

(No Model.)

2 Sheets—Sheet 1.

E. L. HOWE.

LOOP CLOSING MACHINE.

No. 370,143.

Patented Sept. 20, 1887.

Fig. 1.

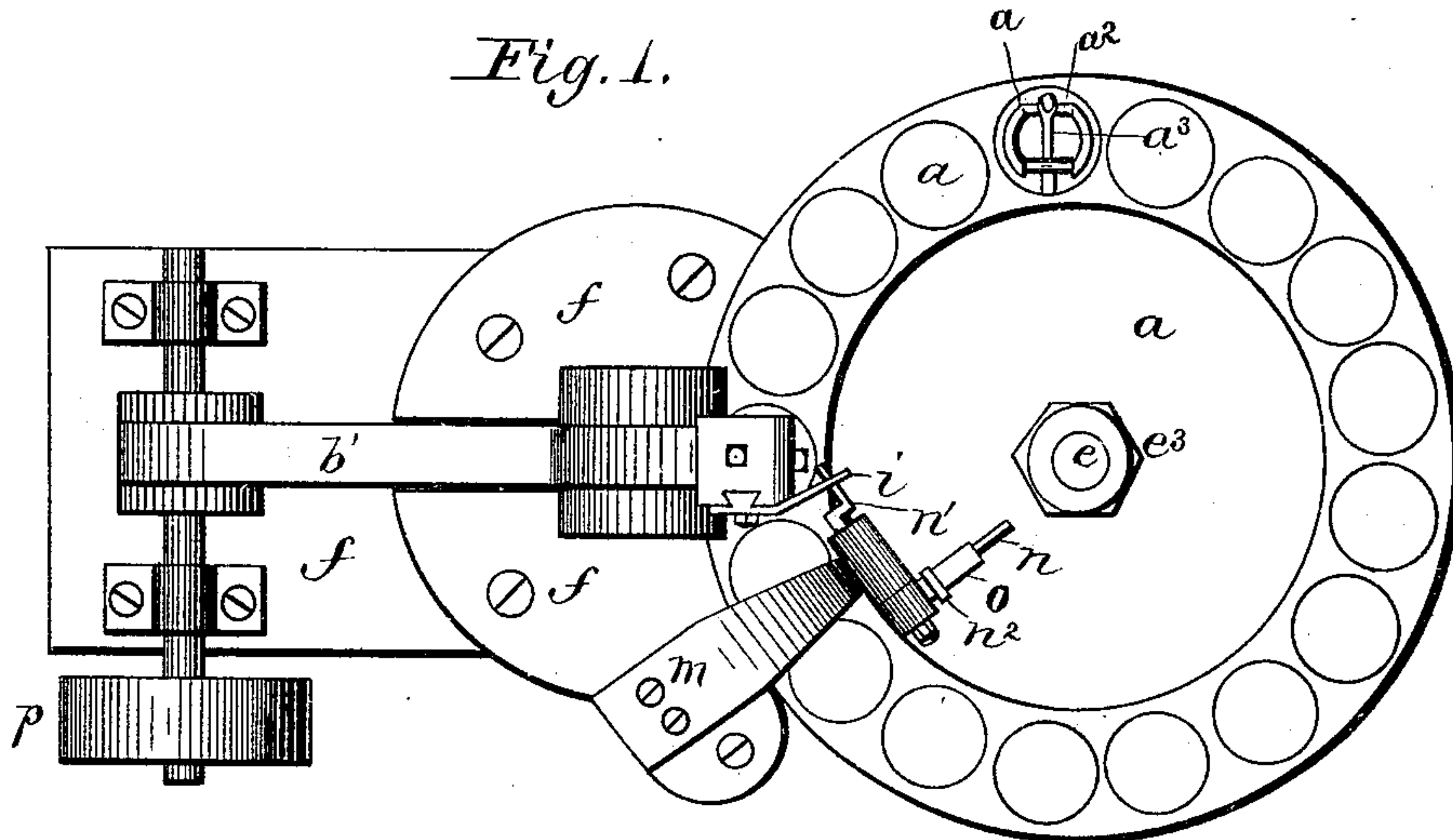
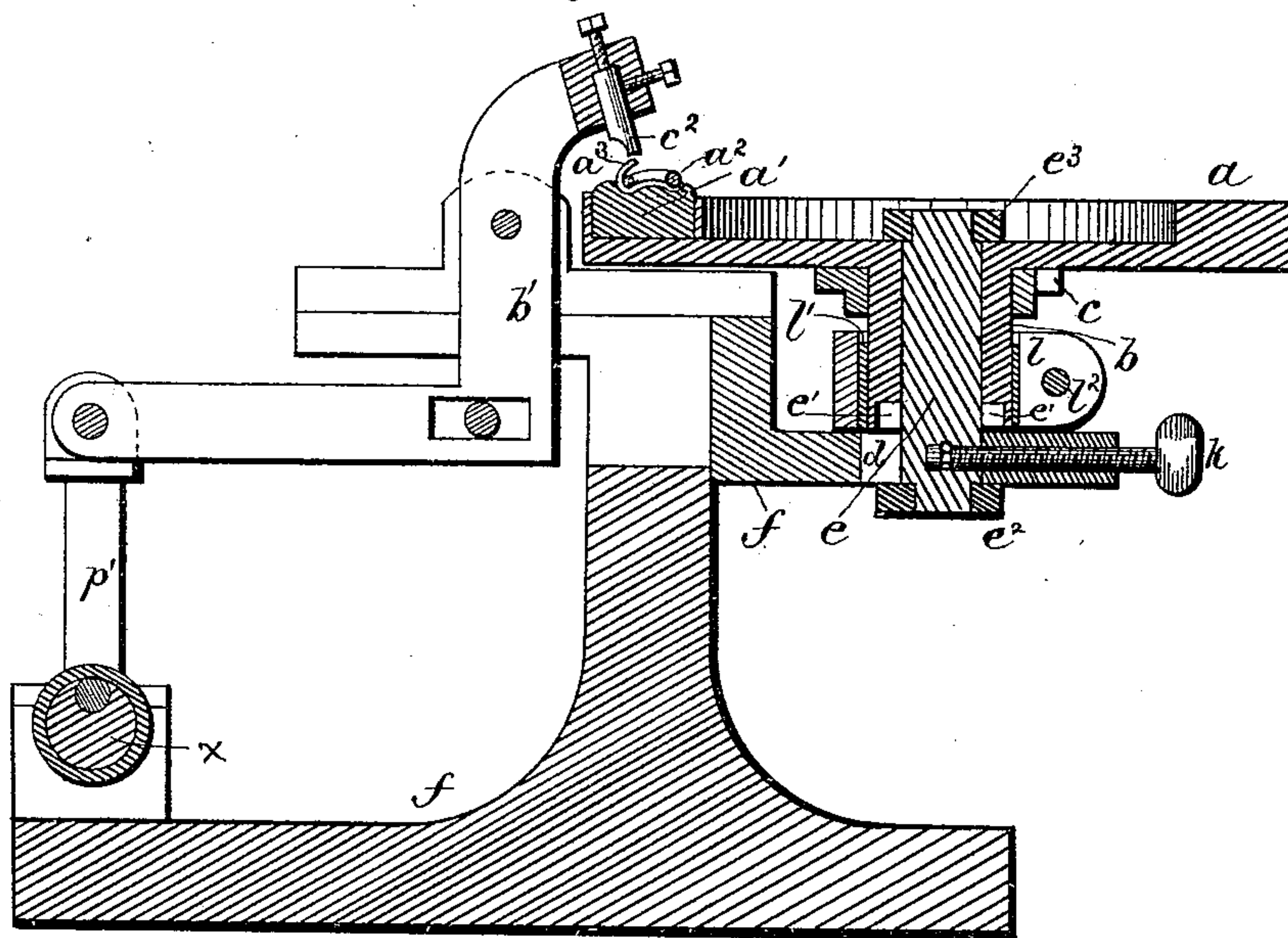


Fig. 2



Witnesses:

George F. Robinson
David B. Day.

Inventor

Eugene L. Howe
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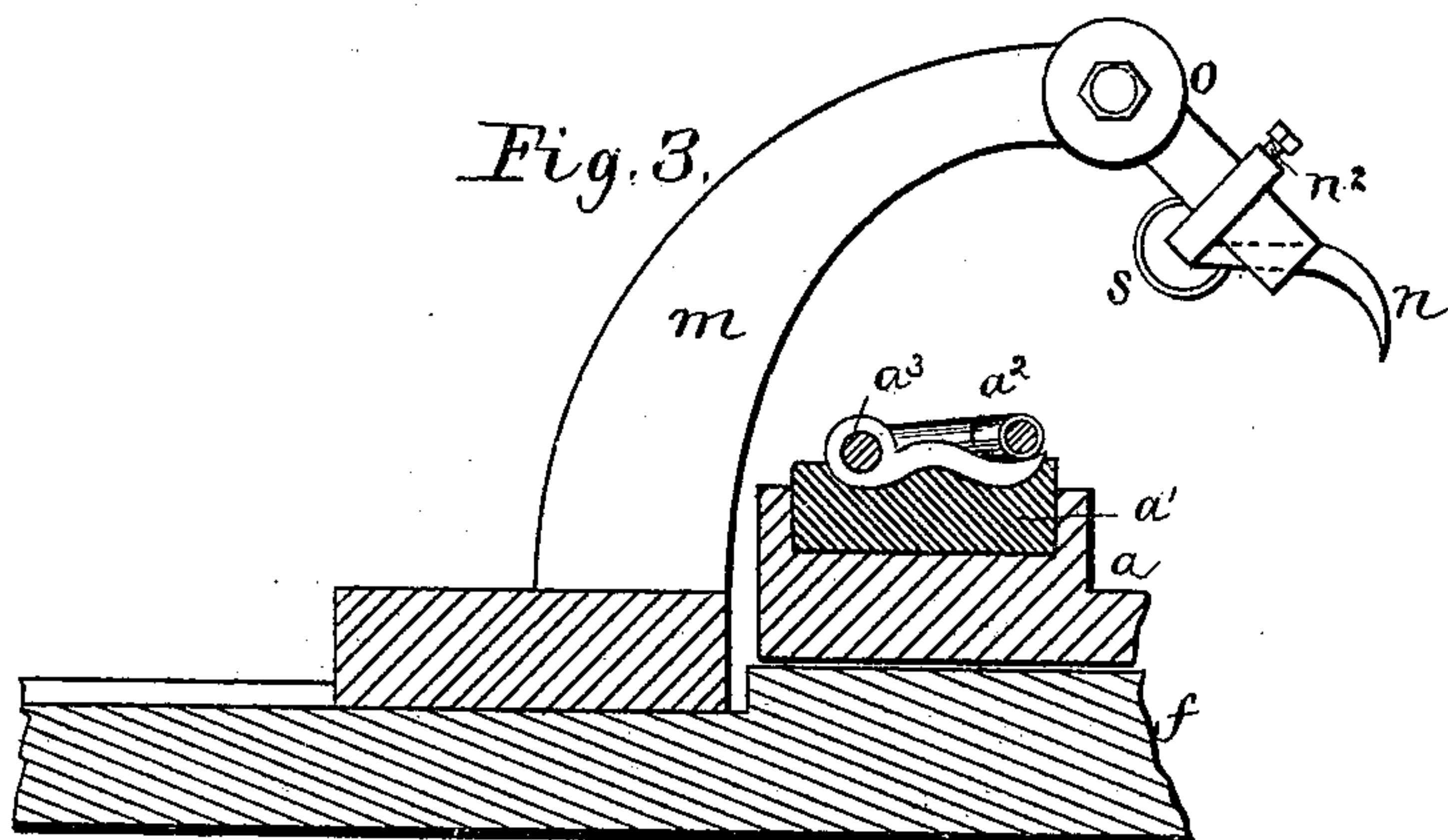


Fig. 4.

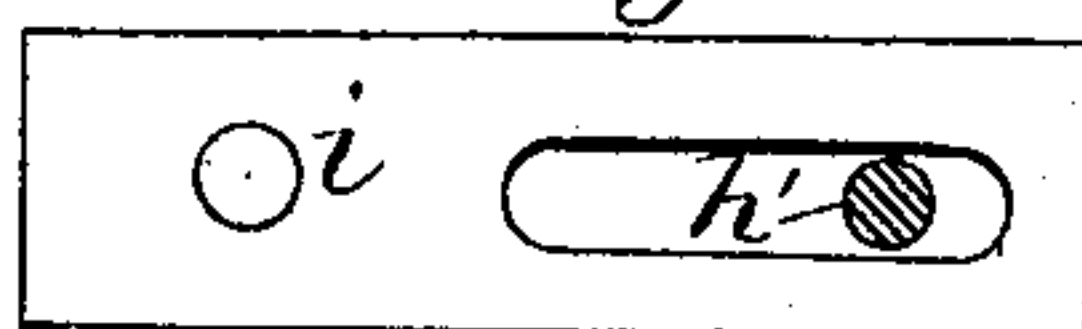
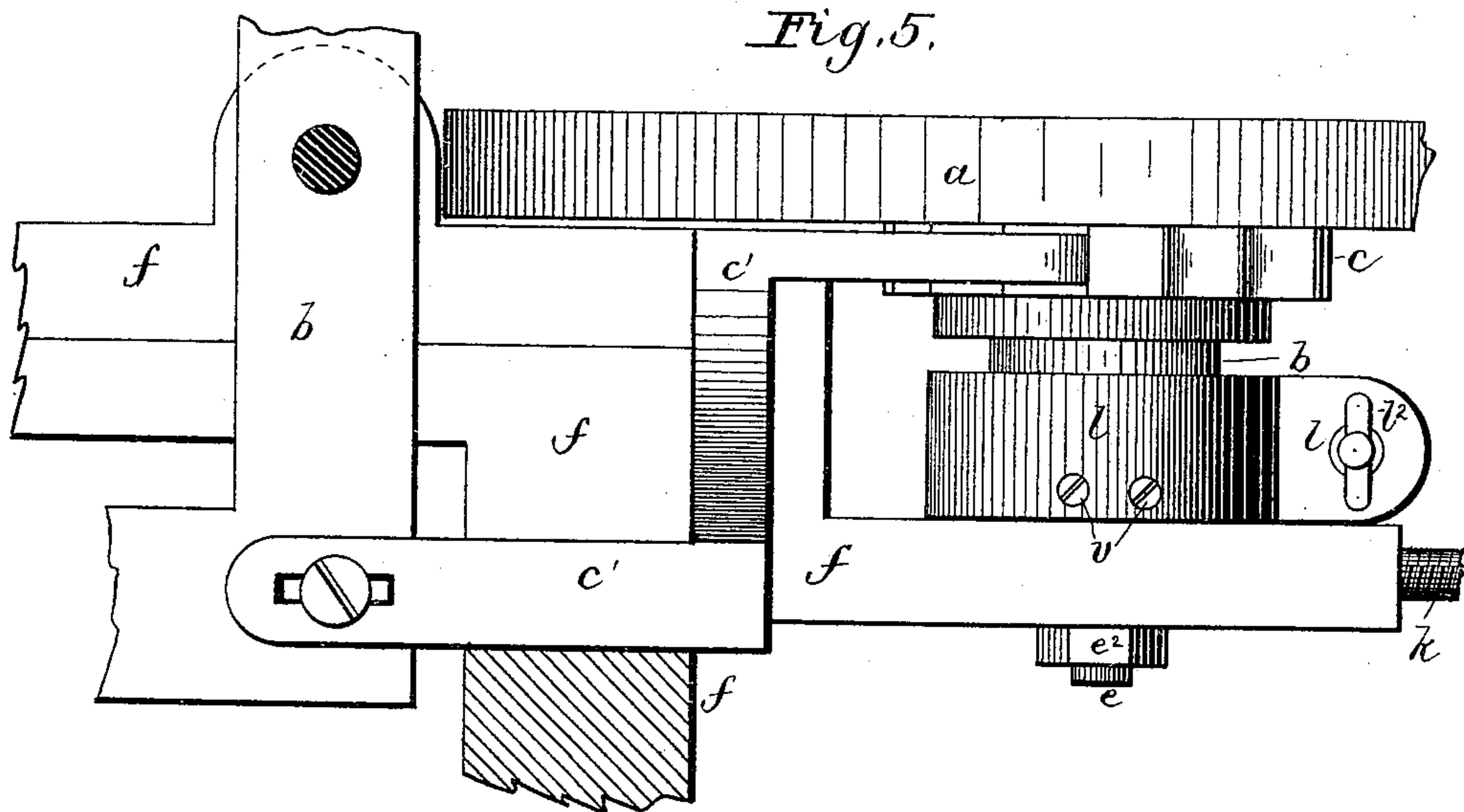


Fig. 5.



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UNITED STATES PATENT OFFICE.

EUGENE L. HOWE, OF CLEVELAND, OHIO.

LOOP-CLOSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 370,143, dated September 20, 1887.

Application filed September 11, 1886. Serial No. 213,349. (No model.)

To all whom it may concern:

Be it known that I, EUGENE L. HOWE, a citizen of the United States, residing at the city of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Loop-Closing Machines, of which the following is a specification.

My invention relates to machines for bending down an open loop and closing it over a rod or part of the article to which the loop is to be attached.

The object of my invention is to automatically carry the articles with the open loops in dies successively under a die for closing the loops; also, to automatically discharge from the machine the article with the loop thereto attached.

In the drawings forming a part of this specification, Figure 1 is a plan of the machine. Fig. 2 is a vertical cross-section of the same. Fig. 3 represents a side view of the discharging device; Fig. 4, a like view of the part which operates the latter, and Fig. 5 a like view of parts operating the carrier.

The carrier *a* is formed with a series of die-seats, *a*¹, to receive a series of dies, *a*², in which are placed rings *a*³ and stud *a*⁴, to be operated upon. Other articles of various shapes and for different purposes requiring a looped staple or tongue to be attached may be placed in dies *a*², the latter being suitably formed to receive the articles.

The carrier *a* is supported by frame *f* and intermittently rotated by means of ratchet *c* and pawl *c*¹. Its hollow shaft *b* rotates on stud *e*, formed with circular flange *e*¹, resting on frame *f* and held by nut *e*². The carrier may be removed from stud *e* and a different one put in its place on taking off the upper nut, *e*³, which retains it on the stud. The frame is formed with a slot, *d*, in which stud *e* is adjustable by means of thumb-screw *h*. Shaft *b* rotates in a friction-collar, *l*, having a lining, *l*¹, of leather or other suitable material, and adjustable by means of thumb-screw *l*² to prevent any farther forward motion of the carrier *a* than that of pawl *c*¹. Collar *l* is kept from turning by set-screws *v v*, turned against flange *e*¹ of stud *e*. Lever *b*¹ carries die *c*² and pawl *c*¹, and is operated by means of pulley *p*, eccentric *x*, and connecting-rod *p*¹. It is pro-

vided with a slotted bar, *i*, which operates crank-shaft *n*¹, arm *o*, and finger *n*, thereto attached, for the purpose of discharging from die *a*² the article to which the loop has been closed by die *c*², the point of the finger lifting and throwing the article or ring *a*³ from die *a*². The finger is adjustable on arm *o* by means of slide *n*², to which it is hinged. The finger may be connected directly with shaft *n*¹; but I prefer the intermediate arm, *o*, in order to provide it with a spring, *s*, to guard the finger against strain or injury while it is moving back to the position shown in the drawings. Each die *a*² is grooved for the passage of finger *n* through it. Crank-shaft *n*¹ rocks in and is supported by arm *m*, bolted to frame *f*. Die *c*² is suitably formed and adapted to turn down or close the open loop. When die *c*² is descending to close a loop, finger *n* removes from one of the dies *a*² an article already operated on, and at the same time pawl *c*¹ is drawn back on ratchet *c*. When die *c*² is ascending, finger *n* returns to the position shown in the drawings, and pawl *c*¹ turns carrier *a* to bring its next following dies *a*² under die *c*² and finger *n*, respectively. Pawl *c*¹ should be so adjusted that it will not turn carrier *a* until finger *n* has returned through the grooved die *a*²; but if not so adjusted springs *s* will enable the finger to pass over the die.

It is obvious that more than one die *c*² and a like number of fingers *n* may be used, so that two or more articles or loops may be operated simultaneously. The curvilinear motion of the forming-die *c*², being eccentric to the eye of the loop, aids in properly closing the latter.

An endless apron, a vertically-rotating wheel, or other form of carrier having intermittent motion may be used instead of the horizontal disk *a*; but I prefer the latter.

I claim as my invention—

1. In a loop-closing machine, a die-carrier having intermittent motion and formed or provided with a series of dies adapted to receive and hold a stud or tongue having an open loop, and a vibrating arm or lever formed or provided with a die, this die describing a curvilinear motion toward and from the dies in said series successively and operating eccentric to the eye of said loops to close them, substantially as described.

2. A carrier having intermittent motion and formed or provided with a series of dies, in combination with a forming-die having a motion toward and from the dies in said series successively, and a discharging-finger having motion across the dies in said series successively, substantially as described.

3. A die-carrier having intermittent motion and formed or provided with a series of dies, each of which is grooved for the passage of a discharging-finger, in combination with such finger and forming-die, substantially as described.

4. The die c^2 and finger n , in combination with and both operated by lever b' , substantially as described.

5. The die-carrier a , ratchet c , pawl c' , die c^2 , crank-shaft n' , and finger n , in combination with and all operated by lever b' , substantially as described.

6. Lever b' , formed or provided with slotted bar i , in combination with crank-shaft n' and a discharging-finger, substantially as described.

7. The finger n , in combination with arm o , slide n^2 , spring s , and crank-shaft n' , substantially as described.

8. The die-carrier a , formed or provided with hollow hub b , in combination with stud e , formed with flange e' and provided with nuts $e^2 e^3$, substantially as described.

9. The die carrier a , formed or provided with hollow shaft b , in combination with stud e , formed with flange e' and provided with nuts $e^2 e^3$, and friction-collar l and screw l^2 , substantially as described.

10. The die-carrier a , having hollow hub b , in combination with stud e , frame f , formed with slot d , and adjusting-screw k , substantially as described.

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Witnesses:

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