

(No Model.)

2 Sheets—Sheet 1.

R. W. BAILEY.

CLUTCHING DEVICE FOR METAL SHEARS.

No. 350,713.

Patented Oct. 12, 1886.

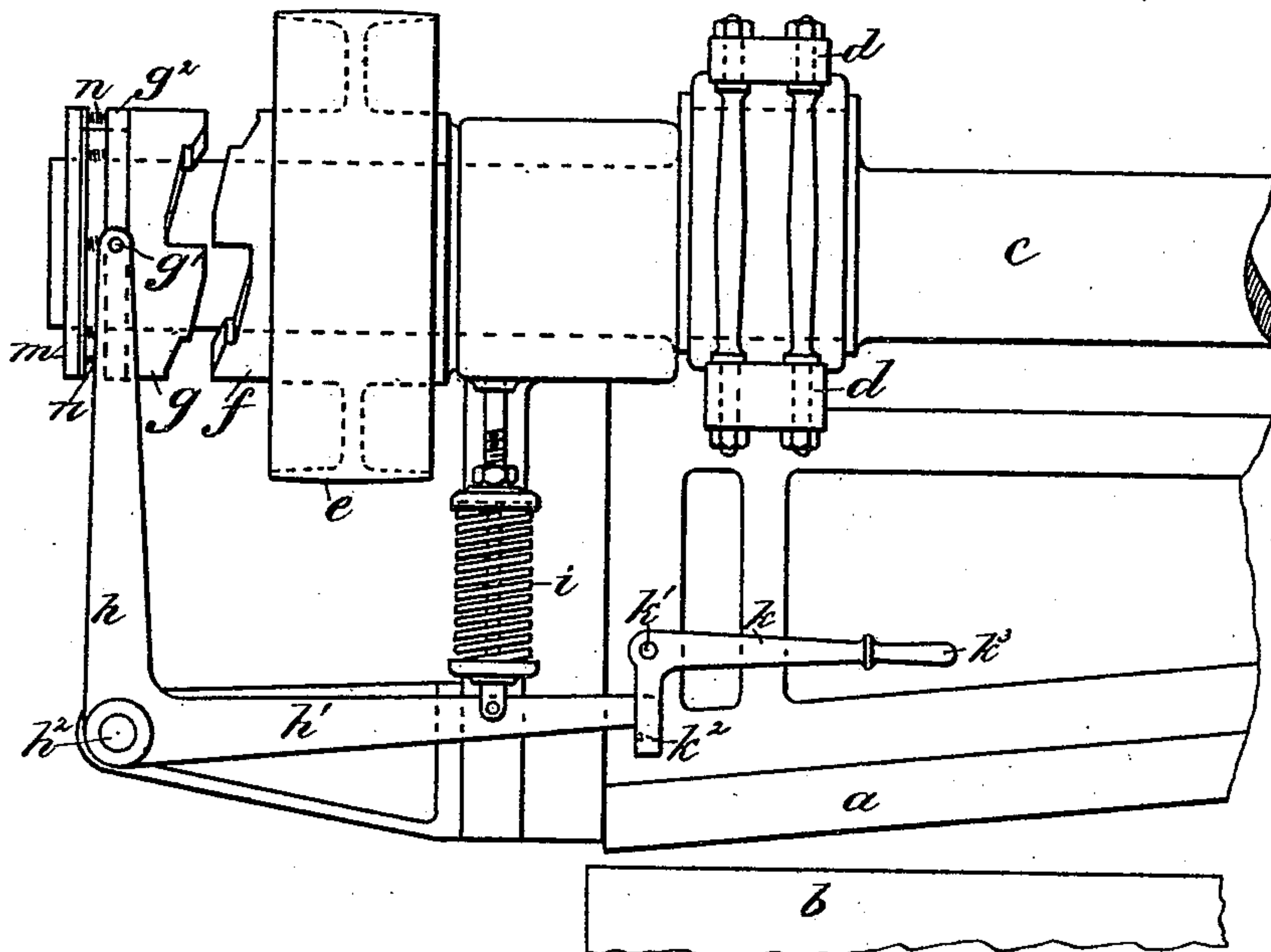


Fig. 1.

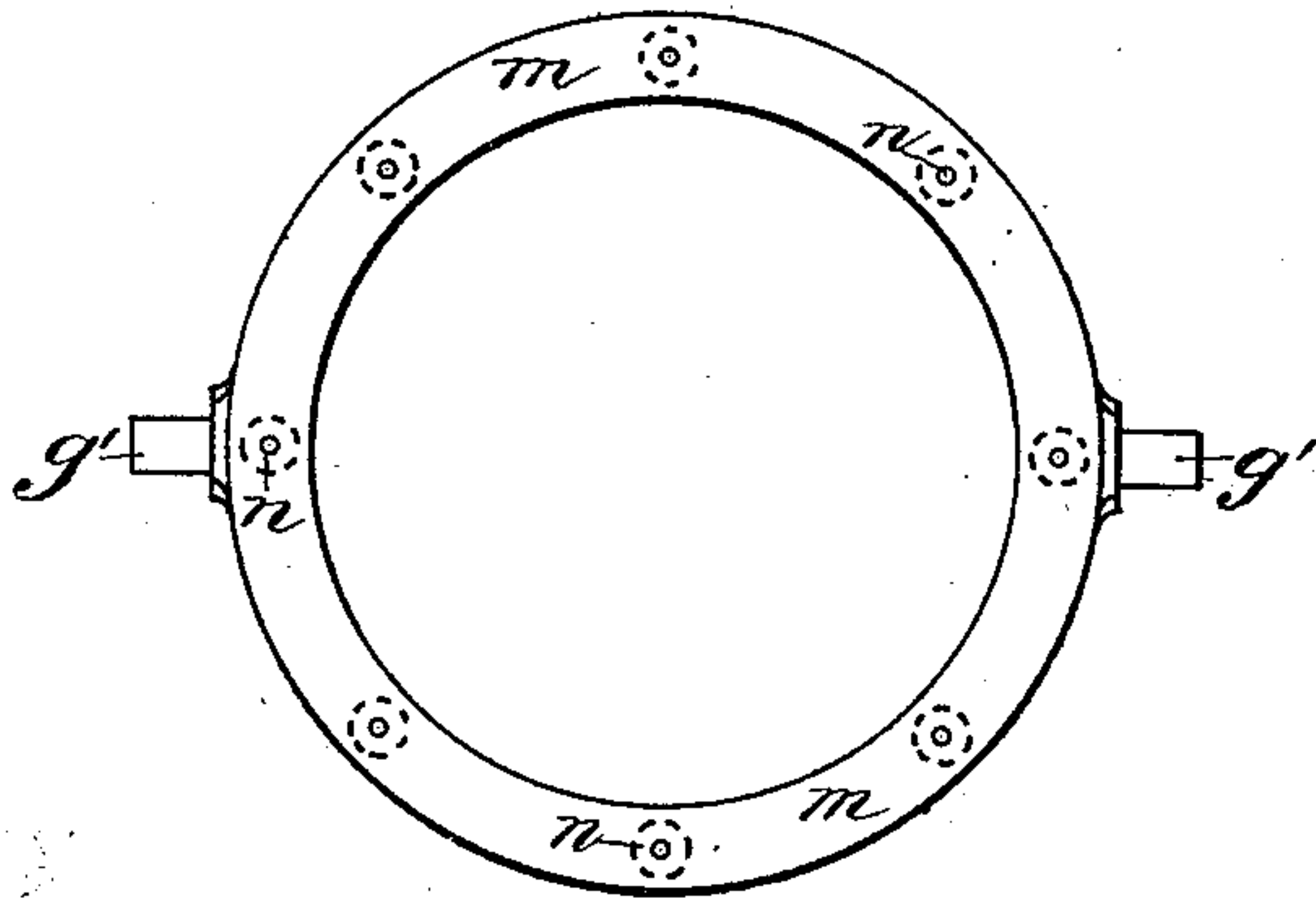


Fig. 2.

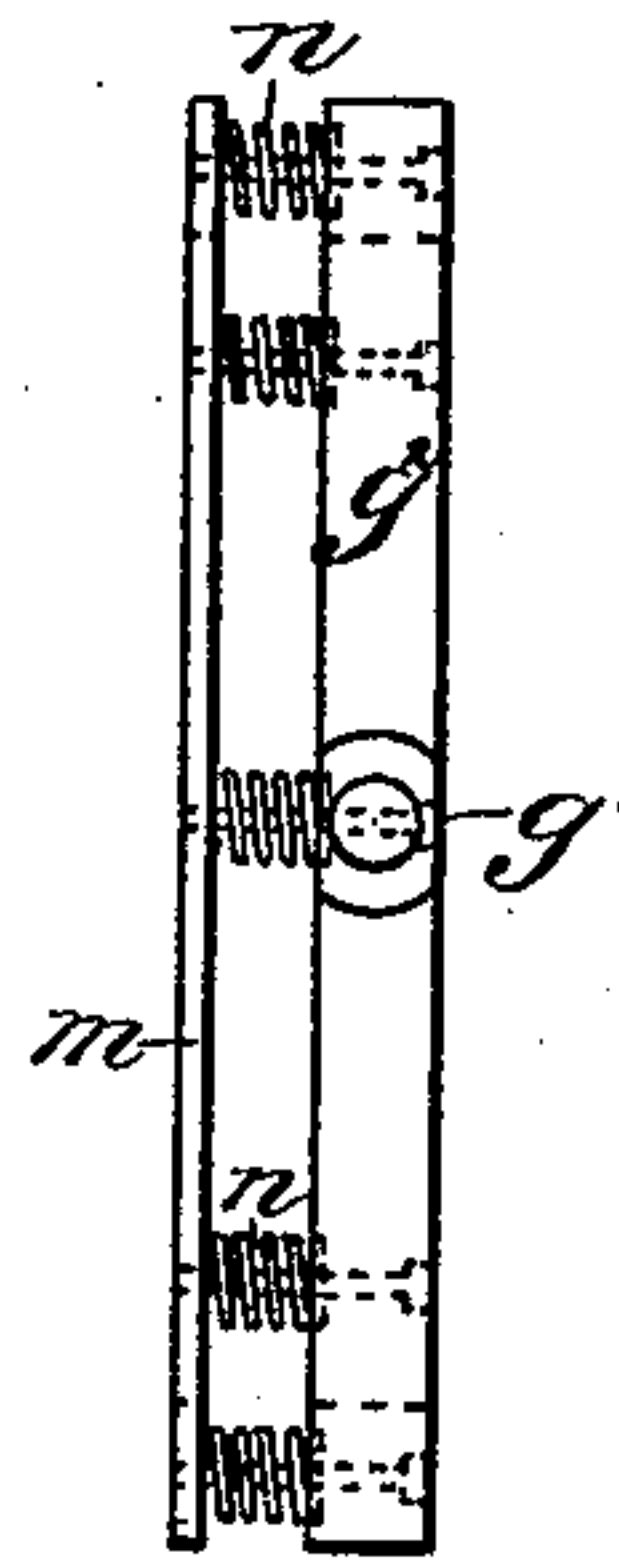


Fig. 3.

Witnesses:
W. T. Corwin
H. L. Gill.

Inventor.
R. W. Bailey
by Baxwell & Kerr
his Attorneys

(No Model.)

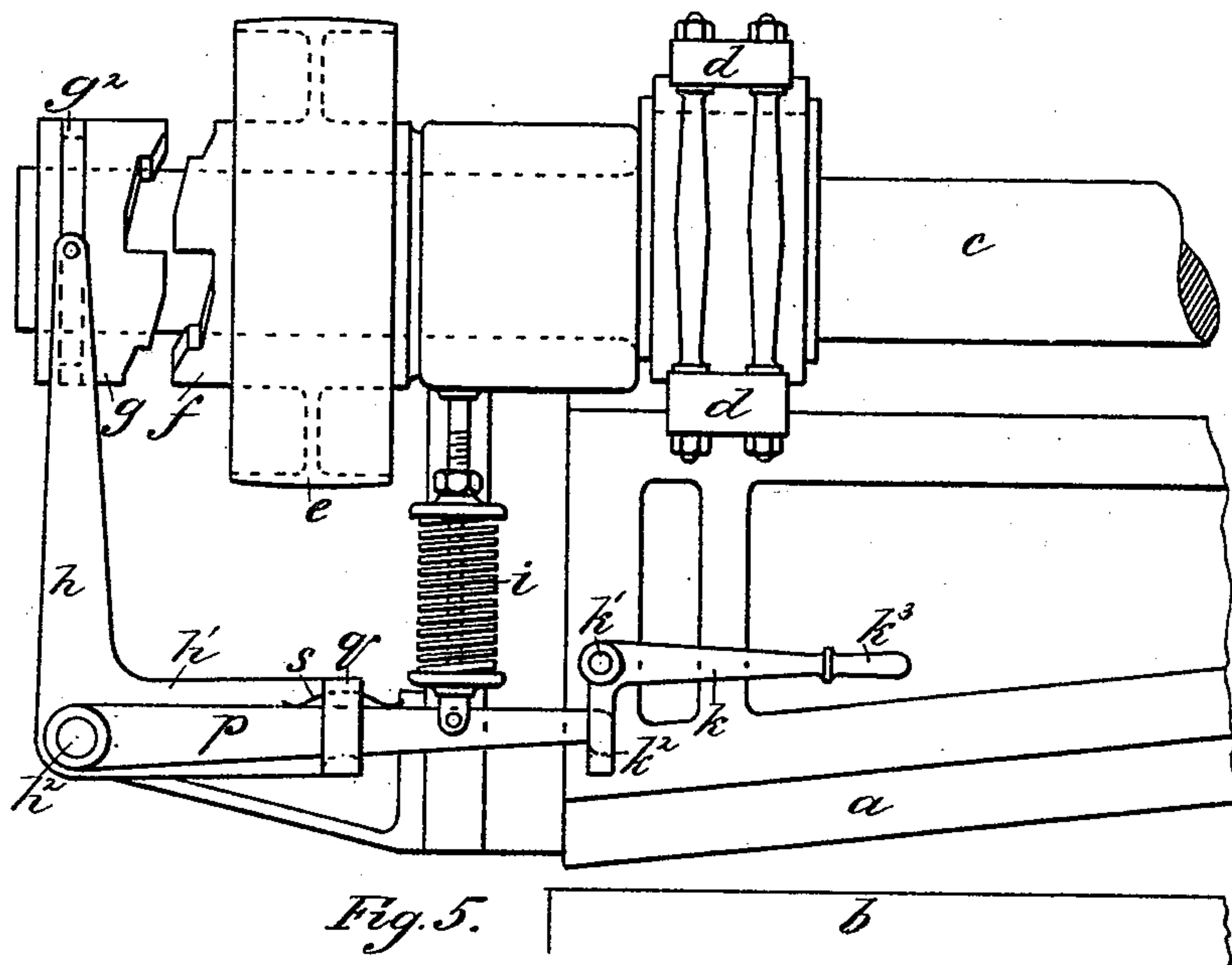
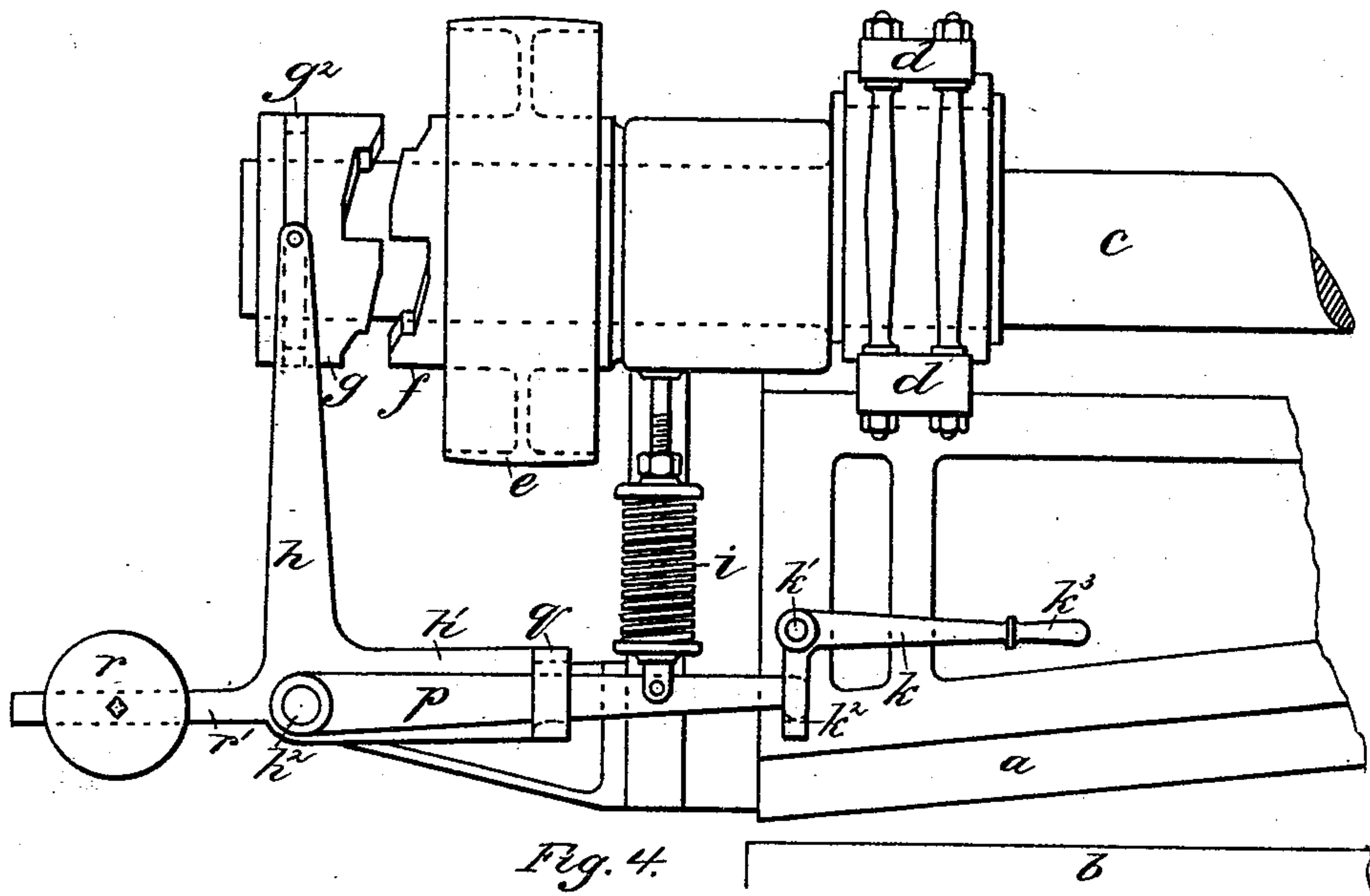
2 Sheets—Sheet 2.

R. W. BAILEY.

CLUTCHING DEVICE FOR METAL SHEARS.

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Patented Oct. 12, 1886.



Witnesses:

W. B. Corwin

H. L. Gill

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Reade W. Bailey
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his Attorneys

UNITED STATES PATENT OFFICE.

READE W. BAILEY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE
ROBINSON-REA MANUFACTURING COMPANY, OF SAME PLACE.

CLUTCHING DEVICE FOR METAL-SHEARS.

SPECIFICATION forming part of Letters Patent No. 350,713, dated October 12, 1886.

Application filed June 28, 1886. Serial No. 206,435. (No model.)

To all whom it may concern:

Be it known that I, READE W. BAILEY, of
Pittsburg, in the county of Allegheny and
State of Pennsylvania, have invented a new
5 and useful Improvement in Clutching Devices
for Metal-Shears; and I do hereby declare the
following to be a full, clear, and exact de-
scription thereof, reference being had to the
accompanying drawings, forming part of this
10 specification, in which—

Figure 1 is a front view of metal-shears pro-
vided with my improvement. Fig. 2 is a de-
tached plan view of parts. Fig. 3 is an edge
view of the parts shown in Fig. 2. Figs. 4
15 and 5 are front views of shears, illustrating
modifications of my invention.

Like letters of reference indicate like parts
in each.

In the figures on the first sheet of the draw-
20 ings, *a* represents the moving blade of a
metal-shear, and *b* is the bed-knife. The
blade *a* is operated by a cam on a rotary shaft,
c, which cam works in a cam-yoke, *d*, and
thereby imparts a vertical reciprocating mo-
25 tion to the shear. A belt-pulley, *e*, is jour-
naled loosely on the shaft *c*, and has affixed to
it a collar, *f*, which forms part of a clutch, the
other part, *g*, of which is mounted on the shaft
by a feather and keyway, (not shown,) and is
30 thus adapted to be moved against and away
from the collar *f*. The opposite faces of the
clutch-sections *f* and *g* are toothed in the usual
way, so that when they are brought together
they will engage, and the continuously-run-
35 ning pulley *e* will then drive the section *g* and
the shaft *c* to cause the reciprocations of the
shear.

The clutch-section *g* is operated by a bell-
crank lever, *h h'*, fulcrumed at *h²*, and pivot-
40 ally attached at the end of the arm *h* by a
yoke to pins *g'* on a loose collar, *g²*, on the
clutch-section. A spring, *i*, bears against the
upper side of the arm *h'*, and tends to actuate
the bell-crank lever so as to move the clutch-
45 section *g* on the shaft *c* toward the collar *f*.

k is a hanger pivoted at *k'* to the shear-blade
a, and having at its lower end a hook, *k²*,
which, when the hanger is allowed to depend
perpendicularly, is adapted to engage the un-

der side of the arm *h'* of the bell-crank lever. 50
This hanger has a hand-lever, *k³*, by which it
may be moved to engage or to release the hook
k² from the arm *h'*.

Supposing, now, the parts to be in the posi-
tion shown in Fig. 1, the parts of the clutch 55
being separated, the shear will remain sta-
tionary. To start the shear the workman
raises the hand-lever *k³*, and thereby releases
the hook *k²* from the arm of the bell-crank
lever. The spring *i* then acting on this lever 60
will throw the clutch-section *g* forward to en-
gage the section *f*, which will immediately
start the machine, causing the shear-blade to
descend. The workman then releases the le-
ver *k³*, which drops by its own gravity, and, 65
when the shear reaches the end of its down-
ward stroke, automatically engages the hook
k² with the end of the arm *h'*. Then, as the
shear-blade rises, the hanger *k* will elevate
the arm *h'*, thereby compressing the spring *i* 70
and moving the clutch-section *g* away from its
companion part *f* until, when the blade
reaches the limit of its ascent, the parts of
the clutch will be separated. This at once
stops the machine and brings the parts again 75
to the position shown in Fig. 1.

The machine as thus described is old and has
been in common use, and while of great utility
it is subject to a disadvantage in that because
the clutch is operated by the rise of the shear- 80
blade, and must come to rest simultaneously
with the stoppage of the latter, the section
g is not always completely separated from the
part *f*, and the rotation of the latter is there-
fore apt to wear or break the corners of the 85
clutch-teeth, so that they will not fit neatly
together. This causes the parts of the clutch
to jar and rattle, and materially impairs the
working of the machine.

It is the object of my invention to obviate 90
this difficulty just noted, and I accomplish
this by providing means whereby as soon as
the actuating motion of the shear on the clutch
ceases an additional force, consisting either of
a spring, weight, or equivalent mechanism, 95
comes into play and further separates the parts
of the clutch.

I have shown three forms of my invention

in the drawings. In that illustrated in Sheet 1 the collar g^2 is mounted on a contracted portion or neck of the clutch-section g , so as to be capable of a sliding motion thereon lengthwise of the shaft c . A second collar, m , is fixed to the clutch a little back of the sliding collar g^2 , and springs n are interposed between them. The effect of this arrangement is, that when the shear-blade rises and moves the bell-crank lever the friction of the contact of the clutch-sections with each other causes the first force to be exerted in moving the collar g^2 toward the collar m , and compressing the springs n without moving the clutch-section, which commences to move only after the springs n have been sufficiently tensioned. As soon as the section g has been retracted far enough to separate the clutch, the friction of contact of course ceases, and the springs, then being free, react and exert their force on the collar m , and give the clutch-section a sudden additional back movement, which completely disengages the parts of the clutch, and separates them so far as to prevent the possibility of their striking and wearing, as above described. The operation of the remaining parts of the mechanism is the same as above explained, the blade being started by disengaging the hanger k , and being stopped automatically on the rise of the blade.

The modification of my invention shown in Fig. 4 is the same in principle as the form illustrated on the first sheet of the drawings, but differs somewhat in details of construction. Here the loose collar g^2 , unlike its counterpart in Fig. 1, has no play lengthwise on the shaft, and is not provided with the springs n . The bell-crank lever h h' does not connect directly with the hanger k on the shear-blade, but is indirectly connected therewith by means of a lever, p , which is pivoted at one end to the fulcrum h^2 of the bell-crank lever, and passes through a yoke or strap, q , on the arm h' , in which it has some loose vertical motion independently of and without affecting the bell-crank. The spring i bears on the lever p , and the end of this lever is adapted to engage the hook k^2 of the hanger k . A weight, r , is mounted on a lever-arm, r' , which projects from the bell-crank lever h h' . Fig. 4 shows the parts as they are when the shear has risen and the clutch is disconnected. To start the shear the lever k^3 is raised to disconnect the hook k^2 from the lever p . The spring i then forces the lever p down until it engages the bottom of the yoke q , when it operates the bell-crank lever and moves the clutch, so as to start the shear and to cause it to descend. On the rise of the shear the hook k^2 , engaging the lever p , raises it without affecting the bell-crank lever until the lever p reaches the upper end of the yoke q , when the bell-crank lever is raised, and the clutch disconnected, as before described with reference to Fig. 1. The action of the weight r , which tends continually to separate the parts of the

clutch, is not sufficiently strong to overcome the frictional resistance of the latter; but as soon as the parts of the clutch are separated and the friction ceases the weight comes into play, and suddenly moves the clutch-section g away from its companion f until the rise of the arm h' brings the lower end of the yoke q into contact with the lever p . The weight r therefore performs the same function as that of the spring n , and is the same in operation, in that both are devices which acquire potential energy during the loose motion of the mechanical connections of the shear and clutch, and which react at the cessation of the friction of the clutch to operate the latter.

The modification shown in Fig. 5 is the same as that of Fig. 4, except that the weight r is substituted by a spring, s , which bears upon the upper end of the yoke q and the lever p . The first part of the rise of the lever p is occupied in tensioning the spring s , and as soon as the friction of the clutch ceases this spring reacts, and by pushing the arm h' upward gives additional impetus to the clutch-section g , so as to separate the parts of the clutch completely.

It will be apparent from the foregoing description that my invention can be modified in many other ways than those which I have described without departing from its essential principles. It may also be applied to metal-punches and like machinery without essential change in the arrangement of the parts.

I claim—

1. The combination, with the reciprocating part of a machine and a clutch connected therewith so as to be disjoined automatically by movement thereof, whereby the driving mechanism of the said reciprocating part is thrown out of gear, of mechanical devices loosely connecting the clutch with said reciprocating part, so that part of the motion thereof shall not operate the clutch, and mechanism connected with the clutch and arranged to acquire potential energy of less force than the frictional resistance of the clutch during the loose motion of the reciprocating part, and to react on the clutch when the frictional resistance of the clutch is diminished, substantially as and for the purposes described.

2. The combination, with the reciprocating part of a machine and a clutch connected therewith so as to be disjoined automatically by movement thereof, whereby the driving mechanism of said reciprocating part is thrown out of gear, of a lever connecting the clutch and said reciprocating part and a spring interposed between the clutch and the lever, substantially as and for the purposes described.

3. The combination, with the reciprocating part of a machine and a clutch connected therewith so as to be disjoined automatically by movement thereof, whereby the driv-

ing mechanism of said reciprocating part is
thrown out of gear, of a ring or collar mounted
on the clutch and movable loosely thereon, a
spring interposed between the ring and the
5 clutch, and a lever connecting the ring with
the said reciprocating part, substantially as
and for the purposes described.

In testimony whereof I have hereunto set
my hand this 23d day of June, A. D. 1886.

READE W. BAILEY.

Witnesses:

THOMAS W. BAKEWELL,
W. B. CORWIN.