

(Model.)

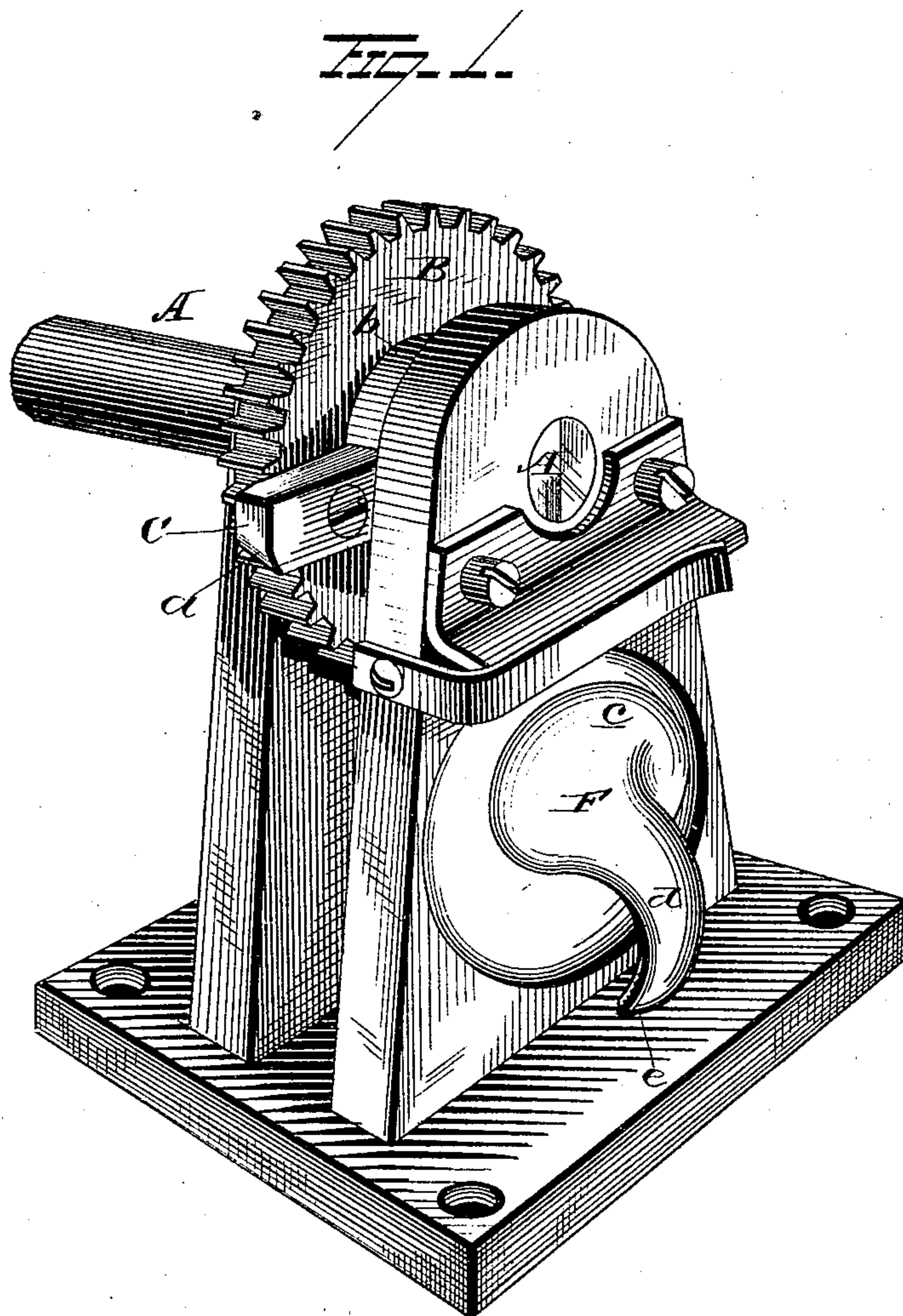
3 Sheets—Sheet 1.

F. OGDEN.

KNOT TYER.

No. 250,956.

Patented Dec. 13, 1881.



WITNESSES

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Geo. S. Seymour.

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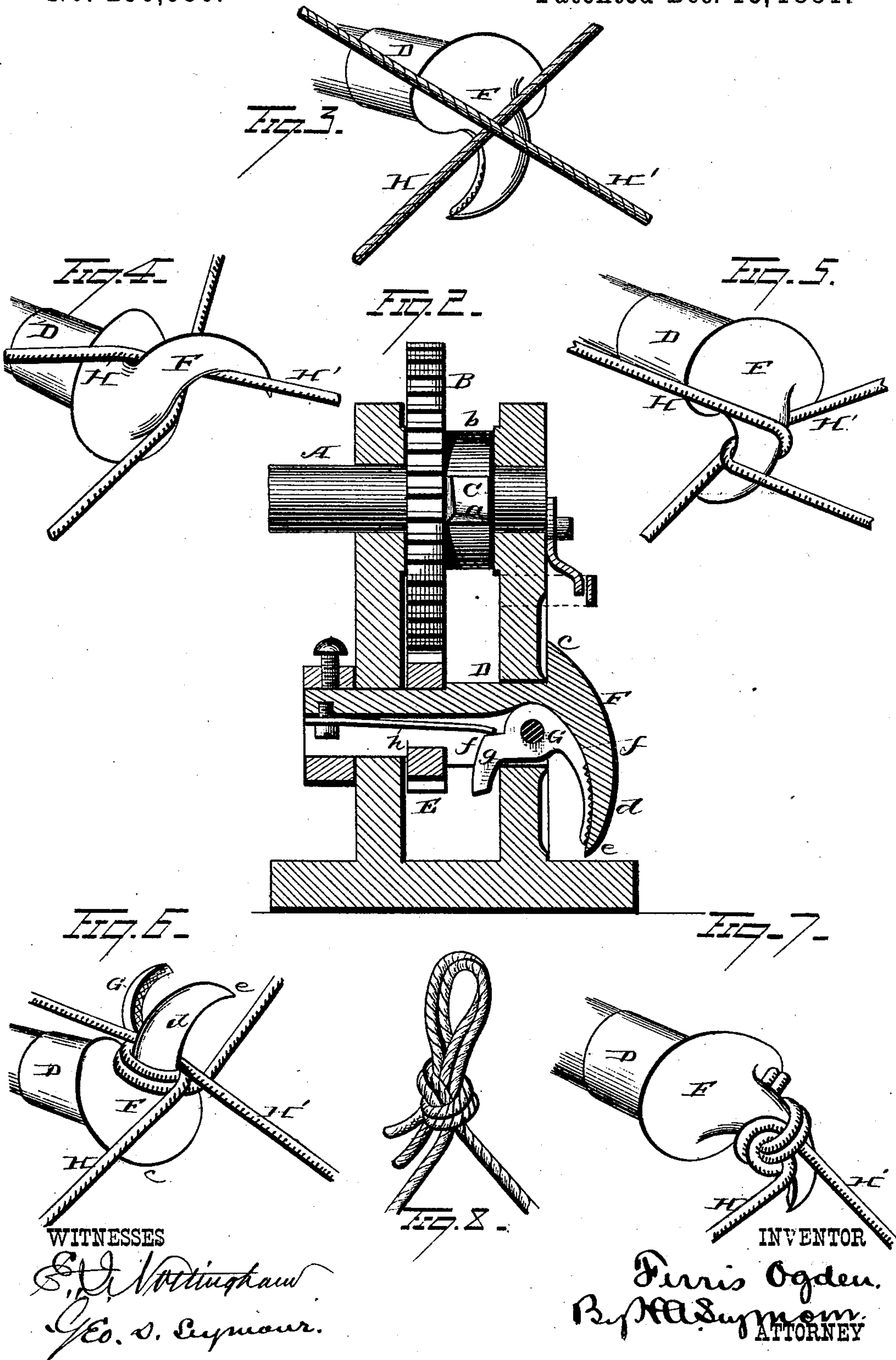
(Model.)

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(Model.)

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FIG. 9.

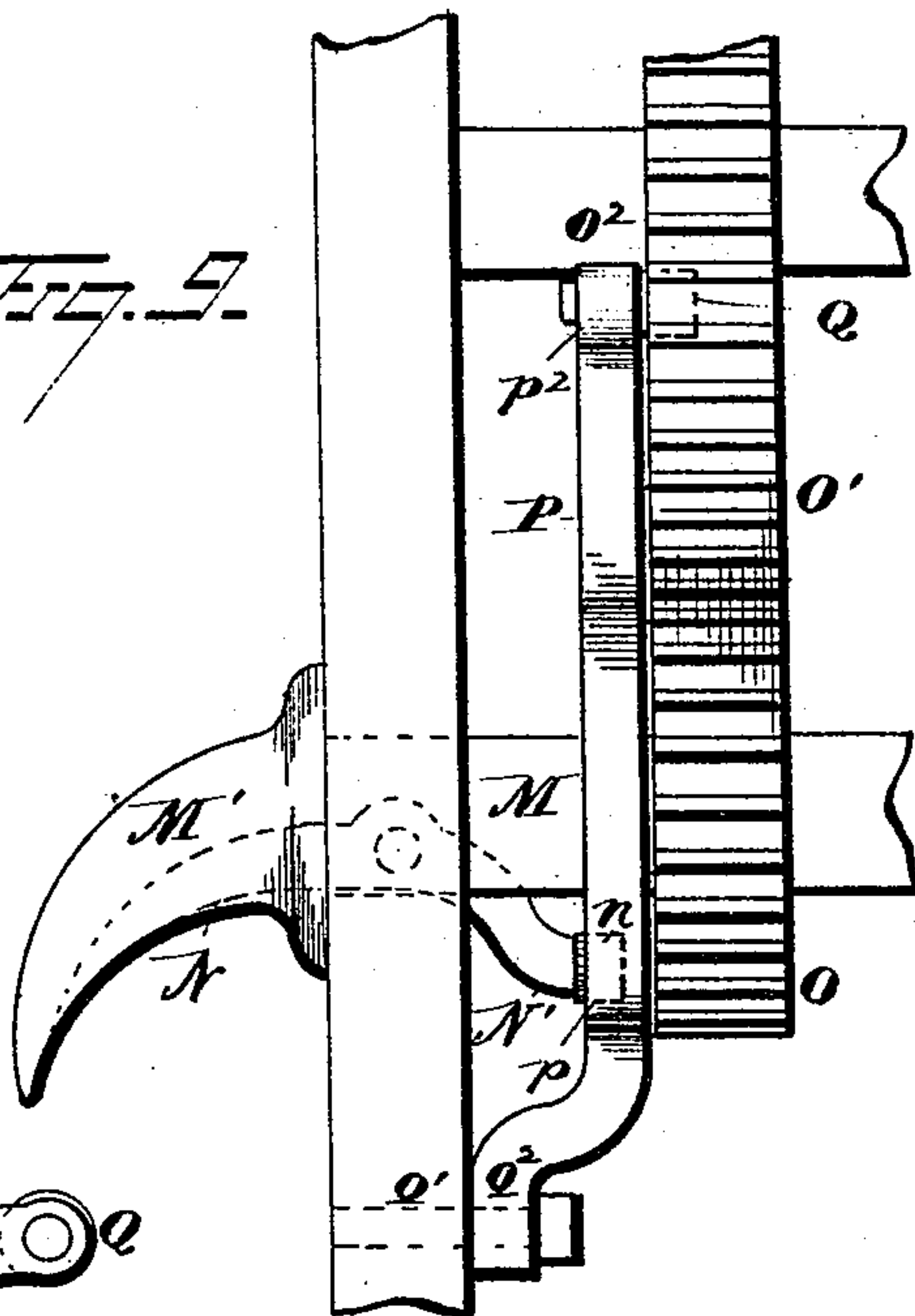


FIG. 10.

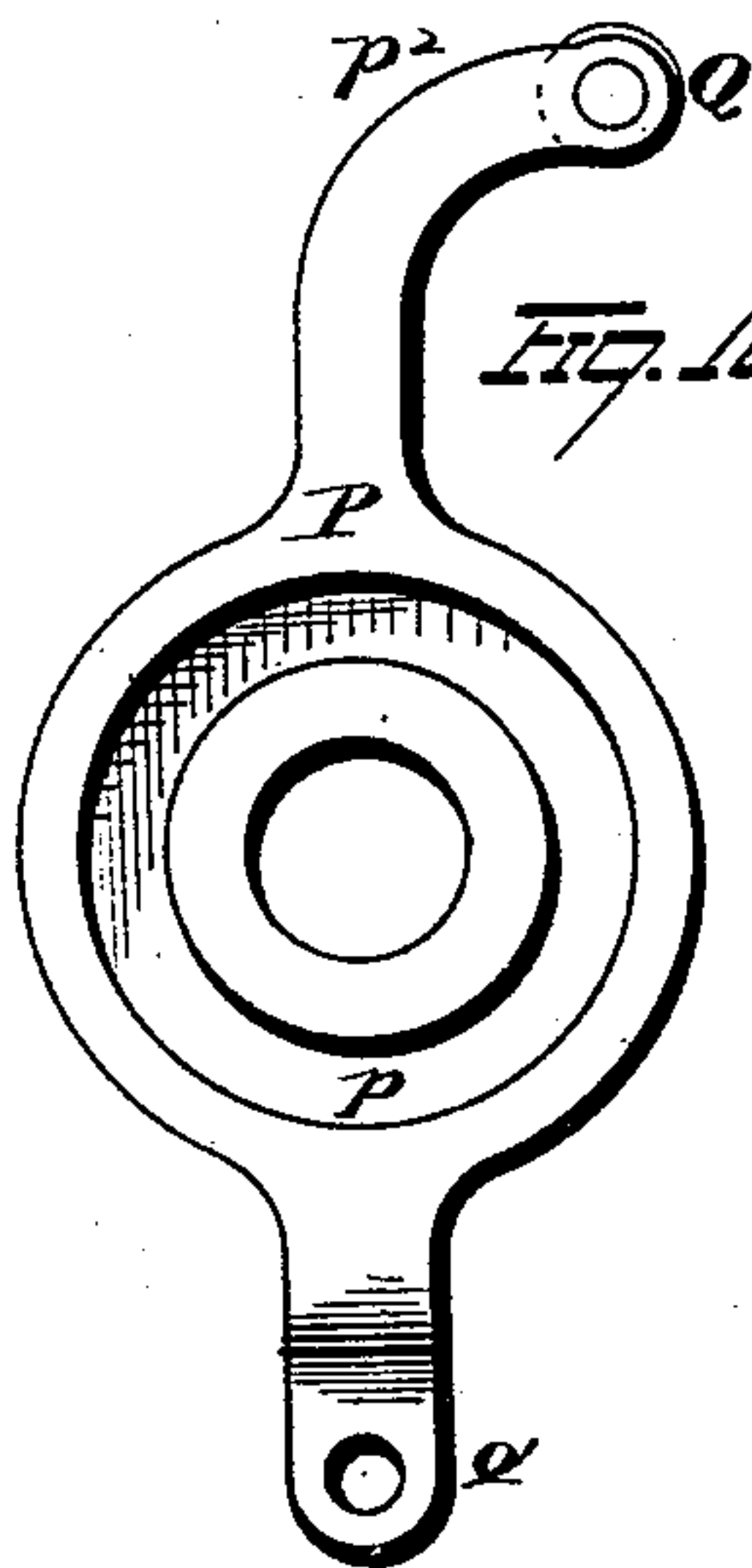


FIG. 11.

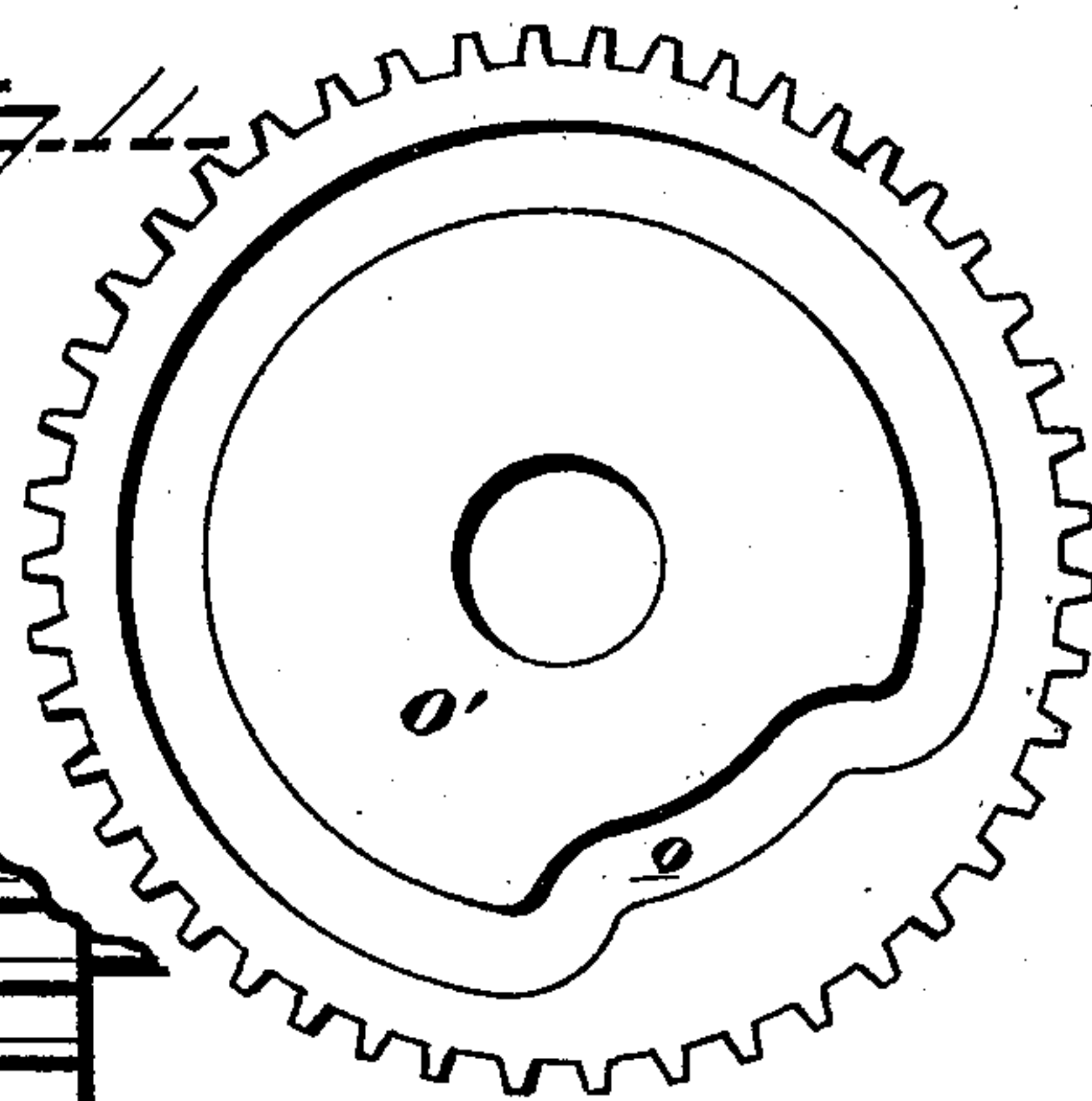
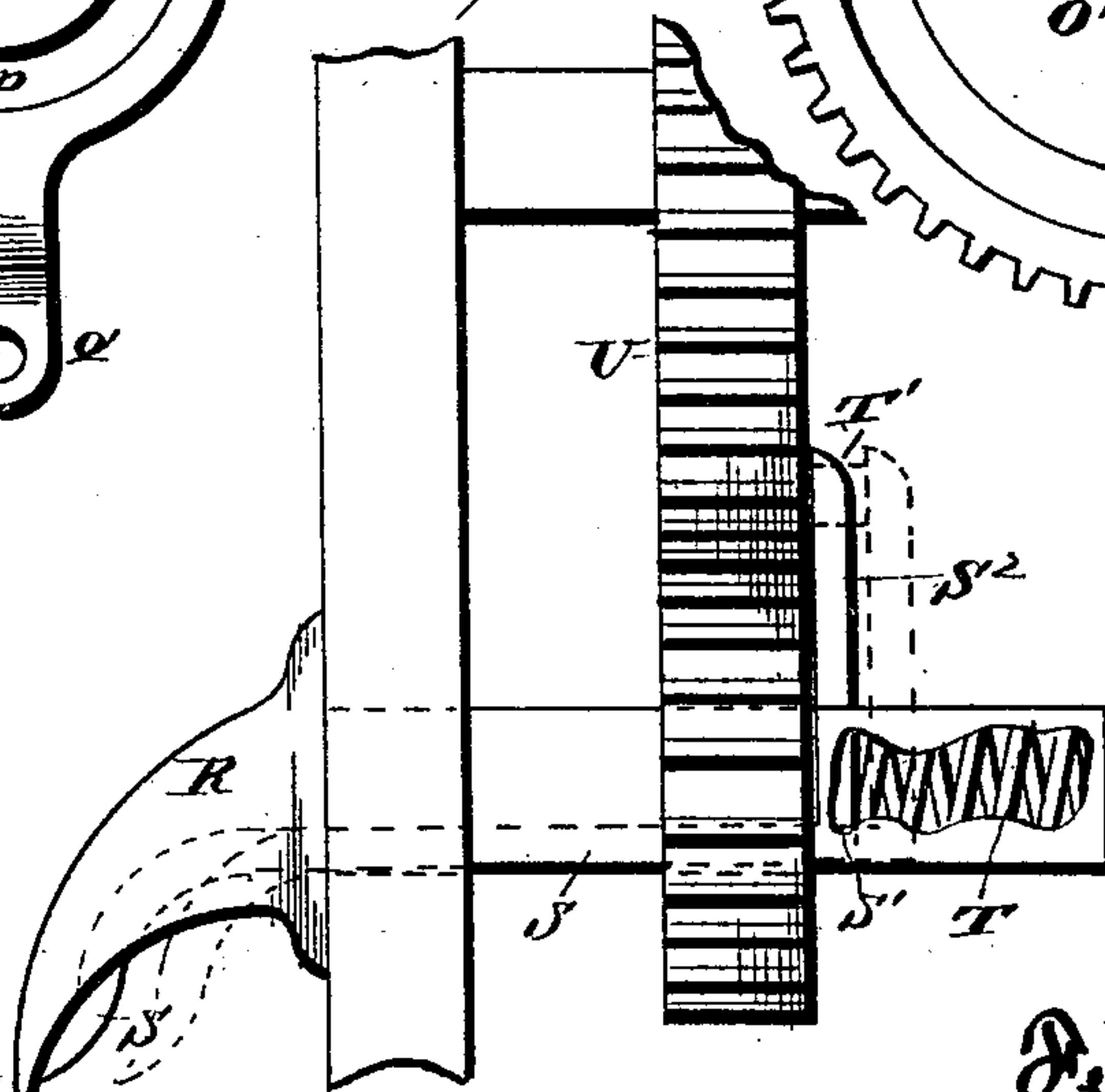


FIG. 12.



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UNITED STATES PATENT OFFICE.

FERRIS OGDEN, OF MANSFIELD, OHIO.

KNOT-TYER.

SPECIFICATION forming part of Letters Patent No. 250,956, dated December 13, 1881.

Application filed September 24, 1881. (Model.)

To all whom it may concern:

Be it known that I, FERRIS OGDEN, of Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful

5 Improvements in Knot-Tyers; 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.

10 My invention relates to an improvement in knot-tyers for grain-binders, the object being to provide simple and efficient means for securely tying the binding-cord around the bundle of grain.

15 My invention consists in certain features of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view, in perspective, of my invention. Fig. 2 is a vertical section of the same. Figs. 3, 4, 5, 6, and 7 represent the tyer in its different positions, and Fig. 8 is a view, in perspective, of the knot. Figs. 9, 10, 11, and 12 are modifica-

25 tions.

A represents a shaft, to which continuous rotation is imparted by gearing engaging with the binding mechanism.

To shaft A is rigidly keyed or otherwise secured the large spur-gear B and a finger or stud, C, the latter having a beveled end, *a*. The finger may be formed integral with a collar, *b*, and the latter secured to the shaft by a set-screw or other device.

30

D is a counter-shaft, to which is secured a small spur-gear, E, which meshes with the large spur-gear B. As the large spur-gear B has twice the number of teeth as the small gear, the latter will be revolved twice during every complete revolution of the large gear.

40

To one end of the shaft D is rigidly secured, or made solid therewith, the jaw or beak F, which is of peculiar form, the base being large, as at *c*, while the beak gradually tapers from *d* to its point *e*. The rigid beak is curved outwardly from the end of the shaft and projects at right angles to one side thereof. The inner side of the beak F has a slot, *f*, formed therein, which extends into the shaft D. Within the slot or groove *f* is pivoted the beak G, which latter is provided with an arm, *g*, whereby it

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practically forms a bell-crank lever. A spring, *h*, is inserted beneath the arm *g*, and serves to retain the beak G in its closed position. The arm *g* projects outwardly from the groove *f* in the shaft, as at *i*, and is arranged in line with the finger C on the shaft A.

Having described the construction and arrangement of the several parts of my improved knot-tyer, I will now give a brief description of its operation.

60

The cord passes from the spool through an eye located in close proximity to the tyer, the end of the cord being retained in the beak of the binding-arm. After the cord has been carried around the bundle by the binding-arm the two ends H H' of the cord will be located immediately over the beak F, as represented in Fig. 3. A quarter-turn of the shaft D causes the beak F to engage with both ends H H' of the cord. The shaft D is then given about three-quarters of a revolution, thereby winding both ends H H' of the cord around the rigid and pivoted beaks, as shown in Fig. 4. At this point the rounded beveled end *a* of the finger C strikes the beveled end *i* of the pivoted beak-arm *g*, depressing the latter and opening the beak G, causing the ends H H' to be grasped between the beaks F G, as represented in Fig. 5. As the shaft D continues to revolve the projection *i* becomes disengaged from the finger C, thereby allowing the spring *h* to close the pivoted beak G firmly upon the cords and retain them in place, as illustrated in Fig. 6. The ends of the cord are thus severed, as represented in Fig. 6, by any suitable cutting device, and the bundle is then forced from its receptacle and the machine by any suitable ejector, which serves to pull the loop on the beak over the ends of the cord held between the rigid and pivoted beak, as shown in Fig. 7. The cord is retained between the beaks sufficiently tight to cause the loop to be tightly drawn around the ends of the cord before it is released, thereby forming a perfectly tight and secure knot, I, as shown in Fig. 8.

85 90 95

From the foregoing it will be observed that only very simple mechanism is employed to form the knot. Two revolutions are imparted to the shaft D for every single revolution of the shaft A, and the complete knot is formed by two continuous revolutions of the beaks,

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and no stoppages of tyer are necessary. Instead of employing a spur-gear, B, a rack may be used for the same purpose. Again, the adjacent faces of the beaks may be made either
5 plain or corrugated, as desired.

Fig. 9 is a detached view, partly in side elevation and partly in vertical section, of a modified form of construction of my invention.

M represents the tyer-shaft, having the rigid
10 beak M' attached thereto.

N is the pivoted beak, provided with an arm, N', having a roller, n, journaled in its outer end.

To the shaft M is keyed a small gear, O,
15 which meshes with and is driven by a gear, O', keyed upon the shaft O², the gear O' being of twice the diameter of the gear O. The gear O' has a cam-groove, o, formed in its face, or the cam-groove o' may be formed in the face of
20 an independent disk fastened to the shaft O².

To the framing of the machine at o' is pivoted the lower end, o², of the shifting device P, which latter is provided with a groove, p,
25 within which is received the roller n on the arm of the pivoted beak.

The upwardly-extending arm p² of the shifting device is provided with a roller, Q, which engages in the cam-groove o of the gear O'. At every revolution of the gear O' the roller
30 is forced toward the shaft O² by reason of the depressed portion of the cam-groove, thereby serving to carry the arm of the pivoted beak toward the shaft and spin the beak; and this operation will be effected once during every
35 two revolutions of the beak.

In Fig. 12, R is the stationary beak, and S a reciprocating beak, the latter being provided with an arm, S', that terminates in the finger S². The beak S is retained in its closed position
40 by means of a spring, T, and is opened by means of a projection, T', on the large gear-

wheel U, said projection being arranged to strike the finger and cause it to recede during every two revolutions of the beak.

It is evident that slight changes may be
45 made in the construction and arrangement of parts without departing from the spirit of my invention, and hence I would have it understood that I do not restrict myself to the exact construction and arrangement of parts
50 shown and described; but,

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

1. In a tying-bill, the combination, with a
55 revolving shaft having a curved rigid outer jaw attached thereto or connected therewith, of a movable inner jaw adapted to be opened and closed and engage in a groove in the rigid
60 outer jaw, and devices for opening and closing the movable jaw during every second revolution of the tyer-shaft, substantially as set forth.

2. In a tying-bill, the combination, with a
65 revolving shaft having a curved rigid jaw connected therewith, a pivoted jaw located in a groove in the rigid jaw, said pivoted jaw being provided with an arm which projects outward from the tyer-shaft, and a spring for retaining the pivoted jaw in its closed position,
70 of gearing for imparting rotary motion to the tyer-shaft, and a finger or stud that opens the pivoted jaw during its every second revolution, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.
75

FERRIS OGDEN.

Witnesses:

H. E. BELL,
T. Y. McCRAY.