

No. 667,564.

Patented Feb. 5, 1901.

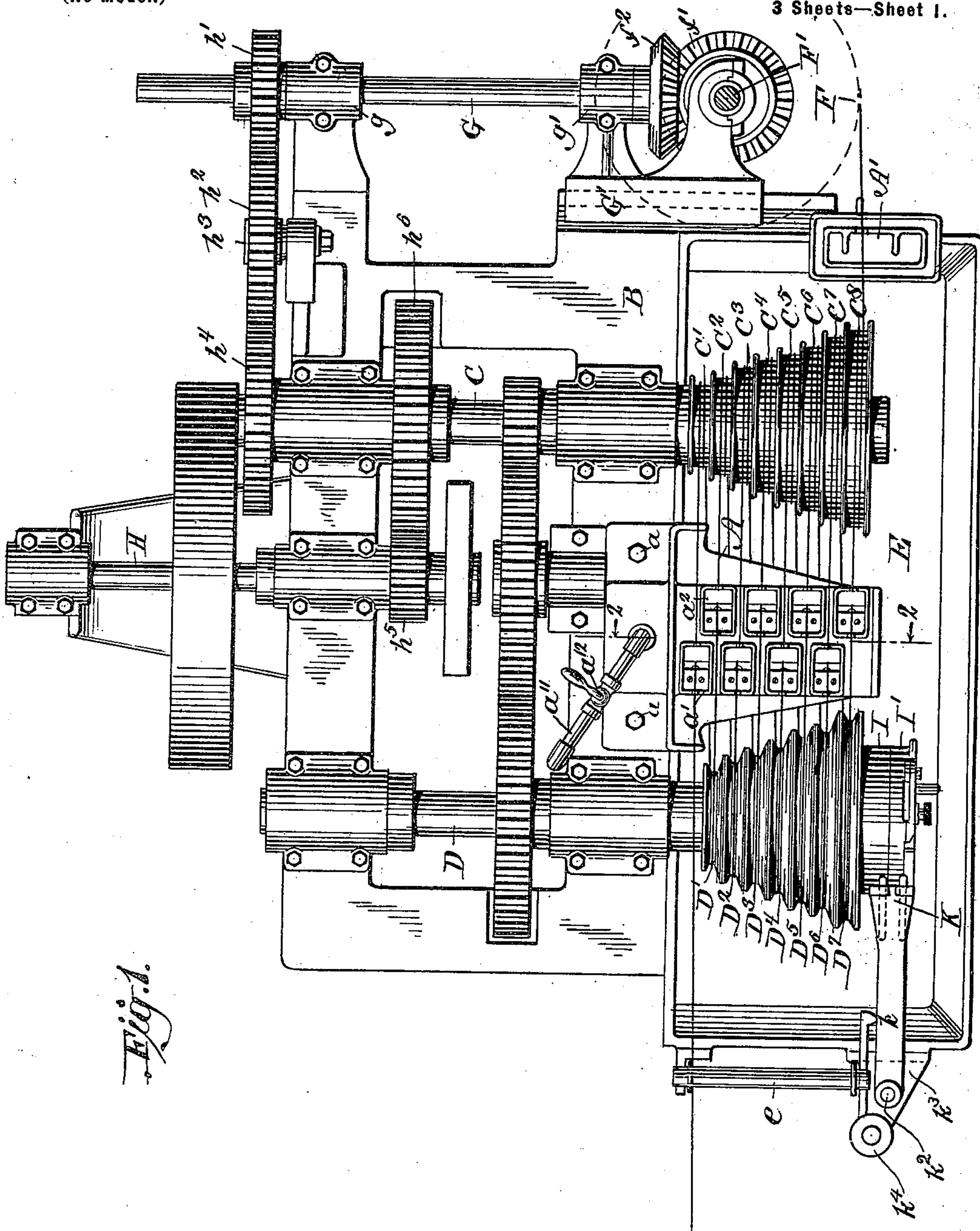
J. H. O'DONNELL & W. D. PIERSON.

WIRE DRAWING MACHINE.

(No Model.)

(Application filed July 18, 1900.)

3 Sheets—Sheet 1.



WITNESSES:

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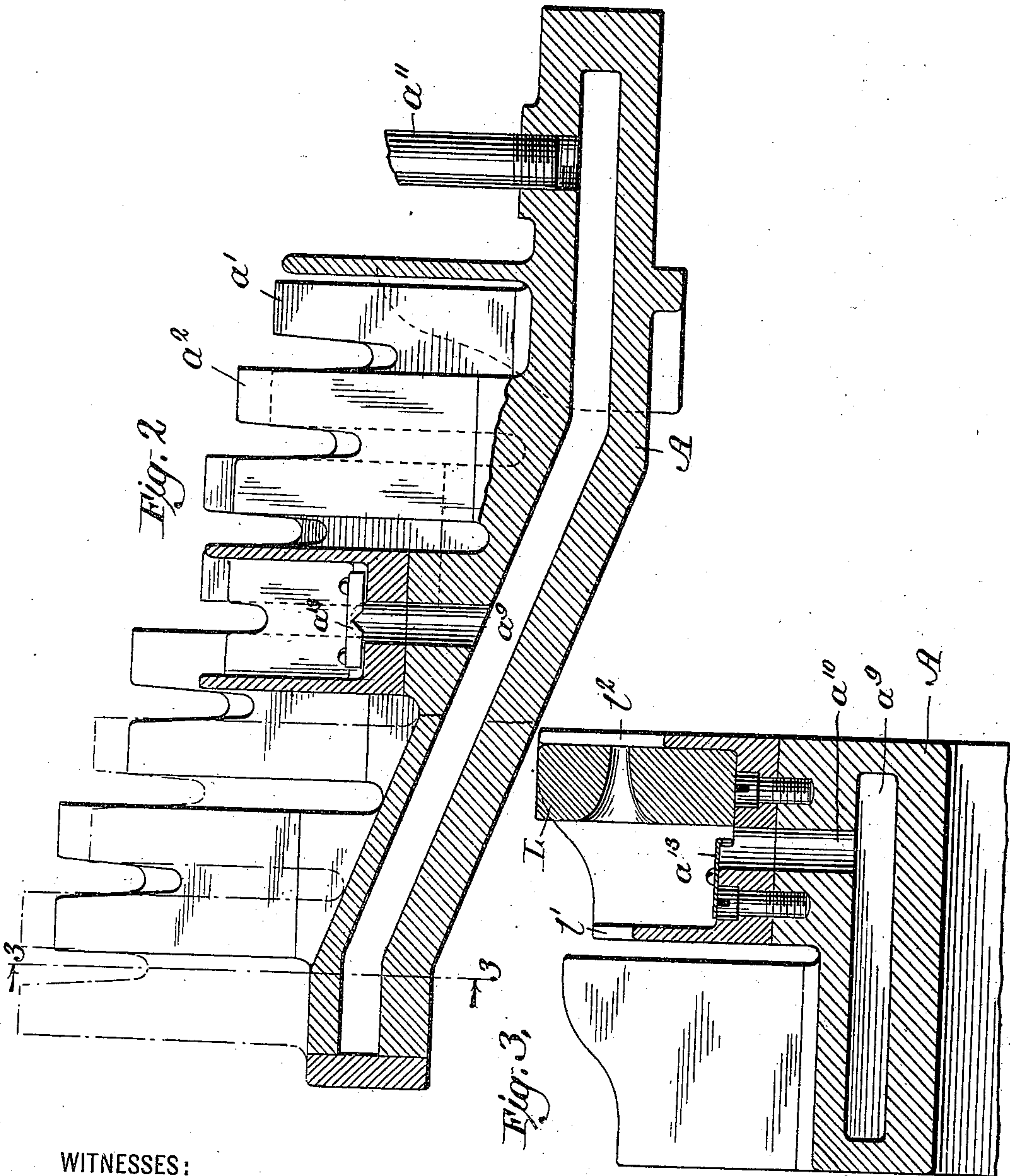
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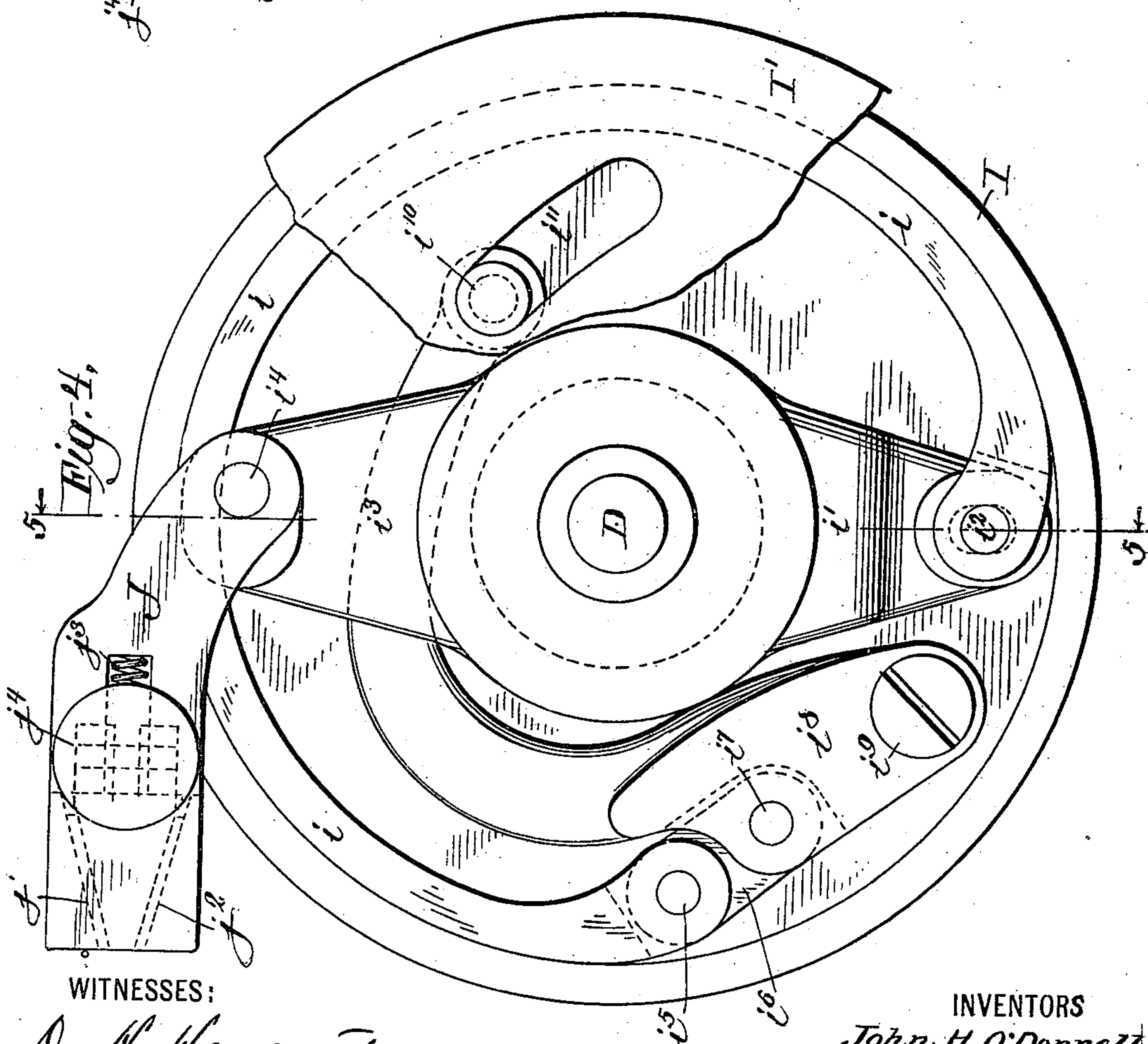
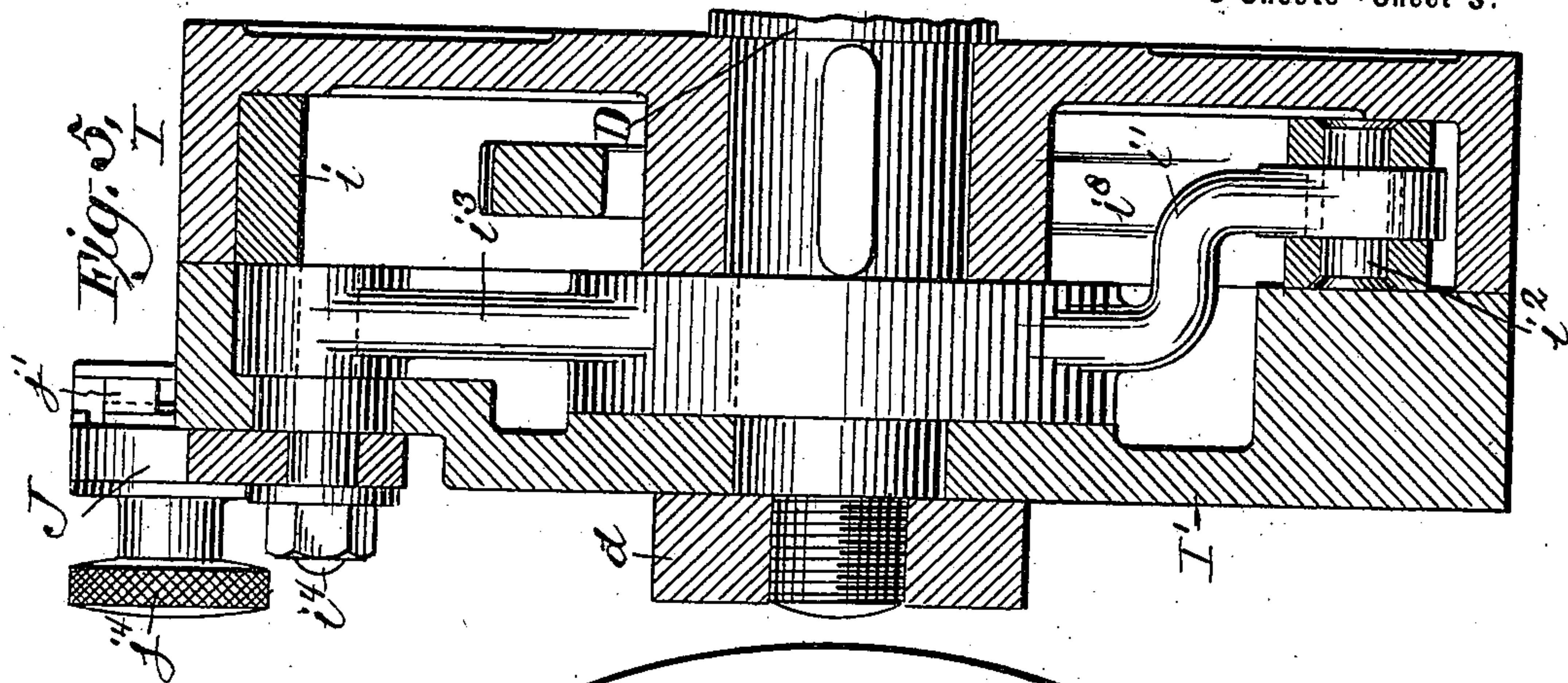
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(No Model.)

(Application filed July 18, 1900.)

3 Sheets—Sheet 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN H. O'DONNELL AND WILLIAM D. PIERSON, OF WATERBURY, CONNECTICUT, ASSIGNORS TO THE WATERBURY MACHINE COMPANY, OF SAME PLACE.

WIRE-DRAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 667,564, dated February 5, 1901.

Application filed July 18, 1900. Serial No. 24,032. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. O'DONNELL and WILLIAM D. PIERSON, of Waterbury, county of New Haven, State of Connecticut, have invented a new and useful Improvement in Wire-Drawing Machines, of which the following is a specification.

A machine embodying the improvement will be described in detail, and then the novel features will be pointed out in claims.

In the accompanying drawings, Figure 1 is a plan view of a machine embodying the improvement. Fig. 2 is a transverse section, upon an enlarged scale, upon the line 2 2 of Fig. 1. Fig. 3 is a longitudinal section on the same scale as Fig. 2 on the plane of the dotted line 3 3 of Fig. 2. Fig. 4 is a side elevation of certain portions of the machine, including stringing mechanism. Fig. 5 is a transverse section taken at the plane of the dotted line 5 5 of Fig. 4.

Similar letters of reference designate corresponding parts in all the figures.

A designates a die-box comprising a number of die-holders a' a^2 , constructed to receive the dies through which the wire is passed. They are here shown as eight in number and are arranged in two rows, one row in front of the other, the die-holders in each row being arranged opposite spaces between those of the other row. This die-box A is secured by screws or bolts a to the frame B of the machine. Forward of the die-holders are a number of drawing-rolls C' C^2 C^3 C^4 C^5 C^6 C^7 C^8 . They are all fixed to a shaft C, journaled in the frame B of the machine.

Rearward of the die-box is a shaft D, which is journaled in bearings in the frame B of the machine and has loosely mounted upon it, rearward of the die-box, a number of idlers D' D^2 D^3 D^4 D^5 D^6 D^7 . The die-box A, the drawing-rolls C' C^2 C^3 C^4 C^5 C^6 C^7 C^8 , and the idlers D' D^2 D^3 D^4 D^5 D^6 D^7 all project over a tank E, in which a supply of liquid is maintained. At one end this tank is shown as provided with a loosely-turning roller e , having flanges near its ends. Over this roller the wire may pass to the first drawing-die, that die being contained in the first die-holder a' . Thence the wire passes a suitable num-

ber of times around the drawing-roll C' . From that roll it passes back to and around the first idler D' . Thence it passes to the second drawing-die, that die being contained in the first die-holder a^2 . Thence it passes a suitable number of times around the drawing-roll C^2 , and from there passes backward, and after turning around the second idler D^2 it passes into the third die, that die being supported in the second die-holder a' . Then it extends forward to the drawing-roll C^3 , and after passing a suitable number of times around that drawing-roll it returns and passes around the third idler D^3 . From there it enters the fourth drawing-die, that die being in the second die-holder a^2 . Then it passes a suitable number of times around the drawing-roll C^4 , returning thence to pass around the fourth idler D^4 . From this idler it passes through the fifth drawing-die, that die being supported in the third die-holder a' . Thence it passes a suitable number of times around the drawing-roll C^5 , and returning passes around the fifth idler D^5 , so that it may pass forward and through the sixth drawing-die, that die being supported in the third die-holder a^2 . Beyond the last-mentioned die-holder it extends through and around the drawing-roll C^6 . It returns from the latter to pass around the idler D^6 . Thence it passes through the seventh drawing-die, that die being supported in the fourth and last of the die-holders a' . Next it passes around the drawing-roll C^7 , and returning from there it passes around the seventh and last idler D^7 . Then it passes through the fourth and last of the drawing-dies in the holder a^2 and forward to and around the eighth and last drawing-roll C^8 . Subsequently it passes through a die in a die-holder A' , and thence it is taken up by a wire block whose body is indicated by the dotted line F, carried by an upright shaft F' , deriving motion through bevel gear-wheels f' f^2 from a horizontal shaft G. This shaft G is supported near one end by a bearing g , comprised in the frame B of the machine, and near the other end is journaled in a bearing g' , forming part of a slide G' , which also comprises the bearing for the upright shaft F' . The slide G' is employed in order to provide for

adjusting wire blocks of different diameters into positions suitable for the last of the drawing-rolls $C^1 C^2 C^3 C^4 C^5 C^6 C^7 C^8$, which may be in use at any time.

5 The shaft G has mounted upon it beyond the bearing g a gear-wheel h' . In order to permit of the sliding of the shaft during adjustments of the slide g' , it is necessary to connect it with the gear-wheel h by a feather
10 or spline.

The gear-wheel h' meshes with a gear-wheel h^2 , mounted upon a stud h^3 , which is adjustable in a slot made in the form of an arc concentric with the shaft G , so that the wheel h^2
15 may be adjusted into different positions to permit the wheel h' to be removed from the shaft G and another wheel of a different size arranged in its place to mesh with the gear-wheel h^2 , all in a manner well known for
20 change-gearing to provide for different speeds of the shaft G , suitable for wire blocks of different diameters. The gear-wheel h^2 derives its motion from a gear-wheel h^4 , fixed to the shaft C .

25 The shaft C derives motion from a driving-shaft H , journaled in the frame B of the machine and having fixed to it a small gear or pinion h^5 . This gear-wheel h^5 meshes with a gear-wheel h^6 , fixed to the shaft C .

30 Affixed to the shaft D , near one end, is a wheel-like portion I . Inside the rim portion is a metal clutch-strap i , pivotally connected at one end to an arm i' by means of a pin i^2 , which passes through a slot formed length-
35 wise in the arm, so as to afford the pin play in that direction. The arm is formed integral with an arm i^3 , and the piece of metal comprising these two arms is loosely mounted upon the hub of the part I .

40 Mounted loosely upon the shaft D , just beyond the wheel-like part I , is another wheel-like part I' . The arm i' extends below into both the parts I and I' ; but the arm i^3 is wholly within the part I' . The hub formed
45 with these two arms and mounted upon the hub of the part I is wholly within the part I' . A pin i^4 extends from the arm i^3 through a hole in the wheel-like part I' , and also through a wire-gripping head J , its outer extremity
50 being screw-threaded and fitted with a nut to secure it and the wire-gripping head together. The shaft D extends beyond the hub, which is integral with the arms $i' i^3$, into and through the wheel-like part I' . Outside the latter the
55 shaft is reduced in size and screw-threaded to receive a nut d for securing the wheel-like parts I and I' in place.

The wire-gripping head J may be of any suitable construction, it being here shown as
60 provided with inclined sliding jaws $j' j^2$, working in slideways formed in the head and normally impelled outward by a spring j^3 , so as to approach each other sufficiently to grip the wire. A handpiece j^4 affords provision for
65 conveniently moving the jaws inwardly, so that they will release the wire.

It has already been stated that one end of

the strap i is pivotally connected with the arm i' . The other end of the strap is pivotally connected by a pin i^5 with a link i^6 , and
70 the latter is pivotally connected by a pin i^7 with a lever i^8 , that is fulcrumed by a pin or screw i^9 to the wheel-like part I . A lever i^8 is bent so as to pass around the central hub-like portion of the wheel-like part I . It is
75 provided with a pin i^{10} , that extends through a slot i^{11} in the wheel-like part I' .

A die-rest K is supported by a rod k , which is pivoted by a pin k^2 to a bracket k^3 , affixed to one end of the tank E . The bracket k^3 is
80 provided with a guide-wheel k^4 . A die to be threaded or strung upon the wire is first placed upon the wire by properly pointing the end of wire and passing said end through the die. Then it is placed upon the rod k
85 while in a position to bear against the rear side of the die-rest K . The end of the wire is gripped by the jaws $j' j^2$. The attendant takes hold of the pin i^{10} and oscillates the lever i^8 , so that the latter will expand the strap
90 i against the inner surface of the rim-like portion of the wheel-like part I . Then the arms $i' i^3$ will be locked to the wheel-like part I , so that they will participate in its rotary motion. Thus the wire-drawing head J will
95 be enabled to draw the wire through the die. The wire thus drawn will be wound upon the exterior of the wheel-like parts $I I'$. After a sufficient quantity of wire shall have thus
100 been drawn through the die the lever i^8 will be manipulated the pin i^{10} be oscillated, so as to contract the strap i for the purpose of disengaging the arms $i' i^3$, and consequently the wire-drawing head J , from the wheel-like
105 part I .

No matter what speed is given to the shaft C the shaft D will turn so slowly as to be well adapted for stringing dies upon wire to be drawn.

The die-box A is provided practically
110 throughout its length and width with a channel a^9 , through which may be circulated any suitable cooling and lubricating liquid. Each of the die-holders $a^1 a^2 a^3 a^4 a^5 a^6 a^7 a^8$ is a box-like construction and has a suitable seat for
115 a die. It is removably secured by screws or other means to the die-box. In Fig. 3 a die is shown in position in one of these die-holders, and it will be seen that opposite the opening of the die are vertical slots $l' l^2$ for the
120 passage of the wire. In the bottom of each die-holder is a passage a^{10} , which communicates with a channel a^9 . The cooling and lubricating liquid passes up the passages a^{10} of the various die-holders and rises into the die-
125 holders until it reaches the wire for the purpose of cooling and lubricating it. Afterward it flows away. The liquid thus overflowing falls into the tank E , whence it is taken by a pump and delivered to a pipe a^{11}
130 to again enter the die-box. The pipe a^{11} is provided with a cock a^{12} to control the flow of liquid through it.

Above each of the passages a^{10} is a deflector

a^{13} , made in the form of a plate, fastened by a screw to the bottom of the die-holder and bent downwardly and notched suitably to extend across such passage a^{10} . The liquid in passing will be deflected against the face of the die L for the purpose of lubrication and cooling.

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

10 1. In a wire-drawing machine the combination of a number of dies, a number of rolls of different diameters affixed to a common shaft and serving to draw wire through said dies, a number of idlers around which such wire passes, a wire-stringing device carried by the shaft supporting the idlers and gearing for rotating the said shaft at a suitably-slow speed for stringing wire.

20 2. In a wire-drawing machine the combination of a number of dies, a number of rolls for drawing wire through said dies, a number of idlers around which such wire passes, a wire-stringing device carried by the shaft supporting the idlers, and gearing for rotating the said shaft at a suitably-slow speed for stringing wire, said gearing connecting said shaft with the shaft carrying the said rolls, so that the latter shaft while run at a high speed may transmit a slow speed to the shaft upon which the idlers and stringing device are mounted.

30 3. In a wire-drawing machine the combination of a die-box provided with a passage for the circulation of liquid, separately-re-movable die-holders mounted upon the die-box and having passages communicating with

the passage of the die-box, deflectors adjacent the passages of the die-holders for deflecting liquid against the dies and means for drawing wire through the dies.

40 4. In a wire-drawing machine the combination of dies, means for drawing wire through the dies and a wire-stringing device upon one of the shafts, said wire-stringing device comprising a gripper for the wire, two wheel-like parts, one affixed to and the other loosely mounted upon a supporting-shaft, arms extending from a loosely-mounted hub, and connected, one with the said wire-gripping device, a clutch-strap connected with the other arm, and a lever for expanding and contracting such clutch-band.

50 5. In a wire-drawing machine the combination of dies, means for drawing wire through the dies, and a wire-stringing device upon one of the shafts, said wire-stringing device comprising a gripper for the wire, two wheel-like parts, one fixed to and the other loosely mounted upon a supporting-shaft, arms extending from a loosely-mounted hub and connected one with said wire-gripping device, and a strap connected with the other arm whereby the strap will be rendered operative by tension upon the wire-gripper.

60 In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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WILLIAM D. PIERSON.

Witnesses:

WM. E. FULTON,

G. E. HARCKE.