

"Improved Boiler Rivet Machine."

PATENTED JUL 18 1871

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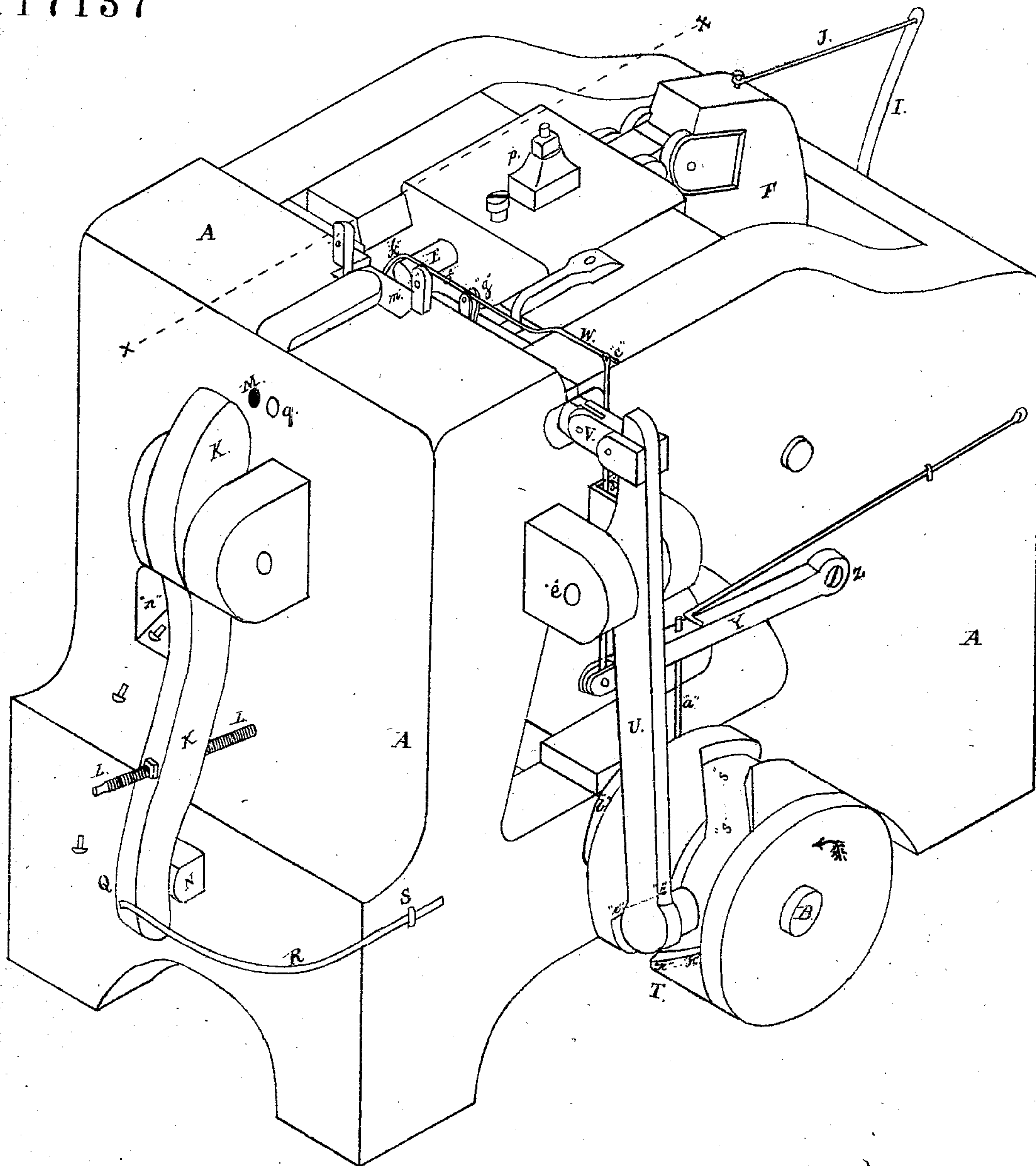


Fig. 1:- Isometrical View.

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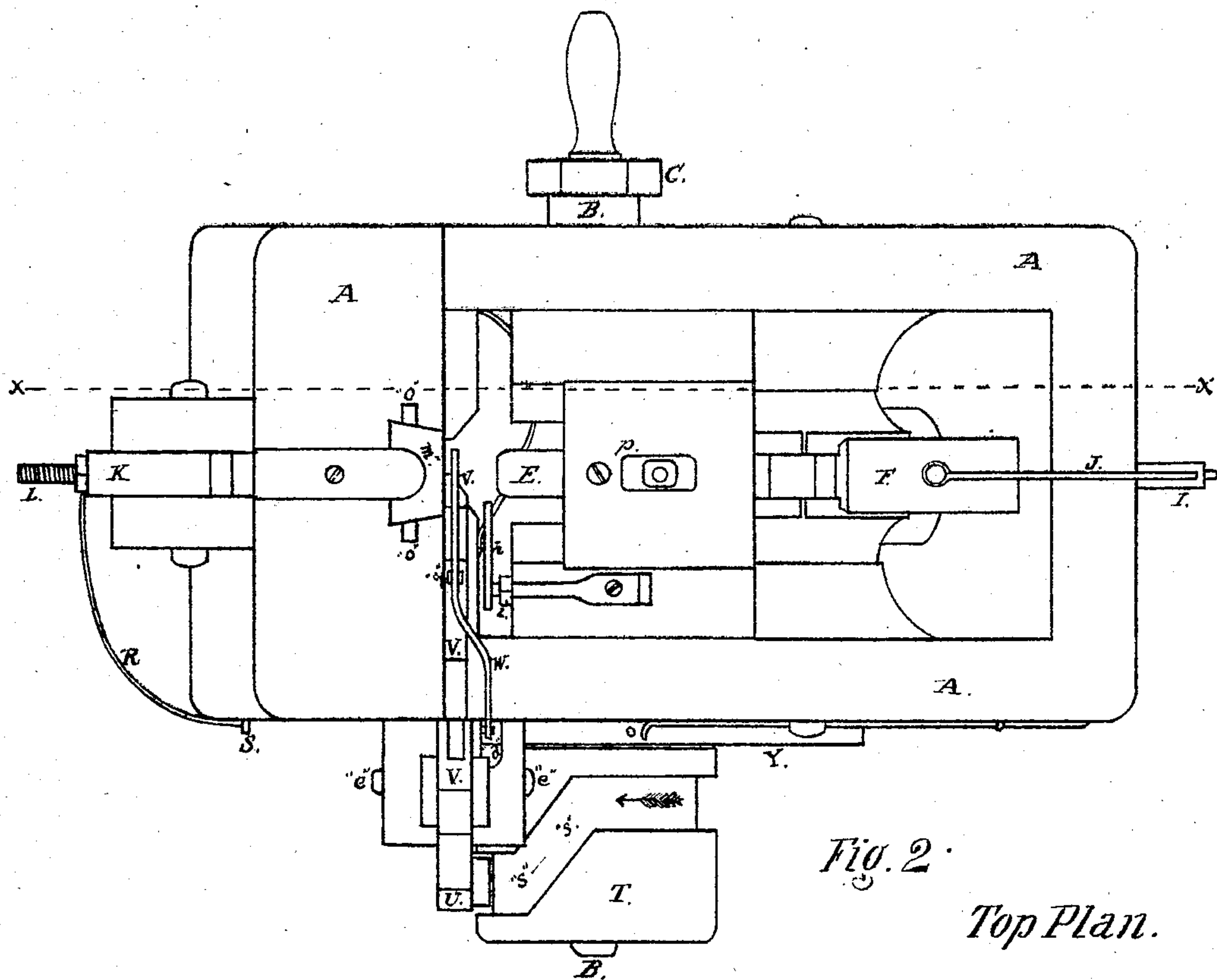


Fig. 2.

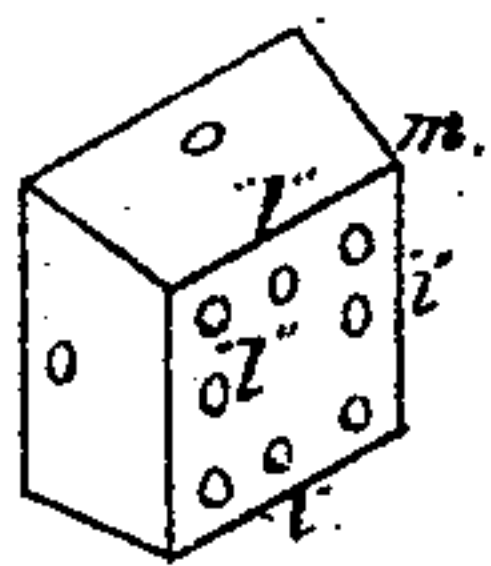
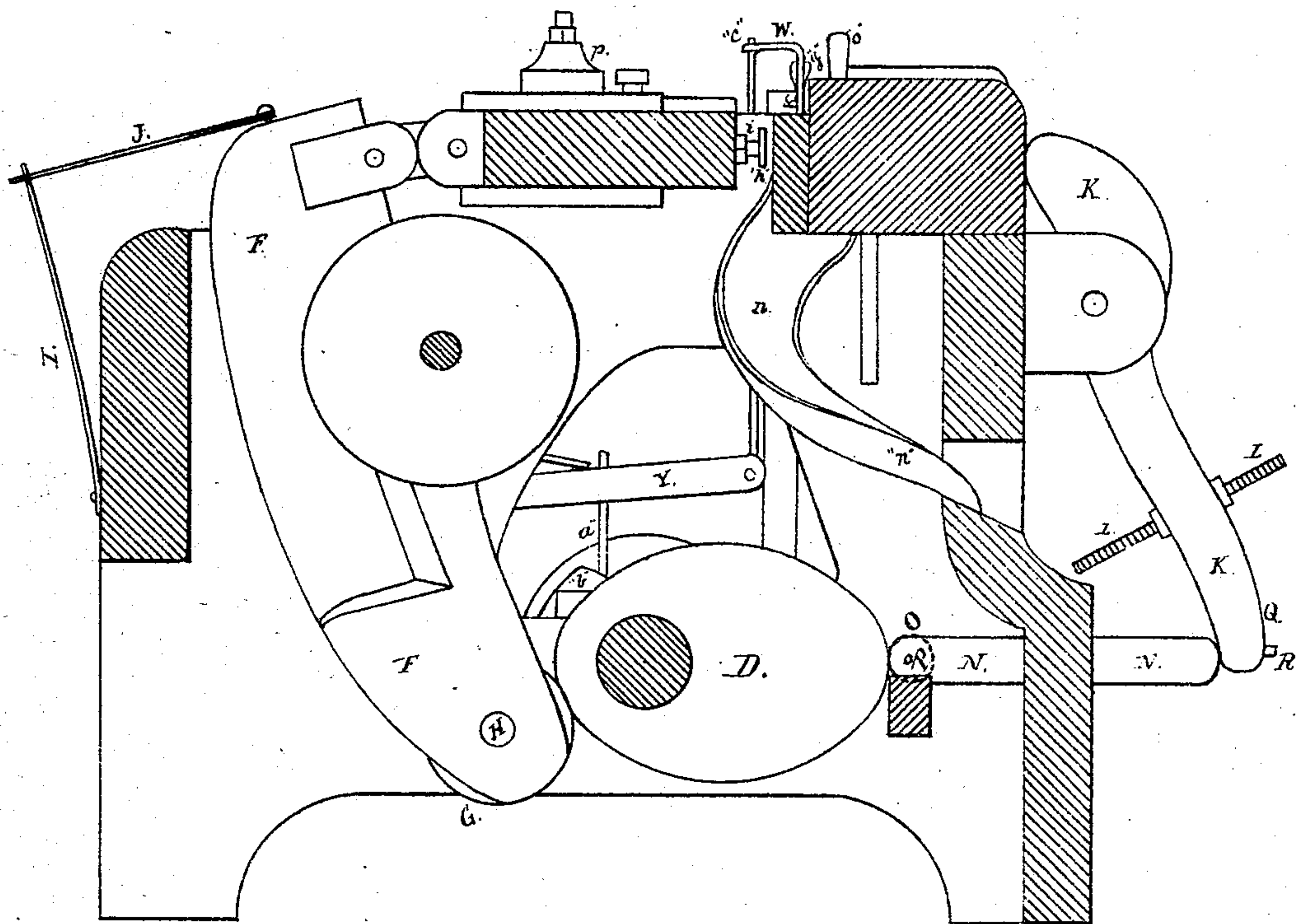
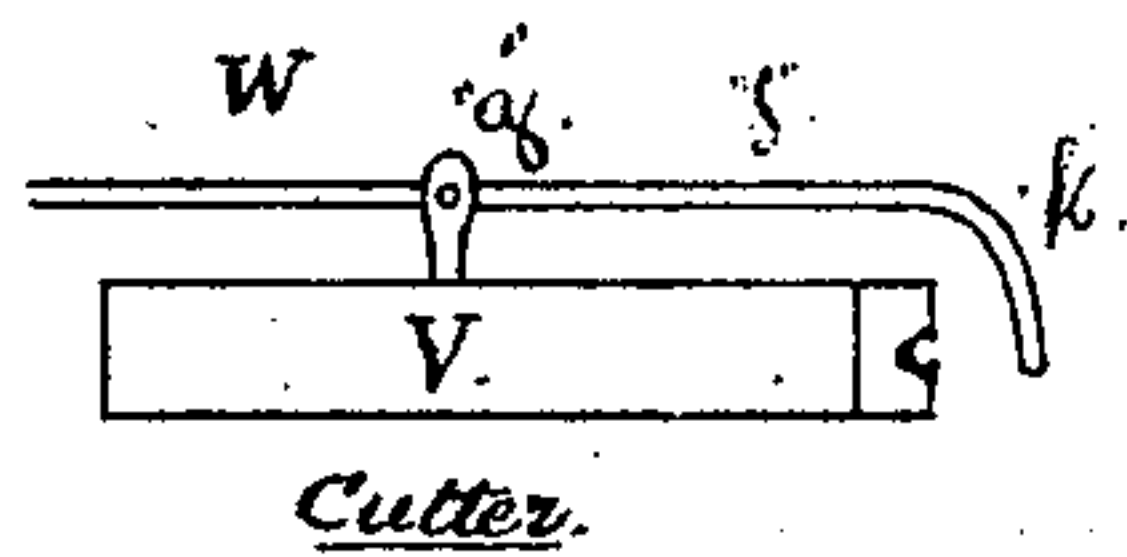
Top Plan.

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"Improved Boiler Rivet Machine."



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Fig. 3.- Section x---x. Figures 1 & 2.

UNITED STATES PATENT OFFICE.

CHARLES B. ALLEN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN BOILER-RIVET MACHINES.

Specification forming part of Letters Patent No. 117,137, dated July 18, 1871.

To all whom it may concern:

Be it known that I, CHARLES B. ALLEN, of the city of Philadelphia, State of Pennsylvania, have invented an Improved Boiler-Rivet Machine, of which the following is a specification:

The first part of my invention relates to the combination of two levers, one working the header, the other the plug to knock out the rivets by means of a sliding bar and cam, so that at each revolution of the cam a rivet is headed and, sufficient time being allowed the rivet to cool and shrink in the die, knocked out without any difficulty. The second part of my invention relates to the combination of a side lever for working the cutter with the finger, holding the rivet while being carried forward to be headed, operated by a cam-motion produced by means of ordinary devices, such as oblique grooves, shoulders, &c., on wheels keyed to the shaft of the principal cam. The third part of my invention relates to the arrangement of the die, whereby a solid block of metal with central holes of the requisite size or sizes is used until worn, when, by reaming out, the same block can be reused for producing rivets of the next larger diameter.

Figure 1 is an isometrical view of the machine, showing the header, knock-out, and side levers with the finger attachment. Fig. 2 is a top plan, showing clearly the method of producing the cam-motion for operating the side lever. Fig. 3 is a vertical transverse section, showing those parts of the machine which are at the lower side of the line *xx* drawn across Fig. 2, and right side of the line *xx* drawn across Fig. 1.

A is the frame of the machine, substantially constructed to resist the vibrations of the operating parts. B is the main shaft, worked by a driving-pulley, C, and from which motion is communicated to the other parts of the machine. D is the cam, operating the header E by means of the lever F, which is cast with jaws and has a roller, G, set upon an axle, H, between them to diminish friction, the lever F being assisted in its return motion by a spring, I, or similar device, connected with the head of the lever by rod J. K is the knock-out lever, adjusted by means of screw L, and which, not striking the plug M until after the rivet is headed and nearly a half-revolution of the cam completed, permits the rivet to cool and to be struck out without difficulty. N is the sliding bar with roller O, indicated by dotted lines

in black ink in Fig. 3, which set between jaws cast at end of the bar, and, revolving on pinion P, also diminishes friction. This sliding bar works through an opening at the lower side of the frame opposite the lower end of the knock-out lever, and communicates the blow received from the cam to the lever, which is assisted in its return to its original position not only by the weight of its lower portion Q, but by a spring or bar, R, fastened to the side of the frame, as at S. T is the wheel, keyed upon the axis of the principal shaft B, with a groove, in which the lower end of the lever U works, cut in such a manner as to produce the cam-motion the same as though the lever was worked by a very rank cam operating in the direction of the motion of the lever, and adjusted so as to act in contact with the other and principal cam, as hereafter described. V is the cutter, operated by this side lever U. This cutter is accompanied in its forward motion by the finger W, supported at its lower end by a rod, Y, turning upon a pivot, Z, and resting at its center by means of a support, *a*, upon a wheel, *b*, made with a shoulder and keyed upon the principal shaft B, or cast as part of the wheel T. W, the finger, is jointed at *c*, and works through an opening, *d*, in one of the lugs, supporting the pin *e* of the lever U, and is supported at its upper end *f* by a pin turning in jaws *g*, fastened to the cutter V, so that while playing freely up and down in the jaws, according as the lower support *a* rests upon the periphery of the wheel *b* or its shoulder, the finger travels back and forth with the cutter V. *h* is the gauge-bar, fastened onto the frame of the machine, and adjusted by screw and nuts at *i*, by which the length of metal to be cut off for each rivet is regulated, each rivet being held firmly in its place after being cut off by the end *k* of the finger W until opposite the central opening *l* in the die *m*, when the header E, having advanced and taken hold, the finger is instantly relaxed, flying upward, the rivet headed by the header E and allowed to cool in the die, which is kept cool by means of a constant supply of water introduced around it by means of a pipe fed from beneath or in any convenient method. After having cooled off during the half-revolution of the cam D, the headed rivet is knocked out by the lever K and plug M, and falls through the discharge-trough *n*, as represented in Fig. 1. *m*, the die, is cast solid, with usually eight openings,

so that an alternate pair of openings may be used, the corner holes being a sixteenth of an inch larger in diameter than the central ones, and the central ones made of exactly the size requisite to produce the rivets needed. By this means, even when worn out for one size, by reaming out, the die can be reused for the next size larger, and the expense attending the old process avoided. The die *m* is adjusted by side pins or wedges *o*, and the header *E* by means of wedges, nuts, and screws at *p*.

The bar of heated metal is fed through the opening *g*, the side lever being then in that portion of the groove in the wheel *T* nearest the body of the machine, (indicated on Fig. 2 by an arrow in black ink.) The length of the cut off having been already regulated by the gauge-bar *h*, adjusted as already described, motion is communicated by belting attached to the main shaft *B*. The side lever *U*, traveling in the diagonal portion *r r* of the groove in wheel *T*, advances the cutter *V*, while the shoulder cast on the wheel *b* raises the rod *Y* and jointed portion *C* of the finger, which, secured at *f*, falls against the circular opening in the cutter, and, by its lower extremity *k*, secures the piece of metal when severed by the cutter until it is brought opposite the axis of the central opening *l* in the die, adjusted so as to be exactly opposite the center of the opening in the frame of the machine in which the plug *m* is worked. During this time the cam *D* has pressed forward the header *E*, and the instant the bar is seized and being pressed into the central opening the support *a* drops from the shoulder of the wheel *b* upon its periphery, causing the extremity *k* of

the finger to release its hold and fly up, while the side lever, traveling in the direction of the diagonal portion of the groove in wheel *T*, marked *s s*, draws back the cutter ready for another rivet, in which position it continues until the groove is traversed to *r r* again. Meanwhile, the rivet being headed and cooled, the cam *D* strikes the sliding bar, which forces the knock-out lever against the plug *M*, which ejects the rivet into the discharge-trough *n*. The rankness of the cam-motions and the sudden drop by means of the shoulder on wheel *b* produce an instant blow and release just at the times needed, while interval enough is allowed to cool the rivet before being ejected.

I claim as my invention—

1. The die *m*, provided with two or more holes, in combination with the cutter *V*, the finger *W* pivoted on said cutter, and the mechanism described for operating the cutter and finger to grasp and carry forward the rivets to the die, substantially as described.

2. The header *E*, lever *F*, and cam *D*, in combination with the subject-matter of the first claim, substantially as described.

3. The pin *M*, lever *K* provided with adjusting-screw *L* and mechanism, as described, to vibrate said lever, in combination with the subject-matter of the first claim.

4. The combination of the pin *M*, lever *K* provided with the adjusting-screw *L*, sliding bar *N*, and cam *D*, substantially as and for the purpose set forth.

Witnesses:

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