

(No Model.)

2 Sheets—Sheet 1.

J. F. COLLINS.  
SPIKE MACHINE.

No. 399,500.

Patented Mar. 12, 1889.

Fig. 1.

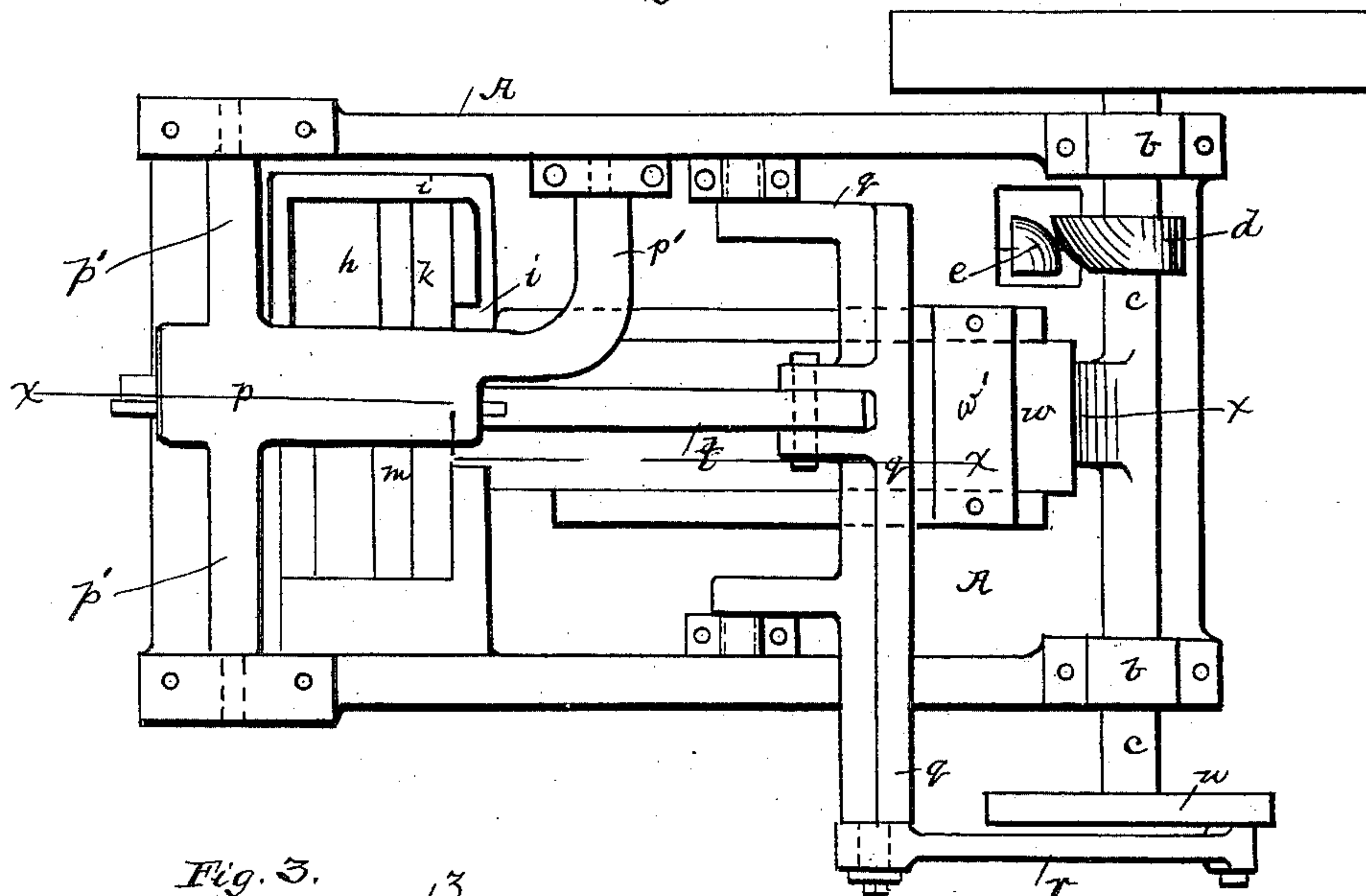


Fig. 3.

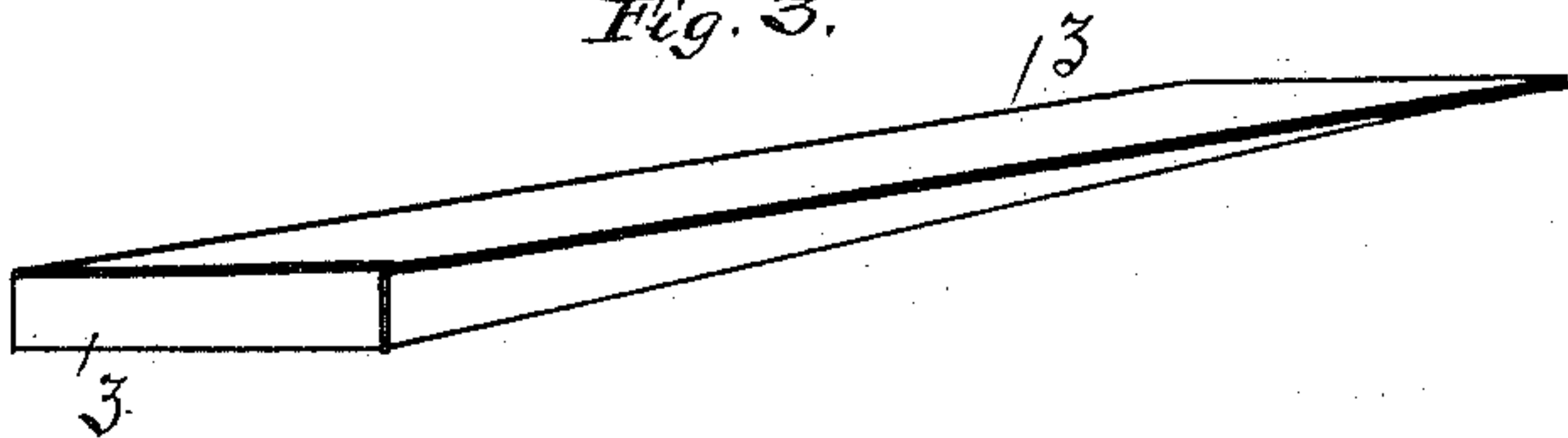
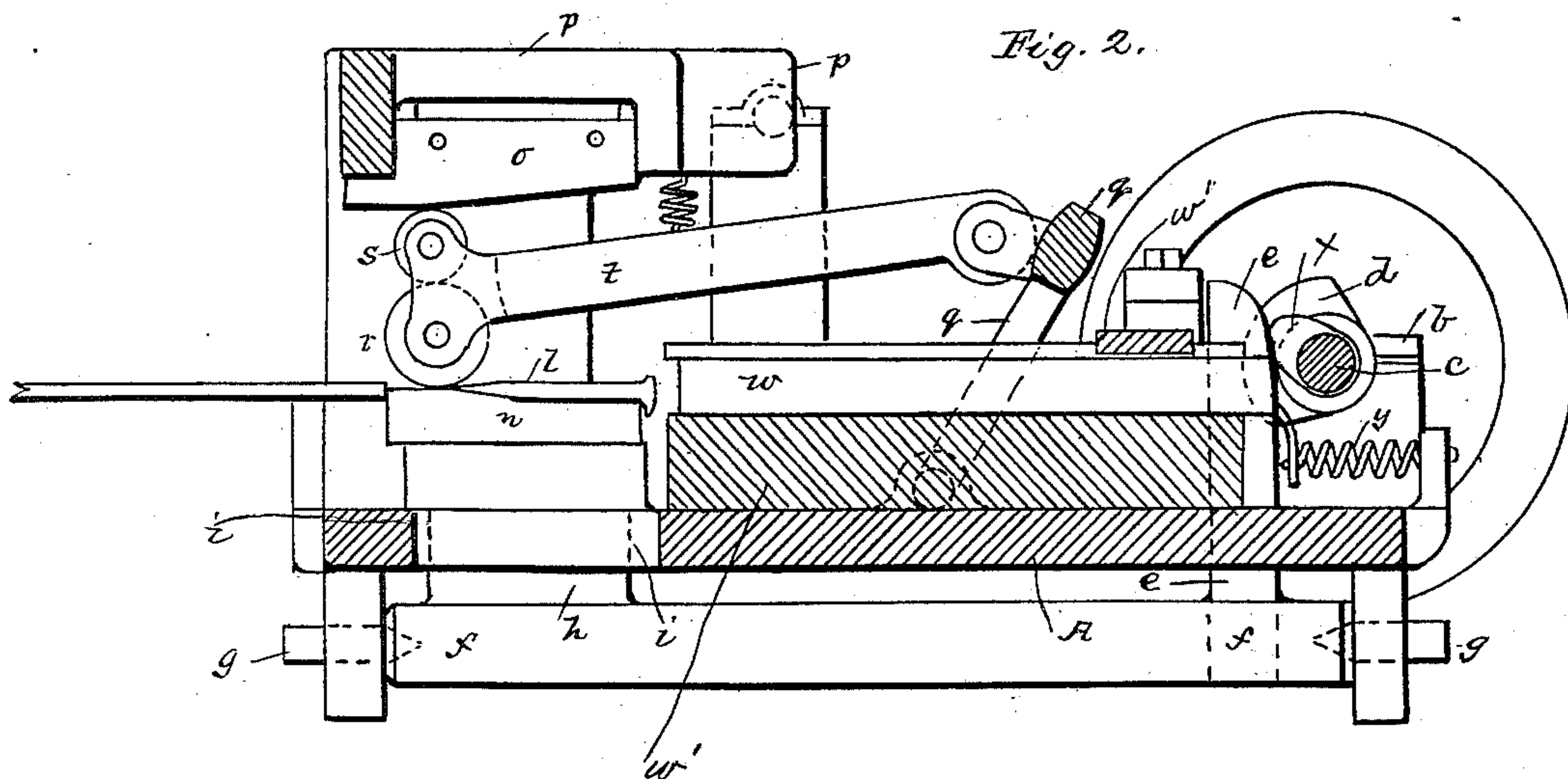


Fig. 2.



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(No Model.)

2 Sheets—Sheet 2.

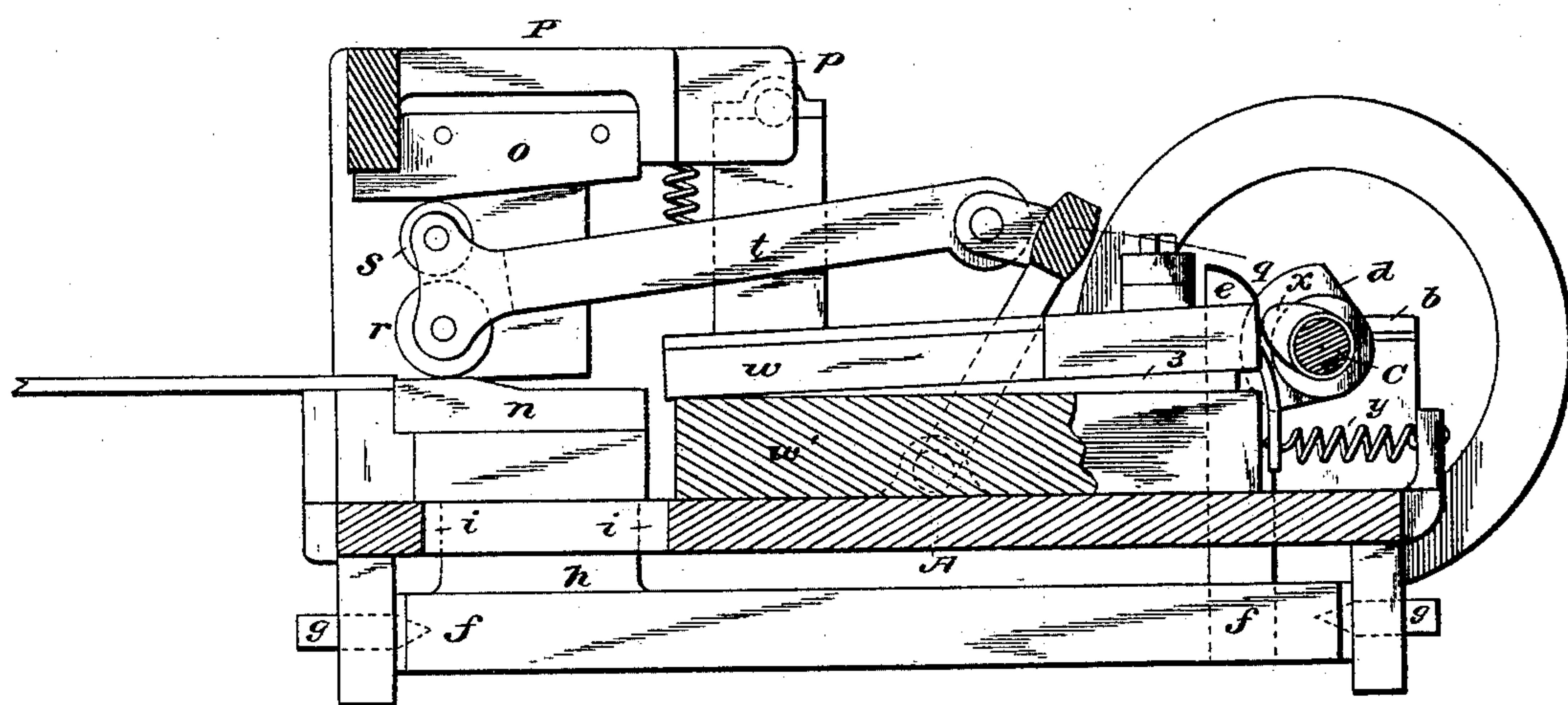
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Fig. 4



Witnesses:

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# UNITED STATES PATENT OFFICE.

JAMES F. COLLINS, OF ALLEGHENY, PENNSYLVANIA.

## SPIKE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 399,500, dated March 12, 1889.

Application filed October 4, 1888. Serial No. 287,218. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. COLLINS, a citizen of the United States, residing at Allegheny in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Spike-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improved machine for manufacturing railroad and other large spikes; and it consists in a means for forming the points by rolling and a device for shaping the heads, together with certain other details of construction and combination of parts, as will be fully set forth hereinafter.

In the accompanying drawings, Figure 1 is a plan view of my improved spike-machine constructed in accordance with my invention. Fig. 2 is a vertical view, partly in side elevation, on the line *x x* of Fig. 1. Fig. 3 is a perspective view of a wedge or inclined strip, used beneath the "header" when making railway-spikes. Fig. 4 is a side elevation, partly in section, showing the removable wedge in position beneath the header *h* to incline the latter longitudinally.

To put my invention into practice I provide a bed-plate, *A*, of suitable size and form of construction, and mount thereon in suitable bearings, *b*, a strong driving-shaft, *c*, capable of a powerful rotary movement on its axis. Secured to this shaft *c* is an eccentric, *d*, which, when brought in contact with a vertical oscillating arm, *e*, moves the same side-wise and thereby gives a rocking motion to a shaft, *f*, secured in bearings or pivots *g* beneath the bed-plate *A*. At the one end of this shaft *f* is secured a die-box, *h*, which projects upward through an opening, *i*, formed in the bed-plate *A*. This die-box *h* contains suitable dies, *k*, for gripping the bar from which the spikes are formed, by pressing the same against other dies, *m*, directly opposite. The gripping-dies *k* are carried by the rock-shaft *f* and the opposite gripping-dies, *m*, are fixed or held stationary in a similar die-box, which is rigidly fixed to the bed of the machine. When

the rock-shaft *f* is oscillated by the cam striking the upper end of the oscillating vertical arm *e*, the movable gripping-dies *k* are moved toward the stationary gripping-dies, said dies being of any suitable construction to firmly grip and hold the blank or metal between themselves while the point and head is being formed on the spike, and when the movable gripping-die is moved laterally away from the stationary gripping-die, after the head and point has been formed on the spike, the latter is released from the dies and falls or drops by gravity through the opening *i* in the bed *A* of the machine. Between these die-boxes *h m* is a plate, *n*, of a width equal to the spikes being formed, and capable of being detached and removed to substitute others of greater or less width. This plate *n* has a tapering or inclined portion corresponding to the taper or inclination of one side of the point of a railway-spike. Above this plate *n* is detachably secured an inclined block, *o*, the incline of which corresponds to that below, and is held in position by a suitable frame *p*, which is erected in a vertical position immediately over the plate *n*, so as to hold the inclined block *o* in a fixed position over the blank or embryonic spike, which is held in a fixed position on said plate *n* by the fixed and movable gripping-dies. This vertical supporting-frame *p* has diverging arms *p'*, which are secured or fixed to the frame or bed *A* of the machine. Between these upper and lower inclined plates, *n o*, are two narrow rollers, *r s*, mounted in an arm, *t*, capable of moving a limited distance in the direction of the length of the two plates *n o*. This arm *t* is pivoted to a rocker, *q*, which is operated by a disk, *u*, secured on one end of the driving-shaft *c*, and connected to the same by a wrist, *v*, to one end of the rocker *q*.

Directly back and in line with the rollers *r s* is a horizontally-moving header, *w*, which is moved forward at the proper time by an eccentric, *x*, secured to the driving-shaft *c*, and is recovered or brought back by a spring, *y*, attached to the rear of the same. This header *w* is supported in a horizontal position on a raised central support or block, *w'*, which is erected and fixed on the middle of the bed *A* at a point in rear of the gripping-dies *k m* and with its upper face slightly be-



low the horizontal plane of the upper face of the plate *n*, on which rests the blank or spike. This header *w* is guided in a direct line by suitable ways or other means on the support *w'*, and when the header is drawn rearwardly by the retracting-spring *y* its rear end is arranged in the path of the cam *x* on the driving-shaft, so that it will be again forced forward when said cam strikes the rear end of the same at the next rotation of the shaft. In Figs. 2 and 3 of the drawings I have shown the retracting-spring *y*, arranged below and out of the path of the rotary cam *x*, and the rear end of said header connected to the spring by a depending arm; but I would have it understood that I do not confine myself to the described means, or to any particular arrangement and connection intermediate of the spring and header. When the header is arranged in a horizontal position, as indicated in Figs. 1 and 2, I prefer to employ a plate, *w'*, for keeping the rear end of the header in a proper position. This plate is removably secured in place by means of screws or other suitable devices to the ways or guides between which the header reciprocates, and when it is desired to adjust the header to the vertically-inclined position (shown in Fig. 3 of the drawings) this plate is removed and the tapered wedge *z* inserted between the header and the bed on which it reciprocates, as will be more fully described hereinafter.

The devices for shearing and feeding the bar into and between the dies *m k* are well-known features of this class of machines. Therefore it is deemed unnecessary to describe or show such devices, as they differ in no essential feature from those now in common use. When this machine is used for making railway-spikes, a tapering plate, *z*, (shown in Fig. 3 of the drawings,) is inserted with its reduced or thin end foremost between the rear end of the header and raised central support *w'* thereof, as indicated by dotted lines in Fig. 2, thereby elevating the rear end of said header and causing it to assume a horizontal inclined position, and deflecting the front vertical edge of the header from a vertical line to a slightly-inclined vertical line, so that when the header is again forced forward by the cam *x* its vertically-inclined face impinges at an angle against that portion of the blank designed to make the head, and thereby bends or forces the metal downward at an angle, which greatly facilitates the forming of the peculiar long head of the spike.

The operation of my spike-machine is as follows: The bar or blank which is to form the spike is first cut into suitable lengths, brought to a high degree of heat, and fed into the machine by devices provided for that purpose to the plate *n*, on which it rests, and where it is gripped and held in a stationary rigid position by the gripping-dies, the movable dies *k* moving laterally of the fixed dies to permit the blank to be properly adjusted between said dies and on the plate *n*. The

link *v* and disk *u* now force the endwise-movable arm *t* and the rollers *r s* forward, the upper roller, *s*, riding against the lower inclined face of the fixed block to positively depress the roller *t* on the blank, and as the upper face of the plate *n* and the lower face of the block *o* are inclined in reverse directions it is obvious that the opposite sides of the blank operated on by the roller *t* and the plate *n* are correspondingly incline *l*, and the spike is thus tapered longitudinally to the desired contour. Simultaneously with the forward movement of the rollers and arm, the header *w* is forced in the same direction by the cam *x*, so that the front end of the header acts against the opposite end of the blank to form the head thereon, and the header and rollers *r s* are now drawn rearward by the spring *y* and the shaft *c*, respectively, away from the spike, and the shaft *f* is rocked to withdraw the movable die *k*, and thus release the spike, thereby allowing the latter to drop through the opening *i* in the bed *A*.

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

1. In a machine for the purpose described, the combination consisting of the shaft *c* and a means for rotating the same, the gripping-dies *m k*, one of which having a limited movement toward the other, the inclined plates *n o*, the rollers *r s*, operating between the same, mounted in an arm, *t*, connected to a rocker, *q*, actuated by means of a disk, *u*, and pitman *v*, connected to the driving-shaft *c*, and the heading device *w*, capable of moving forward toward the gripping-dies *m k* by means of a cam, *x*, secured to the shaft *c*, the said heading device being capable of being elevated and made to operate on a tapering or inclined surface, substantially as and for the purpose set forth.

2. In a spike-machine, the combination of a stationary inclined plate, *n*, the fixed and movable gripping-dies for holding the blank in fixed position on said plate, an inclined fixed block arranged in the vertical plane of said plate *n* and above the latter, and an endwise-movable arm carrying two rollers, one adapted to ride against the inclined block to depress the other roller upon the blank held on the plate *n* by the gripping-dies, substantially as and for the purpose described.

3. In a spike-machine, the combination, with the gripping-dies, of an endwise horizontally movable-header and a tapered block or plate removably fitted between the rear end of said header and the support thereof, substantially as and for the purpose described.

In testimony that I claim the foregoing I hereunto affix my signature this 11th day of September, A. D. 1888.

JAMES F. COLLINS. [L. S.]

In presence of—

M. E. HARRISON,  
C. C. LEE.