(No Model.) 2 Sheets—Sheet 1.

W. T. SMITH & B. WALMSLEY.

SLOTTING MACHINE.

No. 590,343. Patented Sept. 21, 1897.

Fig. 1

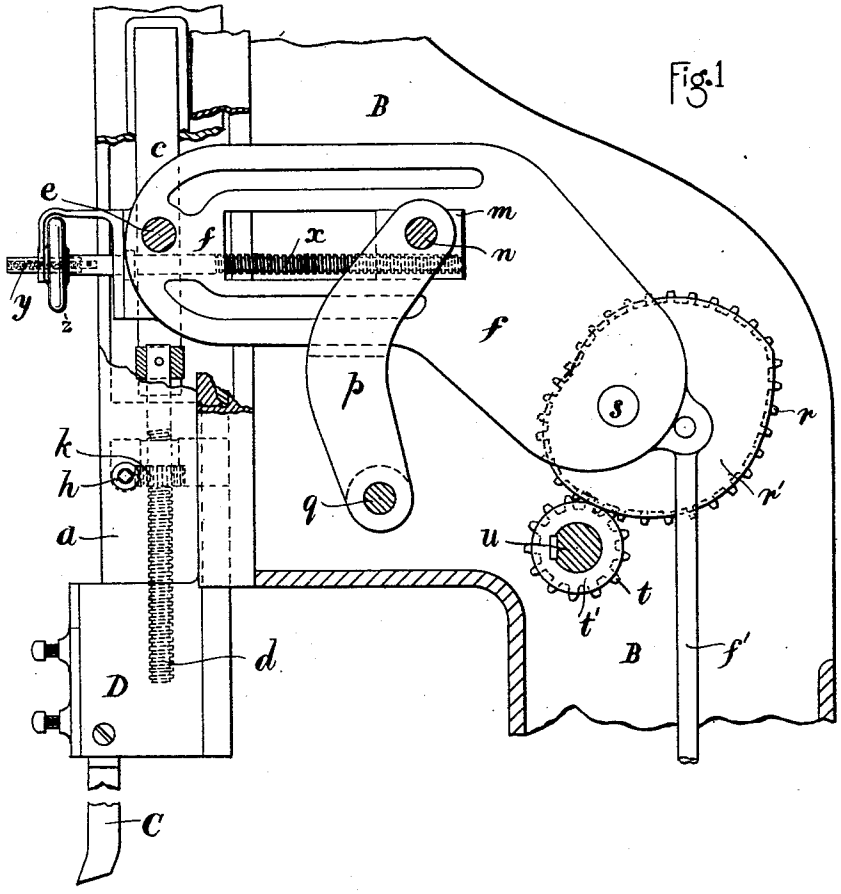
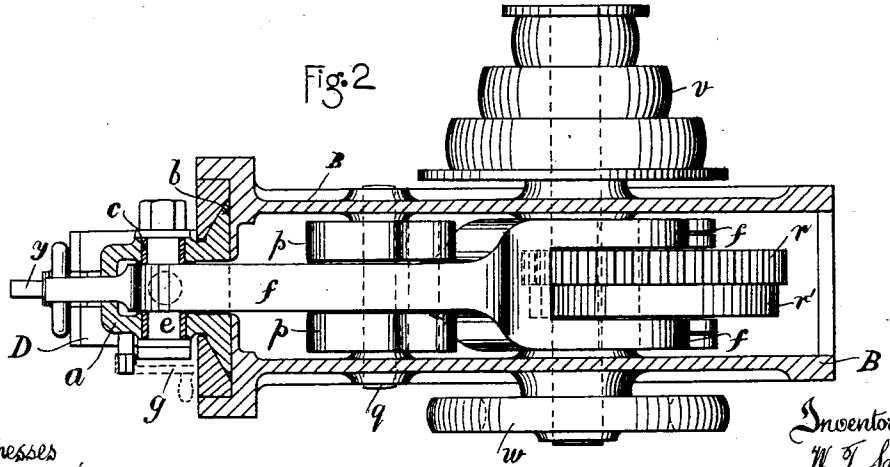


Fig. 2



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4

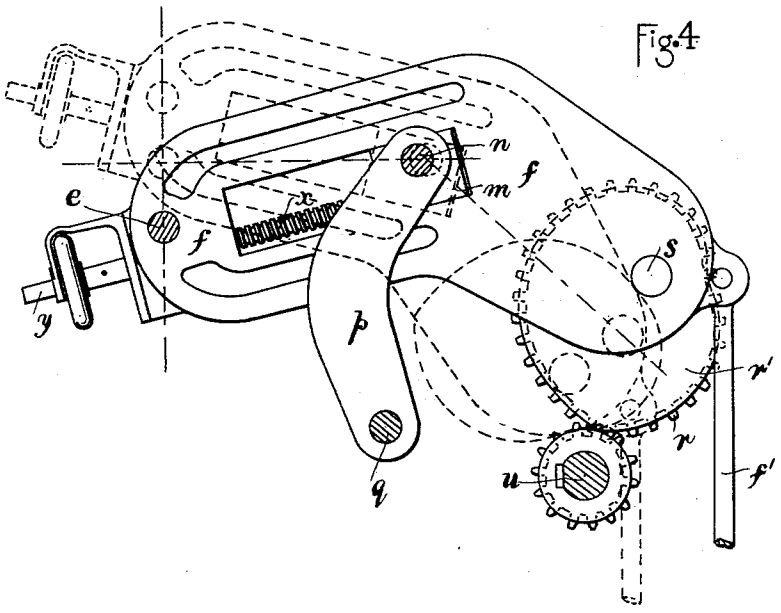
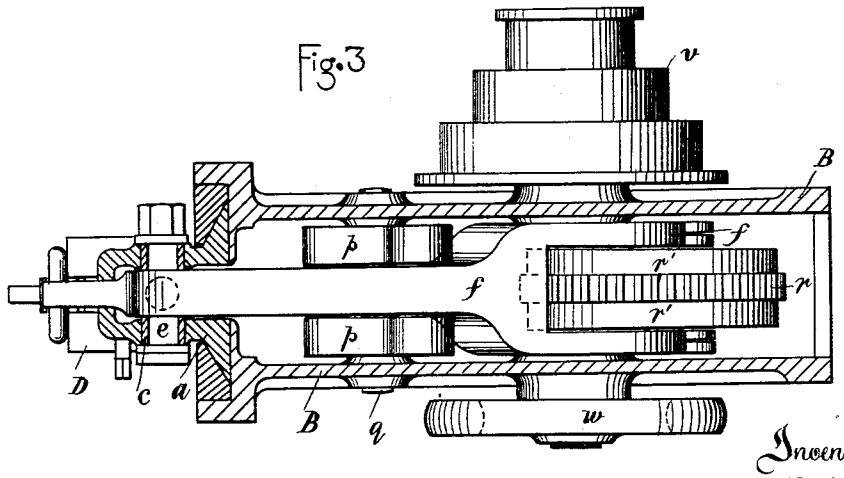


Fig. 3



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UNITED STATES PATENT OFFICE.

WILLIAM THOMAS SMITH AND BEN WALMSLEY, OF BOLTON, ENGLAND.

SLOTTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 590,343, dated September 21, 1897.

Application filed November 27, 1896. Serial No. 613,669. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM THOMAS SMITH and BEN WALMSLEY, subjects of the Queen of Great Britain, residing at Bolton, in the county of Lancaster, England, have invented a new and Improved Slotting-Machine, of which the following is a specification.

In the usual kind of machines employed in the cutting of metal and known as "slotting-machines" the return or ineffective stroke of the cutting-tool occupies or entails an expenditure of as much time as does the outward or effective stroke. Hence considerable time is wasted and expenses thereby incurred.

To produce mechanism that will perform the return or ineffective stroke of the cutter at a greatly-increased speed as compared with the other stroke, and by the employment of parts that are of comparatively little cost and yet that will allow the adjustment or regulation of the stroke of the cutter to be readily effected is the object of our invention, and this object we attain by the mechanism hereinafter described, and as illustrated in the accompanying sheets of drawings, in which—

Figure 1 is a side sectional elevation of the upper part of a slotting-machine, the parts omitted from this view being those of ordinary construction or formation. Fig. 2 is a sectional plan of parts shown by Fig. 1. Fig. 3 is a similar view to Fig. 2, but illustrates a modification hereinafter described. Fig. 4 is a diagram illustrating the relative positions of the several parts during certain of their movements.

Similar letters indicate similar parts throughout the several views.

B indicates the framework, C the cutting-tool, and D the tool-holder.

The holder D is secured to the ram *a*, which is arranged to slide upon the face *b* of the framework B in the usual manner. However, to transmit motion to this ram *a* it is secured by the link or connecting part *c*, the adjusting-screw *d*, and the coupling-pin *e* to the operating-lever *f*, the said adjusting-screw *d* being used for the purpose of raising or lowering the ram *a* relatively with the coupling-pin *e*, in order that the tool C may be adjusted to perform its functions nearer to or farther from its operating-lever *f*, as occasion may necessitate. The raising of the part *c* by the screw *d* is performed through or by a winch-handle *g*, (shown by Fig. 2 in broken lines,) operating a worm *h*, which imparts motion to the worm-wheel *k*, through which an internal screw or thread is formed for the reception of the screw *d*, by which means, and since said wheel *k* is held rigidly except for its rotary motions, the said screw *d* is raised and lowered as the handle *g* is rotated in one direction or the other, as will be understood.

The lever *f* is pivotally connected by the sliding block *m* and pin *n* to the link *p*, which swivels on the pin *q*, secured to the framework B, while at its inner end is mounted the cam-wheel *r*, so that it may rotate upon the pin *s*, carried by said lever *f*. This wheel *r* is arranged to mesh with a pinion *t*, mounted upon the shaft *u*, carried by the framework B, and which shaft *u* has a driving-cone *v* at its outer end for receiving the driving-belt, while at the other end of the shaft *u* is the hand-wheel *w* for effecting any slight movements manually as may from time to time be required.

The pinion *t* is of ordinary formation, but it has a flange or disk *t*, formed in proximity with it and preferably of a size corresponding with that of the pitch-circle of its teeth in order that a flange or disk *r'*, formed on the cam-wheel *r*, (which in like manner corresponds with the pitch-circle of the said cam-wheel,) by which means these flanges or disks *t'* and *r'* may be kept in constant rolling contact with each other and their respective wheels prevented from being forced too deeply into gear. The cam-wheel *r* and its flange *r'* are of such an irregular and eccentric shape as may be thought or found to be suitable for imparting irregular motion to the lever *f* as it (said wheel *r*) is rotated, since, as will clearly be seen, when this wheel *r* and its disk *r'* are rotated as their pivotal pin *s* approaches the pinion *t* their speed will be increased, while as they continue their motion to cause the cam-disk *r'* to roll on the disk *t* and raise the pin *s* (see Fig. 4) and its lever *f* the speed of same will decrease, and such increased speed is arranged to take place as the ram *a* is performing its upward move-

ment, while during its descending stroke it is caused to travel at a slower rate.

Since the pin *e*, which couples the lever *f* to the sliding ram *a*, is caused to travel in the same straight course through which said ram *a* moves, it is necessary that the fulcrum *n* of the lever *f* should be free to move and accommodate itself to such straight course of the pin *e*, and this we attain by mounting the pin *n* on the end of the link *p*. Yet, however, we obtain a further advantage by making use of the link *p* and sliding block *m*, because by having the adjusting or regulating screw *x* to engage with this block *m* we can easily change its position within the slot of the lever *f*, causing this lever *f* to impart a less stroke to the ram *a* as the block *m* is brought nearer to the pin *e* or to increase the length of such stroke as this block *m* is made to approach the pin *s*. Again, as the movements of the block *m* by the screw *x* always agree with or are in exact proportion to the variations that may be desired to produce on the ram *a* by having a counter-screw *y*, which is always operated with the hand-wheel *z*, as this said hand-wheel is used to operate the screw *x* and block *m*, said screw *y* may be used as a pointer or indicator to show exactly the length of stroke the ram *a* is making.

The ram *a*, holder D, and tool C are counterbalanced by weights being placed upon the rod *f'* in the manner well known.

In Figs. 1 and 2 the cams or disks *r'* and *t'* are shown as being on one side of the wheels *r* and *t*, respectively, but we are aware that they may be made on both sides of these wheels, as shown by the sectional view Fig. 3.

Having thus described the nature and object of our invention, what we claim is—

1. In a slotting-machine a ram made to slide upon the framework, a lever for transmitting motion to said ram, a cam-wheel having a cam disk or flange secured to it, said wheel and disk being mounted on said lever, a pinion and disk or flange secured to it mounted on the frame and means for operating said pinion, in combination substantially as specified.

2. In a slotting-machine, the combination of a sliding ram, adjustable means for securing said ram to its operating-lever, said operating-lever, a cam-wheel carrying a cam-disk mounted on said lever, a pinion for transmitting motion to said cam-wheel and cam-disk, and means for rotating said pinion substantially as specified.

3. In a slotting-machine the combination with a sliding ram, an operating-lever therefor, means for securing the ram to the operating-lever, a link or lever-arm upon which the operating-lever is pivoted, the pivot being adjustable lengthwise of the lever, and means for transmitting motion to said operating-lever, substantially as specified.

4. In a slotting-machine the combination of a sliding ram and having a longitudinal slot, a lever for operating said ram, means for securing said lever to said ram, a link or lever for bearing the fulcrum-pin of said operating-lever, means for transmitting motion to the operating-lever, a sliding block mounted upon the pin carrying the operating-lever and movable in the slot of the lever, a regulating-screw for moving and holding said sliding block to adjust the same to obtain the desired movement of the ram, and means for transmitting motion to said screw, substantially as herein specified.

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Witnesses:
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JOHN WHITEHEAD.