(No Model.)

3 Sheets—Sheet 1.

A. MARLAND.

NUT MACHINE.

No. 385,128. Patented June 26, 1888.

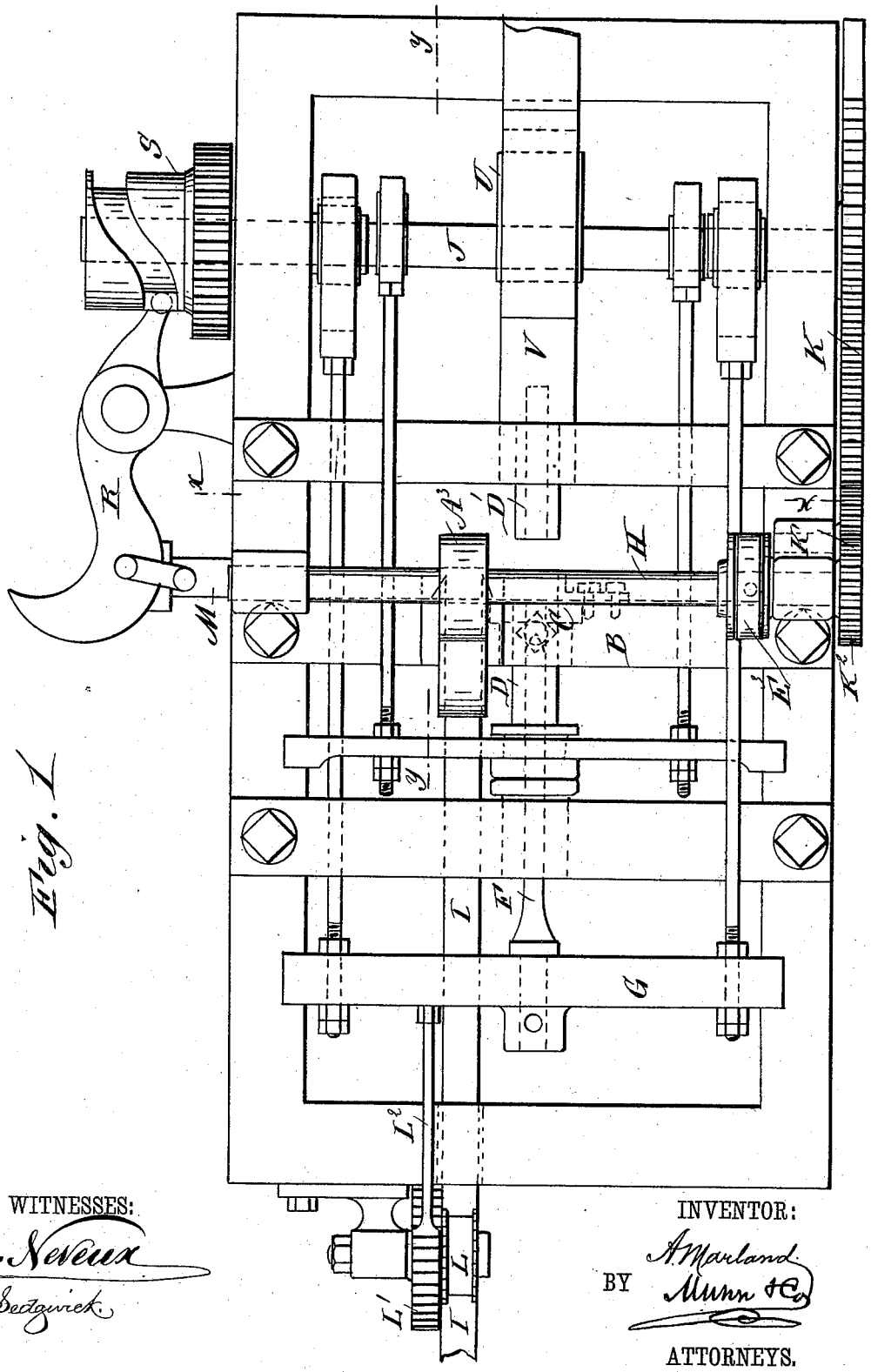

Fig. 1.

WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR:

A. Marland.

BY Munn & Co

ATTORNEYS.

(No Model.) 3 Sheets—Sheet 2.

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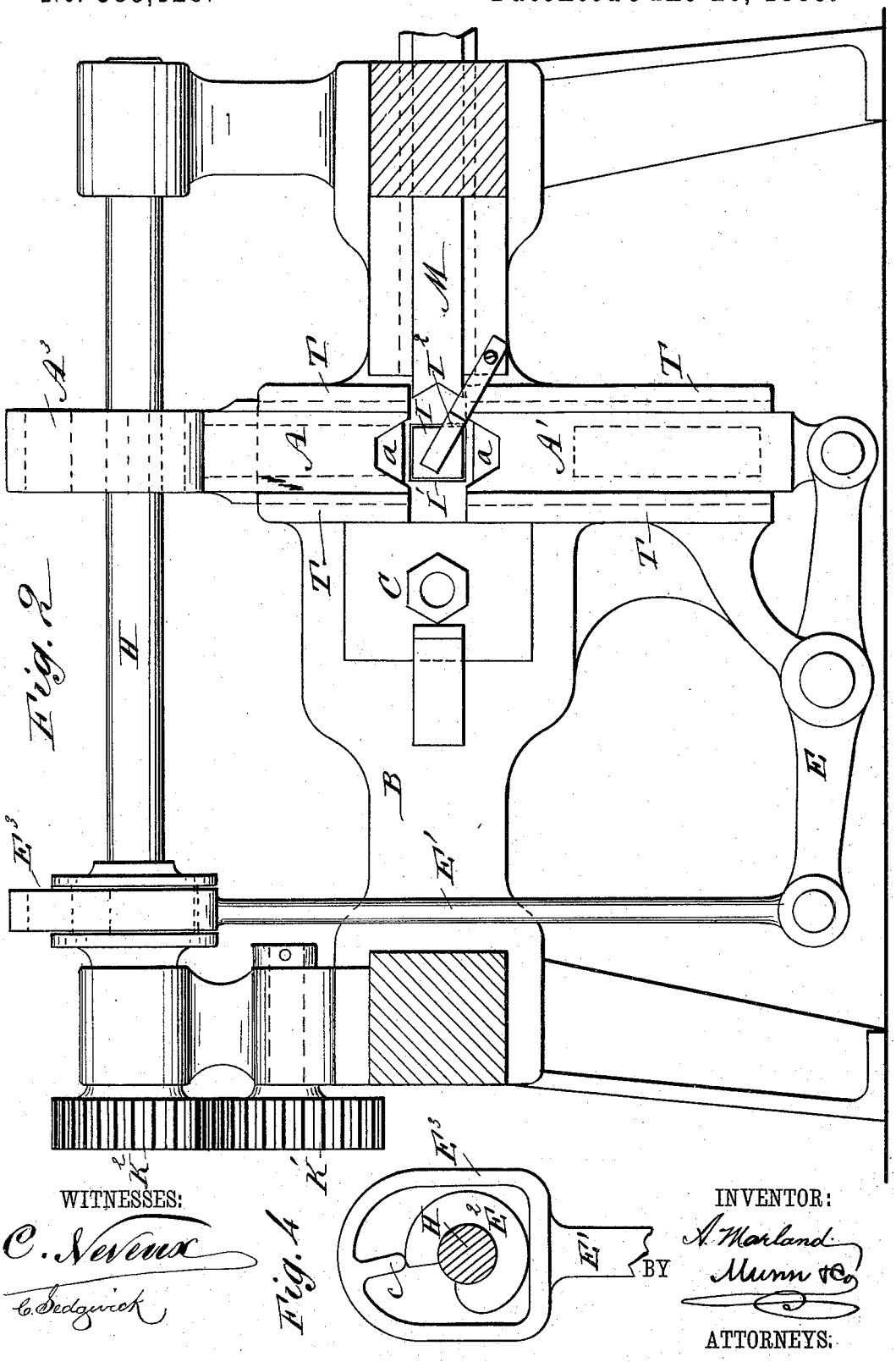

Fig. 2

Fig. 4

WITNESSES:

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INVENTOR:

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(No Model.)

3 Sheets—Sheet 3.

A. MARLAND.

NUT MACHINE.

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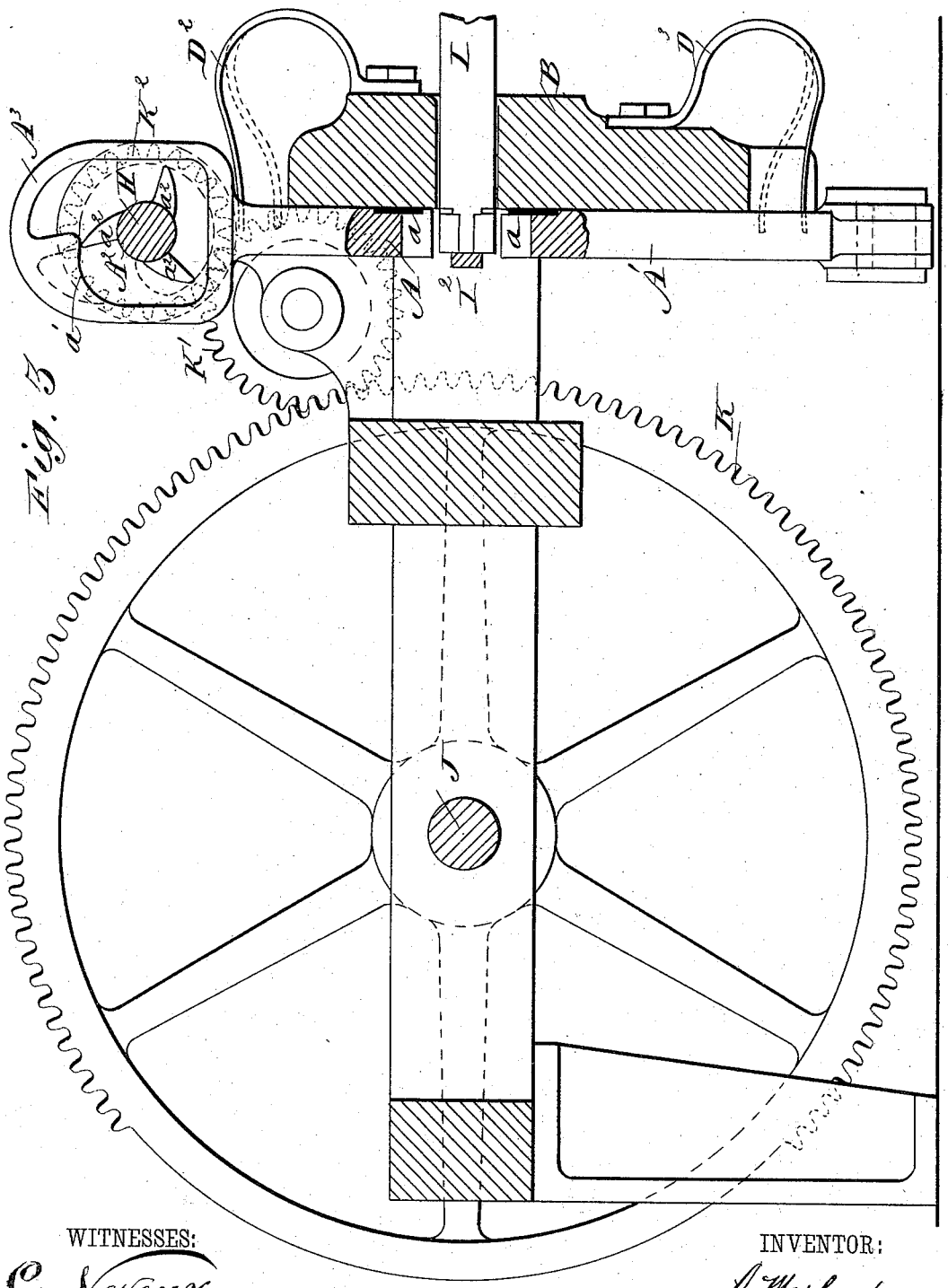

Fig. 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ALFRED MARLAND, OF PITTSBURG, PENNSYLVANIA.

NUT-MACHINE.

SPECIFICATION forming part of Letters Patent No. 385,128, dated June 26, 1888.

Application filed February 21, 1888. Serial No. 264,722. (No model.)

To all whom it may concern:

Be it known that I, ALFRED MARLAND, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Nut-Machines, of which the following is a full, clear, and exact description.

This invention relates to a machine for making hexagonal or other polygonal nuts from a flat bar of iron or soft steel without waste of material other than that comprised by the core or punching forced out in making the eye of the nut.

Heretofore machines for the manufacture of nuts have been distinguished as between hot-hammered nut-machines and hot or cold pressed nut-machines, while my invention consists in a machine that will first hammer the iron or steel to the shape I desire the nut to have, and then slightly press the blank, so as to remedy any defect the hammering may have left, and then punching the eye of the nut while under pressure. In hammering the bar in the shape I desire the nut to have I use two movable swages, which work vertically with the cross-bar or die-box, (marked B,) and in front of said die-box, and are operated by revolving shafts and cams, so as to hammer the blank in shape, and then I carry the blank by means of a carrying-finger into position and in line with the forming-die, where it is forced in and punched, as hereinafter described. Nuts thus made are more uniform and much better than those which are only pressed and punched, or those that are only hammered and punched.

My present invention therefore combines the good qualities of both the hot-hammering and hot-pressing nut-machines.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of a nut-machine having my present invention applied thereto. Fig. 2 is an enlarged transverse sectional elevation taken on the line *x x* of Fig. 1. Fig. 3 is an enlarged sectional view taken on the line *y y* of Fig. 1, and Fig. 4 is a detailed view of the cam and eccentric for reciprocating the lower swage.

With my present invention I take a flat bar or rod, I, of iron, and, after heating the same, place the end of it to the cross-bar or die-box B, which holds the box I′ parallel with the die C, which latter formerly had to bear the strain of a great pressure, but is now greatly relieved by the blank being swaged into shape by the two swages A A′, which work in a dovetailed slide, T T, attached to said cross-bar or die-box B, said swages being operated by a shaft, H, which runs parallel and in line with the main shaft J, and, as hereinafter described, moves the upper swage, A, many times faster than the lower swage, A′, is moved, so as to hammer gradually the end of the bar until a blank is formed of desired shape. Attached to each swage or hammer A A′ is a steel knife, *a*, and as the swages or hammers operate the said knives gradually cut the rod, and by the time the two swages meet, the blank is thus formed and is nearly severed from the rod. The blank is then pushed forward through and along the front of the cross-bar B by the carrier M, which is reciprocated by the lever R, which is rocked upon its central pivot by the cam S, secured to the main shaft J, or by some other mechanical motion. The carrier M then carries the blank along to a position in line with the forming-die C and the compressing-die D′, which latter is adapted to be forced forward by the cam U on main shaft J and the sliding yoke V, against which the said cam acts for forcing the blanks in the forming-die, where the ends are compressed by dies D D′, and the hole punched by the punch F in a manner well known to nut-makers.

The shaft H is revolved from the main shaft J by the cog-wheels K K′ K² and reciprocates the hammers or swages A A′. The hammer or swage is reciprocated at a rapid speed by means of the three-faced cam or tappet A², which works against the curved cam or projection *a′*, formed in the yoke or bow A³, connected to the upper end of the swage A. The lifting of the swage by the projections *a²* of the cam A² puts a tension upon the spring D², which, when each projection passes the curve *a′*, projects the swage downward with great force.

The lower hammer or swage, A′, is given a comparatively slow reciprocating motion by the centrally-fulcrumed lever E, (see Fig. 2,) connecting-rod E′, the cam E², secured on the

shaft H, and the yoke E^3, connected to the upper end of the connecting-rod E'. This yoke is formed with a single projection, *c*, and the cam E^2 is formed with a cavity, *c'*, into which said projection drops. The lowering of the hammer or swage A' puts a tension upon the spring D^3, (the normal position of which is indicated in dotted lines in Fig. 3,) which acts to throw the swage A' violently upward when released by the eccentric E^2 and projection *c*. The lower swage may be also operated by a shaft driven by a cog-wheel, the same as the upper swage.

The rod, I, from which the blanks are cut is fed from the rear of the machine parallel with the motion of the dies D D' and punch F, and said bar may be fed by hand; or it may be fed automatically by a feed-roller, L, ratchet-wheel L', and pawl L^2, connected to the cross head G, which carries the punch F, and is reciprocated by eccentrics on the main shaft J and connecting-rods. The distance of insertion of the bar I in the box I' is limited by the stop-arm I^2. (Shown in Fig. 2.)

Heretofore in making hexagonal nuts of flat or bar iron there has been great waste of material, equaling about fifty per cent. of the iron used, and in making hexagonal nuts out of round iron it is found extremely difficult to make a nut with all its sides well filled out by compressing it in a matrix or die-box, as is now done; but by taking flat or other shaped bars and first swaging them down to the desired form, whereby the corners of the blank become well filled out, and then subjecting them to a slight pressure in a closed die-box and punching out the eye of the nut while under pressure, gives the product the character of hot-hammered as well as hot-pressed nuts, and makes them stronger and far more uniform. The hammering solidifies the grain of the iron, and the nuts do not crack and split, as hot-pressed nuts as now manufactured very often do.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the cross-bar B, having the box I', of the swages A A', and means, substantially as described, for reciprocating one swage at a greater speed than the other, substantially as described.

2. The cross-bar B and the swages A A', having knives *a a*, in combination with means for reciprocating the swages, substantially as described.

ALFRED MARLAND.

Witnesses:
JOHN C. THOMPSON,
JAMES G. MONTGOMERY.