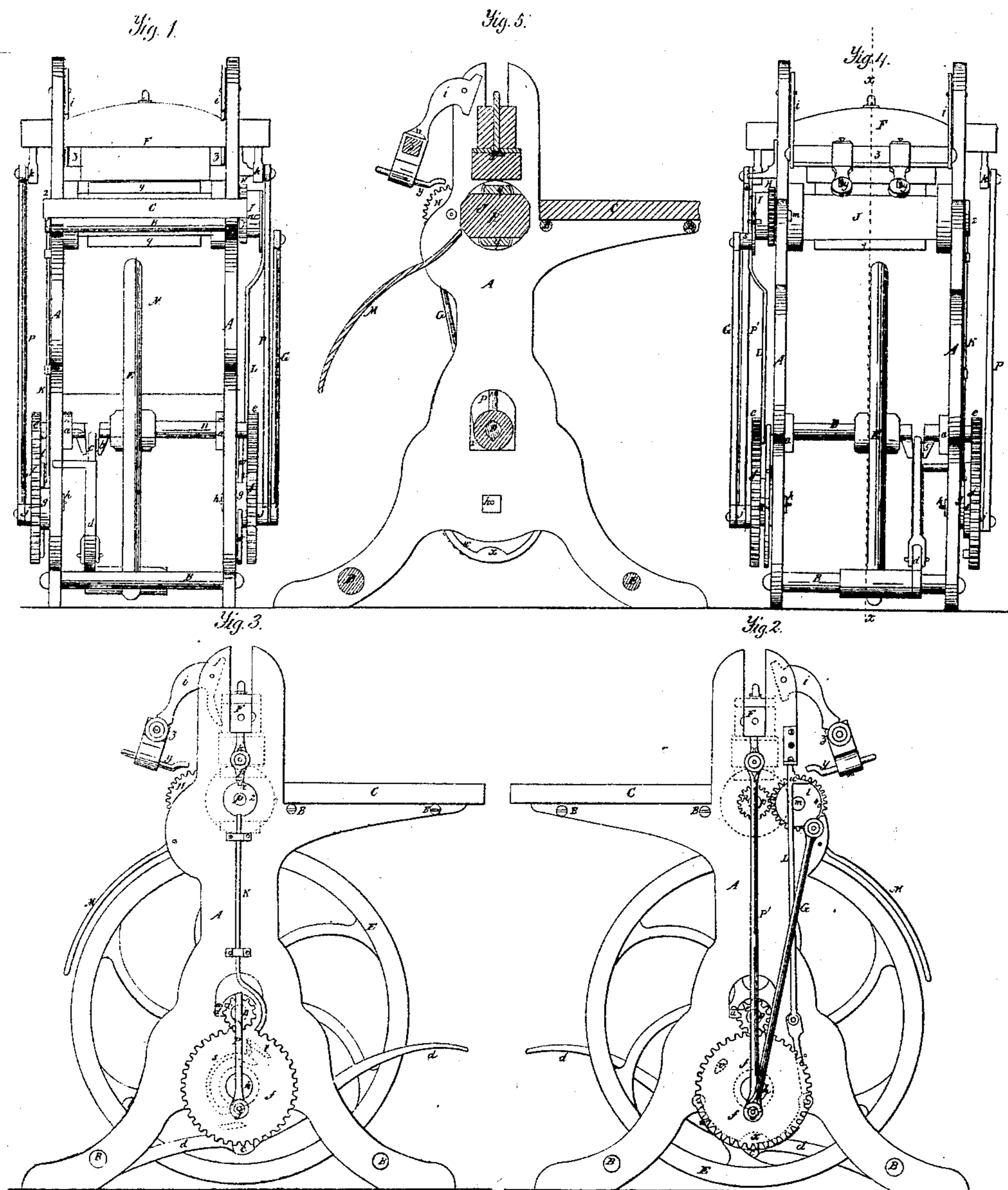


C. H. GRIFFIN.
SOLE CUTTING MACHINE.

No. 30,520.

Patented Oct. 23, 1860.



Witnesses:
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UNITED STATES PATENT OFFICE.

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MACHINE FOR CUTTING BOOT AND SHOE SOLES.

Specification of Letters Patent No. 30,520, dated October 23, 1860.

To all whom it may concern:

Be it known that I, CALEB H. GRIFFIN, of
Lynn, in the county of Essex and State of
Massachusetts, have invented a certain new
and useful Improvement in Die Cutting-
Machines for Cutting Out Soles for Boots
and Shoes, of which the following is a full,
clear, and exact description of the same, ref-
erence being had to the accompanying draw-
ing, making part of this specification, in
which—

Figure 1 represents a front elevation of
a machine, having my improvements ap-
plied thereto; Fig. 2, an elevation of one
side; Fig. 3, a similar view of the other side,
with a portion of the connecting rod broken
off; Fig. 4, a rear elevation of the same, with
the apron removed; Fig. 5, a vertical section
of the same, taken through the line (*x x*)
of Fig. 4.

My invention relates to a new and im-
proved mode of cutting out the heel and toe
of soles for boots and shoes from the same
side of a strip of leather alternately, in a
die cutting machine.

To enable others skilled in the art, to
make construct and use my invention, I will
now proceed to describe it in detail.

In the accompanying drawing the work-
ing mechanism is represented as being
mounted on a frame work, consisting of two
sides (A) connected together, at the top and
bottom, by means of cross beams or rails
(B) and feed table (C). On these two sides
is mounted in suitable bearings (*a*) a driv-
ing shaft (D) carrying a fly wheel (E).
When driven by a treadle, the driving shaft
(D) is provided with a crank (*b*) to which
is attached, in any suitable manner, one end
of a connecting rod (*c*) the other end of
which is attached to a treadle (*d*) mounted
on the lower rear cross beam (B). But,
when the machine is intended to be driven
by some prime motor, one end of the driv-
ing shaft (D) is prolonged to a sufficient dis-
tance to afford room for a driving pulley by
means of which motion can be communicated
to the machinery.

On either end of the driving shaft and
on the outside of the sides (A) of the frame,
is mounted a small gear wheel (*e*) which
meshes in another larger gear wheel (*f*),
mounted on studs (*g*) secured to the frame
of the machine by means of a screw-bolt
(*h*), the gears being countersunk to accom-

modate the head of the screw bolts (*h*). On
each of these larger gears (*f*) and on their
outer side are secured studs (*j*), each being
arranged at the same relative distance from
the center of the gear. On one of these
gears is mounted the end of one connecting
rod (R) the other end of which is mounted
on a stud (*k*) secured to the pressure beam
(F). On the stud of the other gear (*f*) are
mounted the ends of two connecting rods
(P' and G) the other end of the rod (P'),
being mounted on a stud (*l*), secured to the
other end of the pressure beam (F) while
the other end of the connecting rod (G) is
mounted on a stud (*5*) secured to a disk
(*l*) having an intermittent rotary reciprocating
motion upon a stud (*m*) made fast
in the side of the frame of the machine. On
the same stud (*m*) is mounted a gear wheel
(H) on the side of which is formed a ring
(I) in the edge of which four notches (*n*)
are cut into which successively a spring
catch (*o*) takes, when brought by the
action of the reciprocating disk (*l*) in a line
with the notch; the spring catch (*o*) works
in and is guided by a slot (*4*) cut in the
disk (*l*) so that, when engaged with either
of the notches cut in the ring (I) and the
gear wheel (H) and motion communicated
to the disk (*l*) through the connecting rod
(G) it will cause the gear wheel (H) to
rotate one quarter of a revolution which in
turn imparts motion to the pinion (R) with
which it meshes. This pinion is mounted
on a shaft (*p*) which forms the axis of the
rotating cutters or dies (J). Now, as the
pinion (R) is only half the size of the gear
wheel (H), it will, for every quarter of rev-
olution of the latter, be made to perform a
half revolution, thus presenting one of the
die cutters (*q*) (there being two) alter-
nately to cut out a sole for each quarter rev-
olution of the gear wheel (H) and for each
revolution of the large gear wheel (*f*) so
that every time one of the die cutters is pre-
sented in a horizontal plane by the action
above described of the crank disk (*l*) and
spring catch (*o*) on the gear wheel (H) and
the latter on the pinion (R) the pressure
bar (F) through the connecting rods (P and
P') will be caused to descend with such
pressure on the die cutters as to cause the
latter to cut such leather, as may have been
interposed between them, into soles, the die
block, for this purpose, being retained dur-

ing the descent of the pressure-bar (F) in its proper relative position with respect to the pressure bar by means of a stop bolt (K), arranged on the opposite side of the machine in such manner as to be made to engage with one of two notches (*r*) cut in a disk (Q) secured to the opposite end of the die block shaft (*p*) where it is held by means of a cam (*s*) formed on the inner side of the gear wheel (*f*). As soon, however, as the sole has been cut out, the stop bolt (K) is withdrawn from the notch (*r*) by means of the cam (*t*) on the wheel (*f*) which acting on the lower end of the slide bolt (K) withdraws it from the notch (*r*) releasing the die or cutter block (J), which is then ready to be acted upon to bring the other die uppermost to cut out the next sole, the two sets of dies or cutters being so arranged as that the one, when used will cut out the toe on one side, while the other cuts it out on the other side, that is to say, cutting out the soles with the heel and toe on the same side of the strip of leather alternately. It may be here remarked that inasmuch as there are two sets of dies or cutters and each presented alternately the disk (Q) is provided with two notches (*r*) one for each, into which the stop bolt (K) is projected in order to retain them in their proper position, until the sole has been cut out. In like manner, there would be four notches, were there four dies or cutters used and so on with any number of pairs of cutters. It may also be observed that instead of a stop bolt (K) operated by means of cams, a spring stop bolt properly arranged, constructed and operated may be sustained in its place.

I will now describe the operation of the disk (*l*) spring catch (*o*) and gear wheel (H). The ring (I) formed on the outside of the gear wheel (H) is provided with four notches cut at regular intervals apart into which the spring catch (*o*) when brought into a line with them takes, when once engaged and which takes place when the connecting rod (G) is at the full length of its downward stroke and about the time that it commences its upward stroke, (its upper end being so mounted on the disk that the latter cannot be made to make a full revolution) the connecting rod (G) then causes the disk (*l*) to perform a quarter revolution, and, as the spring catch (*o*) is engaged at once with it and with the notch (*n*) of the ring (I) of the gear wheel (H), it carries with it the gear wheel (H) causing it also to perform a quarter revolution which, in turn, causes the pinion (R), it being only half the size, to perform a half revolution. Now, as the disk (*l*) in its upward revolution, carries with it the spring catch (*o*) the latter is brought in contact with the lower side of a hook or finger (*u*)

formed on a slide (L) raising the hook as it passes under it, until it has attained the full length of its stroke, when it is depressed by the action of the slide hook (L) as it is acted upon by means of a cam (*v*) formed on the inner side of the gear wheel (*f*) on that side of the machine, for which purpose the slide (L) is pivoted to or connected by hinged joints to two curved links (*w*) one end of the last of which is pivoted to the side frame of the machine, there being on the lower link a curved elevation (*x*) formed, on which the cam (*v*) acts, for the purpose of depressing the slide (L) with the hook (*u*).

As the hook is depressed, it disengages the spring catch (*o*) from the notch (*n*) in the ring (I) of the gear wheel (H) thus leaving the disk (*l*) free to be again drawn to its original position by the descent of the connecting rod (G), the spring catch (*o*) being retained in its retracted position during the descent of the disk (*l*) by the action of the inner periphery of the ring (I) until it has been brought opposite another one of the notches (*n*) cut in the ring (I) and so on operating in the manner just above described for every revolution of the gear wheel (*f*). Various other devices for effecting the same object could be described, but as they would not alter the principle of operation or *modus operandi* of the machine, it is not deemed necessary so to do.

A great advantage is derived by this mode of operating the cutters as in their operation, they are made the means of discharging the sole after it is cut upon the guide apron (M) thus, thereby preventing mutilation of the sole, after it has been cut out, a thing of frequent occurrence in other machines for the want of effective means to insure their discharge. Another great advantage, in this machine, arises from the fact that, during the operation of cutting, the knives themselves remain stationary, the necessary pressure for this purpose being exerted by an independent agent which insures regularity of cut and prevents the dulling of the knives from twisting, strains, &c.

In operating the machine, the leather cut in strips of the proper width is fed up to the knives on the table (C) and if arrested by means of gages (*y*) adjusted to the proper width of the soles required to be cut. These guides (or gages) (*y*) are secured to a swinging frame (*z*) pivoted to the two sides of the machine. On one of the pendent arms (*i*) of this frame is formed a small arm (3) which bears against the pressure bar (F) while it ascends and descends to perform its part of the operation in cutting out the sole, the weight of the frame (*z*) causing it, the arm (3,) to bear against the pressure bar. This arm is made of the proper curve to allow the gages (*y*) and their frame to descend while the pressure bar ascends to regu-

late the width of the next sole to be cut, the leather, for this purpose, being fed up until it is made to abut against the ends of the gages (*y*); the gages and frame, as the pressure bar descends, being forced outward, by the action of the pressure bar on the curved arm of their frame and kept there until the cutter block has been made to revolve and discharge the cut sole upon the conducting apron.

The peculiar construction of the die and the spring that forces the sole out of the die after it has been cut, it is here unnecessary to describe as they may be made in any known suitable manner. Nor is it necessary particularly to describe the pressure block and the manner in which it is attached to the pressure bar further than to say that it is made of a size and shape suitable for the purposes for which it was intended and capable of being removed to be renewed and, if necessary, adjustable to compensate for the wear of its surface on the knives. Nor is it scarcely necessary to remark that the die cutters are also so constructed as to be capable of being removed for the purpose of adapting different sizes to cut out different size soles. It may, however, be remarked that the gages for regulating the width of the soles are capable either of lateral or endwise adjustment. These various devices could be modified in

different ways, but as that would not, in any way, affect the principle of the operation of the machine, it is deemed here unnecessary to describe them, as such will readily suggest themselves to any good mechanic, nor are such changes deemed unprotected by this patent.

I claim—

1. The combination of the traveling pressure bar (*F*) and block with the rotating die block (*J*) and dies (*g*), when such are held stationary during the operation of cutting, substantially as described.

2. The stop bolt (*K*) as operated and notched disk (*Q*) or their or either of their equivalents, in combination with the rotary die block (*J*) for the purpose described.

3. The within described combination of the disk (*l*) spring catch (*o*) and notched ring gear wheel (*H*), as operated, or their or either of their equivalents, with the rotary die block (*J*) and its pinion (*R*) and shaft (*p*) for the purpose set forth.

4. The gages (*y*) as arranged, constructed and operated for the purpose described.

In testimony whereof, I have hereunto set my hand to this specification.

C. H. GRIFFIN.

Witnesses:

S. EDWIN IRWIN,
E. B. FOSTER, Jr.