

G. W. Fogg.

File-Cutting Machine.

N^o 22, 329.

Patented Dec. 14, 1858.

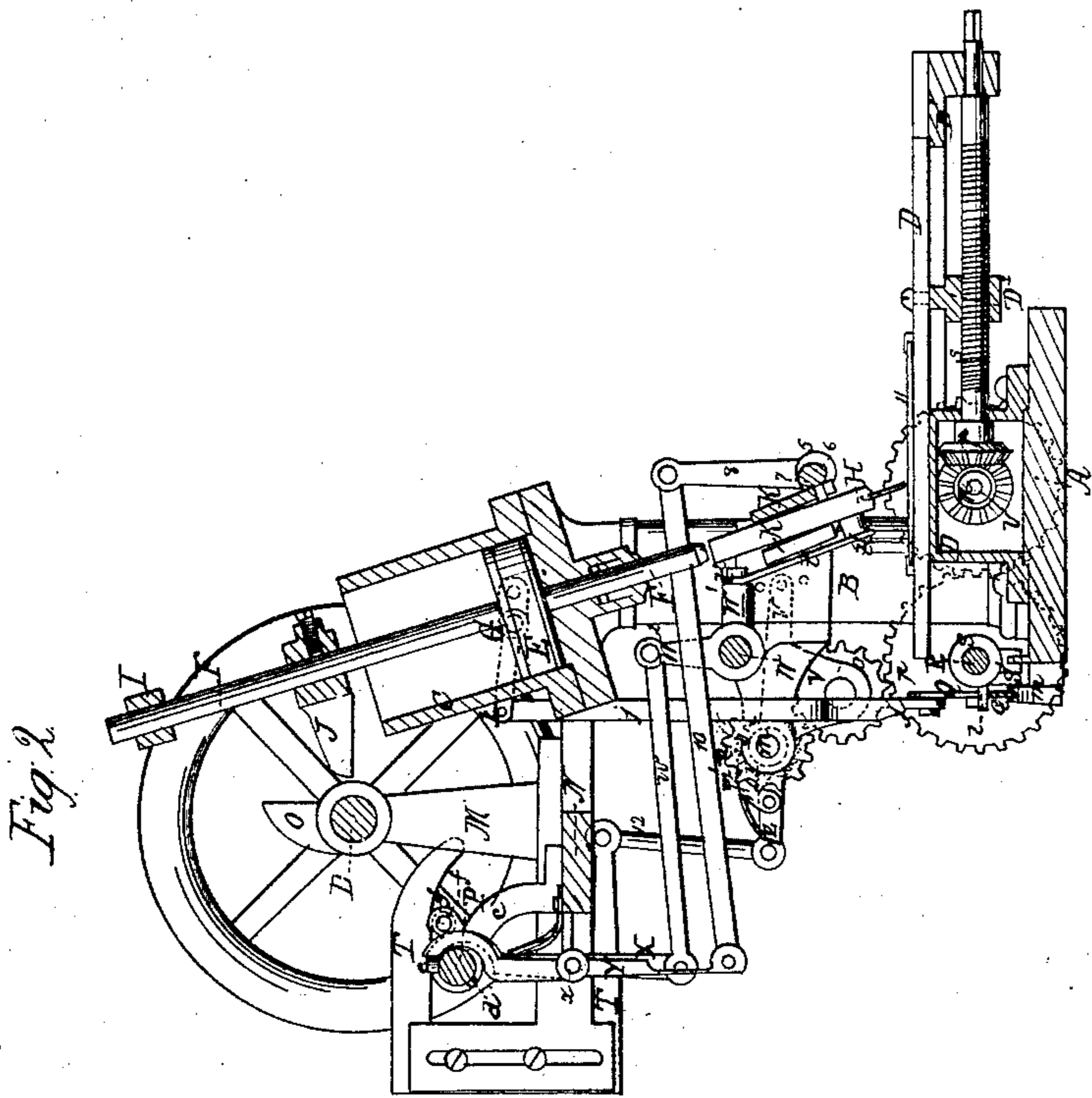


Fig. 2.

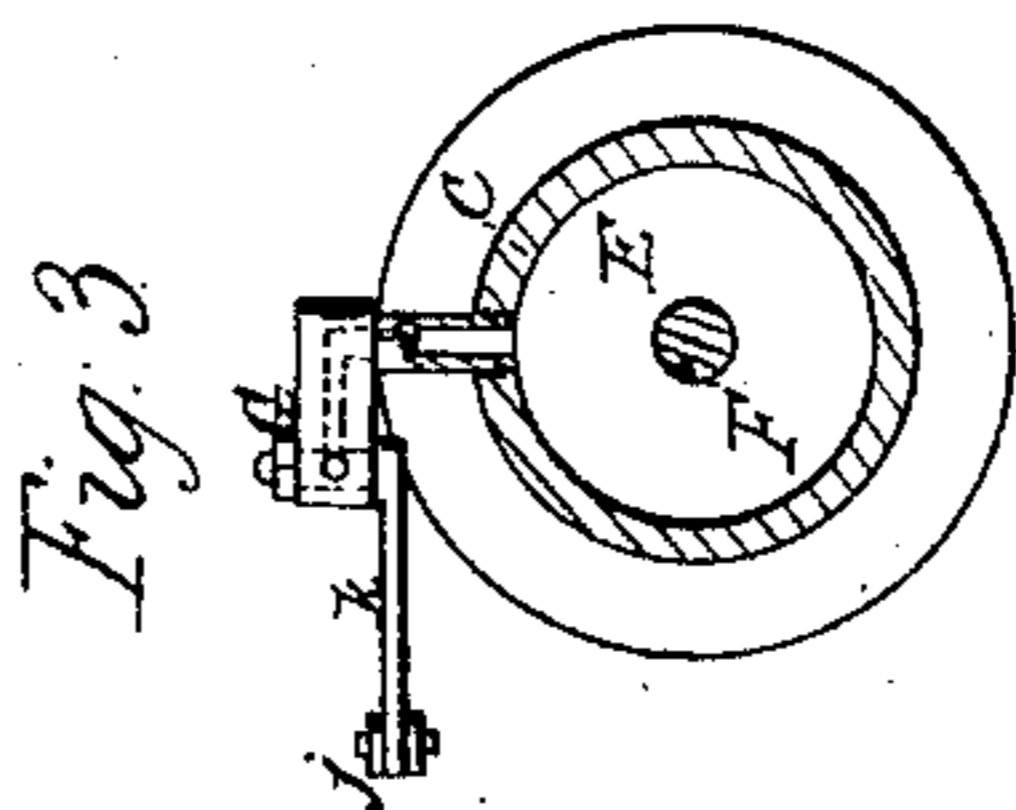


Fig. 3

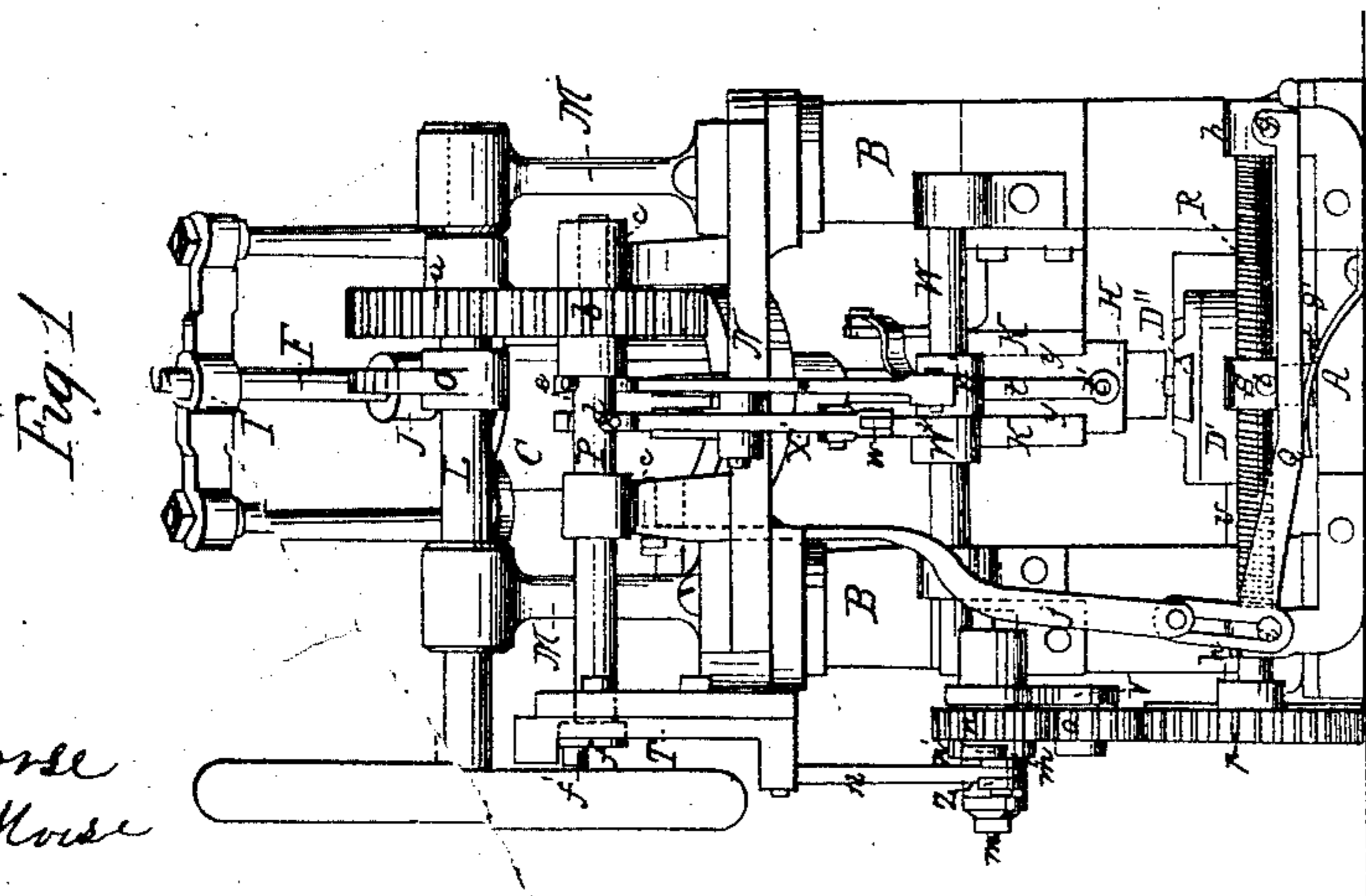


Fig 1

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UNITED STATES PATENT OFFICE.

GEORGE W. FOGG, OF SOUTH DEDHAM, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND
D. S. FOGG, OF SAME PLACE.

FILE-CUTTING MACHINE.

Specification of Letters Patent No. 22,329, dated December 14, 1858.

To all whom it may concern:

Be it known that I, GEORGE W. FOGG, of South Dedham, in the county of Norfolk and State of Massachusetts, have invented
5 certain new and useful Improvements in File-Cutting Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings,
10 forming part of this specification, in which—

Figure 1, is a back elevation of a machine with my improvements. Fig. 2, is a vertical section of the same, in a plane at right
15 angles to Fig. 1. Fig. 3, is a horizontal section of a portion of the same.

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

My invention consists in so applying a
20 pattern of a form corresponding with or having a proper relation to the longitudinal profile form of the faces of a file to be cut, in combination with an atmospheric trip hammer properly arranged to act on
25 the cutter, that as the cutting of the file proceeds the said pattern will control the operation of the regulating valve of the air cylinder and thereby control the descent of
30 all along the file, so that the said depth may be made uniform notwithstanding the taper of the file or the curved form of its faces.

It further consists in certain appliances
35 operating in combination with a properly arranged cutter guide, whereby the hammer, in striking the cutter, is caused to impart to it an action resembling that produced by the action of the hand to throw
40 up the bur of the tooth in cutting files by hand.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

45 A, is the bed plate of the machine upon which are erected two strong pillars or standards B, B, which support the cylinder C, of an atmospheric trip hammer which is arranged at a suitable inclination to the
50 horizontal file carriage D.

E, is the piston of the hammer; F, the piston rod or hammer stem; I a stationary guide for the upper part of said rod or stem, and J, the lifter secured to the said
55 rod or stem.

G, is the regulating valve for the admission of air to and its escape from the cylinder C, below the piston. This valve is constructed on the principle of a cock, as shown in Fig. 3, but may be of other construction that will serve the same purpose,
60 it being intended to produce the same effect as the regulating valve of any other atmospheric trip hammer.

H, is the cutter fitted quite loosely to a
65 stationary guide block K, which is secured to one of the standards B, B, and which has a slightly greater inclination from a vertical position than the cylinder C, and the hammer stem F.
70

L, is the main shaft of the machine fitted to rotate in bearings in standards M, M, erected upon a frame N, that is supported upon the main standards B, B, said shaft carrying, besides its driving pulley or gear,
75 a toe O, to act on the lifter J, to raise the hammer, and a spur gear *a*, gearing with a spur gear *b*, on a shaft P, that is fitted to rotate in bearings in standards *c*, *c*, erected on the frame N. The shaft P, carries two
80 wipers *d*, and *e*, and a crank *f*, whose duties will be presently explained.

R, is a long horizontal screw having journals at its ends which are received in two journal boxes *h*, *h*, secured to the back part
85 of the bed plate A.

Q, is a lever attached by one end to a fulcrum pin *g*, secured in one of the journal boxes *h*, *h*, and slotted at the other end to work on a guide pin *i*, secured in the other
90 journal box. The latter end is connected by a rod *j*, with a lever *k*, secured to the valve G. The upper edge of the lever Q, constitutes the pattern, being formed to correspond with or have a proper relation to the
95 longitudinal form of the face of the file, but instead of having the pattern on the lever itself, patterns to suit different files may be made of separate pieces of plate metal, and a suitable one attached by screws
100 to the lever so as to stand up above it.

S, is a nut fitted to the screw R, and grooved to fit a stationary guide S', arranged parallel with and below the screw to prevent it turning along with the screw.
105 This nut has a pin or projection *l*, on its back side which stands above the pattern lever Q, which is held up in contact with the said pin or projection by means of a spring *m*², placed below the said lever, the
110

said spring, by its upward pressure on the lever, exerting a tendency to make the said lever, by its action through the rod *j*, on the lever *k*, open the regulating valve, and the pin or projection *l*, by serving as a stop to the lever, controlling the degree of opening, and thereby regulating the force of the blow. The screw *R*, when the machine is in operation, has a rotary motion imparted to it, and this motion causes the nut *S* to travel along the pattern, as the file moves under the cutter, and thus permits a greater or less opening of the regulating valve, according as the hammer is required to strike lower or higher, as required by the curved or taper form of the faces of the file, the lowest parts of the faces requiring the hammer to strike the lowest, and vice versa, to produce a uniform depth of cut throughout the whole length. The rotary motion of the screw, to produce the above-described operation of the pattern, is derived from the crank *f*, which carries a friction roller *f'*, which, by its revolution, raises and lowers a vertical sliding frame *T*, at one side of the machine, which frame is connected by a rod *12*, with a lever *Z*, working on a fixed stud *m*, and carrying a pawl *m'*, which engages with a ratchet wheel *n'*, secured to a spur gear *n*, turning freely on the said stud. The movement of the frame *T*, produces an intermittent rotary motion of the gear *n*, which is geared by an intermediate gear *o*, with a spur gear *p*, fast on one end of the screw. The spur gear *p*, drives the file carriage by gearing with a gear *q*, on a shaft *U*, which is geared by a pair of bevel gears *r*, *r'*, with the feeding screw *s*, which works in journal boxes secured to the bed *D'*, in which the file carriage slides, and in a nut *D²*, secured to the carriage. The intermediate gear *o*, is hung in a lever *V*, fitted to turn on the stud *m*, which permits it to be thrown out of gear to permit the file carriage and the nut *S*, to be run back quickly by turning the screw *s*, by hand after the whole length of the face of a file has been cut.

The cutter *H*, is connected by a rod *t*, and pins *t'*, *t²*, with an arm *W'*, on a rockshaft *W*, which works in journal boxes *u*, *u*, secured to the backs of the standards *B*, *B*. Another arm *W²*, on the said rockshaft *W*, is connected by a rod *w*, with a lever *X*, working on a fixed fulcrum *x*, secured to the back of the frame *N*, said lever being so arranged as to be actuated by the wiper *z*, on the shaft *P*, which wiper by its action on the said lever causes the cutter to be lifted up from the face of the file after every cut and before the movement made by the file carriage to feed the file blank *11*, or present it in condition for the next cut, the object of thus lifting the cutter being to enable it to rise out of the notch it has cut

and to pass over the bur raised on the file tooth produced by the previous cut, without injury to itself or to the said tooth. The lever *X*, has a spring *d'*, applied to hold it toward the shaft. The cutter guide *K*, has an opening *y*, *y*, in the back for the rod *t*, and pin *t'*, to work in.

z, is a small sliding piece of flat steel fitted easily into a transverse slot made through the front of the cutter guide *K*, opposite to the lower edge of the back part of the said guide, said back part not extending so far toward the edge or bottom of the cutter as the front part. This sliding piece *z*, has its inner extremity, which is presented toward the front of the cutter, rounded, as shown in Fig. 2.

To the front of the cutter guide and at one side of the sliding piece *z*, there is attached a journal box *5*, to which is fitted a short shaft *6*, which is furnished with an eccentric or cam *7*, which is situated exactly in front of the piece *z*. The said shaft *6*, has a lever *8*, secured to one end which lever is connected by a rod *10*, with a lever *Y*, arranged to work on the same fulcrum *x*, as the lever *X*, said lever *Y*, being so arranged as to be actuated by the wiper *e*, on the shaft *P*, and being held toward the said shaft by a spring *e'*. The action of the said wiper on the said lever *Y*, causes the said lever to act through the rod *10*, upon the lever *8*, of the shaft *6*, in such a manner as to cause the eccentric or cam *7*, to force the sliding piece against the front of the cutter *H*, and so to clamp the cutter between it and the lower edge of the back of the guide *K*, such clamping action always taking place after the feed movement of the carriage *D*, and after the cutter has been allowed by the action of the wiper *d*, to drop into contact with the file. It has been before observed that the cutter is fitted quite loosely in the guide block, and hence, when the cutter is clamped, as above described, it is capable of vibrating to some extent back and forth. It has also been observed that the guide block *K*, has a greater inclination from a vertical position than the hammer stem, and in consequence of its being thus inclined and of being capable of vibration, the blow of the hammer upon it will tend to throw back its head and throw forward its edge, by which means it is made to throw up a bur on every tooth in a similar manner to what is done in cutting files by hand, and which renders hand cut files so superior to files heretofore cut by machinery. The lower portion of the lever *Y*, is made elastic, to prevent the breaking of any of the connections by the continued action of the wiper *e*, upon it, after the cutter is firmly clamped by the sliding piece *z*.

Though I have described, and the drawing represents the cutter as being fitted to

the guide block K, the cutter may be secured in a stock that is fitted to slide in the said guide block, as herein described of the cutter.

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

1. Controlling the opening of the regulating valve of an atmospheric trip hammer employed in a file-cutting machine, for the
10 purpose of regulating the blow thereof and producing a uniform depth of cut from end to end of the file, by means of a pattern whose form corresponds with or has a proper relation to the longitudinal profile of the
15 file blank, applied and operating upon the said valve substantially as herein described.

2. In combination with the arrangement of the cutter guide block K, at a greater inclination from a vertical plane than the hammer stem and with the fitting of the
cutter or cutter stock loosely in said guide block, I claim the employment of a clamping piece z, or its equivalent, applied to the
said guide relatively to a proper bearing on
the opposite side of the cutter and operated
25 substantially as described, to produce the peculiar action of the cutter herein specified.

GEORGE W. FOGG.

Witnesses:

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