

(No Model.)

2 Sheets—Sheet 1.

J. T. KENNEDY.
SWAGING MACHINE.

No. 585,151.

Patented June 22, 1897.

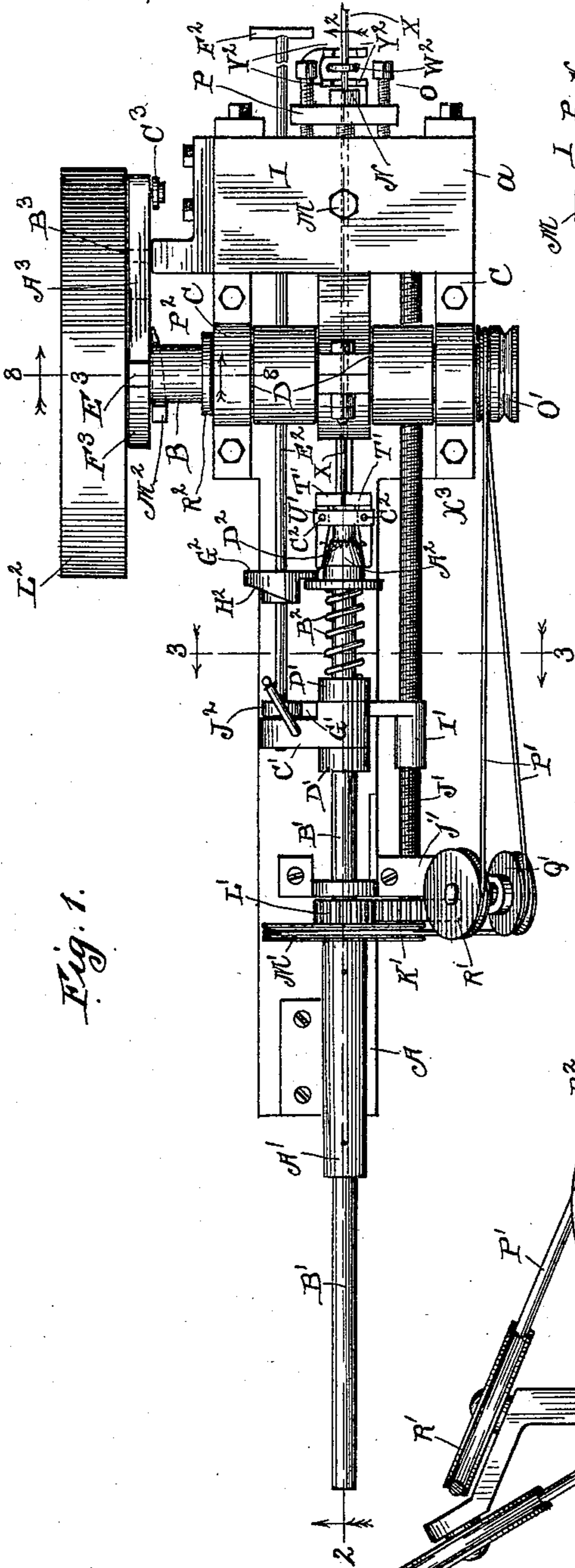


Fig. 1.

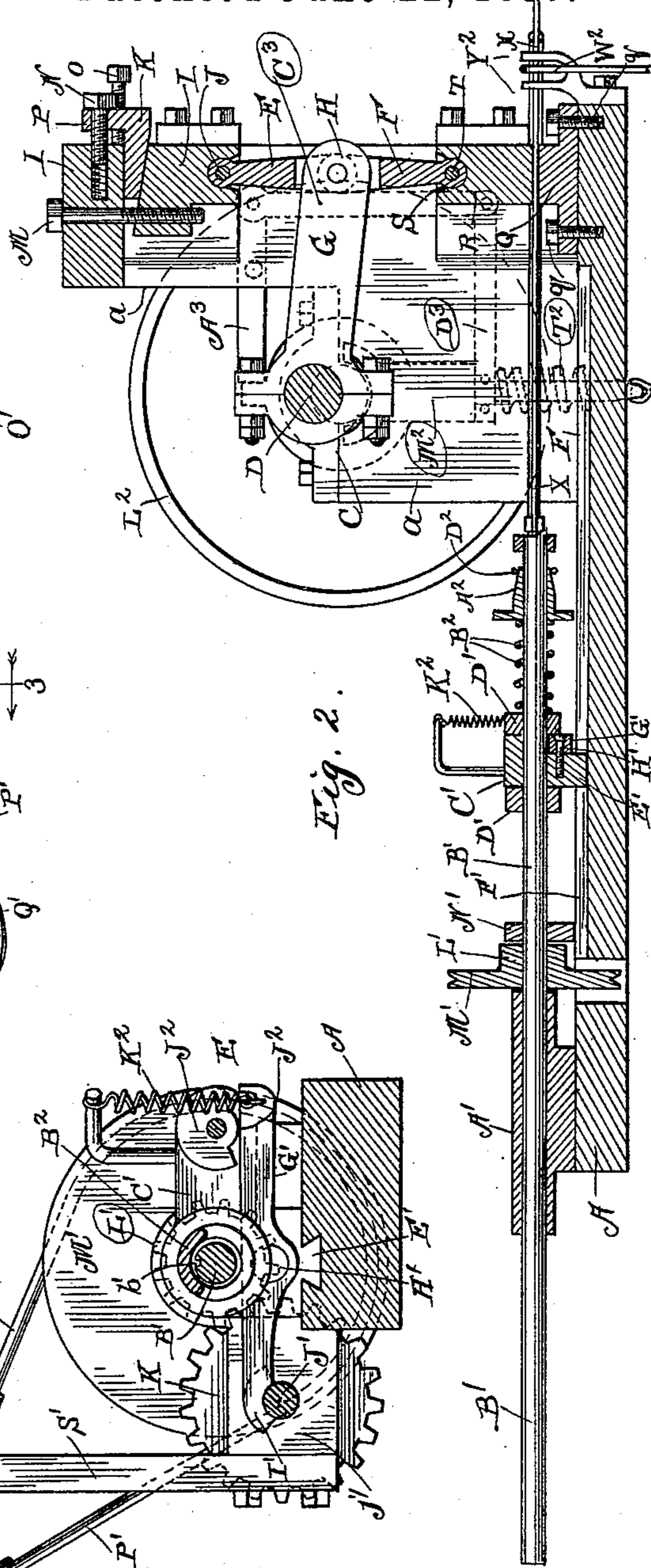


Fig. 2.

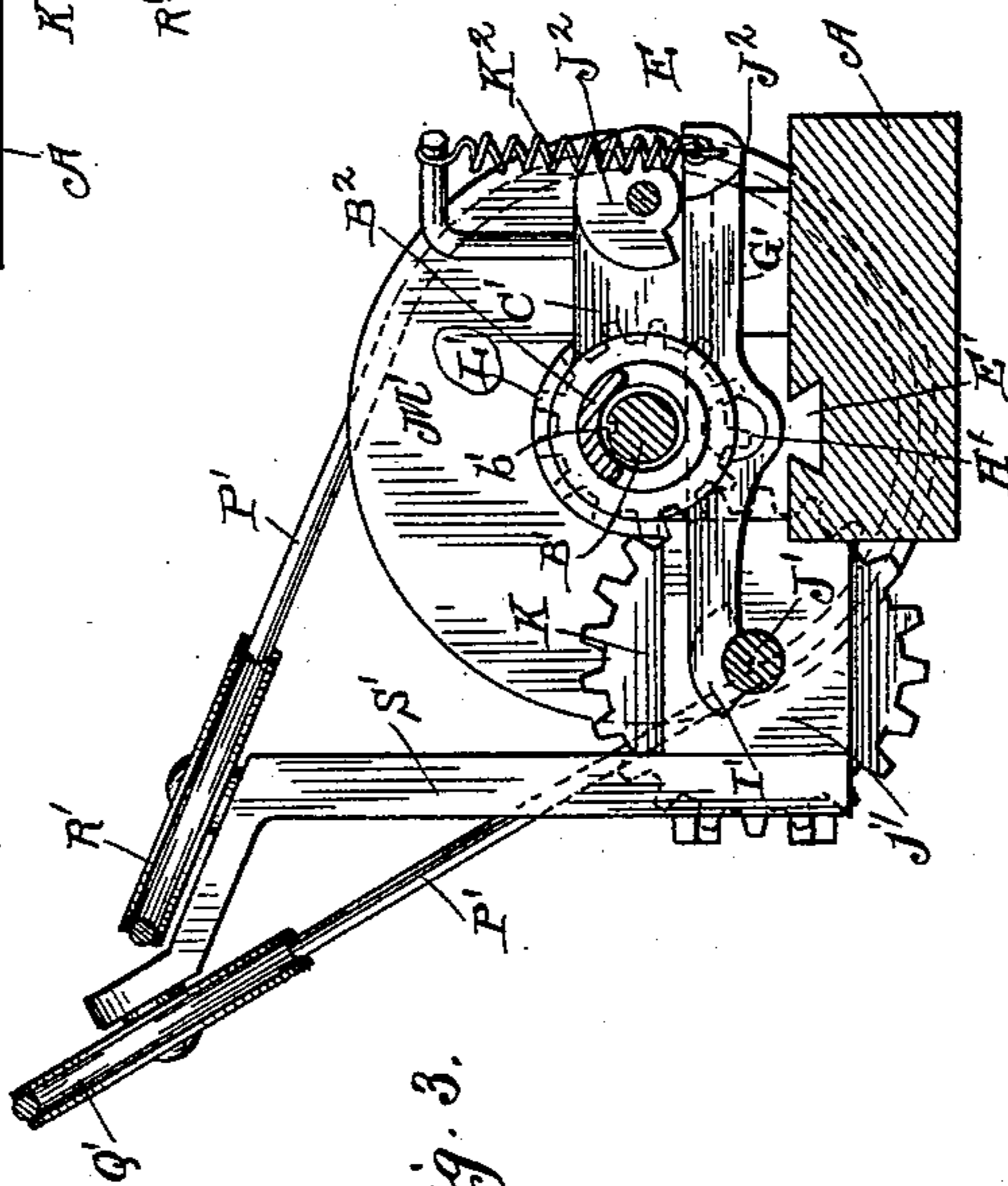


Fig. 3.

Witnesses:
R. J. Jaeger,
J. H. Harrison.

By

Inventor:
John T. Kennedy,
Brown & Brown,
Atty's.

(No Model.)

2 Sheets—Sheet 2.

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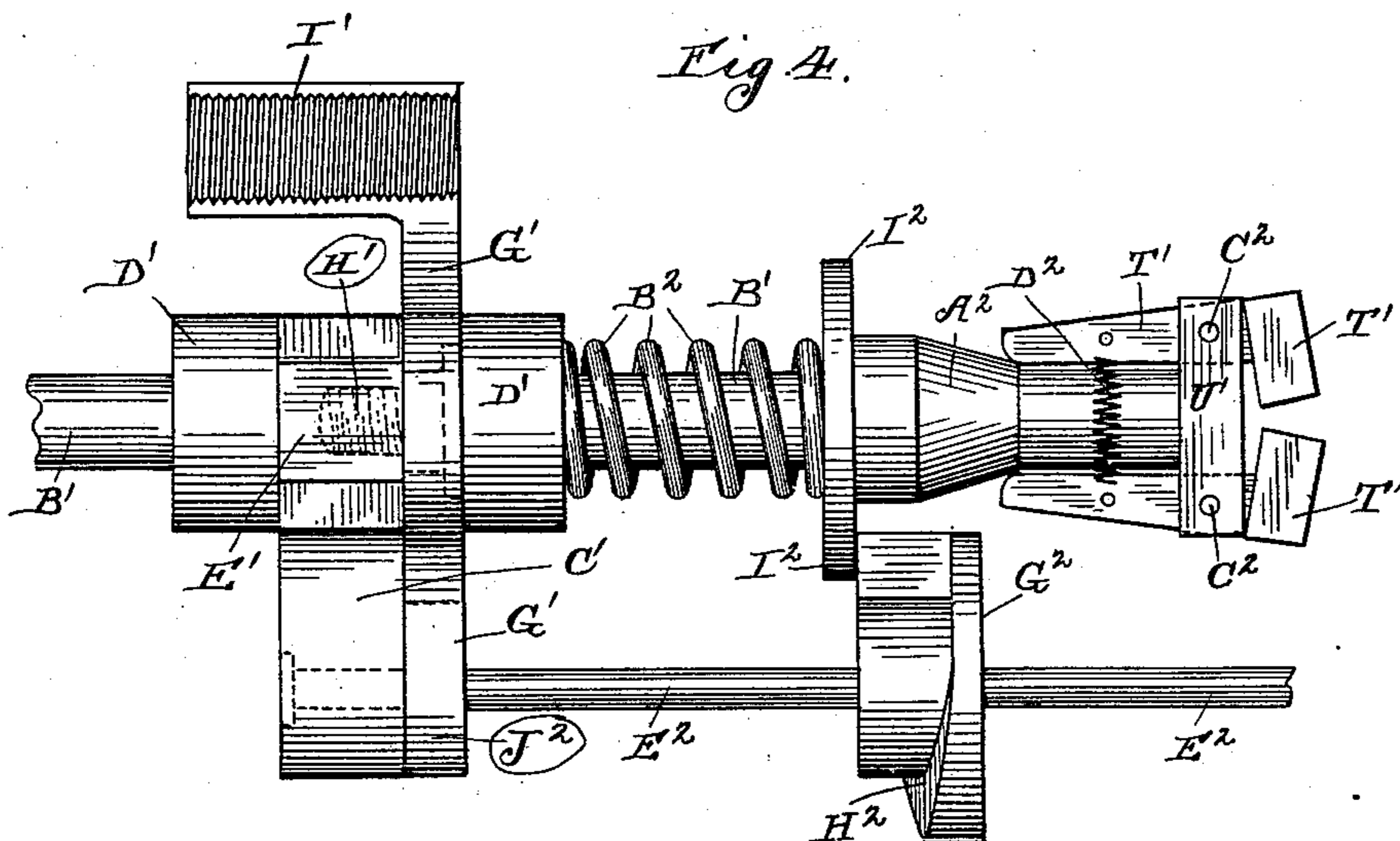


Fig. 5.

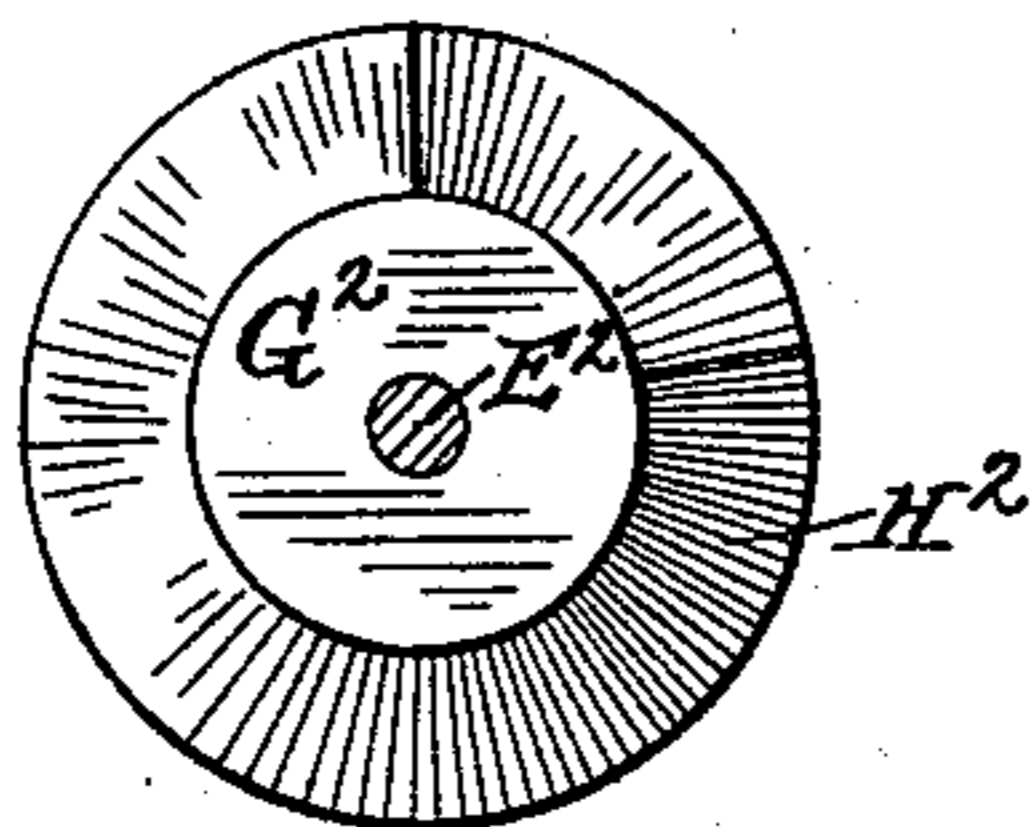


Fig. 7.

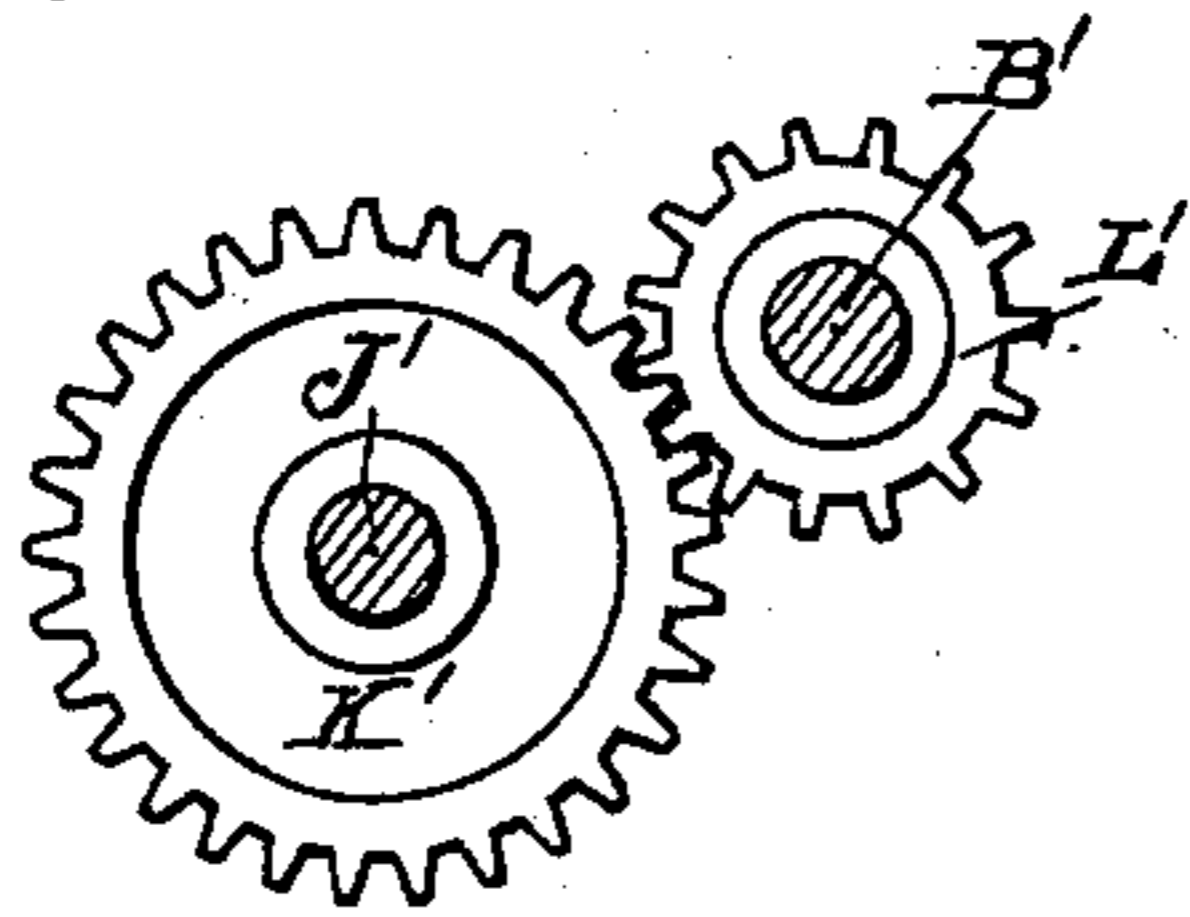


Fig. 6.

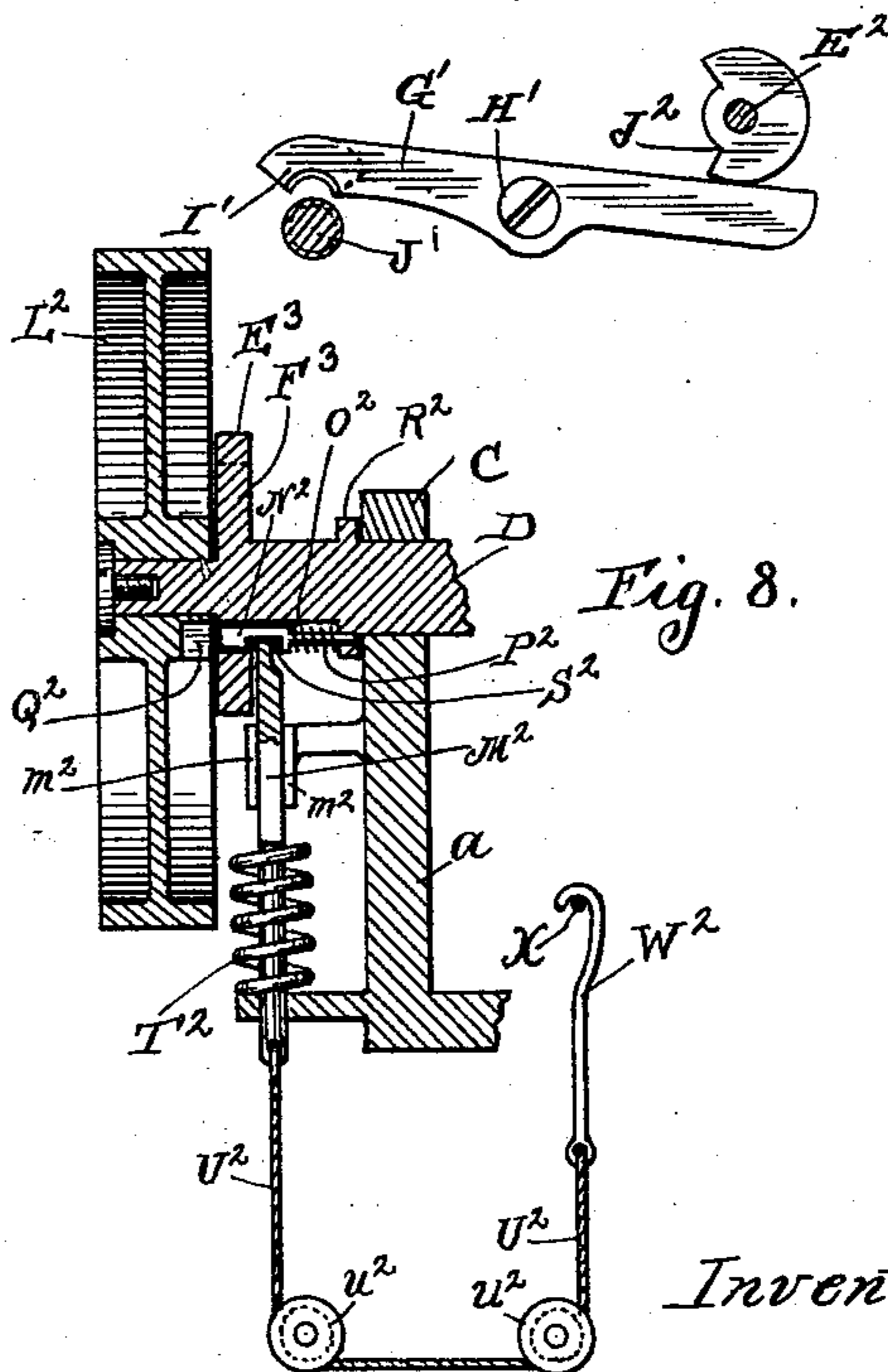


Fig. 8.

Witnesses:

R. J. Jaeger,
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UNITED STATES PATENT OFFICE.

JOHN T. KENNEDY, OF CHICAGO, ILLINOIS.

SWAGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 585,151, dated June 22, 1897.

Application filed May 14, 1896. Serial No. 591,455. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. KENNEDY, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Swaging Machinery, of which the following, when taken in connection with the drawings accompanying and forming a part hereof, is a full and complete description, sufficient to enable those who understand the art to make and use the same.

The invention relates to machines designed to swage a portion of the length of a spoke composed of wire for bicycles or carriages. Such machines may of course be used to swage other materials, as tubes, wires for other purposes, and the like.

In the accompanying drawings, composed of two sheets, Figure 1 is a plan view of a swaging-machine embodying my invention. Fig. 2 is a sectional view of such machine on line 2 2 of Fig. 1, viewed in the direction indicated by the arrows; Fig. 3, a sectional view on line 3 3 of Fig. 1, viewed in the direction indicated by the arrows; Fig. 4, an enlarged view of the gripping mechanism of the machine; Fig. 5, a rear elevation of a cam forming an element in the mechanism illustrated in Fig. 4; Fig. 6, an elevation of the lever and nut thereon engaging with the revolving screw, (shown in cross-section,) by means of which the spoke is drawn through the swaging-dies of the machine; Fig. 7, an elevation of engaging gear-wheels by means of which the rotation of the spoke as it is drawn through the swaging-dies is effected and controlled with relation to its longitudinal movement; and Fig. 8, a sectional view on line 8 8 of Fig. 1, viewed in the direction indicated by the arrows.

A letter of reference applied to a given part is used to designate such part throughout the several figures of the drawings wherever the same appears.

A is the base of the machine.

a a are uprights secured to base A.

B is the driving-shaft of the machine, rotatably mounted in journal-bearings C C on uprights *a a*, respectively.

D is an eccentric on driving-shaft B.

E F are levers forming what is termed a "knuckle-joint," and G is a link connecting

the coupling H of levers E F and the eccentric D on shaft B. The rotation of the shaft B is thus made to produce reciprocatory rectilinear movement of coupling H.

I is a stationary head between uprights *a a*, and J is a recess in the lower side of head I, suitably journaled to receive the upper end of lever E. For reasons about to be given I desire to make the head I vertically adjustable, and this is effected by interposing wedge K between head I and cross-bar L, such cross-bar being rigidly secured to uprights *a a*. To maintain head I in its adjusted position, I use set-screws M N.

O is an adjusting set-screw extending through lip or lug P on wedge K and against the face of cross-bar L.

Q is a swaging-die firmly secured to base A, as by screws *q q*.

R is a swaging-die vertically movable between uprights *a a* on guides S S.

T is a shaft extending through die R and through the lower end of lever F, such shaft being journaled in lever F or die R (or both of them) and connecting them together.

Lever E being journaled to block I and levers E F being coupled together and to connecting-bar G, with such connecting-bar G on eccentric D on shaft B, the rotation of the driving-shaft B produces a vertical movement of the die R, and die R can be (and is) so adjusted with reference to die Q by means of wedge K, as hereinbefore described, that a wire spoke or other article placed between the dies is properly swaged by the movement of die R.

I will now proceed to describe the mechanisms by means of which the spoke or other article being swaged is moved longitudinally between the dies Q R to determine the place and amount of swaging thereof.

A' is a journal-bearing secured on base A, and B' is a shaft rotatably mounted in such journal-bearing. Shaft B' can also move longitudinally in journal-bearing A'.

C' is a journal-bearing through which the shaft B' extends and in which it is rotatable.

D' D' are collars rigidly secured on shaft B on each side of the journal-bearing C' to prevent longitudinal movement of shaft B' in such journal. It occurs, therefore, that when it is desired to move shaft B' longitudinally

in the journal-bearing A' it is merely necessary that journal-bearing C' be correspondingly moved. So that such journal-bearing C' may at all times constitute the proper and desired support for shaft B', I place the dove-tailed part E' of such bearing C' in groove F' in base A.

G' is a lever pivotally mounted on journal-bearing C' by pin H'.

I' is a half-nut on one end of lever G', engaging with the screw-threads on rotatable screw-shaft J'.

K' is a gear-wheel rigidly secured on shaft J' and engaging with gear L' on shaft B'.

Shaft J' is rotatably journaled in journals j' j'.

M' is a driving-pulley secured to gear-wheel L'.

Wheels L' M' are mounted loosely on shaft B', so that such shaft may move longitudinally through the hubs thereof, but with feather b' interposed between such hubs and the shaft, so that such wheels will be rotated by the shaft.

O' is a pulley on driving-shaft B, and P' is a belt or cord extending over pulley O', idlers Q' and R', and pulley M'.

S' is the standard, secured to base A, on which idlers Q' R' are rotatably mounted. Shaft B' and screw-shaft J' are thus rotated by driving-shaft B through pulley O', belt P', pulley M', feather b', and gears K' L'. When lever G' is in position so that half-nut I' is in engagement with screw-shaft J', the shaft B' (through journal-bearing C') is moved longitudinally away from dies Q R. So that the longitudinal movement of shaft B' away from dies Q R shall rotate and at the same time draw through such dies the wire X or other material I mount gripping-jaws T' T', connected by tie U, on the end of such shaft adjacent to such dies and arrange such gripping-jaws to properly grasp such wire or other material.

A² is a sleeve longitudinally movable on shaft B' and fitting between the rear end of gripping-jaws T' T' at its forward and beveled end.

B² is a spring mounted on shaft B', so that its rear end shall thrust against bearing C' and its forward end against sleeve U', thus tending to force the sleeve between the jaws T' T' and so force such jaws upon the wire spoke or other material between them, such jaws T' T' turning on pivots C² C².

D² is a spring tending to turn the jaws T' T' on pivots C² C², and so hold the jaws open when the sleeve A² is forced back against the spring B².

E² is a rod, one end whereof is mounted in journal-bearing C' and the other end whereof projects beyond the front of the machine and has thereon handle F². The rod E² can be partially turned by the handle F². G² is a cam rigidly secured to rod E². Cam G² has cam H² on the rear face thereof with which the circular flange I² on sleeve A² engages by being forced against it by spring B². J² is a

peripheral cam also secured on shaft E². Cam J² is in engagement with lever G', (see Fig. 6,) that is, lever G' is held against peripheral cam J² by spring K². (See Figs. 2 and 3.)

L² is the driving-wheel of the machine, loosely mounted on shaft B, and M² is a clutch arranged to be forced into and moved out of contact with wheel L². I of course make no claim for the particular form of clutch employed.

Whatever clutch is employed the construction and arrangement thereof should be such as will obtain an automatic stopping of the machine when the proper part of the spoke to be swaged has been extended through between the dies. In order to explain the mechanism by which I obtain the automatic stopping of the machine, a brief description of the clutch is given.

N² is a bolt longitudinally movable in groove O² in shaft B, and P² is a spring tending to force bolt N² into engagement with aperture Q² in driving-wheel L². The rear end of spring P² is against annular flange R² on shaft B.

S² is a beveled cut in bolt N².

Clutch M² is movable in guides m² m² and is yieldingly forced forward into engagement with the beveled edge of cut S² in bolt N² by spring T².

U² is a cord extending from clutch or fork M² over the pulleys u² u², and W² is a hook on the end of cord U², which can be engaged with the spoke X when spring P² is retracted, so that clutch or fork M² is released from engagement with bolt N².

When the machine is started, the hook W² is put over spoke X, between guides Y² Y², and the machine will continue to run until the spoke passes on, so that such spoke goes out from under such hook W². Spring P² then forces the clutch or fork M² up into the path of pin N², and as such pin is rotated against the clutch or fork the beveled edge of the cut S² in the bolt coming against the inclined or beveled edge of the clutch or fork M² such bolt is withdrawn from engagement with driving-wheel L², and the machine stops.

To be sure that the machine will stop, so that the dies Q R are separated to permit the spoke to be inserted between them and into the gripping-jaws T' T', I pivotally mount the pawl A³ on pivot B³, connect pawl B³ by connection C³ with abutment D³, and put abutment E³ on ring F³. Abutment D³ is rigidly secured to clutch or fork M², so that when the clutch is retracted from engagement with bolt N² the pawl A³ is retracted from engagement with abutment E³, and when such clutch or fork M² is in engagement with such bolt N² the pawl A³ is in the path of such abutment E³ and will arrest such abutment (and so the machine) when the abutment is brought in contact therewith.

The operation of the machine is: Handle F² is grasped and turned so as to disengage nut

or half-nut I' from the screw-threaded shaft J' by means of peripheral cam J² and brought forward, thereby bringing forward the journal-bearing C', shaft B', and gripping-jaws T' T'. Handle F² is turned so as to open gripping-jaws T' T' by cam H² forcing sleeve A², through peripheral flange I², against spring B² and out of the rear end of jaws T' T'. A wire spoke is then inserted between dies Q R and into position between gripping-jaws T' T' and handle F² turned so as to release cam G² from flange I², thereby permitting spring B² to force sleeve A² between the rear end of such jaws T' T', and also releasing peripheral cam J² from lever G', permitting spring K² to raise the end of the lever G' in contact with the peripheral cam J², thus forcing nut or half-nut into engagement with the screw-threads on screw-shaft J'. Driving-wheel L² rotates continuously while the machine is being operated. Clutch M² is forced into engagement with driving-wheel L², and the machine is started. The revolution of shaft B produces continuous and rapid vibratory movement of die R on die Q and the interposed spoke X. Pulley M' is rotated by belt or cord P', extending thereover and over pulley O' on shaft B, and consequent rotation of shaft B', gripping-jaws T' T', and spoke X is produced. Gear-wheel L' on pulley M' rotates gear K', and gear K' being rigidly secured to screw-shaft J' such shaft is thereby rotated, thus moving nut or half-nut I' away from the dies Q R. Nut I' being mounted on lever G' and such lever secured to journal-bearing C' the movement of the nut I' produces longitudinal movement of the shaft B' away from the dies Q R, thus drawing the spoke X longitudinally through between the dies as they vibrate and at the same time rotating the spoke. As the spoke passes out from guides Y² Y² hook W² is released, as hereinbefore described, and the machine stopped. Handle F² is again turned slightly, brought forward, the spoke which has been swaged released, and the operation repeated with another spoke.

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

1. In a swaging-machine, the combination with the dies of a rotatable and longitudinally-movable shaft, gripping-jaws mounted on the end of the shaft, a stationary journal-bearing and a movable journal-bearing for the shaft, a rotatable screw, a lever adjustably mounted on the movable bearing and a nut on such lever engageable with the rotatable screw, means for rotating the shaft, means for simultaneously rotating the rotatable screw, and means for disengaging the nut from the rotatable screw; substantially as described.

2. In a swaging-machine, the combination with the dies and a rotatable and longitudinally-movable shaft having a stationary and a movable journal-bearing, of gripping-jaws pivotally mounted, respectively, on the shaft,

a longitudinally-movable sleeve mounted on the shaft, a spring on the shaft yieldingly forcing the sleeve into engagement with the gripping-jaws and closing them, a second shaft one end whereof is journaled in the movable journal-bearing of the first-named shaft, a cam on such second shaft engaging with the sleeve on the first-named shaft, and means for turning the second-named shaft, whereby the sleeve is withdrawn from the gripping-jaws by the cam thereon; substantially as described.

3. In a swaging-machine, having dies and means for vibrating one thereof, of a longitudinally-movable rotating shaft, gripping-jaws on the shaft, a journal-bearing and a movable journal-bearing for the shaft, a lever on the movable bearing, a nut on the lever, a rotatable screw with which the nut engages, a second longitudinally-movable shaft, one end whereof is journaled in the movable journal-bearing, a peripheral cam on such second shaft engaging with the lever, and a handle on the second-named shaft; substantially as described.

4. In a swaging-machine, the combination with the dies, the rotatable and longitudinally-movable shaft and means for grasping a spoke to rotate and move longitudinally with the shaft, of a rotatable screw-shaft, a movable journal-bearing in which the first-named shaft rotates, a lever on the journal-bearing and a nut thereon engaging with the rotatable screw-shaft, a second longitudinally-movable shaft, a cam on such shaft engaging with the lever on the movable journal-bearing, and a second cam on such second-named shaft, a sleeve on the first-named shaft engaging with the gripping mechanism and with the last-named cam on the second shaft, and a handle on such second shaft by which it can be rotated and moved longitudinally; substantially as described.

5. The combination of a die forming an anvil, a movable die, levers connected together by a pivot common to both, an abutment in which one of the levers is journaled at one of its ends, a journal by which the other lever is connected at one of its ends to the movable die, and means for forcing the pivot common to the levers, together with the ends thereof connected thereby, through the common axial line of the levers, with means for passing a spoke longitudinally between the dies, and a hook engaging with the spoke in such manner that the movement of the spoke disengages it from the hook, a driving-wheel loosely mounted on the driving-shaft of the machine, a clutch between the shaft and wheel consisting of a recess and a bolt, the bolt yieldingly held out of engagement with the recess, and a connection between the bolt and the hook; substantially as described.

6. In a swaging-machine, the combination of a rotatable driving-shaft, a driving-wheel on the shaft, a clutch between the driving-shaft and driving-wheel, such clutch consist-

ing of a recess and a bolt yieldingly held out
of engagement with the recess, a hook engag-
ing with a longitudinally-movable spoke in
such manner that the longitudinal movement
5 of the spoke carries it out of engagement with
the hook, thereby permitting the hook to be
moved transversely to the axis of the spoke,
and a connection between the bolt and the
hook, whereby when such hook may move
10 transversely to the axis of the spoke the bolt
is automatically moved out of engagement
with the recess; substantially as described.

7. In a swaging-machine, the combination
with the dies, of a rotatable and longitudi-
15 nally-movable shaft, a stationary journal-
bearing and a movable journal-bearing for
the shaft, gripping-jaws on the shaft, a ro-
tatable screw, an adjustable lever mounted

on the movable journal-bearing and a nut on
the lever engaging with the rotatable screw, 20
a rocking shaft journaled at one end in the
movable journal-bearing, a cam on the rock-
ing shaft, a sleeve on the rotatably and lon-
gitudinally movable shaft, with which sleeve
the cam engages, and a spring on the shaft 25
forcing the end of the sleeve adjacent to the
gripping-jaws into engagement therewith to
yieldingly close the jaws; whereby the rock-
ing of the rock-shaft forces the sleeve out of
engagement with the gripping-jaws, permit- 30
ting them to open; substantially as described.

JOHN T. KENNEDY.

In presence of—

CHARLES TURNER BROWN,
EDWIN B. CADWELL.