

(No Model.)

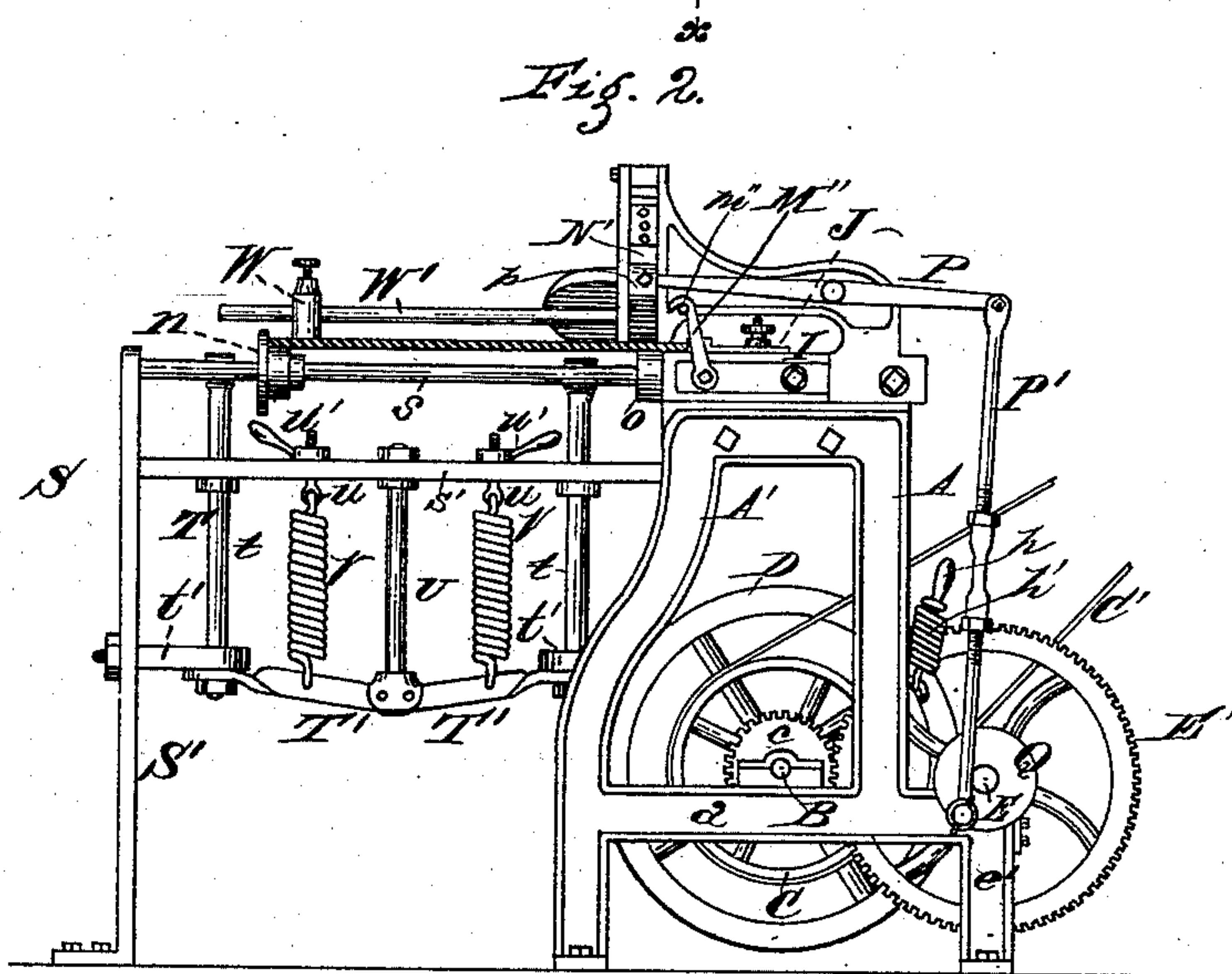
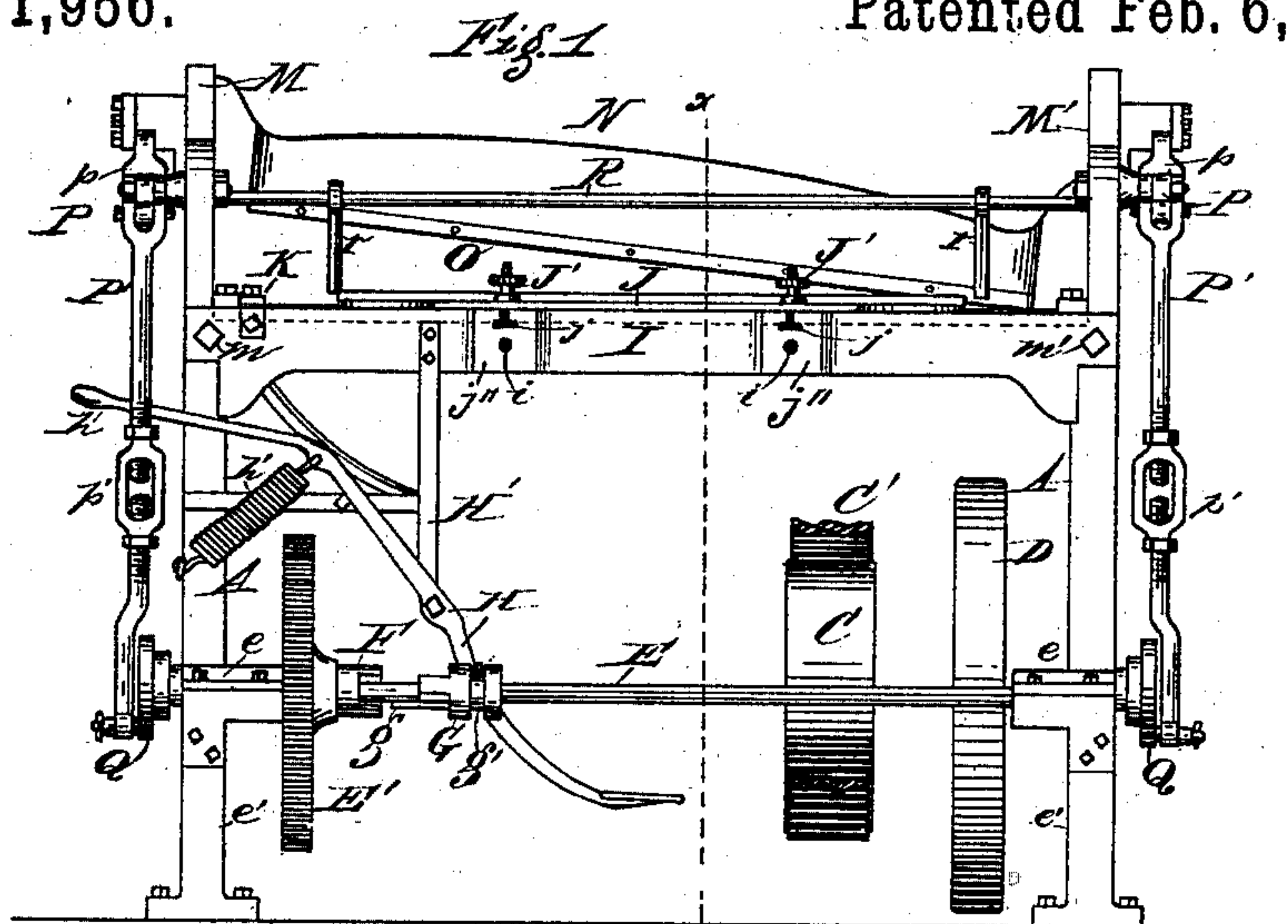
2 Sheets—Sheet 1

C. WAIS.

SHEET METAL SHEARING MACHINE.

No. 271,956.

Patented Feb. 6, 1883.



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Jno. C. Miles.  
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Inventor,  
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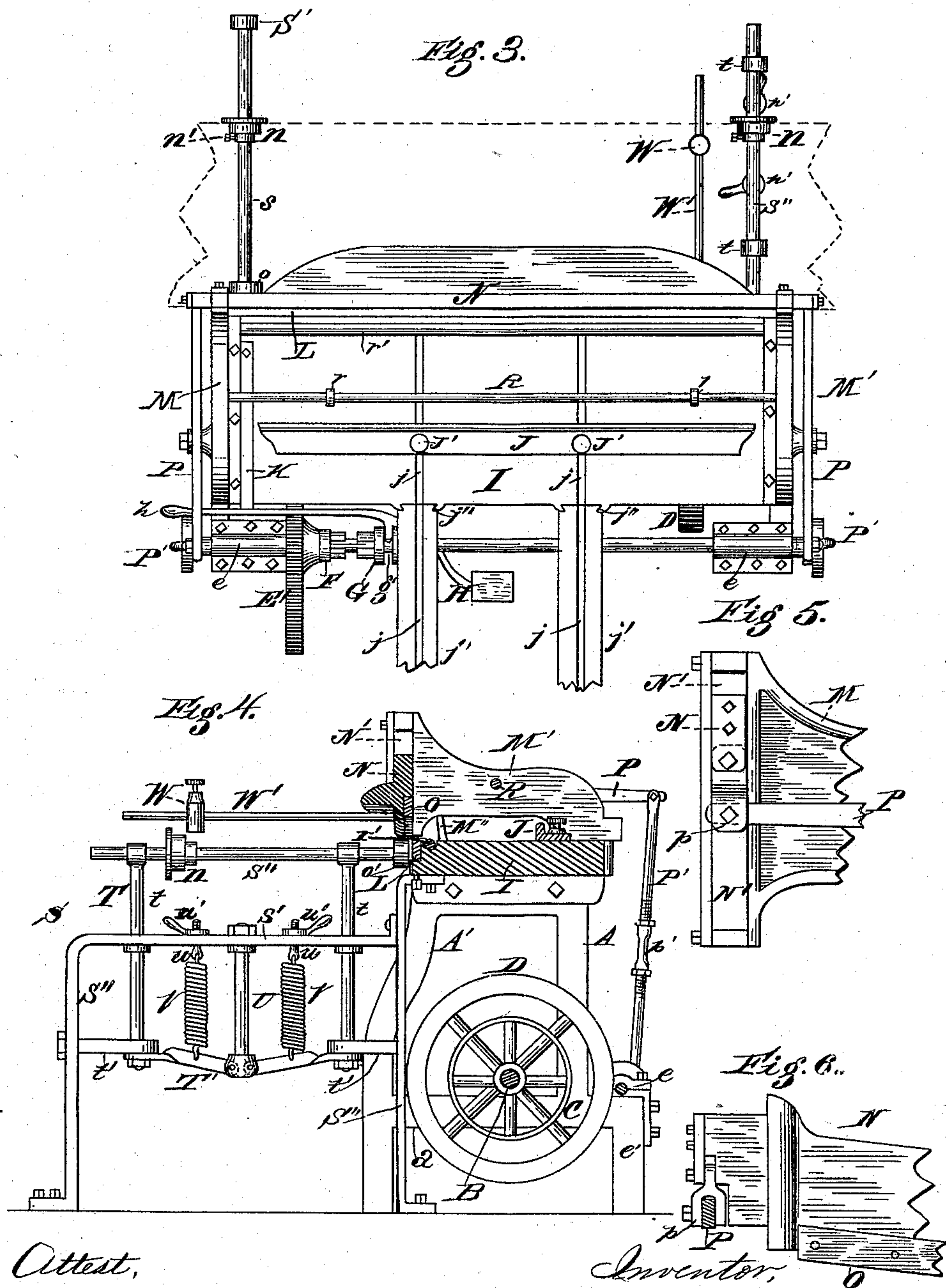
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# UNITED STATES PATENT OFFICE.

CHRISTIAN WAIS, OF NEWPORT, KENTUCKY, ASSIGNOR OF ONE-HALF TO  
WILLIAM J. ROTHWEILER, OF SAME PLACE.

## SHEET-METAL-SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 271,956, dated February 6, 1883.

Application filed September 6, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN WAIS, a citizen of the United States, and a resident of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Machines for Shearing Sheet Metals, of which the following is a specification.

My invention relates to improvements in machines for shearing iron, steel, and other materials in sheet form.

The object of my invention is to provide novel, economical, and durable means, in a single machine, for cutting, squaring, splitting, and trimming sheet metal, the arrangement, construction, and operation of which will be fully understood by reference to the accompanying drawings and the following description thereof.

Figure 1 is a longitudinal front elevation of the machine embodying my invention. Fig. 2 is an end elevation of the same, showing a sheet in cross-section in position for the splitting or trimming operation of the knives. Fig. 3 is a plan view of the machine. Fig. 4 is a vertical sectional elevation on line *x x*, Fig. 1. Fig. 5 is an enlarged view, showing the guide in the end of one of the overhanging arms for the end of the shear-beam to move in. Fig. 6 is an enlarged view, showing one end of the shear-beam and the link for connecting it with its operating-lever, which is shown in section.

A A' represent the legs forming the supporting-frame of the machine.

B represents a driving-shaft journaled in suitable boxes, *b b*, on the cross-bars *a a* of the frame.

C is a driving-pulley keyed to shaft B, and connected by belt C', or otherwise, with any motive power.

D is a fly-wheel, also keyed to shaft B.

*c* is a gear or pinion keyed to shaft B.

E is a horizontal shaft mounted parallel with shaft B in boxes *e e* on the legs *e' e'* of the frame.

E' is a gear-wheel mounted loosely on shaft E. It is of larger diameter than gear *c*, with which it meshes.

F is a clutch-hub on gear E', which hub engages a clutch-collar, G. Collar G is mounted

on shaft E, and slides on a feather or key, *g*.

*g'* is a circular groove made in the periphery of collar G for receiving a pin or fork on an adjusting foot-lever, H, pivoted to a pendent arm, H', which arm is secured at its upper end to the platen or table I.

In order to adjust the driving mechanism from one end of the machine in convenient position for the operator, I provide a handled extension, *h*, to foot-lever H, and also provide a spring, *h'*, secured to the frame-leg A and the said extension, which serves to disengage the said clutch mechanism.

I is the platen or table upon which the sheet metal is supported for either cutting, squaring, splitting, or trimming. It is mounted at its ends on the legs A A'.

J is an adjustable gage-plate, against which the sheet metal is set for cutting the sheets transversely, or squaring them. It is secured in the desired position by bolts J', passing upward from T slots or grooves *j*, running transversely across the table I. Grooves *j* may be continued outward from the table to take in larger sheets by similarly-grooved bars J', constructed with dovetails at one end that fit in dovetail sockets *j''* on the rear face of table I, and secured in position by bolts or taps passing through flanges into threaded holes *i*.

K is a squaring-bar or stationary gage at one end of table I, against which one end of the sheet sets for cutting or squaring.

L represents a steel plate, forming the lower or stationary shear-blade, which is secured longitudinally to the front edge of the table I.

M M' represent overhanging arms secured to the table I at both its ends by the bolts *m m'*.

N represents a vertically-reciprocating arm or beam arranged obliquely, and moving at its ends in slots or guides N' in the outer ends of overhanging arms M M'.

O represents a shear-blade secured to the beam N, along its lower edge, in the usual manner.

P represents levers pivoted midway between their ends to the arms M M', and connecting at one of their ends to the ends of shear-beam N by links *p p*, and their opposite ends to vertically-operating pitmen P'.



P' P' are connecting rods or pitmen, made adjustable longitudinally by coupling-nuts  $p'$ , and pivotally connected at their lower ends with crank-wheels Q, mounted on the ends of shaft E. By turning the coupling-nuts  $p'$  in one direction and shortening the pitmen P' the vertical movement or stroke of shear-beam N is similarly affected for cutting narrow plates, and vice versa by expanding the length of said pitmen. The links  $p$   $p$  are pivoted at their upper ends to the outer ends of shear-beam N, and by their connection at their lower forked ends with the oscillating levers P they serve to insure a direct vertical movement of said beam and its knife O when cutting through the sheet, and prevent the spreading away of said knife O from blade L.

R is a brace-bar or tie-rod for strengthening the overhanging arms M M', secured at its ends thereto.

M'' are hooks at both outer ends of the table I, connecting with pins or staples  $m''$  on the overhanging arms M M'. These hooks are shown in their engaging position for strengthening the machine and receiving any upward strain on the outer ends of overhanging arms M M' during the cutting and squaring operations. These hooks are turned downward below the lever of the table for the splitting and trimming operations.

$r$   $r$  are pendent presser-arms mounted on tie-rod R, under which arms the sheets pass, and prevent their curling or twisting upward during the shearing operation.

It is obvious that, instead of the tie-rod R and pendent arms  $r$ , a heavy tie-beam or bridge-tree might be substituted, with a hand-wheel and screw presser plate or plates, similar to those used in paper-cutting machines, for firmly holding the sheet down on the table I during the shearing operation.

$r'$  is a longitudinal roller mounted at its ends in bearings sunk below the plane of table I, near its front edge, and projecting but slightly above its said plane to elevate the sheets slightly above the table and the shear-blade L for facilitating the manipulation of the sheets, and to prevent the abrasion of said blade when moving them across it.

S is an auxiliary table or frame for supporting sheets of any length during the operation of splitting or trimming them. S' S'' are the supporting-legs of the same.

$s$  is a stationary horizontal bar connecting the leg S' with the front of table I.

$s'$  is a cross-bar connecting the legs S''.

$s''$  is a horizontal bar mounted on a yielding frame, T, composed of vertical bars  $t$   $t$ , passing through openings in the cross-bar  $s'$  and guide-brackets  $t'$   $t'$  to a pivoted cross-head T'. Guide-brackets  $t'$  are secured to the legs S'' and limit the upward movement of the yielding frame T. Cross-head T' is preferably made in two parts, pivotally mounted at their inner ends in the lower forked end of pendent bar U, supported midway between the ends of cross-bar  $s'$ .

V are coil-springs attached at their lower ends to the cross-head T, and at their opposite ends to eyebolts  $u$ , passing through cross-bar  $s'$ , and adjustably secured by handled nuts  $u'$  for regulating their tension. These springs permit the yielding of table T by the pressure on the sheet to be cut of a presser-foot, W, mounted on the shear-beam N to prevent the curling or twisting of said sheet during the shearing operation. Presser-foot W is mounted on a horizontal bar, W', secured at one end to the beam N. It is preferably mounted adjustable on said bar W' to accommodate various widths of sheets.

$n$  represents flanged rollers adjustably secured to bars  $s$   $s''$  by set-screws  $n'$  to support and regulate the cut of different widths of sheets, as shown in Figs, 2, 3, and 4.

$o$   $o'$  are rollers mounted on the inner ends of the bars  $s$   $s''$ , the roller  $o$  being mounted on the stationary bar  $s$ , adjacent the shear-blade L, with its periphery slightly above the blade to elevate the sheets for facilitating their manipulation, and to prevent the abrasion of said blade.

In the splitting or trimming operation of long sheets the squaring-bar K on table I is detached and the sheet run under the overhanging arms M M' and upon the table S longitudinally.

The manner of constructing the machine with the overhanging arms and providing an auxiliary table are important features of my invention, and difficulties heretofore experienced in this class of machinery are thereby overcome.

I claim—

1. In a shearing-machine, the horizontal brace or tie-rod R, mounted at its ends in the overhanging arms M M', and the arms or presser-bars  $r$   $r$ , suspended from the tie-rod R, and arranged for holding the sheet firmly on the table during the shearing operation, substantially as herein set forth.

2. The combination, in a shearing-machine, of the table I, on whose front edge the stationary cutting-blade L is secured, with a roller,  $r'$ , in the rear of and adjacent to the said blade, said roller  $r'$  being mounted in bearings below the plane of the table, and extending slightly above the table, so as to elevate the sheets slightly above the latter and the blade in order to facilitate the manipulation of the sheets and prevent abrasion of the blade when moving the sheets across it, substantially as and for the purpose specified.

3. In a shearing-machine, the combination of the auxiliary table S, upon which the sheets are supported for trimming, adapted to rise and fall by the pressure on said sheets of a presser-foot, W, adjustably mounted on a bar projecting from the reciprocating shear-beam N, the whole arranged, constructed, and adapted to operate substantially as and for the purpose specified.

4. In a shearing machine, the combination of



the table S, provided with the adjustable flanged gage-rollers *n*, acting as guides and supports for the sheet during the splitting or trimming operations, with the roller *o o'*, all  
5 mounted on the bars *s s''*, substantially in the manner and for the purpose specified.

In testimony whereof I have hereunto set

my hand in the presence of two subscribing witnesses.

CHRISTIAN WAIS.

Witnesses:

JNO. E. JONES,

ADOLPH GLUCHOWSKY.