

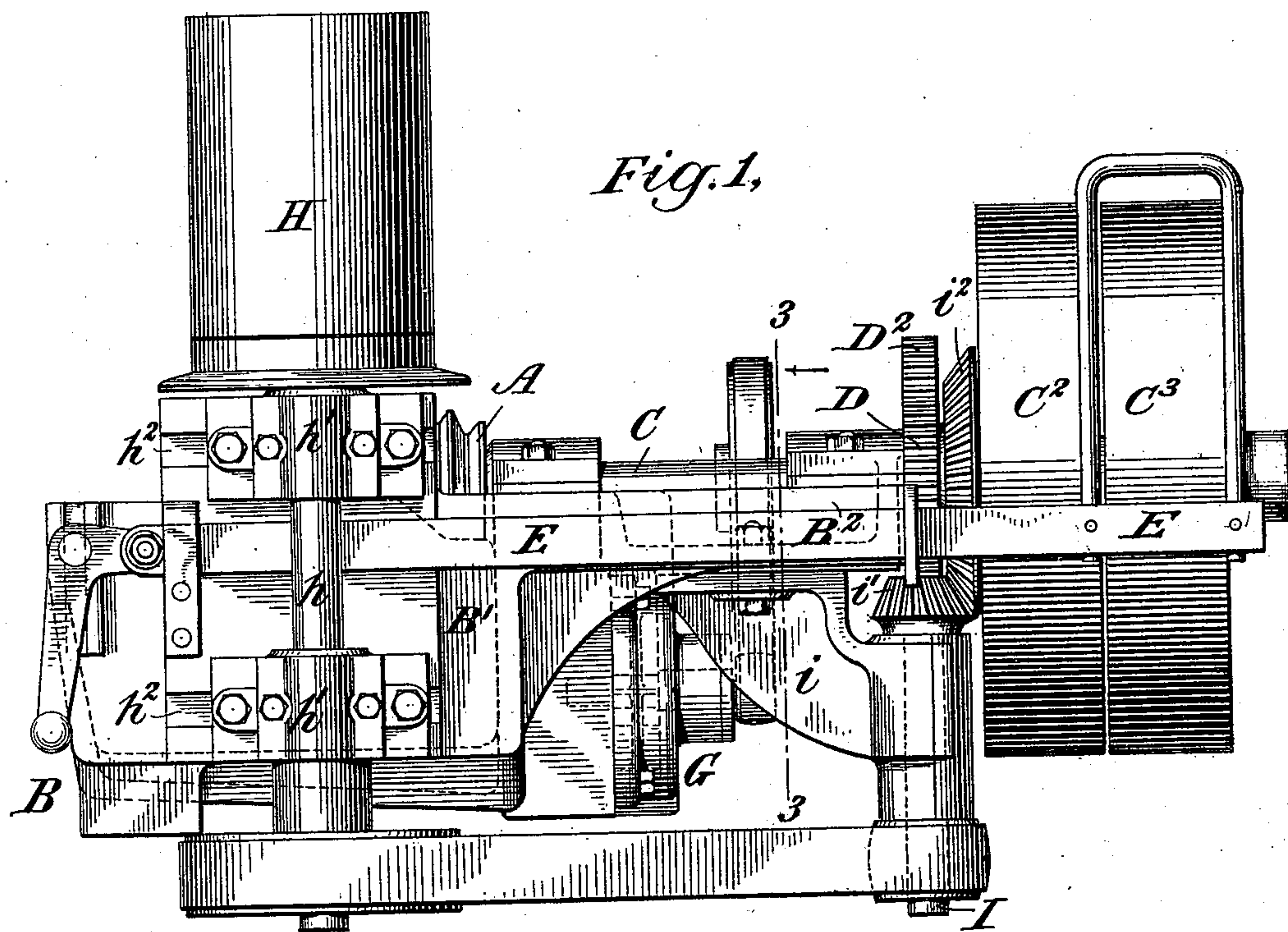
(No Model.)

4 Sheets—Sheet 1.

J. H. O'DONNELL.
WIRE DRAWING MACHINE.

No. 560,278.

Patented May 19, 1896.



Witnesses:-

D. H. Raymond

Piercy L. Wells

Inventor:-
John H. O'Donnell,
by his attorney,

Edwin H. Brown

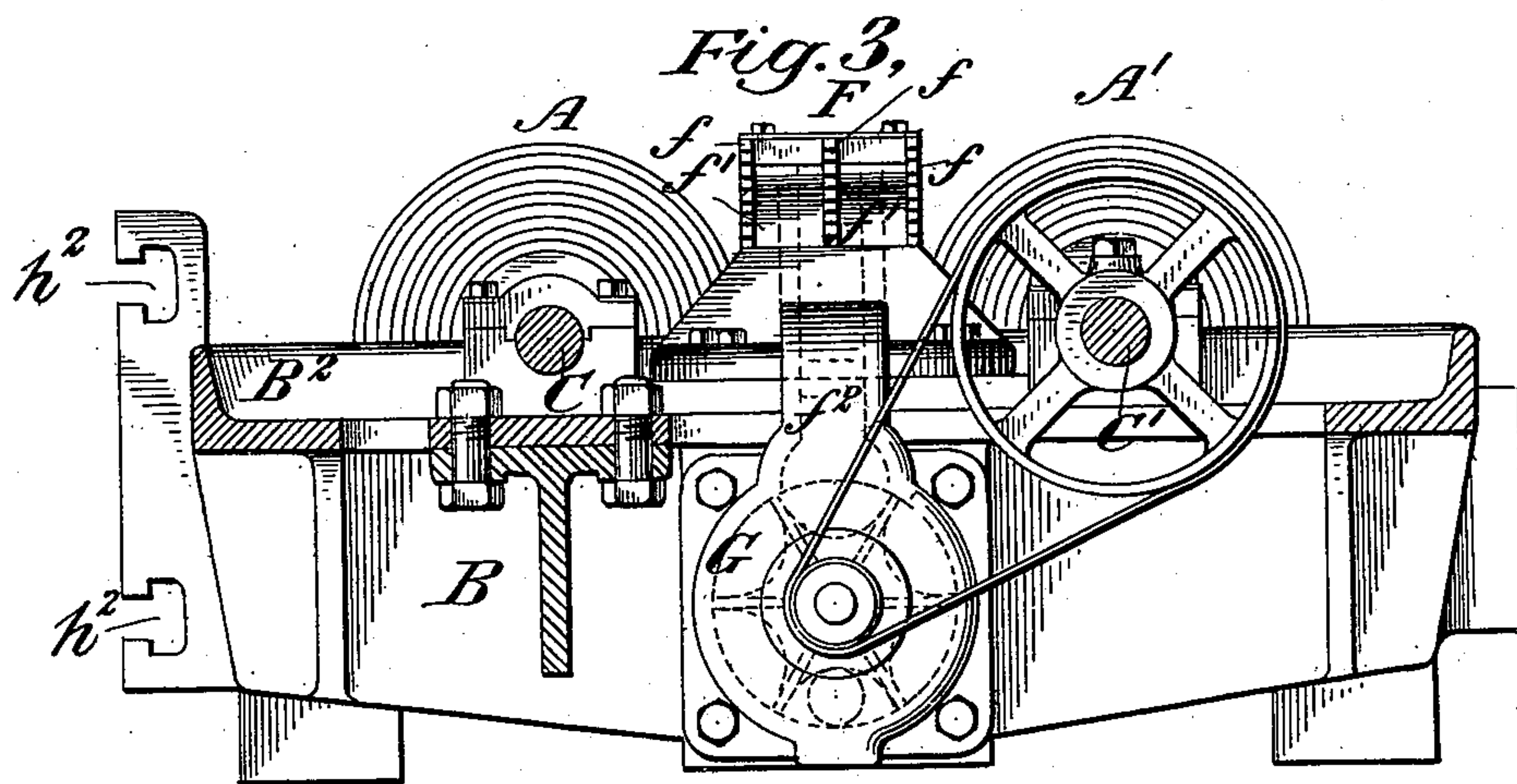
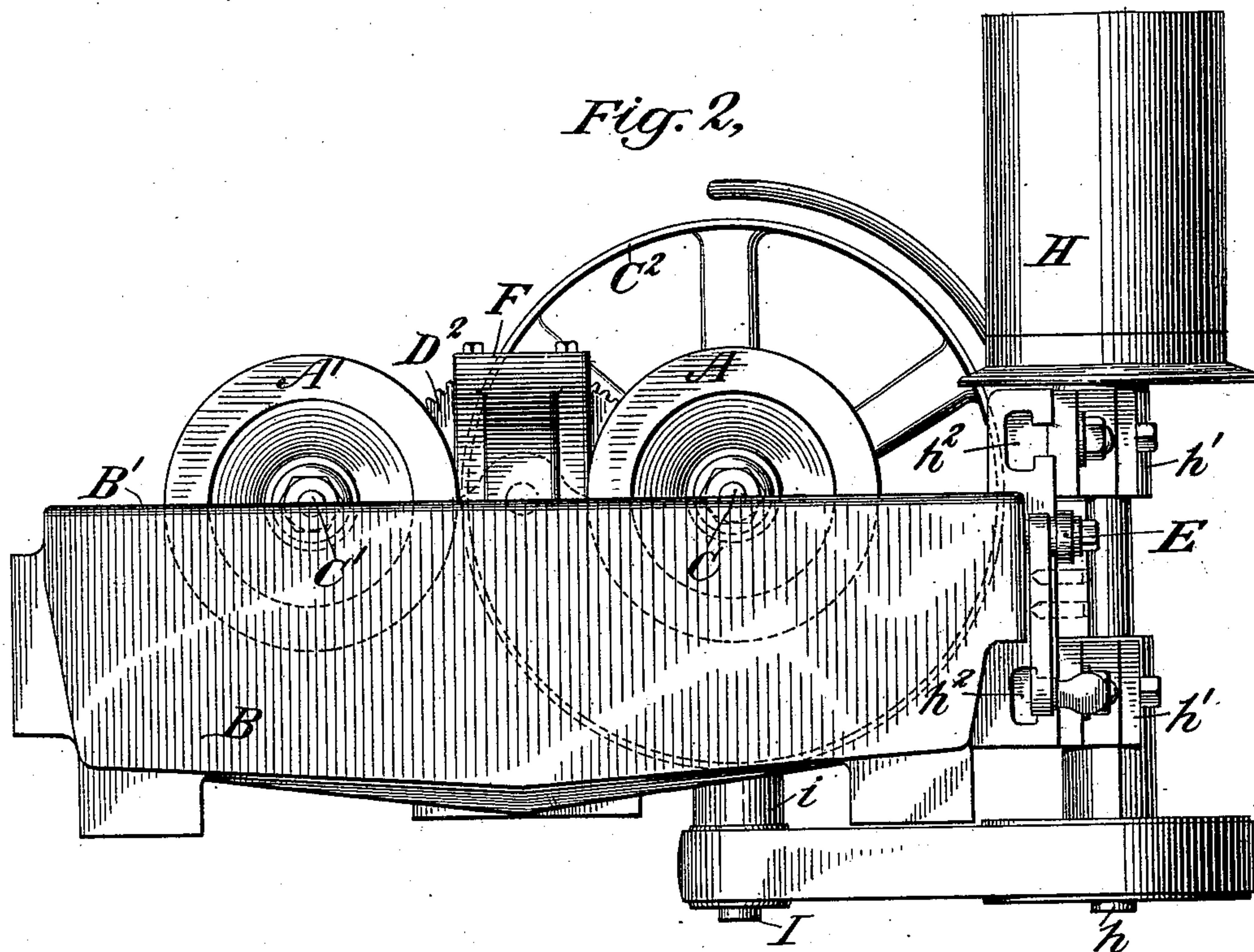
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Witnesses:

N. H. Raymond
Piercy & Wells

Inventor:
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(No Model.)

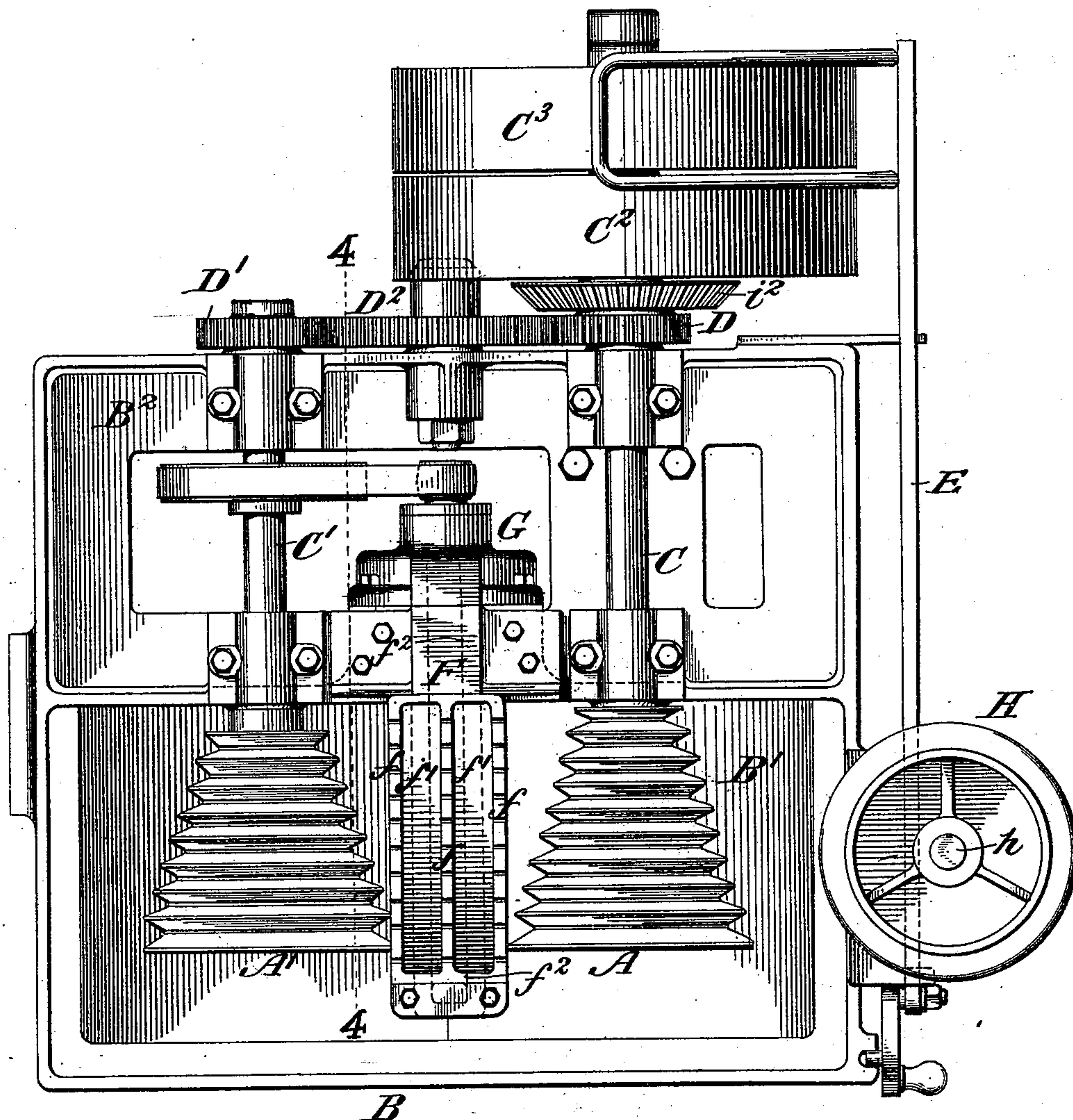
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Fig. 4,



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Edwin H. Brown

(No Model.)

4 Sheets—Sheet 4.

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WIRE DRAWING MACHINE.

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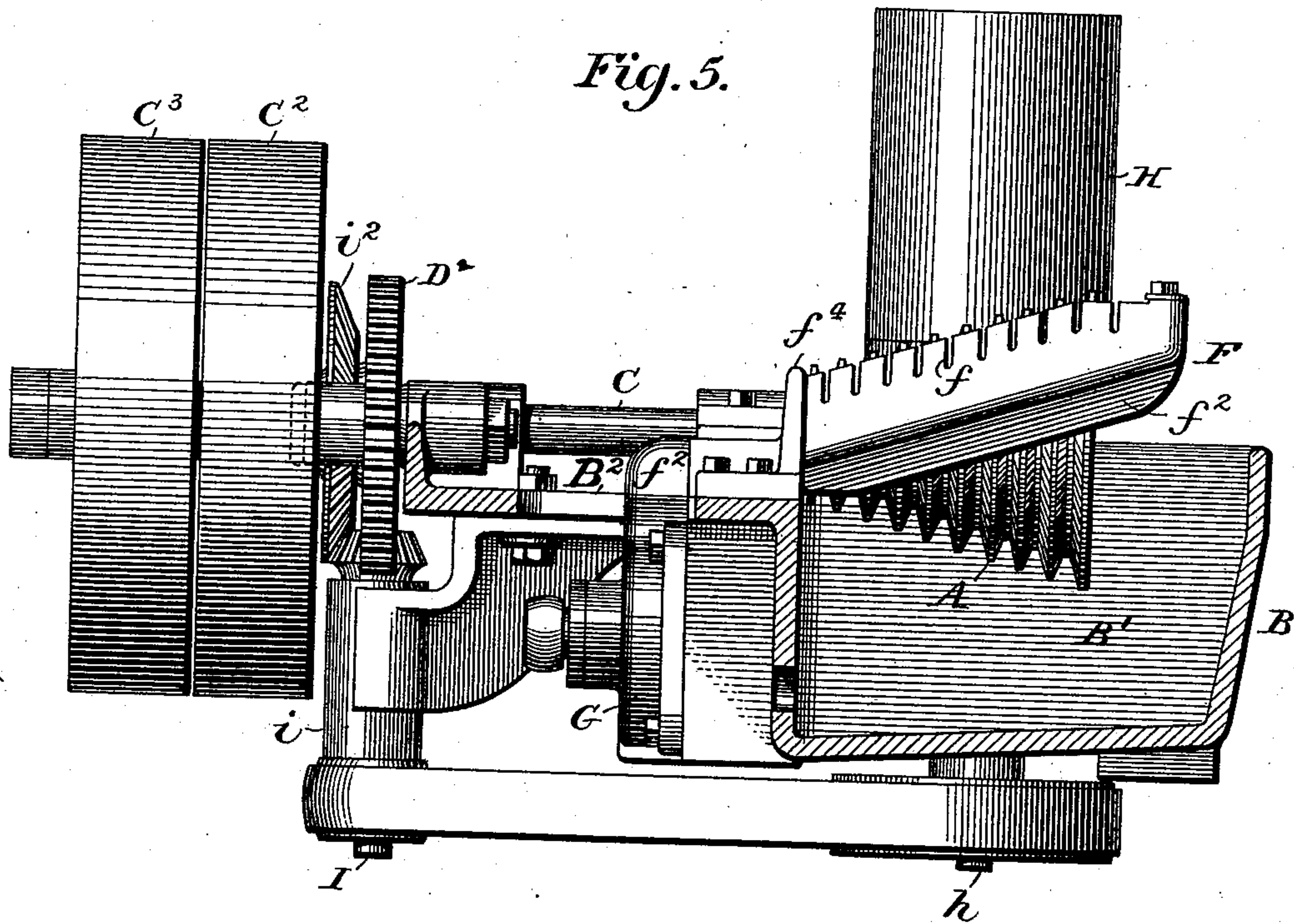
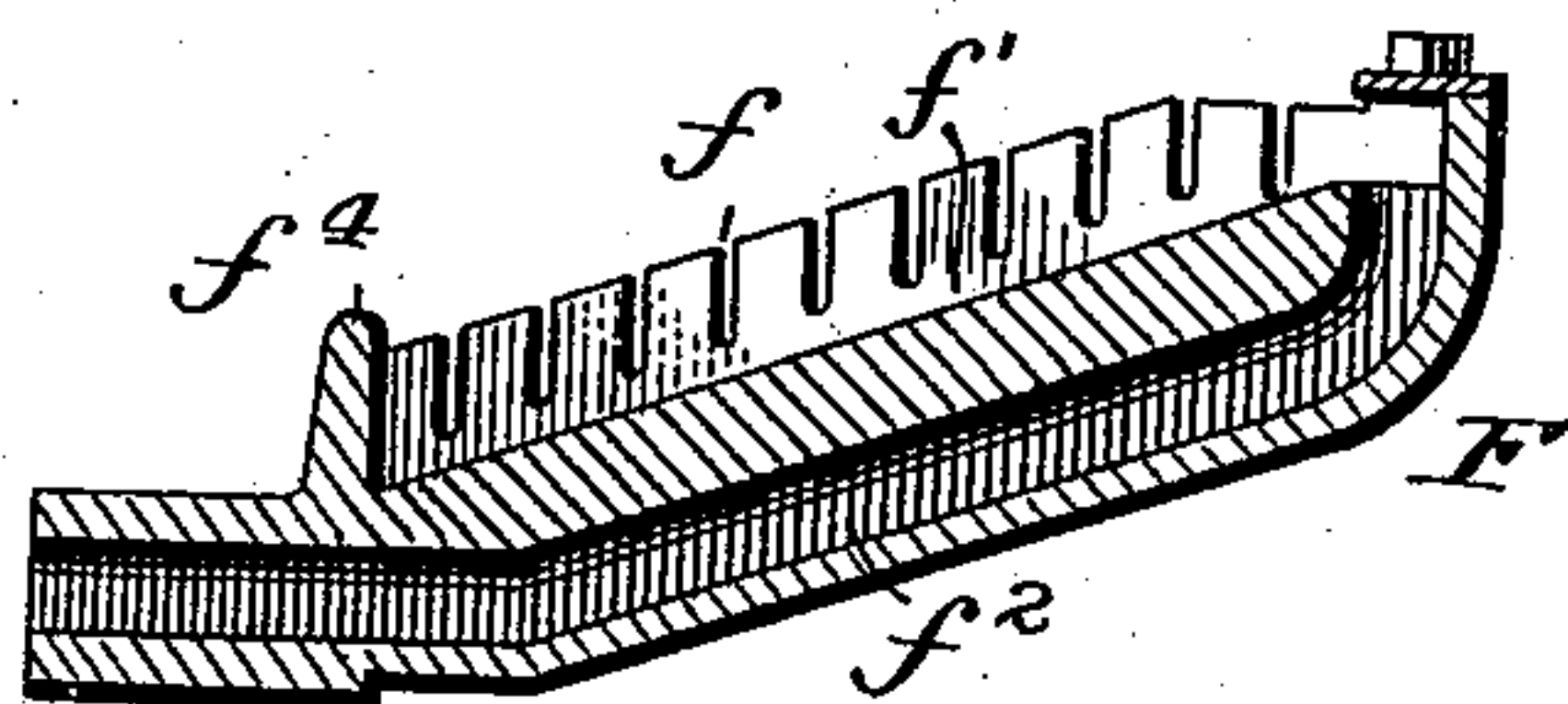


Fig. 6.



Witnesses
Jno. G. Hinkel
James Stevens

Inventor
J. H. O'Donnell
by *Foster Freeman*
Attorneys

UNITED STATES PATENT OFFICE.

JOHN H. O'DONNELL, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE
WATERBURY MACHINE COMPANY, OF SAME PLACE.

WIRE-DRAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 560,278, dated May 19, 1896.

Application filed March 22, 1895. Serial No. 542,764. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. O'DONNELL, of Waterbury, in the county of New Haven, State of Connecticut, have invented certain
5 new and useful Improvements in Wire-Drawing Machines, of which the following is a specification.

My invention relates to that class of wire-drawing machines in which wire is reduced
10 in diameter by drawing the same through a series of dies at one continuous operation, a drawing device being interposed between two consecutive dies to draw the wire through an adjacent die, and from which drawing device
15 the wire is delivered to the next die.

I will describe a wire-drawing machine embodying my improvement, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is
20 a side view of a wire-drawing machine embodying my improvement, looking in a direction at right angles to a driving-shaft embodied in the machine. Fig. 2 is an end view of the same, looking in a direction at right
25 angles to that which results in the view shown in Fig. 1. Fig. 3 is a view on the plane of the line 3 3, Fig. 1, looking in the direction of the arrow. Fig. 4 is a plan view of the machine. Fig. 5 is a sectional elevation on the line 4 4
30 of Fig. 4. Fig. 6 is a detail sectional view of the die-supporting block.

Similar letters of reference designate corresponding parts in all figures.

For drawing the wire through the dies I employ a pair of horizontally-arranged stepped
35 cones A A', whose stepped surfaces are formed with grooves the better to receive and grip the wire. The several steps of the cones will increase in diameter as the wire delivered to
40 them decreases in diameter, and the smaller ends of the cones will be arranged adjacent to the point of application of power to the machine, since it is at these ends that the wire is of the largest diameter and the work of re-
45 ducing it is greatest.

B is the support for the various operative parts of the machine. It may be elevated from the floor on legs. (Not shown.) It is shown to be rectangular and box-like in form, and
50 comprises a tank B', which contains a suitable lubricating agent for the wire undergoing the

drawing process, and an outer supporting-plate B².

C C' are the supporting-shafts of the drawing-cones A A', respectively. These shafts
55 are horizontal and are journaled in suitable boxes carried on the side wall of the tank B' and on the supporting-plate B².

In the present instance the shaft C constitutes the driving-shaft and is provided with
60 a fast and loose pulley C² C³ for receiving a driving-belt.

D is a spur-wheel secured to the shaft C, and from which the shaft C' is driven through a spur-wheel D', affixed to the latter shaft and
65 an intermediate spur-wheel D².

A suitable belt-shifting device E may be supplied and lead to any convenient part of the machine.

F is the die-supporting block, which is lo-
70 cated between the drawing-cones A A', and carries the several dies f, through which the wire is threaded as it passes back and forth from cone to cone. For each stretch of wire I have shown three dies f, separated by lon-
75 gitudinal chambers f' in the die-block, the chambers providing passages for the circulation of the lubricant. The die-supporting block is arranged at an incline to correspond to the upper faces of the drawing-cones and
80 the series of dies f are arranged to bring them in the same horizontal plane as the steps of the drawing-cones, whereby the wire passing through said dies from one cone to the other is caused to travel in a substantially straight
85 line.

The die-supporting block F is provided with an internal longitudinal passage-way f², extending from end to end of the same. Said passage is preferably formed in the floor of the
90 die-supporting block and communicates at its lower end with the discharge of a circulating-pump, while at its upper end it opens out into the chambers f'. The pump G, which may be of any suitable construction, is driven
95 from the shaft C' and its supply of lubricant is derived from the tank B'. It will thus be seen that whenever the pump is in motion a stream of liquid is constantly being forced to the upper end of the die-supporting block
100 and emptied into the chambers f', through which it flows by gravity. In its descent the

liquid successively lubricates all of the wires passing through the die-supporting block, and finally it overflows into the tank B' by reason of its coming in contact with the end wall f^4 of the die-supporting block.

H is the taking-up reel or drawing-block having a vertical shaft h , supported in journal-blocks h' . The journal-blocks h' are adjustable along and may be clamped in guide-ways $h^2 h^2$, provided at the side of the machine. The wire from the finishing-die passes to and is wound upon the block H. This lateral adjustment of the drawing-block is especially advantageous, since it is oftentimes desirable for various reasons to wind the finished wire as it issues from the machine after having undergone the drawing process into coils of different diameters. This necessitates a drawing-block of a diameter corresponding to that of the coil to be wound. As the wire delivered from the last die or from the corresponding groove of the cone must always lead in the same direction—that is, approximately in line with the last die or the corresponding groove of the cone—the receiving-point on the periphery of the drawing-block must always occupy the same position in space. Therefore, in order that blocks of different diameters may be employed, it is necessary to move the axis h one way or the other, so that the receiving-point on the periphery will occupy this same position. It will thus be seen that the adjustability of the drawing-block offers especial advantages as regards the facility with which coils of different diameters may be formed.

I is a vertical shaft journaled in a bracket i , secured to the machine and carrying at its upper extremity a bevel-wheel i' , which engages with a bevel-wheel i^2 , carried by the driving-shaft C, the latter thus actuating the shaft I.

The shaft h of the drawing-block H is driven from the shaft I through a suitable belt-and-pulley connection. Either a crossed or straight belt may be utilized for driving the shaft, which will permit, therefore, the drawing-block H to be driven in either direction.

Of course instead of attaching the driving-pulley directly to the driving-shaft C it may be secured to a separate shaft and the latter connected to the driving-shaft by gearing.

As before stated, the cones with their smaller ends adjacent to the ends of the shafts are arranged horizontally. This arrangement is of importance inasmuch as it permits the wire

to be laid successively into the grooves of the cones, beginning at the smaller ends and gradually laying the wire as it is passed through the dies toward the outer ends, so that there is no interference by the laying of one coil of wire with that which succeeds it, as is the case where the cones have their smaller ends outward and their larger ends connected with the shafts. Further, as the cones are horizontal the wire tends to remain in the grooves without any tendency to uncoil and fall down upon the coils below, as would be the case if the cones were arranged in a vertical direction, and, further, the dies may be properly oiled and maintained in a better lubricated condition than is possible when the dies are arranged on a vertical or nearly vertical line, and the splashing of the oil over the machine and upon the floor which results in the latter case is also avoided.

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

1. In a wire-drawing machine, the combination of the parallel horizontally-arranged supporting-shafts, means for positively driving the same in unison, the horizontally-arranged stepped drawing-cones upon said shafts having their smaller ends arranged nearest the driving mechanism, a die-supporting block intermediate the cones provided with a longitudinal chamber, and a passage communicating with the upper end of said chamber, drawing-dies supported in the die-supporting block, and a pump having its discharge-opening communicating with one end of the passage in the drawing-block, substantially as described.

2. In a wire-drawing machine, the combination of the stepped drawing-cones, a die-supporting block intermediate the cones provided with a longitudinal chamber, and a passage communicating with the upper end of said chamber, drawing-dies supported in the die-supporting block, and a pump having its discharge-opening communicating with one end of the passage in the drawing-block, substantially as described.

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

JOHN H. O'DONNELL.

Witnesses:

ROGER S. WATKYNs,
GEORGE R. LAMB.