

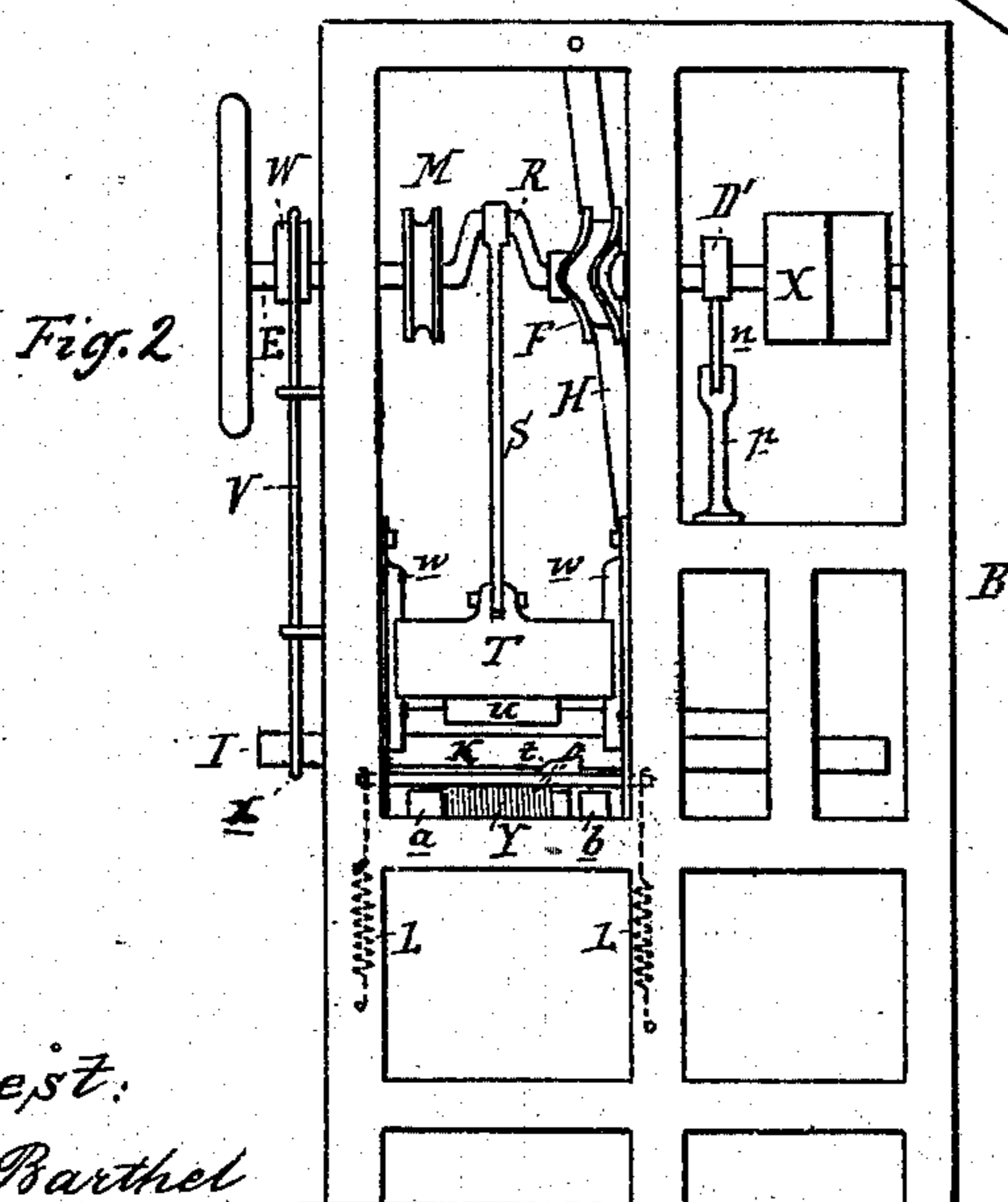
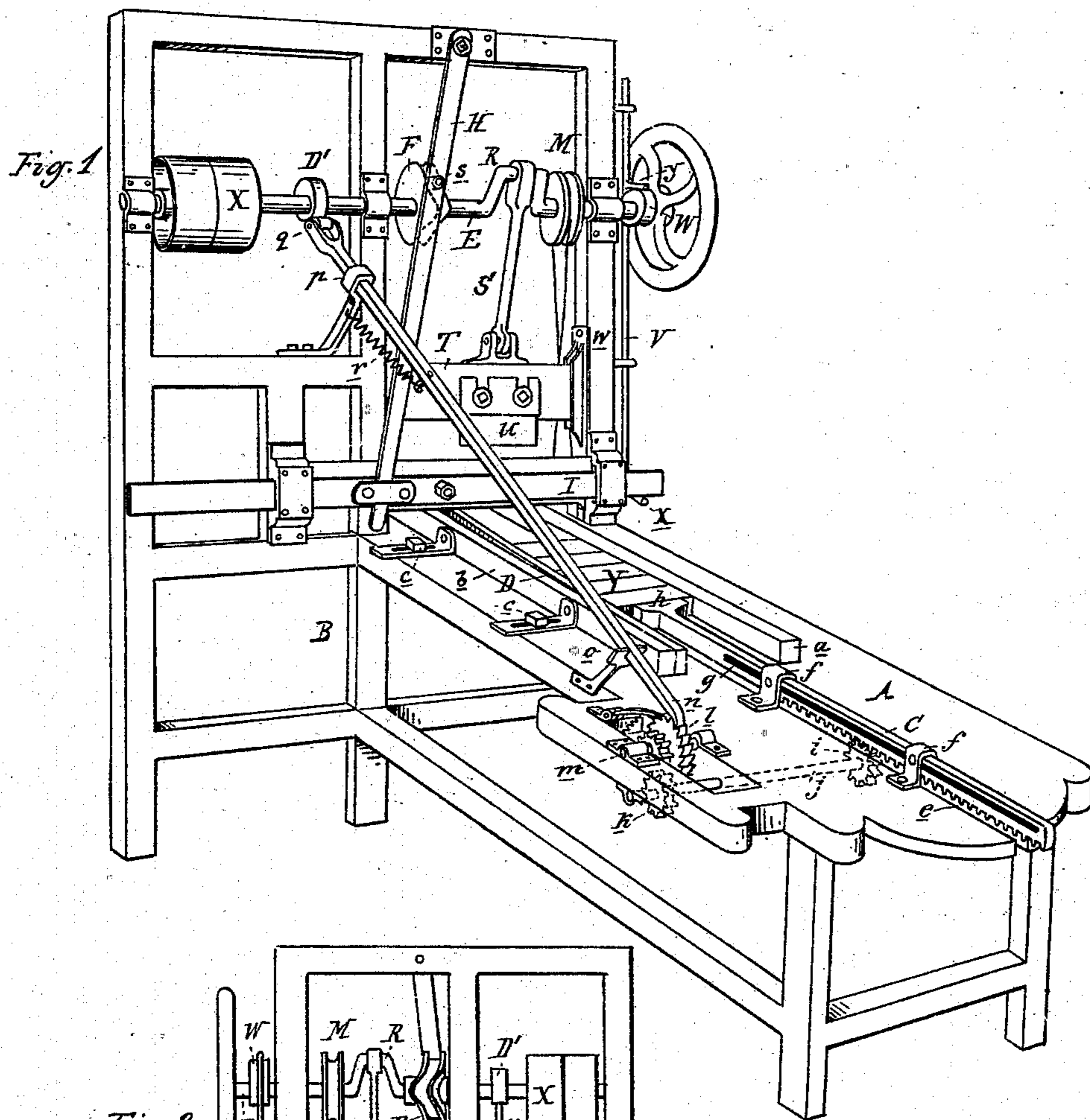
(No Model.)

2 Sheets—Sheet 1.

P. BEER.  
MATCH MACHINE.

No. 272,113.

Patented Feb. 13, 1883.



Attest:  
A. Barthel  
N. J. Sprague

Inventor:  
Peter Beer  
by N. J. Sprague  
att'y

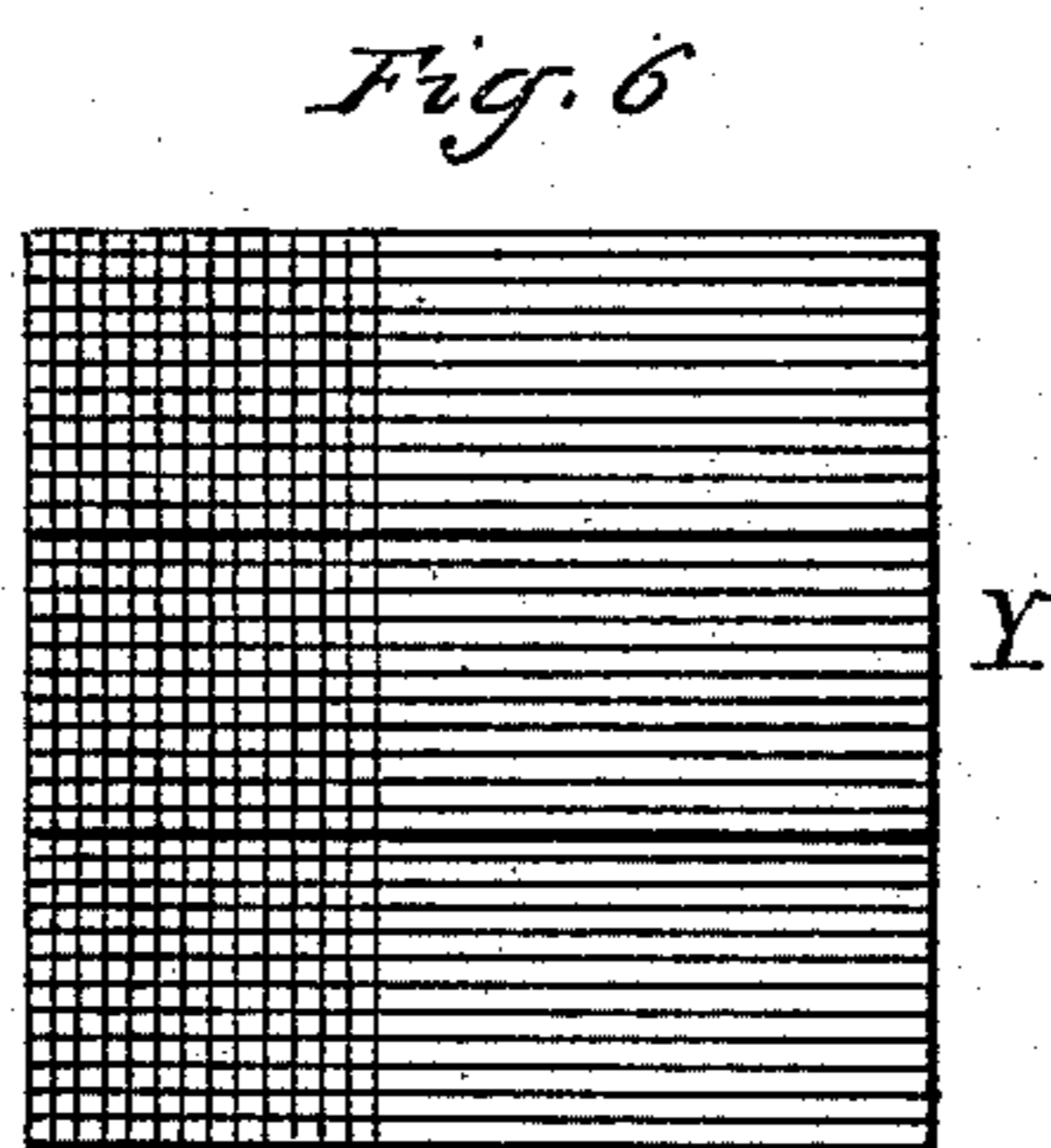
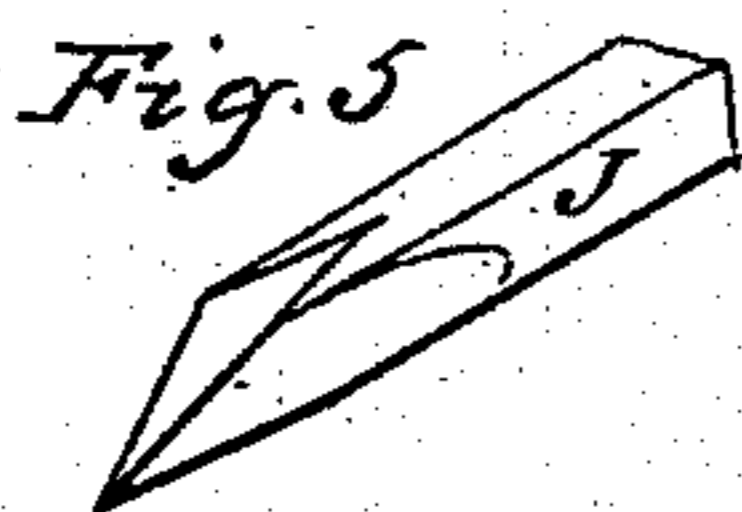
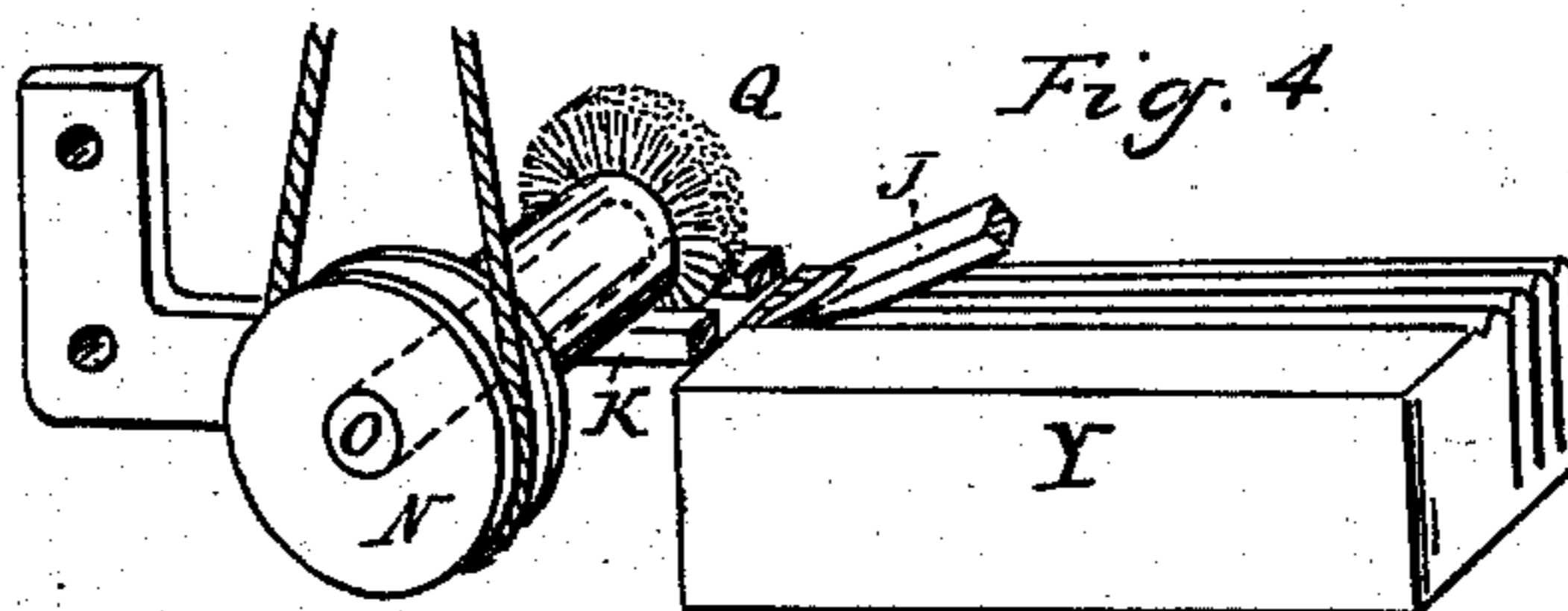
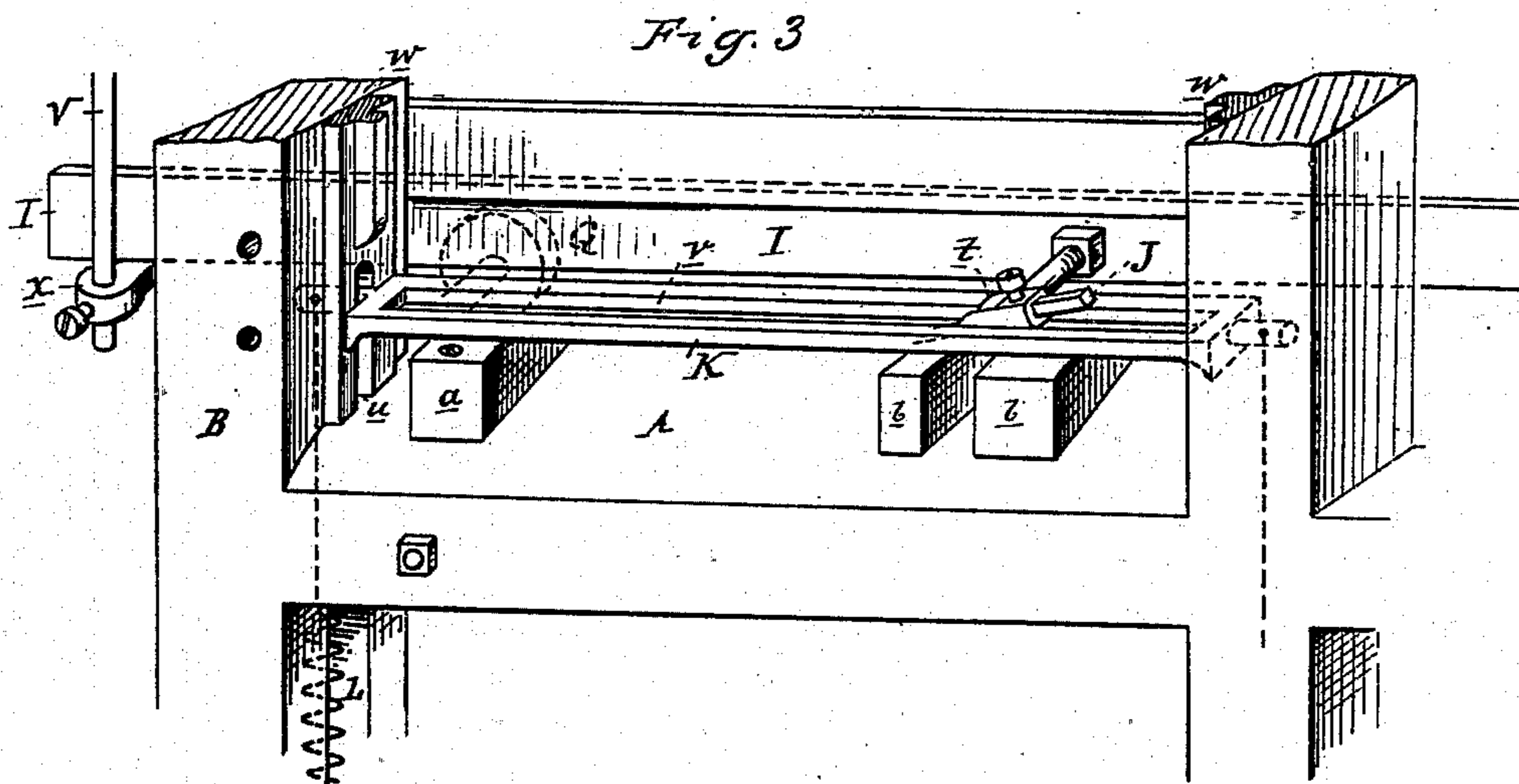
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Inventor:  
Peter Beer  
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# UNITED STATES PATENT OFFICE.

PETER BEER, OF DETROIT, MICHIGAN.

## MATCH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 272,113, dated February 13, 1883.

Application filed August 17, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, PETER BEER, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Match-Machines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

The nature of this invention relates to certain new and useful improvements in the construction and operation of that class of machines employed to prepare blocks cut into proper lengths for matches, whereby the block is split in both directions, not fully through, but to such a distance as allows each match to be detached from the group, while the end to be dipped is conically squared upon its four sides, with a squared end, like the apex of a cone cut off, in order that in the process of dipping each particular splint of the group will take up the necessary material sufficient for the purpose without the material running together, so as to stick the matches together and render it difficult to detach a match without detaching the material from the end of the adjoining one.

Figure 1 is a perspective view of my machine. Fig. 2 is a rear elevation. Fig. 3 is an enlarged sectional detail, and Fig. 4 is a detail showing a brush attachment for clearing the block in the pathway of the graver. Fig. 5 is a detached sectional perspective view of a graver. Fig. 6 shows the method of treating the end of the block, and Fig. 7 is a detached match-splint made by my machine.

In the accompanying drawings, which form a part of this specification, A represents the bed of my machine, and B the frame which supports the operating parts.

Upon the bed A there is secured a straight fixed guide, *a*, and another guide, *b*, adjustable laterally by means of the bolts and nuts *c*. This latter-named guide is bifurcated from the point D to its rear end; or, rather, it is wider at its rear end, and a V-shaped piece is cut out from the point D to the rear end, in order to give the rear end of such guide a tension upon the blocks, as will hereinafter be described.

C is a feed-rack supported over a slot, *e*, in said table by means of the yoke *f*, through which suitable pins run, which engage with a slot, *g*, in the rack. The end of this rack ter-

minates in a follower, *h*, and movement is given to this rack by means of the pinion *i* upon the shaft *j*, to which motion is communicated by the pinions *k*, ratchet-wheel *l* upon the shaft *m*, pawl *n*, which is supported in guides *o* and *p*, and eccentric D' on the main driving-shaft E, said eccentric engaging with the friction-roller *q* in the upper end of said pawl.

To retract the pawl a spring, *r*, is employed, one end of which is secured to the guide *p* and the opposite end to the pawl; or the pawl may be rigidly secured to the guide P, which in that case would be a spring-arm adapted to retract the pawl. The object of this mechanism is that, when the blocks from which the matches are formed are to be operated upon, this feed mechanism will feed them to the graver and cutter at stated intervals, being the thickness of the match desired to be cut.

Upon the main shaft E there is also a grooved cam, F. An arm, H, is pivotally secured to the top of the frame, and provided with a pin projection, *s*, designed to engage in the groove of the zigzag cam, while the lower end of this arm is so attached to the reciprocating bar I that in the rotation of the zigzag cam a quick lateral reciprocating motion is given to the bar, to the rear of which is attached the tool-holder *t*, which carries the graver J.

K is a slotted presser-bar, the ends of which are within the slots *u* on the inner sides of the vertical part of the frame, as shown in Fig. 3, and each end of said presser-bar is secured to a spring, L, to compel its action, and it is also provided with the slot *v*, within which the graver reciprocates, and the sides of the slot act as guides in the reciprocation of such graver.

Upon the main driving-shaft there is a pulley, M, and a proper belt running over said pulley gives motion to a pulley, N, on the counter-shaft O, which runs in a bearing secured by means of a bracket, P, and carries a revolving brush, Q, so situated that as the graver completes its stroke and channel across the face of the block said brush sweeps the accumulated chips and dust from the graver, which otherwise in its return-stroke would deposit such dust upon the face of the block, and when the latter was dipped in the sulphur the dust would become mixed therewith, to the great injury of the perfected match. The main shaft E is provided with a crank, R, and a pitman, S, prop-

erly secured to said crank, gives a vertical motion to the cross-head T, which runs in guides *w* and carries the splitting-knife U.

To enable the graver to make its return-stroke without traveling in the channel which it has just cut in the first half of its reciprocation, and allow the block under treatment to be fed at proper distance for another stroke of the graver, the bar I rests at one end upon an arm, *x*, at the end of the rod V, which is provided with a projecting arm, *y*, which engages with the cam W upon the shaft, so arranged that at the proper time the cam in its rotation will lift that end of the bar I until the graver is free from the face of the block, which it passes over in the last half of its reciprocation, leaving the block free and clear.

In practice the ratchet-bar C is withdrawn, and a series of blocks of proper size to form a group of what are known to the trade as "block" matches is placed between the guides *a b*, and motion communicated then to the machine through the driving-pulleys X on the main shaft.

The graver travels over the blocks, which are marked Y, cutting a series of grooves, as hereinbefore described, and as shown in Fig. 6, and the device is so arranged that in the return-stroke of the graver the blocks are fed forward between the guides, the peculiar formation of the guide *b* tending to hold them rigidly in place and form a partial resistance to the action of the feed mechanism, the cutting-knife descends, its point entering the center of the groove last cut, and its stroke, being limited by the crank, partially severs the block, but leaving the lower end in contact. After the series of blocks have been all grooved and cut in one direction they are changed to produce the cross cuts and grooves, and this action leaves them in a compact block in proper position to be dipped and separated by the finger, one by one, as they are required for use.

What I claim as my invention is—

1. In a match-machine, and in combination

with a splitting-knife, a reciprocating graver for beveling one end of the series of matches, and a revolving brush for clearing such graver of dust, &c., all worked by a common power, as set forth.

2. The feed-rack C and follower *h*, combined with the eccentric D' on the main shaft, the pawl *n*, having roller *q*, the pinion *l*, and connecting-gear, with the feed-rack C and with the spring *r*, as and for the purpose of feeding the blocks forward the width of one match at a time.

3. The graver J, holder *t*, combined with the bar I, lever H, cam F, having zigzag groove, and main shaft, for the purpose of operating the graver alternately with the stroke of the feeder, as set forth.

4. The bar I, graver J, and their operating means, combined with the bar V, having arms *x y*, and the cam W, whereby the graver is thrown out of its channel to allow the feeding of the blocks forward as the graver is making its backward stroke.

5. The reciprocating graver J and the brush Q, operated by the same power, said brush being adapted to clear the graver of accumulated chips, &c., before it makes its return-stroke, as set forth.

6. The graver J and operating connections with the power-shaft, combined with the brush Q, shaft O, and pulleys N M, as specified, for the purposes set forth.

7. The slotted presser-bar K, having longitudinal slot *v*, in which the graver reciprocates, combined with springs L, the graver, and operating means, as set forth.

8. The cutter U, graver J, duster Q, and feed mechanism, combined with the mechanism for shifting the graver for its return movement, and with the main shaft E, the whole being operated automatically, as set forth.

PETER BEER.

Witnesses:

H. S. SPRAGUE,

E. W. ANDREWS.