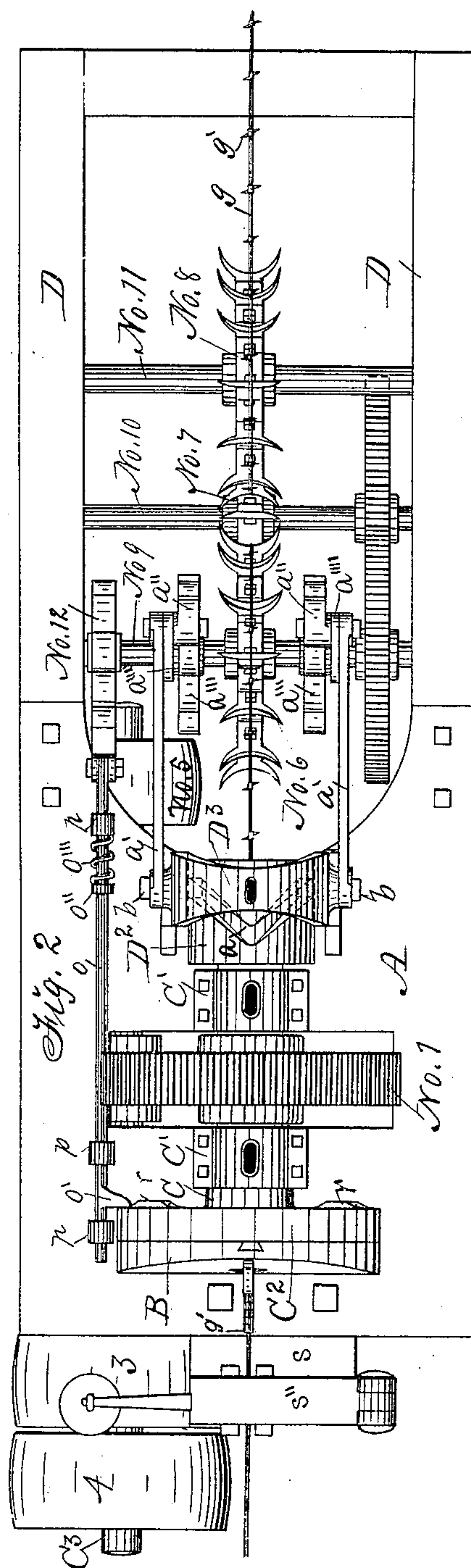


3 Sheets—Sheet 1.

WIRE BARBING MACHINE.

Patented Mar. 13, 1883.

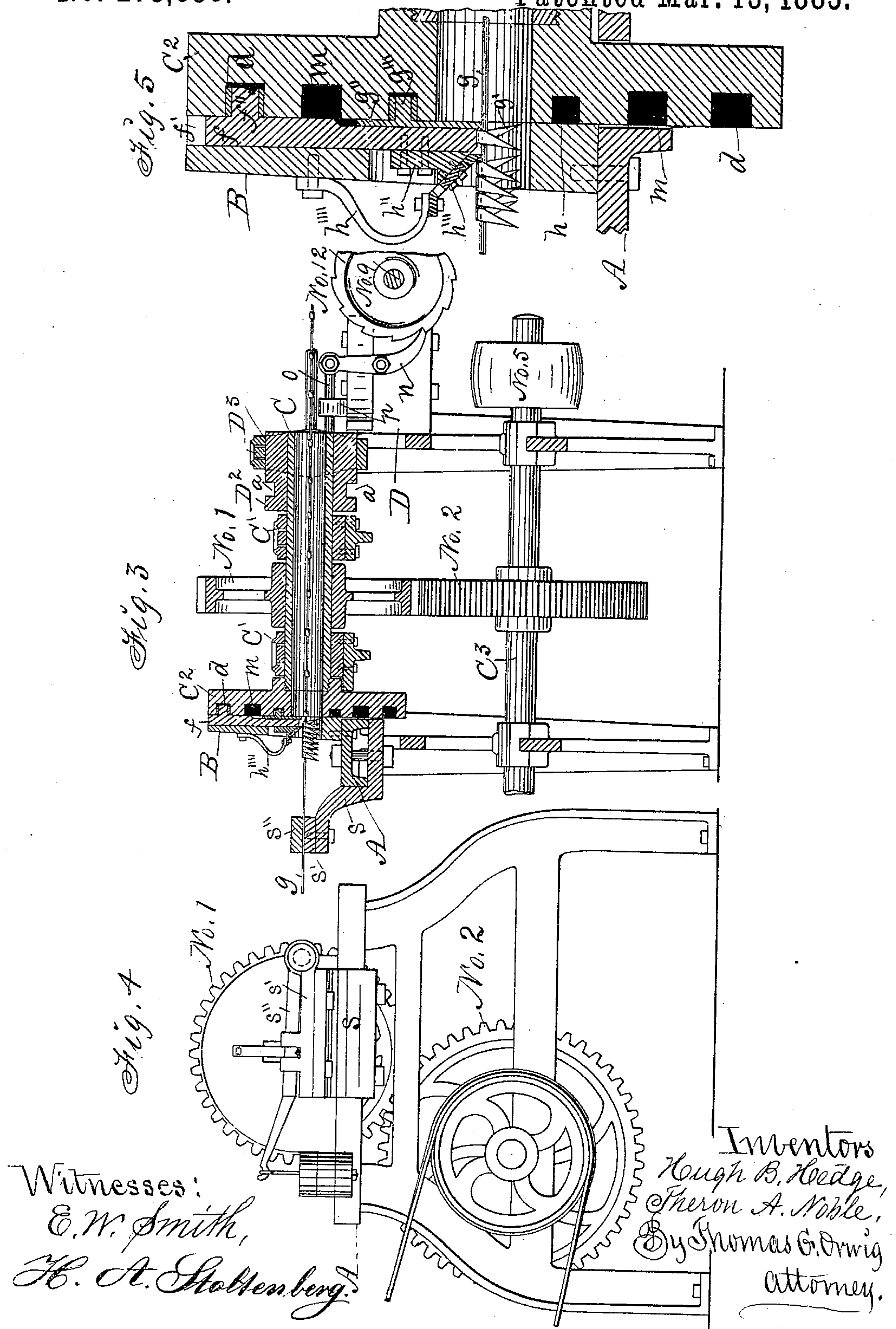


Inventors: { Hugh B. Hledge,
Theron A. Noble,
By Thomas G. Orwig, Attorney.

3 Sheets—Sheet 2.

WIRE BARBING MACHINE.

Patented Mar. 13, 1883.



(No Model.)

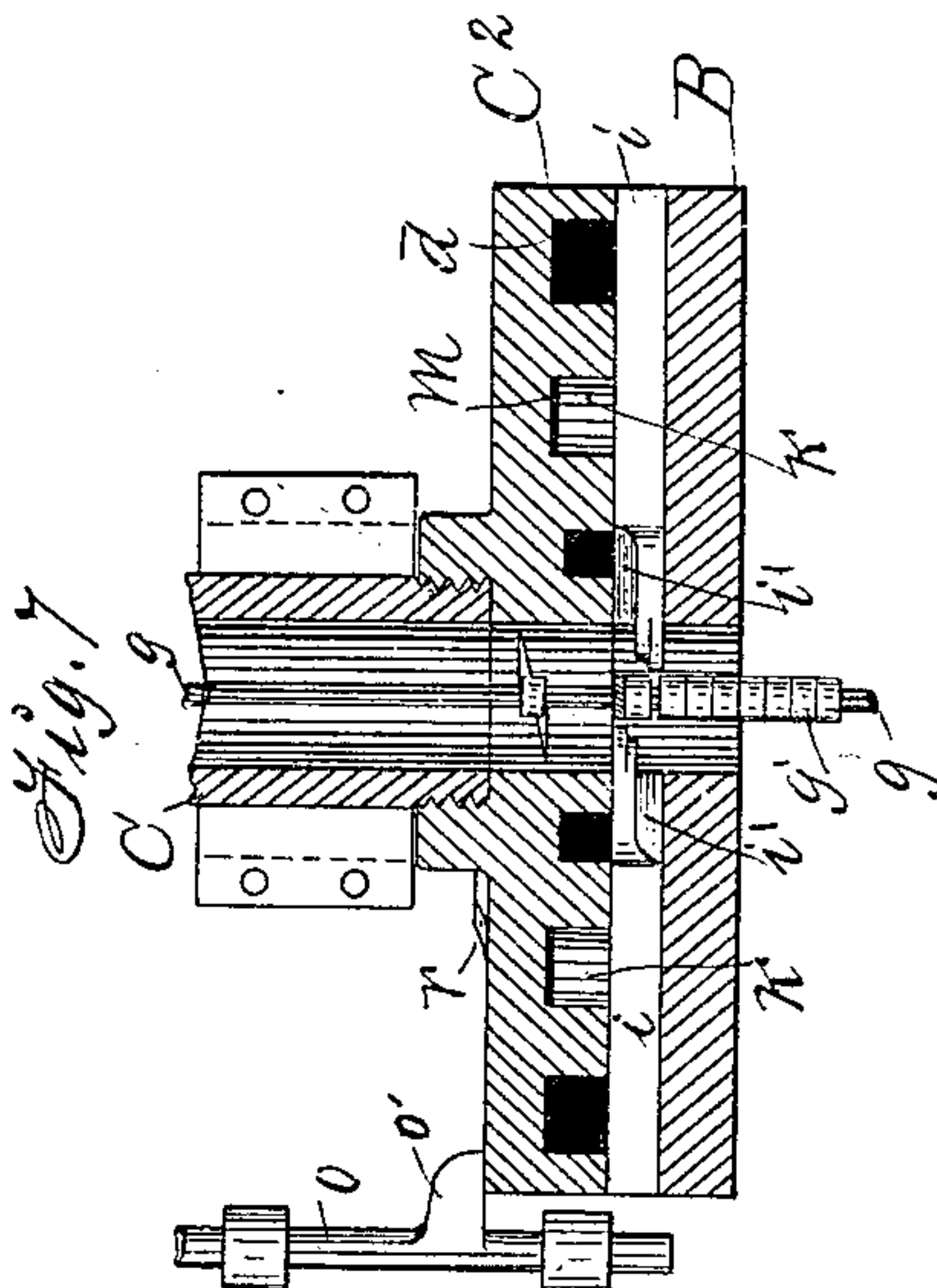
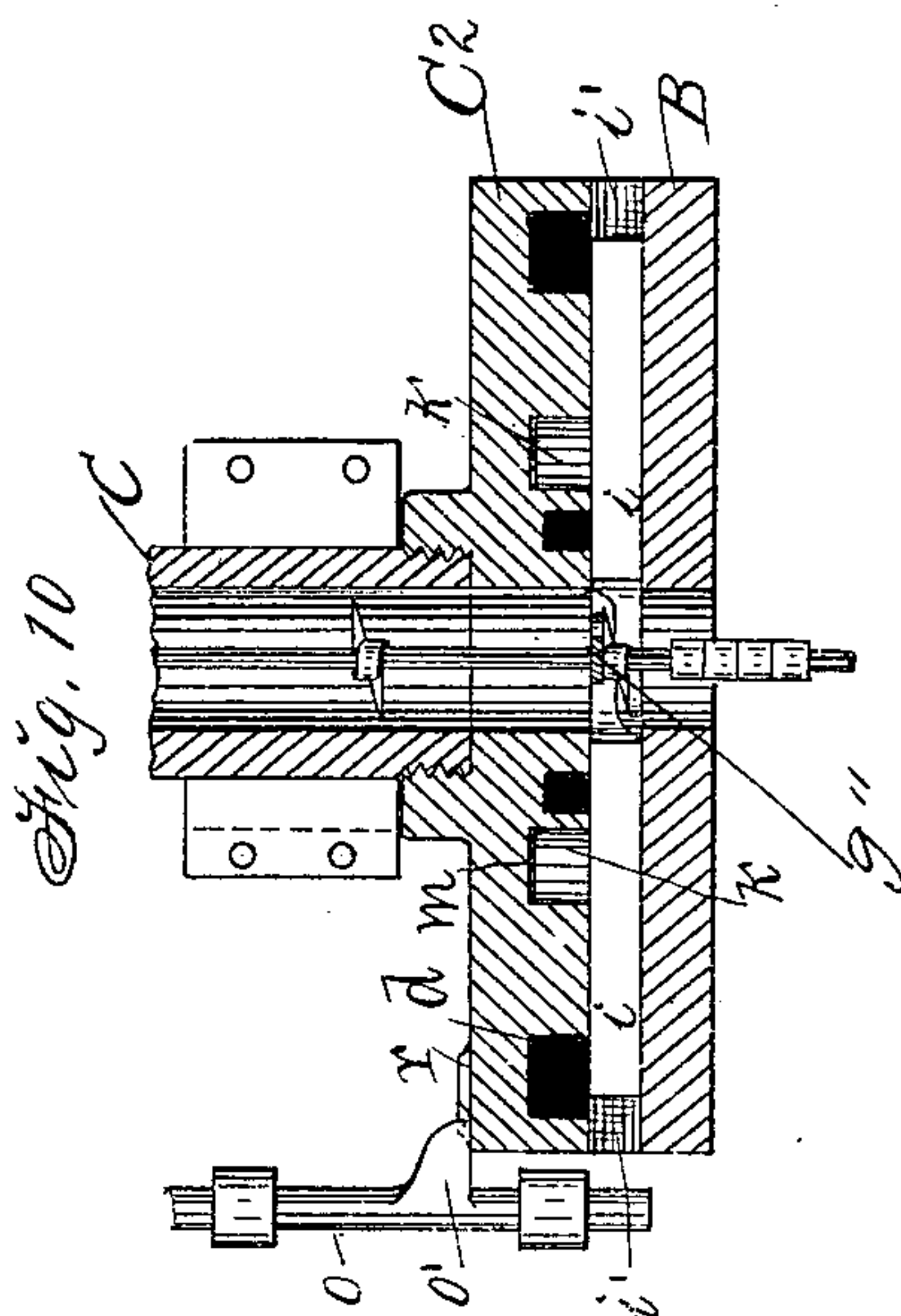
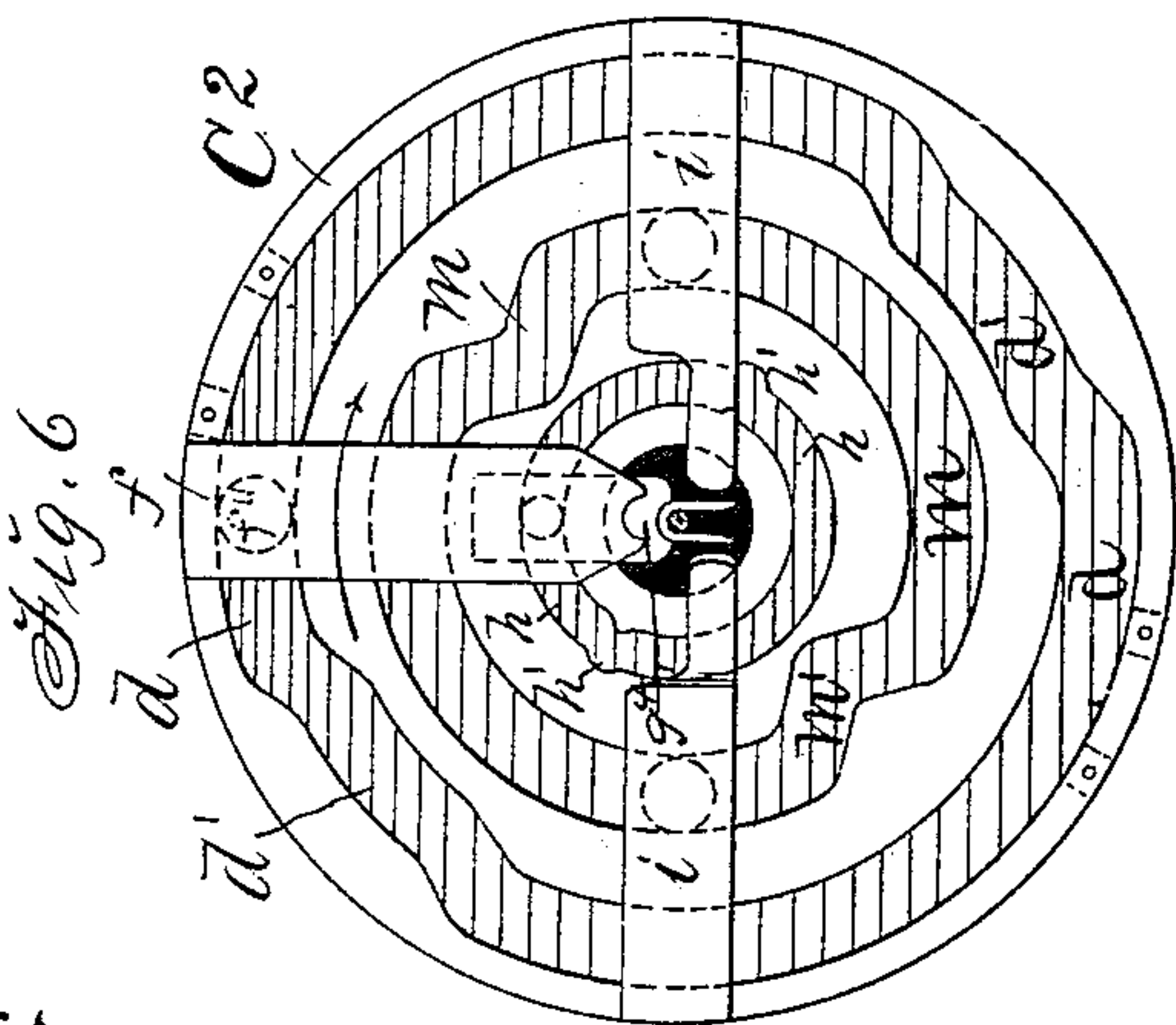
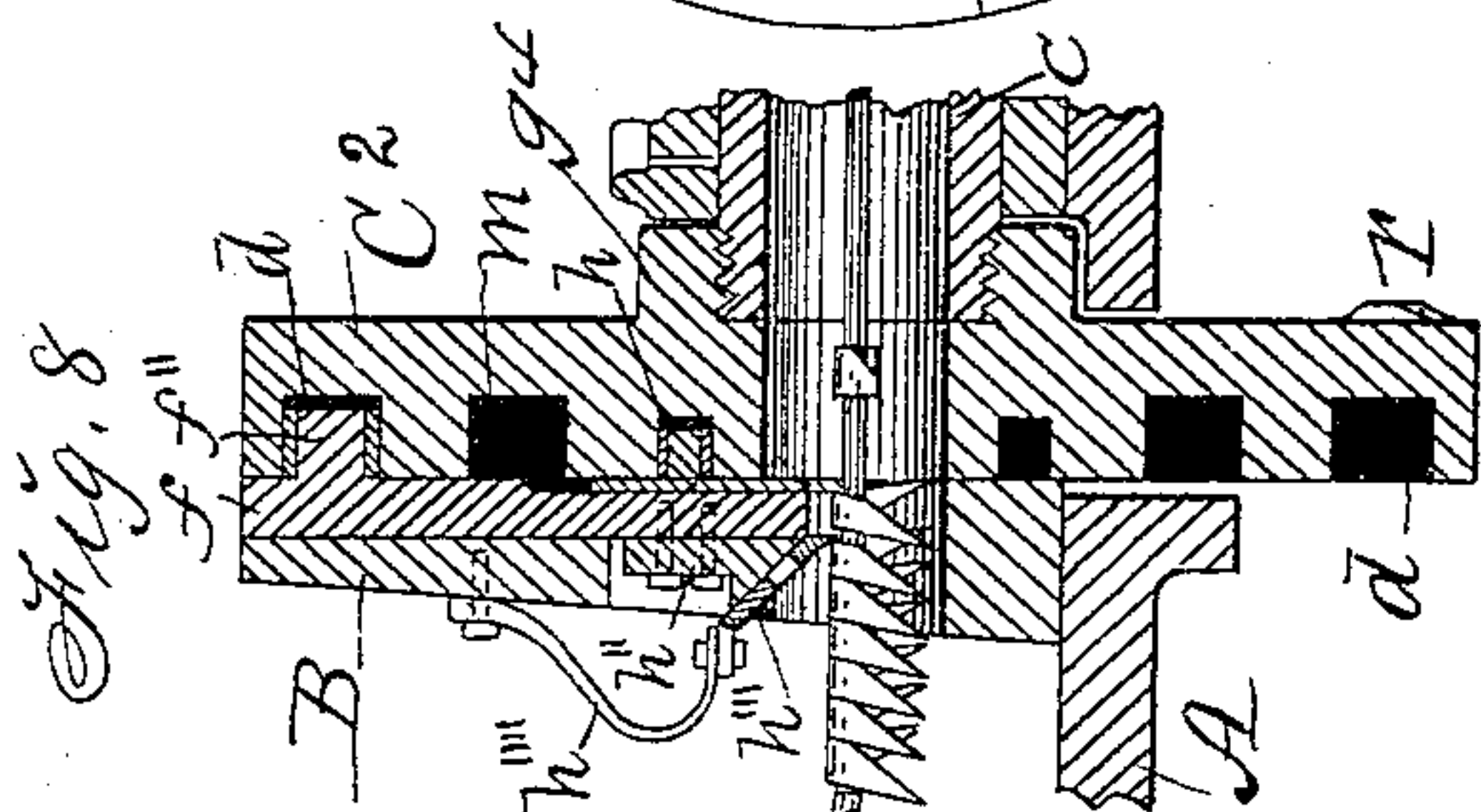
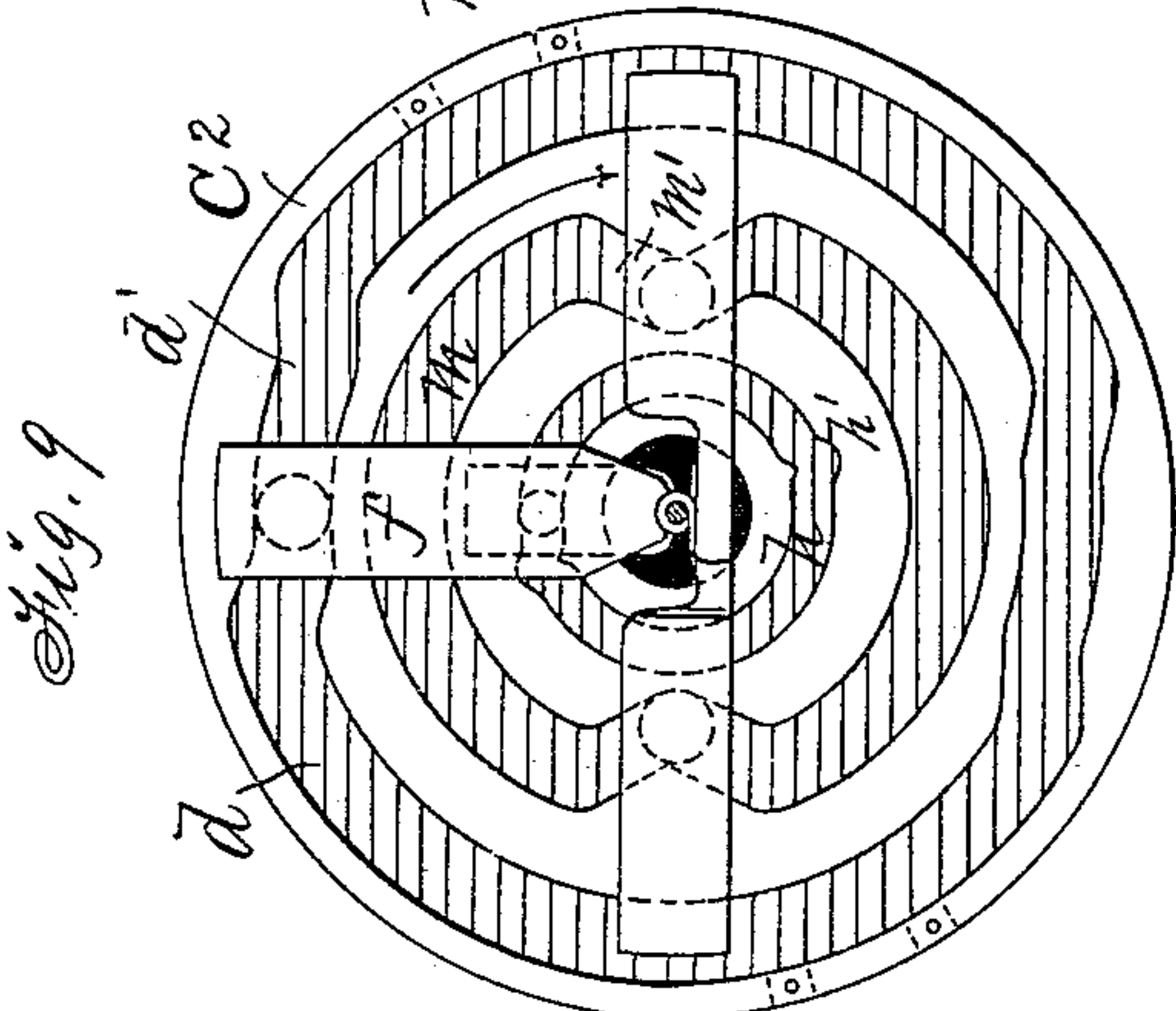
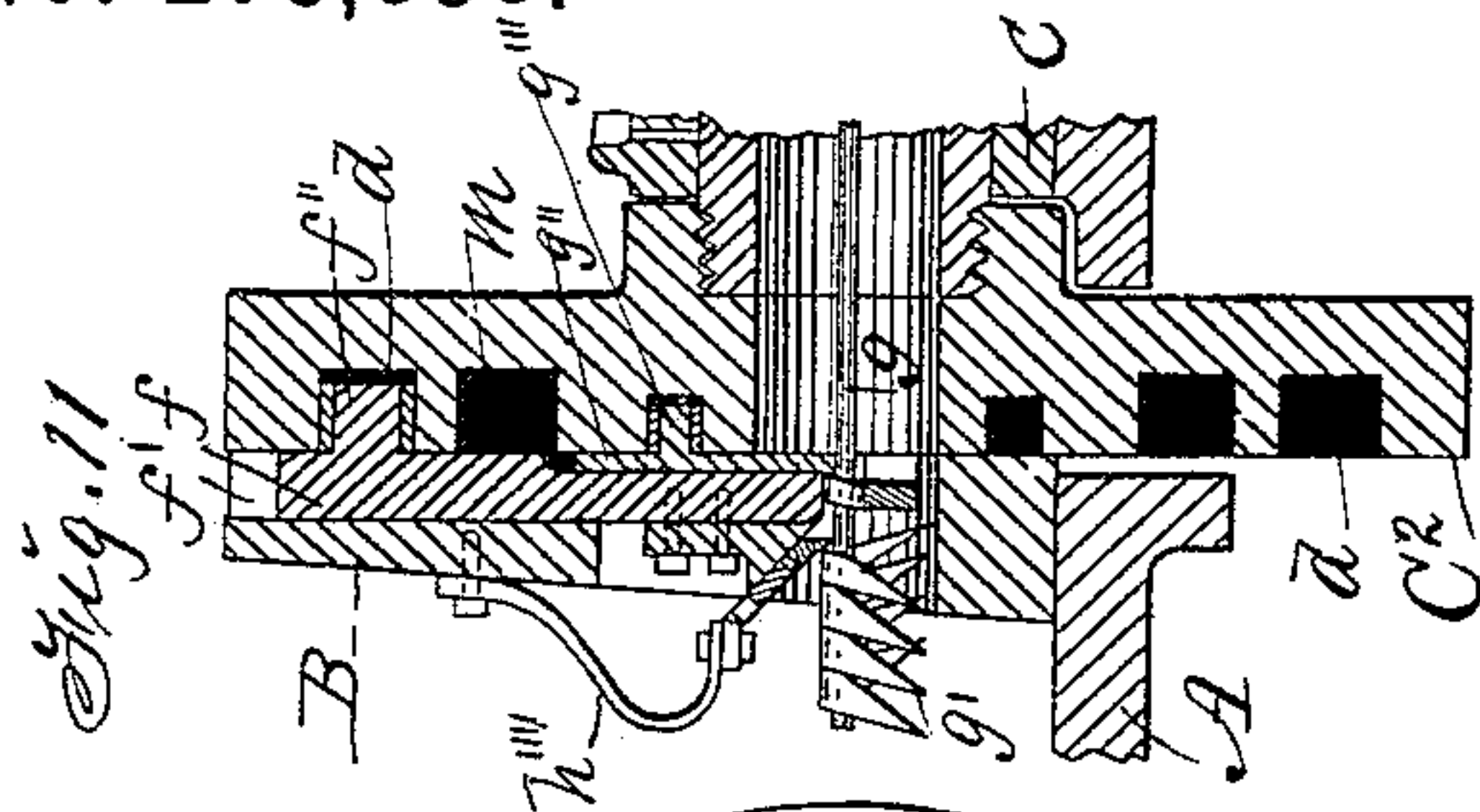
3 Sheets—Sheet 3.

H. B. HEDGE & T. A. NOBLE.

WIRE BARBING MACHINE.

No. 273,838.

Patented Mar. 13, 1883.



Witnesses:

E. W. Smith,
H. A. Stoltenberg

Inventors: { Hugh B. Hedge,
Theron A. Noble,
By Thomas G. Orwig, Attorney.

UNITED STATES PATENT OFFICE.

HUGH B. HEDGE AND THERON A. NOBLE, OF DES MOINES, IOWA, ASSIGN-
ORS OF ONE-THIRD TO M. R. BAKER, OF SAME PLACE.

WIRE-BARBING MACHINE.

SPECIFICATION forming part of Letters Patent No. 273,838, dated March 13, 1883.

Application filed January 8, 1883. (No model.)

To all whom it may concern:

Be it known that we, HUGH B. HEDGE and THERON A. NOBLE, of Des Moines, in the county of Polk and State of Iowa, have invented an Improved Wire-Barbing Machine, of which the following is a specification.

The object of our invention is to provide a means for bending barb-pieces around a fence-wire by imparting reciprocating rectilinear motions to the barb-benders in place of rotary motion, as heretofore, and to actuate the reciprocating barb-benders and wire-moving mechanism by cams on one and the same shaft, and to apply two barbs on the wire at regular distances apart at each revolution of the shaft, to thereby speed the work without increasing the speed of the machine, and to save time and power in producing any given quantity of barbed wire.

It consists, first, in forming and combining a barb-holding device with a stationary head and a revolving grooved disk or cam-wheel; second, in combining reciprocating barb-benders with the stationary head and grooved cam-wheel; third, in combining a wire moving and spacing device with the barb-holding and barb-bending mechanisms; fourth, in combining an automatic wire-holding device with the barb-bending and wire moving mechanisms to hold the wire stationary at regular intervals while the barbs are being fixed thereon, all as hereinafter fully set forth.

Figure 1 of our accompanying drawings is a side view of our machine; Fig. 2, a top view; Fig. 3, a longitudinal section; Fig. 4, an end view; Fig. 5, an enlarged sectional view of the barb-holding device. Fig. 6 is a face view of the grooved cam-wheel and side view of the reciprocating barb-holding and barb forming or bending devices in position as required to allow the legs of a staple-shaped barb-piece astride of the fence-wire to pass downward between them. Fig. 7 is a horizontal section of the stationary head and cam-wheel, showing the barb-benders in the same position relative to the cam-wheel and barb-piece on the wire as shown in Fig. 6. Fig. 8 is a vertical section of the head and cam-wheel, taken at right angles relative to Fig. 6, to show the barb-holding device in position as required when the

wire is moving. Fig. 9 is a face view of the cam-wheel, showing the barb-benders in position after bending the staple-legs of the barb-piece in opposite directions relative to the fence-wire as required to produce a complete fixed two-pointed barb. Fig. 10 is a horizontal section of the combined head and cam-wheel and a top view of the complete barb and barb-benders in the same position as shown in Fig. 9. Fig. 11 is a vertical section of the combined head and cam-wheel, showing the barb-holding device in position as required when the barb-benders are advanced in opposite directions to bend the legs of the barb piece upon the fence-wire. Jointly considered, these figures clearly illustrate the construction and operation of our complete invention.

A represents a metal plate and base, upon which our stationary head B is fixed by means of screw-bolts. It is supported upon suitable legs and a frame.

C is a tubular shaft, supported above the base A by bearings C'.

C² is a disk or wheel having cam-grooves in its front face, fixed to the end of the tubular shaft to revolve against the face of the fixed head B. An opening in the base-plate A allows the cam-wheel C² to extend downward below the fixed head B.

No. 1 is a gear-wheel fixed to the central portion of the tubular shaft. An opening in the base-plate A admits the wheel to extend below the plate to engage a second gear-wheel. No. 2 is a gear-wheel of smaller diameter, fixed to a driving-shaft, C³, that is mounted in bearings fixed to the frame or legs that support the base A. No. 3 is a driver-pulley fixed to the shaft C³, and No. 4 is a loose belt-pulley on the same shaft. No. 5 is a driver-pulley fixed to the opposite end of the shaft C³ to transmit power and motion to wire-twisting and cable-forming mechanism. Nos. 6, 7, and 8 are sprocket-wheels, mounted in a frame, D D', (fixed to the rear end of the base-plate A,) by means of shafts Nos. 9, 10, and 11. The wheels Nos. 6 and 7 are connected by gear-wheels.

D² is a collar fixed on the tubular shaft C. It has a serpentine cam-groove, a, in its periphery.

D³ is a sleeve fitted around the grooved col-

lar D^2 , and it has arms a' , pivoted at its opposite sides to operate pawls a'' , that engage the ratchet-wheels a''' , that are fixed to the shaft No. 9.

5 a'''' are arms pivoted to the shaft No. 9 at their lower ends and to the arms a' and the pawls a'' at their upper ends. The pivots or screw-bolts b , that connect the arms a' with the slide D^3 , extend into the serpentine groove 10 a of the collar D^2 , and by means thereof the rotary motion of the collar imparts a reciprocating rectilinear motion to the slide and the arms a' , as required to operate the pawls a'' , and therewith rotate the ratchet-wheels a''' , the 15 shaft No. 9, and sprocket-wheels Nos. 6 and 7. Bearings fixed to the base A engage the slide D^3 and prevent revolving motion.

20 d is a cam-groove in the front face, and near the circumference of the wheel C^2 . It has inward bends d' at equidistances apart.

f is a reciprocating barb-holder that moves in a vertical groove, f' , of corresponding size, formed in the rear face of the fixed head B, as clearly shown in Fig. 5.

25 f'' is a stud that extends laterally from the upper portion of the straight barb-holder f' into the cam-groove d . At every half-revolution of the cam-wheel C^2 the barb-holder f is pressed down toward the fence-wire g and upon 30 the barb-piece g' by means of the inward bends d' in the cam-groove d and the stud f'' , that traverses the cam-groove.

35 g'' (clearly shown in Fig. 5) is an auxiliary barb-holder, that has a notch in its lower end to fit over the wire g , and to prevent the barb-piece g' from sliding rearward on the wire. It has a stud, g''' , that extends into a continuous groove, h , formed in the center portion of the 40 face of the wheel C^2 .

40 h' are short outward bends in the groove h , that elevate the auxiliary holder g' at every half-revolution of the cam-wheel to allow a fixed barb to pass rearward as the wire g is moved by the spacing mechanism.

45 h'' is a block fixed to the lower end and outside of the barb-holder f , and the two parts are jointly beveled to form an incline of about forty-five (45) degrees. An opening through the fixed head B allows this block vertical motion. 50

h''' is a barb-separator. It has a longitudinal slot or bridle, through which a screw-stud is passed into the inclined bottom face of the block h'' to connect the separator with the 55 barb-holder f . The lower end of the separator is curved and bifurcated in such a manner that when it moves downward with the barb-holder it will straddle the fence-wire g , and separate one of the staple-form barb-pieces g from a series hanging upon the wire by an independent sliding motion on the incline of the block h'' , caused by its contact with the fence-wire and the downward motion of the barb-holder f .

60 h'''' is a spring fixed to the head B at its upper end, and to the separator h''' at its free lower end. As the barb-holder f moves upward the force of the spring will push the separator 65

downward on its inclined bearing, and rearward relative to the machine, and wire g , that extends through the tubular shaft C to retain the loose barb-pieces while the wire is advanced. 70

i i , shown in Figs. 6, 7, 9, and 10, are two reciprocating barb-benders that move in corresponding horizontal grooves, i' , formed in the 75 inside face of the fixed head B. Each has a stud, k , that projects into a continuous cam-groove, m , formed in the face of the wheel C^2 .

80 m' are two equidistant inward bends in the grooves m , by means of which the barb-benders i , having studs k , are simultaneously moved toward each other, and against the legs of the barb-pieces g' , as required, to bend the staple-legs in opposite directions, and upon the fence-wire g at the same time that the barb-holder 85 f presses the barb-piece upon the top of the wire at each half-revolution of the cam-wheel C^2 .

No. 12 is a ratchet-wheel fixed to the shaft No. 9.

90 n is a pawl pivoted to the frame D. o is a reciprocating rod, that slides in bearings p , fixed on top of the base A. The rear end of the rod o is pivoted to the top end of the pawl n .

95 o' is a lateral projection and shoulder at the front end of the rod, that is engaged at every half-revolution of the wheel C^2 by cams r , that project from the rear face of the wheel C^2 at equal distances apart.

o'' is a collar fixed on the rod o .

100 o''' is a spring placed between that collar and one of the bearings p in such a manner that the spring will, in its normal position, press the rod o forward to retain the pawl n in one of the notches of the wheel No. 12 as required to hold the fence-wire g stationary 105 while the barb-benders i are bending the barb-piece around the wire; and when the barb-formers have completed their inward motions and work, one of the cams r on the rear face of the wheel C^2 engages the shoulder o' , and thereby compresses the spring o''' and moves 110 the rod rearward to release the pawl n from the wheel No. 12 as required to allow the wire g to move a certain distance, and to fix barbs upon the wire at uniform distances apart. 115

s is a bracket fixed to the front end and center of the base-plate A.

s' is a bearing, upon which the wire g is advanced into the tubular shaft C.

120 s'' is an adjustable pressing device, hinged to the bearing s' in such a manner that the complete device will guide and straighten the wire as it is drawn through by the operation of the sprocket-wheels Nos. 6 7 8 and a reeling device located at the rear end of the machine, but not shown. 125

From the detailed description of the construction of the various elements and subcombinations and their respective functions their unitary operations and the practical working 130 of the complete machine will be obvious to persons familiar with wire-barbing mechanism.

The staple-shaped barb-pieces may be placed astride of the plain fence-wire, as shown in

Fig. 5, by hand, or by means of suitable automatic machinery, combined and operated in concert with the barb-holding, barb-fastening, and wire-moving mechanisms.

5 We claim as our invention—

1. In a wire-barbing machine, the combination of a stationary head having rectilinear grooves extending outward from its open center, a rotating cam-wheel on a tubular shaft
10 having curvilinear grooves in its face and concentric with the tubular shaft, and reciprocating barb-holders and barb-benders that fit and move in the rectilinear grooves of the stationary head and have studs that extend into and
15 traverse the curvilinear grooves in the rotating cam-wheel, for the purpose of bending barb-pieces and fastening them to a fence-wire.

2. The combination of a base, A, a fixed head, B, having a vertical rectilinear groove, *f*, and
20 horizontal rectilinear grooves, *i' i'*, the wheel C^2 , having continuous curvilinear grooves *d d'* and *m m'*, the barb-holder *f*, having stud *f''*, and the two barb-benders, *i i*, having studs *k*, as shown and described, for the purposes
25 specified.

3. The combination of the auxiliary barb-holder *g''*, having a stud, *g'''*, with the wheel C^2 , having a continuous cam-groove, *h h'*, and the reciprocating barb-holder *f*, substantially
30 as shown and described, for the purposes specified.

4. The barb separating and holding device *h'' h''' h''''*, in combination with the reciprocating barb-holder *f* and the stationary head B,
35 substantially as shown and described, for the purposes specified.

5. The arrangement and combination of the tubular rotating shaft C, the fixed collar D^2 , having a cam-groove, *a*, the slide D^3 , the arms *a'*, the pawls *a''*, the ratchet-wheels *a'''*, and
40 the arms *a''''*, pivoted to the shaft carrying the said ratchet-wheels, substantially as and for the purposes set forth.

6. The wire-holding device *o o' o'' o'''* and *n*, in combination with the cam-wheel C^2 , having
45 cam-grooves *r* on its rear face, the ratchet-wheel No. 12, and wire-moving sprocket-wheels, substantially as shown and described, for the purposes set forth.

7. The improved wire-barbing machine composed of the following elements, to wit: the
50 elevated base-plate A, the fixed head B, having an opening in its center and rectilinear grooves *f'* and *i' i'* in its rear face, the tubular shaft C, carrying the gear-wheel No. 1, and the
55 cam-wheel C^2 , having curvilinear cam-grooves *d d'*, *m m'*, and *h h'* in its front face, the reciprocating barb-holder *f f''*, the auxiliary holder *g'' g'''*, the barb-separating device *h'' h''' h''''*, the reciprocating barb-benders *i k'*, the wire-
60 moving and barb-spacing device *D a D^3 a' a'' a''' a''''*, the wire-holding device *o o' o'' o'''*, cams *r*, on the wheel C^2 and ratchet-wheel No. 12, and the drive-wheel No. 2 on a driving-shaft, substantially as shown and described,
65 to operate in the manner set forth.

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THERON AUGUSTUS NOBLE.

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