No. 717,706. PATENTED JAN. 6, 1903.

H. S. McCOOL.

BAR SEVERING MACHINE.

APPLICATION FILED OCT. 26, 1900.

NO MODEL.

Fig 2.

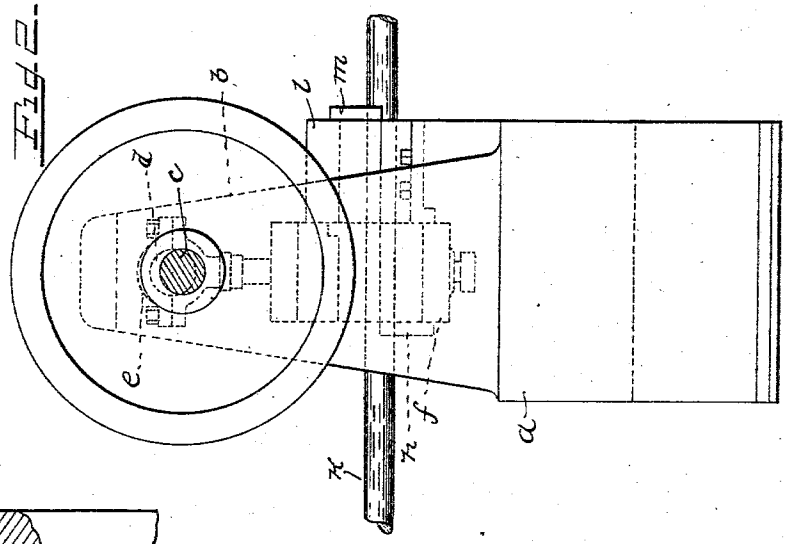


Fig 3.

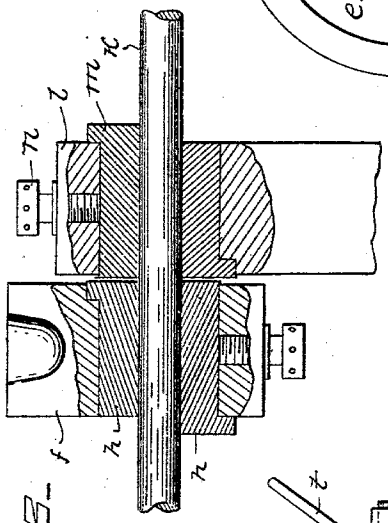
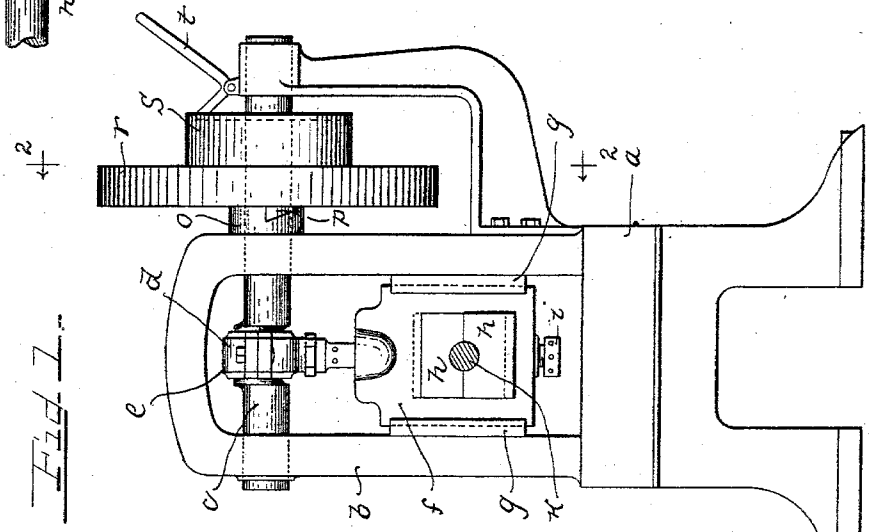


Fig 1.



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# UNITED STATES PATENT OFFICE.

HOWARD S. McCOOL, OF CHICAGO, ILLINOIS.

## BAR-SEVERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 717,706, dated January 6, 1903.

Application filed October 26, 1900. Serial No. 34,412. (No model.)

*To all whom it may concern:*

Be it known that I, HOWARD S. McCOOL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Bar-Severing Machines, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to bar-severing machines, and has for its object the provision of a machine which is adapted in its preferred embodiment to sever metallic rods or bars by exerting sudden transverse stresses thereon.

It is frequently of importance in severing metallic bars or rods that a smooth fracture thereof be obtained, and I have found that I am able to accomplish this result by fracturing the said bars by causing therein sudden stresses due to impact.

More particularly my invention in one embodiment thereof is designed to utilize the energy of a rapidly-rotating wheel to cause the rupture of a bar or rod by creating stresses therein through impact.

A further object of my invention consists in the provision of means, preferably comprising a pair of sleeves, to inclose the bar or rod to be severed and placed adjacent to the point at which the fracture is to occur. A sudden axial displacement of one of the said sleeves is then sufficient to sever the bar.

Further features of my invention in the preferred embodiment thereof will be more clearly set forth hereinafter.

I will describe my invention in detail by reference to the accompanying drawings, illustrating the preferred embodiment thereof, in which—

Figure 1 is a side elevation of a machine constructed in accordance with my invention. Fig. 2 is a sectional view on line 2 2 of Fig. 1, the bracket for supporting the driving-shaft being omitted; and Fig. 3 is a detail view, partially in section, of the bar-severing dies.

Like characters of reference indicate like parts throughout the different figures.

In the drawings I have shown my improved bar-severing machine as mounted upon a suitable base-frame *a*. A preferably U-shaped frame *b* is mounted upon the base-frame *a*, the said U-shaped frame supporting a driving-shaft *c* and at the same time supporting the guides for the reciprocating member of the machine. The shaft *c* is broken in its central portion to accommodate an eccentrically-mounted crank-shaft *d*. An eccentric-strap *e* is rotatably secured about the crank-shaft, which is adapted to transmit a reciprocatory motion to a plunger *f*, moving between suitable guides *g*, placed along the frame *b*. The plunger *f* has a preferably rectangular aperture, which is adapted to receive die *h*, held in place by means of a set-screw *i*. The die *h* is provided with an opening corresponding to the shape of the bar or rod *k* which it is desired to sever, in this instance being shown as a circular bar. A stationary die-supporting frame *l* is preferably fixedly mounted upon the base-frame *a* of the machine, a die *m*, corresponding, preferably, to the die *h* in the plunger *f*, being held in place by means of a set-screw *n*. The dies *m* and *h* are preferably so placed that the apertures therein through which the bar *k* is to be passed register at some point during the revolution of the shaft *c*, preferably when the crank-shaft *e* is at its uppermost position, as shown in the drawings.

The dies *m* and *h* are preferably so constructed that they firmly grip the bar *k* which is to be severed, and a slight vertical displacement of the plunger *f* will sever the bar *k* and cause a smooth break. To cause a rapid displacement of the plunger *f*, I employ a clutch mechanism, in this instance comprising a ratchet member *o*, keyed to the shaft *c*, and a pawl member *p*, fixedly secured to a preferably rapidly-rotating fly-wheel *r*, loosely mounted upon the shaft *c*. A pulley *s* is fixedly secured to the fly-wheel *r* and may be driven in any suitable manner to cause a rapid rotation of the said fly-wheel. A handle *t*, adapted to be actuated in any suitable manner, is provided to engage the pulley *s* and to cause the pawl *p* to engage the ratchet member *o*. The operation of the machine will now be readily understood. The fly-wheel *r* is rapidly rotated by the pulley *s*, the pawl *p* being out of engagement with the ratchet member *o*. The bar *k* which is to be severed is introduced between the dies *h* and *m* and firmly held in place by means of the set-

screws *i* and *n*. In order to sever the bar, the handle *t* is actuated to cause engagement between the pawl *p* and ratchet *o*, thereby rapidly causing a revolution of the crank-shaft *e*, and a consequent displacement of the plunger *f*. The impact due to the momentum of the rapidly-rotating fly-wheel is sufficient to sever the bar and cause a smooth break. I have found that in practice a slight displacement of only one-eighth of an inch may be sufficient to fracture large bars. In thus utilizing the momentum of the rapidly-rotating wheel to exert a sudden force against the bar *k* I am enabled to do away with heavy driving machinery necessary ordinarily to fracture metallic bars, as very little energy is needed in the machine of my invention to cause its effective operation. The dies *h* and *m* may preferably be divided into sections, so that the upper half of the die *h* may be made of tool-steel, if desired, as well as the lower portion of the die *m*, to provide a hard cutting-surface.

In the claims I have used the word "die" as representing the bar-inclosing portion which holds it in place so as to define the limits of the fracture.

I have herein shown and particularly described the preferred embodiment of my invention; but I do not wish to be limited to the precise construction as herein shown and particularly described; but,

Having thus described my invention, I claim as new, and desire to secure by Letters Patent, the following:

1. A bar-severing machine comprising relatively movable dies, the said dies inclosing the bar to be severed and means associated with one of said dies for storing mechanical energy and for applying the energy thus stored to cause a sudden actuation of said die to sever the said bar, substantially as described.

2. A bar-severing machine comprising relatively movable dies, said dies being provided with openings corresponding in cross-section to the cross-section of the bar to be severed and inclosing said bar, means associated with one of said dies for storing mechanical energy and means for releasing the energy thus stored and for applying it to one of said dies to cause a sudden actuation thereof, whereby the bar is fractured, substantially as described.

3. A bar-severing machine comprising relatively movable dies divided into sections, each of the said dies rigidly inclosing the bar to be severed, and means associated with one of the said dies for causing a rapid actuation thereof to sever the said bar, substantially as described.

4. A bar-severing machine comprising relatively movable dies divided into sections, each of the said dies being provided with openings corresponding in cross-section to the cross-section of the bar to be severed, and rigidly inclosing the said bar, and means associated with one of said dies for causing the rapid actuation thereof to sever the bar, substantially as described.

5. A bar-severing machine comprising relatively movable dies, the said dies inclosing the bar to be severed, a fly-wheel adapted to be rapidly rotated, and clutch mechanism interposed between one of the said dies and the fly-wheel to cause a rapid actuation of the said die to sever the said bar, substantially as described.

6. A bar-severing machine comprising relatively movable dies, said dies being provided with openings corresponding in cross-section to the cross-section of the bar to be severed, and inclosing the said bar, a fly-wheel adapted to be rapidly rotated, and clutch mechanism interposed between one of the said dies and the fly-wheel to cause a rapid actuation of the said die to sever the said bar, substantially as described.

7. A bar-severing machine comprising relatively movable dies, said dies inclosing a bar to be severed, a driving-shaft, eccentric mechanism coöperatively associated with said shaft to actuate one of the said dies, a fly-wheel loosely mounted upon said shaft, adapted to be rotated, clutch mechanism interposed between the said fly-wheel and said driving-shaft, and means to actuate the said clutch mechanism, thereby to cause a rapid actuation of the last-aforesaid die, substantially as described.

8. A bar-severing machine comprising relatively movable dies, each of said dies being provided with openings corresponding in cross-section to the cross-section of the bar to be severed, and each rigidly inclosing the said bar, and means associated with one of the said dies for causing the rapid reciprocation thereof to sever the said bar, substantially as described.

9. In a machine for severing bars, the combination with clamps adapted to rigidly grasp and retain the bar at two points, of means for actuating one of said clamps relatively to the other and simultaneously applying therethrough a sudden impact to the bar, substantially as described.

In witness whereof I hereunto subscribe my name this 29th day of August, A. D. 1900.

HOWARD S. McCOOL.

Witnesses:
MAX W. FABEL,
HARVEY L. HANSON.