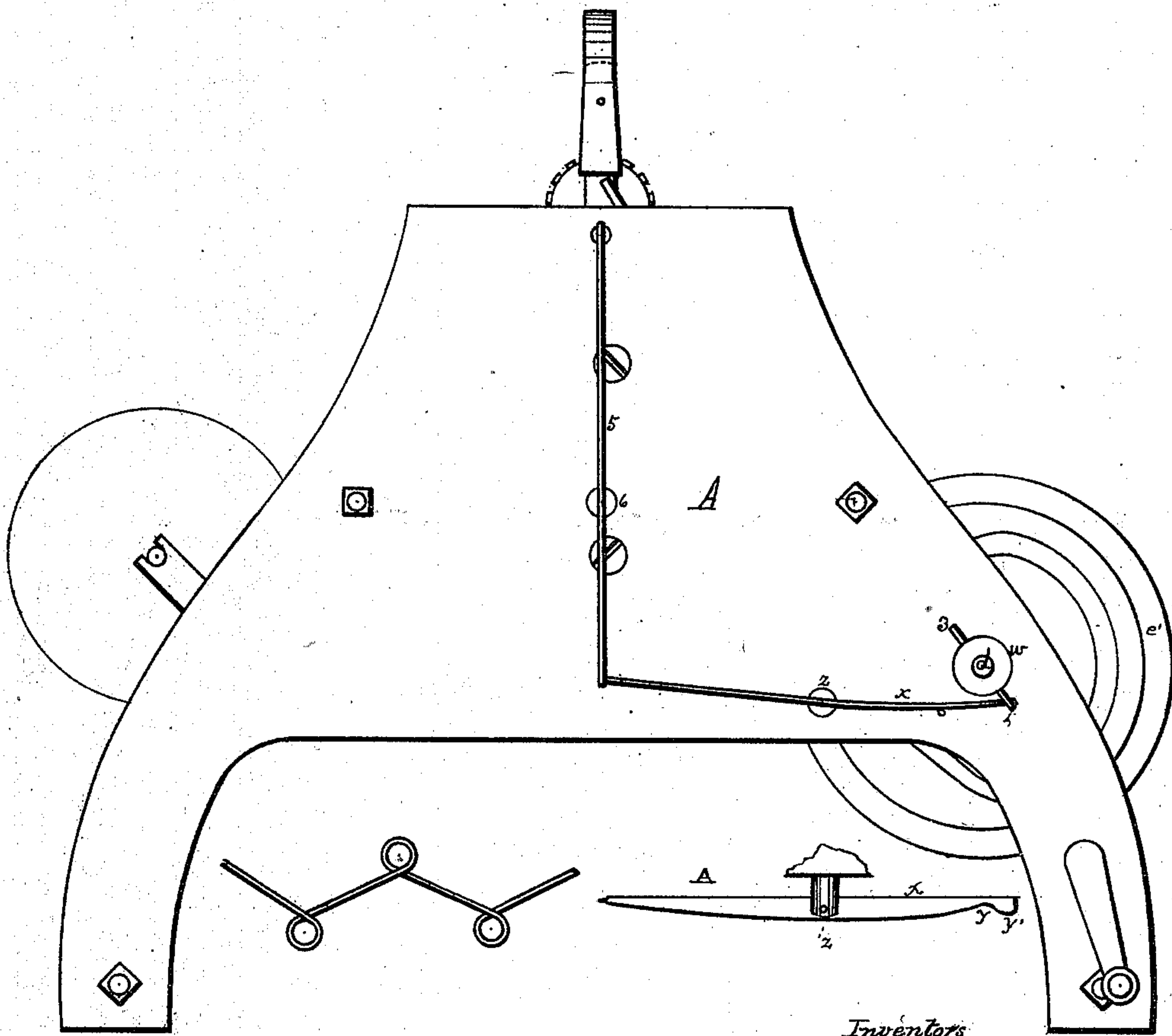


Allen Small & Small,

## Casting Wire.

No. 112,526.

*Patented Mar. 14, 1871.*



Inventors

E. B. Allen

C. O. Small

A. P. Small

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Witness

Henry C. Houston

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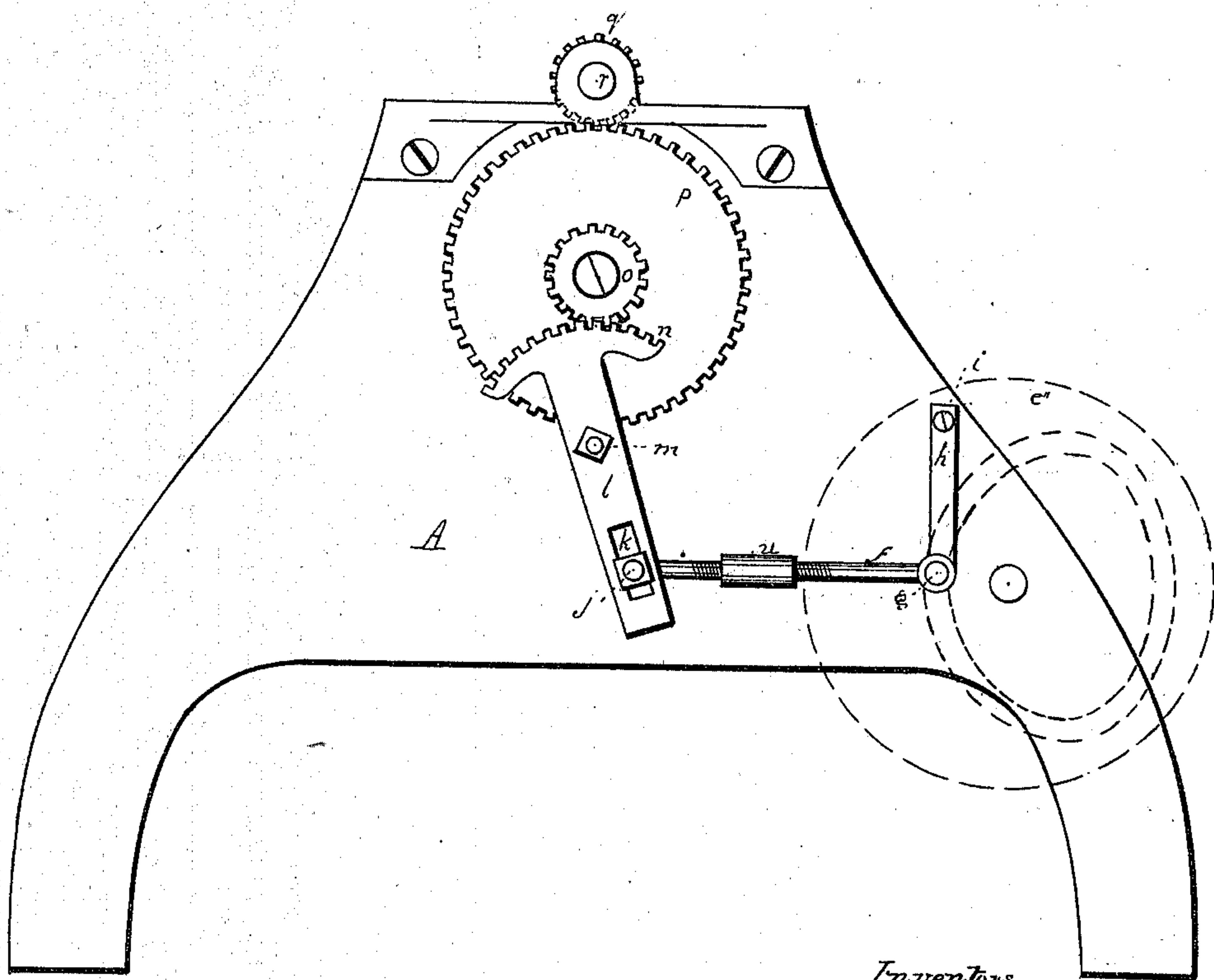


Allen, Small & Small,

*Caiting Nite.*

No. 112,526.

*Patented Mar. 21. 1871.*



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4. Sheets, Sheet 4.

*Patented Mar. 14, 1871.*



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# UNITED STATES PATENT OFFICE.

ELIAS B. ALLEN, CHARLES O. SMALL, AND ALONZO P. SMALL, OF  
AUGUSTA, MAINE.

## IMPROVEMENT IN MACHINES FOR COILING WIRE.

Specification forming part of Letters Patent No. 112,526, dated March 14, 1871.

*To all whom it may concern:*

Be it known that we, ELIAS B. ALLEN, CHARLES O. SMALL, and ALONZO P. SMALL, of Augusta, in the county of Kennebec and State of Maine, have invented a new and useful Machine for Coiling Wire; and we do hereby declare the following to be a full, clear, and exact description thereof, which will enable others to make and use our invention, reference being had to the accompanying drawings, forming part of this specification, in which—

Plate 1 is an exterior side elevation of one side of a machine exhibiting our invention. Plate 2 is a front end elevation of the same. Plate 3 is a side elevation of the interior of one side. Plate 4 is a side elevation of the interior of the other side.

The purpose of our invention is to provide a machine for coiling wire, the same being produced in the form illustrated.

The operating parts of our machine are set upon and attached to a proper frame, A. In Plate 2 is illustrated the method by which motion is imparted to the different parts of our machine. Power is applied to the shaft *a*, at the point illustrated in the drawings, by the crank *e*. On one end of the shaft *a*, and rigidly attached thereto, is the gear *b*, matching the larger gear *c*, which latter is rigidly attached to the shaft *d*. Upon this shaft are set the two cams *e' e''*. In the Plates 3 and 4 is seen the form of the paths of said cams, and therein are also illustrated those portions of our machine to which the said cams impart motion. In Plate 3 the rod *f* is provided with a small stud, *g*, which fits into the path of the cam. This rod is supported or suspended in position by the bar *h*, pivoted to the inside of the frame of the machine at *i*, and allowing of the horizontal motion of the rod *f* as impelled by the movement of the cam. The other end of the rod is provided with a bolt, *j*, which fits into the slot *k* of the sector *l*. This bolt can be adjusted in the slot by means of a nut and a screw-thread on the bolt. The sector is pivoted to the inside of the frame of the machine at *m*, and is provided with teeth *n*, which match the teeth of the pinion *o*, which pinion revolves the gear *p*, matching with the smaller gear *q* on the shaft *r*. This shaft carries and rotates the hoop *s*. The shaft *r* is

hollow a portion of its length for the insertion of the wire *t* to be coiled, which wire passes up over the hoop, as illustrated in Plate 2.

The method of coiling the wire will hereinafter be more fully explained when certain other portions of the machine have first been described; but it may here be observed that by the rotation of the cam *e''* an intermittent reciprocating motion is imparted to the sector *l*, the said sector remaining stationary when the stud *g* is at that point in the path of the cam shown in Plate 3. It may also be observed that the rod *f* is adjustable or extensible, being made in two pieces, and being furnished with the sleeve *u* and the right and left hand screws, as illustrated, the purpose of which arrangement is to regulate the distance of the movement of the sector *l*, and the consequent number of revolutions of the hoop *s*.

The cam *e'* operates the points upon which the wire is coiled. (See Plate 4.) The form of the cam *e'*, which is different from the cam *e''*, is illustrated in this figure; but the bar *h'*, the rod *f'*, the sleeve *u'*, the bolt *j'*, and the slot *k'* are the same as the devices already alluded to, and shown in plate 3, and need not be further described. By the revolution of this cam *e'* a motion is imparted to the pivoted lever *l'* similar to that imparted by the cam *e''* to the sector *l*, but taking place when the sector is at rest. This lever *l'* is pivoted at *m'*, and has the two horizontal arms *n' n''*. Pivoted to the ends of these two arms are the rods *o' p'*, adjustable like *f'*. Attached and pivoted to the ends of *o' p'* are the inclined sliding arms *q' r'*, which move alternately through the guides *s'*. Upon the ends of these sliding arms are the coiling-pins *t'*, Plate 2. By the revolution of the cam *e'* the coiling-pins *t' t'* are alternately presented to the tongue *v* of the hoop *s'* in order to receive the wire *t*. When one is thus presented, the other one is drawn back, as illustrated in Plates 2 and 4. This operation takes place when the stud *g'* is at the points designated by 1 and 2 of the cam *e'*. In Plate 1 is seen a cam, *w*, set upon the end of the shaft *d*, on the outside of the machine-frame. This moves an arm, *x*, having at the end thereof a recess, *y*, and a projection, *y'*, and pivoted at *z*. The movement of the



arm  $x$  is inward and outward on a pivot—that is, when the parts 3 and 4 of the cam  $w$  are in the recess  $y$  the end next to the cam  $w$  moves outward slightly, and the reverse is true when either of these parts are on the projection  $y'$ . This arm  $x$  operates the vertical lever 5, pivoted at 6, in such manner as to push the plate 7, Plate 2, out to the end of the coiling-pins  $t' t'$ , and when thus pushed out, and when the points 3 or 4, Plate 1, are in the recess  $y$ , the plate 7 is drawn back by the spiral 8 to the position shown in Plate 2. The object of this movement of the plate 7 is to push the coils of wire off the coiling-pins after the coil is formed, and thus to make way for the next succeeding one.

$a'$  shows a shaft upon which is set the channel-wheel  $b'$ , to wind up the coiled wire after it passes from the coiling-pins. It has a friction-pulley,  $c'$ , to receive a belt from either of the shafts  $d$  or  $a$ , and the revolution can be adjusted by means of the adjusting-nut  $d'$  in such manner that when the wheel  $b'$  would otherwise draw the coiled wire too fast the pulley  $c'$  will slip round upon its shaft and the wheel  $b'$  remain stationary.

The different parts of this machine operate successively to accomplish the desired purpose, and the general operation will now be described.

As the cam  $e'$  revolves motion is imparted to the gear  $p$ , as before described, the said gear describing a partial revolution and then another partial revolution in an opposite direction. This imparts a similar revolution to the hoop  $s$ . As before described, the wire  $t$  to be coiled passes up over the hoop, under the tongue  $v$ , down to the coiling pins, one of which is always advanced to receive the wire

while the hoop rotates. When in this position, the hoop revolves in one direction and produces the desired number of coils of the wire around the pin thus advanced. The hoop then pauses, during which time the pin that has received the coil is drawn downward and the other one is elevated and another coil of the wire made around it by a movement of the hoop in an opposite direction from that in which it rotated when making the previous coil. It will be seen that the distance between the coils is the distance between the pins. When either of the two pins is drawn downward with the coil upon it, the plate 7 advances and pushes the coil off, and thus prepares the pin to receive the next coil. As fast as it thus passes from the coiling-pins it is wound up on the channel wheel or drum  $b'$ , as before described.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of the cam  $e'$ , the rod  $f$ , sector  $l$ , pinion and gear  $o p$ , the gear and hollow shaft  $q r$ , and the hoop  $s$ , together with the pins  $t' t'$ , substantially as described.

2. The combination of the cam  $e'$ , rod  $f'$ , and lever  $l'$ , the rods  $o', p', q'$ , and  $r'$ , coiling-pins  $t'$ , and the hoop  $s$ , substantially as described.

3. The winding-shaft  $a'$ , with its drum  $b'$  and friction-pulley  $c'$ , as described, in combination with the hoop  $s$  and the coiling-pins  $t' t'$ .

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