carrier, its shaft, clutch, and driving-pulley; Fig. 6, an inside face view of said pulley. Fig. 7 is a face view, and Fig. 8 a longitudinal section of the bolt-carrier with a die fitted therein suitable for carriage-bolts.

Similar letters of reference indicate corresponding parts throughout the several figures.

The object of this invention is to economize time, labor, and expense in putting nuts on bolts, as these articles are manufactured in bulk or mass, by substituting machinery for manual labor in the performance of such work. The invention consists in a certain combination, with a sliding nut-holder, of a spring and treadle operating to feed the nut in a yielding manner up to the bolt in a revolving carrier, and afterward to detach the bolt with the nut screwed on it from the carrier. The invention also consists in a novel construction of the tail-block which carries the sliding nut-holder, whereby said block is made to form a guide for the stem of the sliding nut-holder, a receptacle for the spring which forces said holder forward, and by a cap or bridge with which the tail-block is provided; also, a rest for the arm of the operator, to facilitate his putting the nuts into the holder. The invention likewise consists in a certain combination of devices constituting an automatic clutch mechanism, which is controlled by the sliding nut-holder and operates to stop and start the bolt-carrier in timely relation with the feed of the nut up to the bolt.

Referring to the accompanying drawing, A

represents a bed or shears on which the mechanism is mounted. At the one end of said shears is arranged a bolt-carrier, B, and at any suitable distance from the latter, and capable of being slid or adjusted along the shears to suit different lengths of bolt, the nut-holder C. The bolt-carrier B consists of adjustable and removable clamps or dies *a a*, in a face-plate or carrier, *b*, that may be of oblong or other suitable form, and that is fast on the inner end of a revolving shaft, *c*, which has its bearing in a headstock, *d*. Motion is communicated to said shaft by a pulley, *e*, through the intervention or control of a stop-motion or clutch, which, when arresting the movement of the carrier, allows the driving-pulley to continue running. This provides for the screwing of the nuts on the bolts, or latter into the former, and removal of the same and substitution of fresh bolts and nuts in rapid succession, without stopping the driving-pulley. The dies *a a* are shaped to receive the head of the bolt for rotation by the carrier. It is preferred to drive the bolt-carrier by friction to prevent the nut going onto the bolt too tight, owing to any irregularity in the sizes of the bolts and nuts or fulness of their threads, and so that when going on too tight the carrier would be arrested from rotating when the clutch, which may be a friction one for such purpose, although it is not here shown as such, is set to allow the shaft *c* to be rotated by the pulley *e*. The nut-holder C consists of dies or clamps *f f*, shaped to receive and hold the nut from turning, and carried by a holder, *g*, which is free to slide longitudinally, but restrained from turning, in an adjustable tail-block, *h*, subject to the control of a spring, *i*, which presses said holder *g* toward the bolt-carrier to force the nut up and onto the revolving bolt, and subject to the action of a treadle, *k*, through a cord and pulley, or otherwise, to produce a reverse or retiring motion, for the purpose of taking out a bolt with the nut screwed on it and substituting a fresh bolt and nut to be fitted the one on the other. The tail-piece *h* is constructed to contain both the sliding stem *l* of the holder *g* and spring *i*, and is capped by an elongated bridge, *m*, which serves as a rest for the arm of the operator, the hand of which is engaged in putting the nuts into the holder *g*, while the

other arm and hand are employed in putting the bolt into its carrier. The nuts are fed into the holder *g* by entering them edgewise and front side foremost within an inclined trough, *n*, down which they slide or are passed to the dies *f f*, within which they adjust themselves on pressure being brought to bear upon them by the forcing of the nut, through the sliding of the holder *g*, by the action of the spring *i*, up against the end of the bolt. When it is necessary to keep the holder *g* drawn back, the operator or boy in attendance keeps his foot down upon the treadle *k*; but when it is desired to feed the nut up to the bolt, pressure is removed from the treadle, which causes the spring *i* to force up the nut, but with an elastic action as contradistinguished from a rigid or positive force, so that the nut will not jam on the bolt, but readily yield and adjust itself should there be any tendency to cross threads in putting the nut onto the bolt. Connected with the holder *g*, as by adjustable stops *o o*, for the purpose of varying the action of the clutch to suit different lengths of bolt, is a rod *D*, which is formed with an inclined plane, *r*, on its forward end, to control the operation of the clutch accordingly as said rod, in common with the holder *g*, is pressed forward or drawn back, the incline *r*, when shot forward, acting on the clutch to put the driving-pulley *e* in operating connection with the shaft *c* of the bolt-carrier, and when drawn back acting to allow of the clutch releasing the pulley from operation of said shaft. The clutch itself may be variously constructed, but it is here shown as composed of a hub, *s*, on the shaft *c*, having formed in or around it an annular groove, *t*, and fitted with a longitudinally-sliding key, *u*, the outer end of which is caused, by the action of a spring, *v*, to enter inclined recesses, *w*, on the inside face of the pulley *e*, and so that the back of either one of said recesses becomes the driver of the key *u*, hub *s*, and shaft *c*. When the pulley *e* is required to run loose on the shaft *c*, then the key *u* is forced inward from connection with the pulley by its inner end or portion, which is suitably beveled or rounded and lies within the annular groove *t*, coming in contact with a bevel-nosed upper arm, *x*, of a clutch-detacher, *E*, pivoted as at *y*, and arranged to enter the groove *t* by gravity whenever the rod *E* is drawn back so as to cause the incline plane *r* to discontinue its lift of the clutch-detacher *E* out of the annular groove *t*. But when the holder *g* and rod *D* are shot forward, as in bringing the nut up to the bolt, the incline *r* is projected under the clutch-detacher *E* to raise its arm *x* from con-

tact with the key *u*, that then is shot and remains in gear with the pulley *e*. In this way, although the pulley *e* revolves without interruption, the bolt-carrier is only set in motion when the nut-holder is made to press the nut up to the bolt, and, by the action of the rod *D* through its incline *r* on the clutch-detacher *E*, the clutch is always caused to stop the bolt-carrier in one and the same position, which gives a fixed position for the dies *a a*, that facilitates or expedites the entry of the bolt-heads, and when a single open-ended die, as, for instance, *a'*, in Figs. 7 and 8, is used, insures a more or less upper position for the open end of the die, whereby the bolt is readily dropped to its place in the carrier and ejected therefrom by a jerk applied to it from underneath after the nut has been screwed onto it. Said die *a'* is especially designed for carriage-bolts—that is, bolts with round or mushroom heads and square shoulders on the under or inner sides of the heads, as shown in Fig. 8, and which, presenting no angles on the heads, require to be rotated by the carrier from or at their square shoulders, for which purpose the die *a'* is crooked, as at *c'*, to receive the head of the bolt down behind it, while the slot *a'* in the crooked portion has the square shoulder of the bolt entered within it, and out of which the bolt will not drop during the rotation of the carrier, by reason of the friction of the bolt on the driving side of the slot and the centering tendency of the nut as it is screwed onto the bolt.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination, with the sliding nut-holder *g*, of the spring *i*, inclined trough *n*, and treadle *k*, when arranged for operation, in relation with each other and with the bolt-carrier *B*, substantially as specified.

2. The tail-block *h*, constructed to form a guide for the stem of the sliding nut-holder *g*, a receptacle for the spring *i*, and, by its cap or bridge *m*, a rest for the arm of the operator, essentially as described.

3. The combination of the rod *D*, having stops *o o*, the incline *r*, and the clutch-detacher *E*, with the sliding nut-holder *g* and clutch on the revolving shaft of the bolt-carrier *B*, substantially as and for the purposes herein set forth.

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Witnesses:

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