(No Model.) 4 Sheets—Sheet 1.

J. H. COON.

WIRE BARBING MACHINE.

No. 285,016. Patented Sept. 18, 1883.

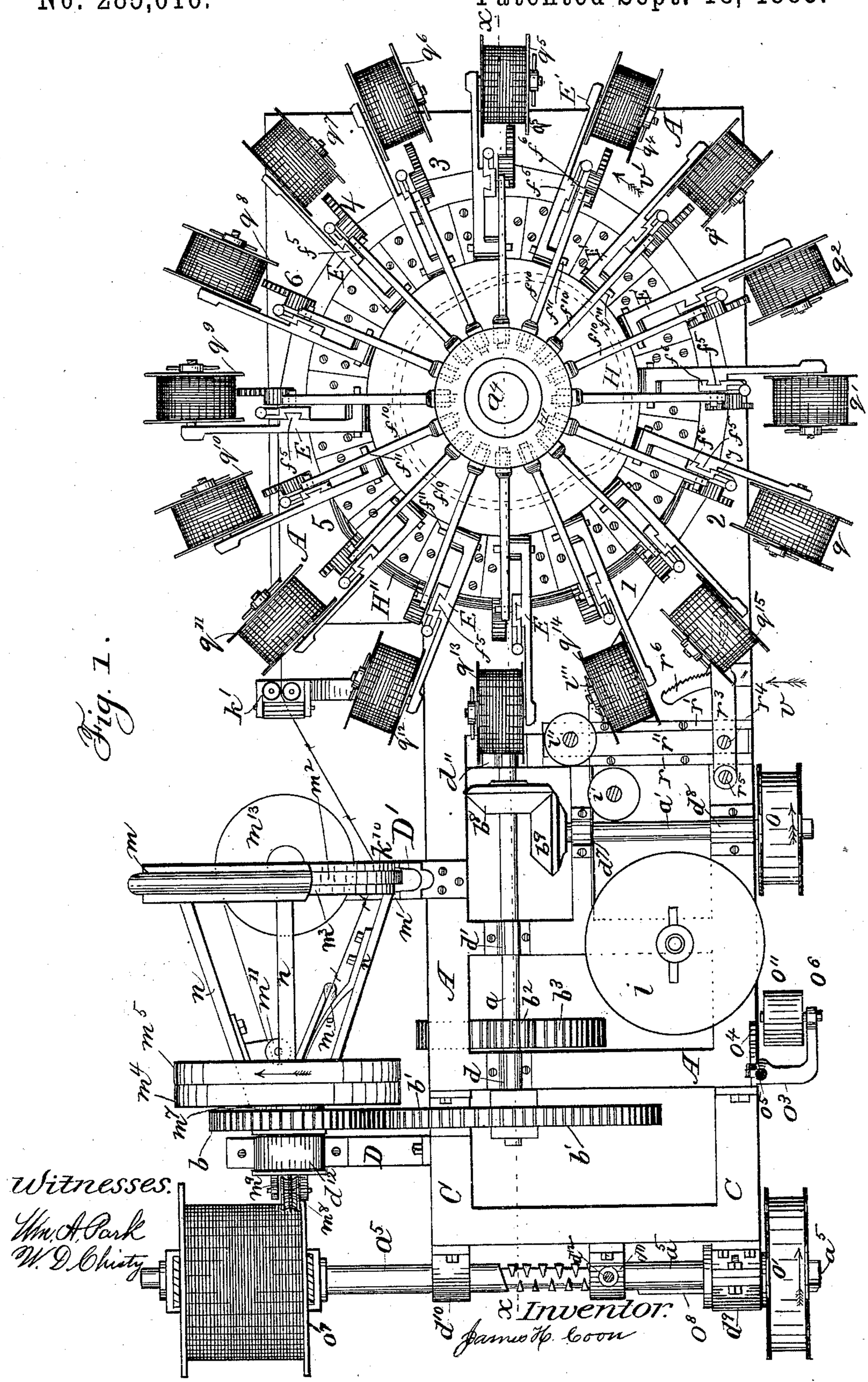


Fig. 1.

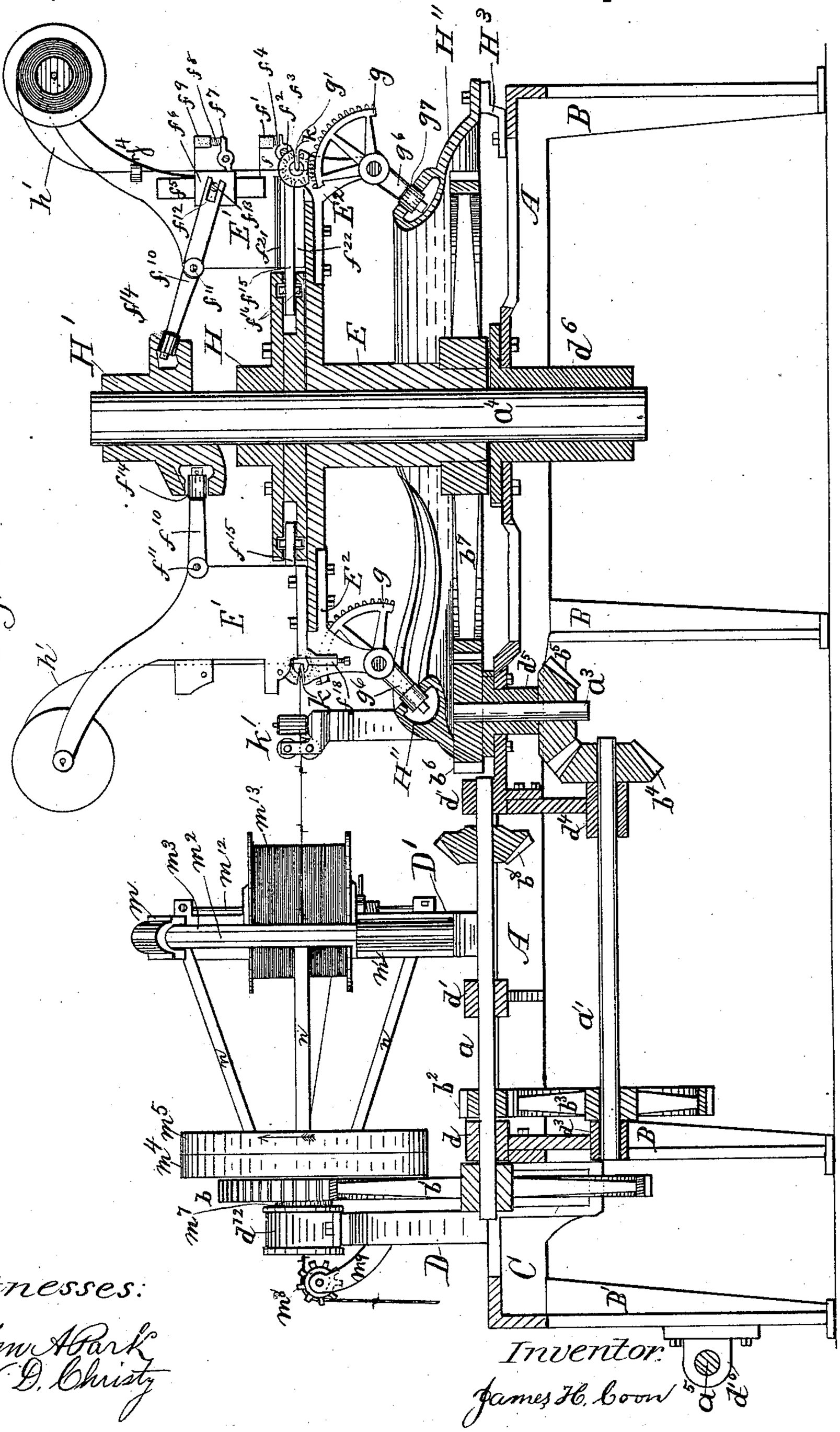
(No Model.) 4 Sheets—Sheet 2.

J. H. COON.

WIRE BARBING MACHINE.

No. 285,016. Patented Sept. 18, 1883.

Fig. 2.



Witnesses:

Wm. A. Park
W. D. Christy

Inventor:

James H. Coon

(No Model.)

4 Sheets—Sheet 3.

J. H. COON.

WIRE BARBING MACHINE.

No. 285,016. Patented Sept. 18, 1883.

Fig. 3.

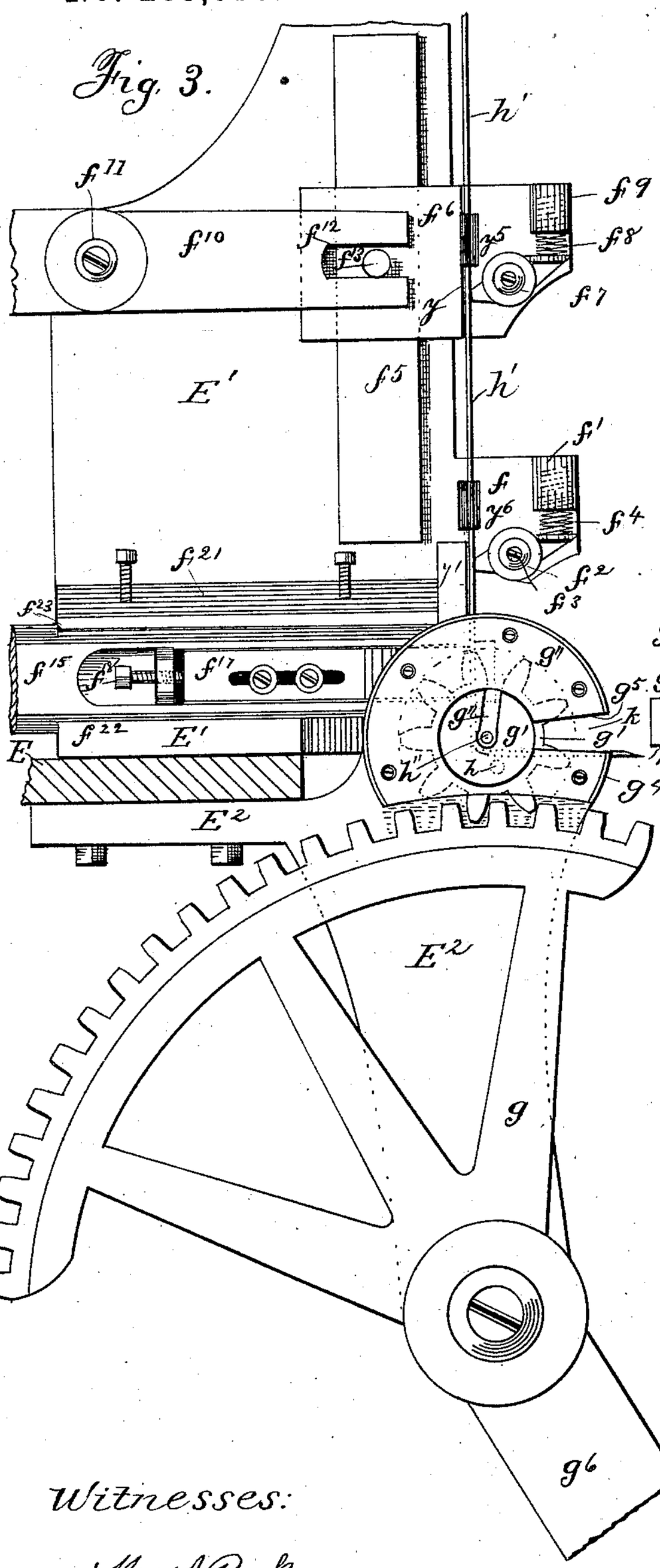
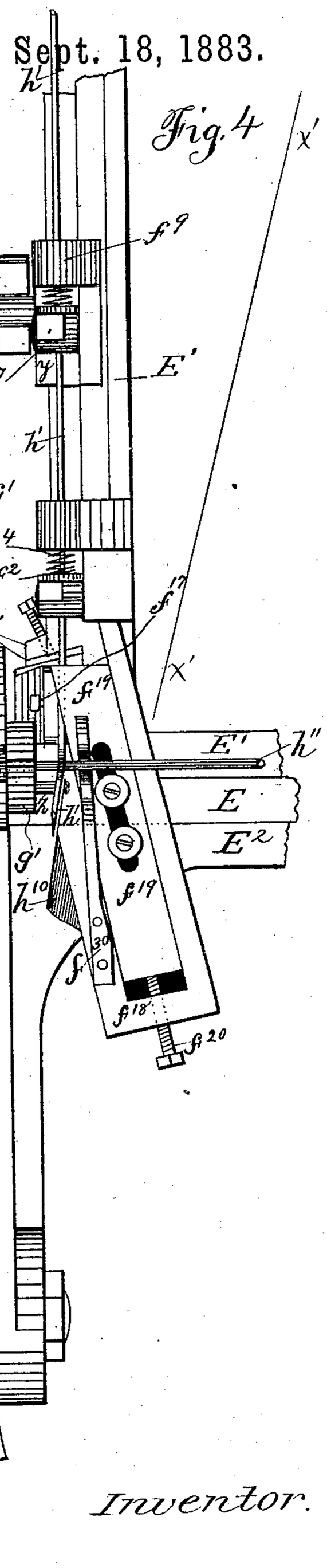


Fig. 4.



Witnesses:

Wm. A. Park
W. D. Christy

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(No Model.) 4 Sheets—Sheet 4.

J. H. COON.

WIRE BARBING MACHINE.

No. 285,016. Patented Sept. 18, 1883.

Fig. 5.

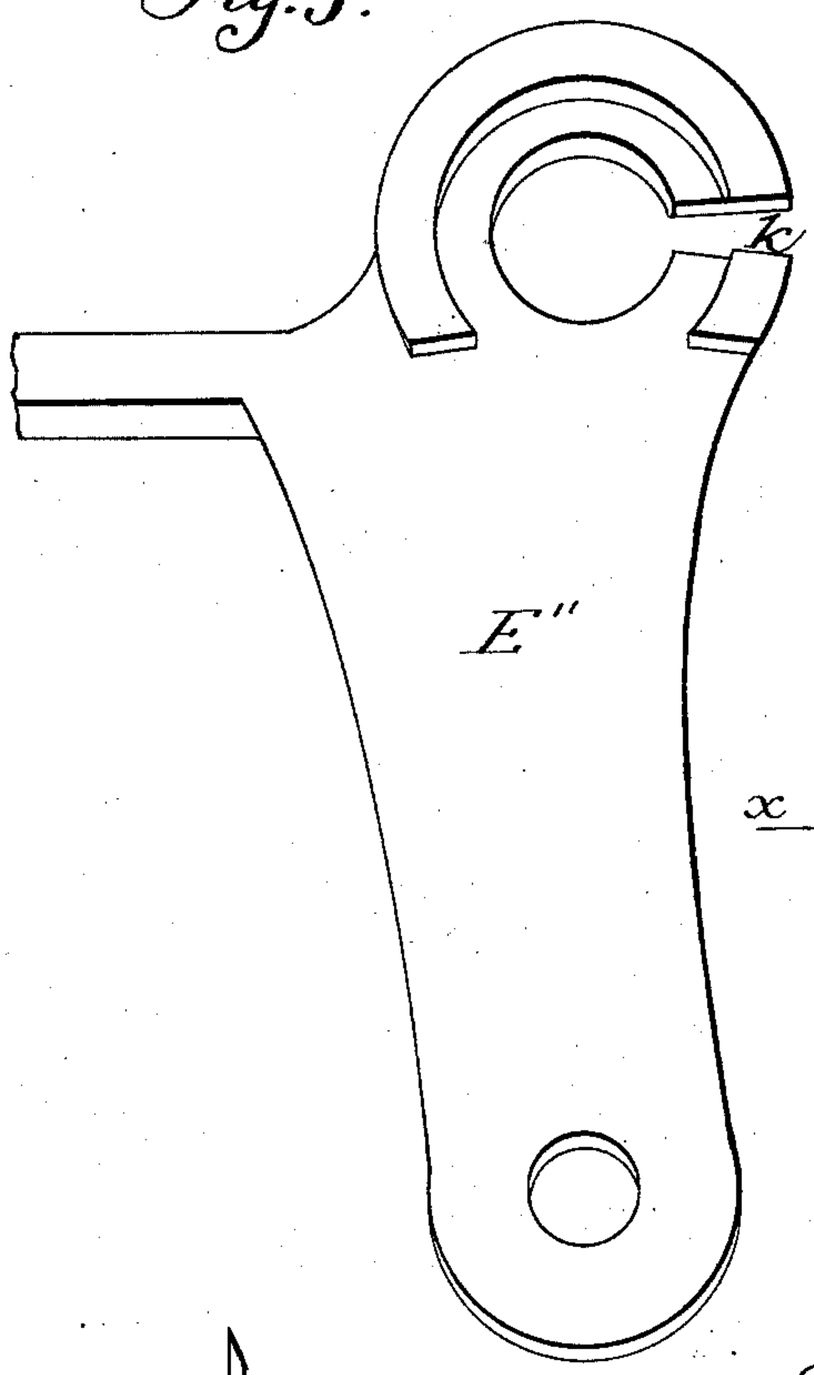


Fig. 6.

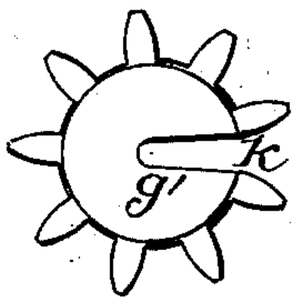


Fig. 7.

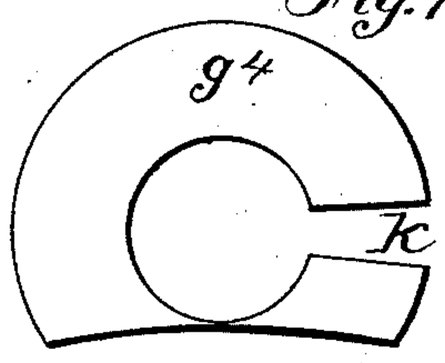


Fig. 10.

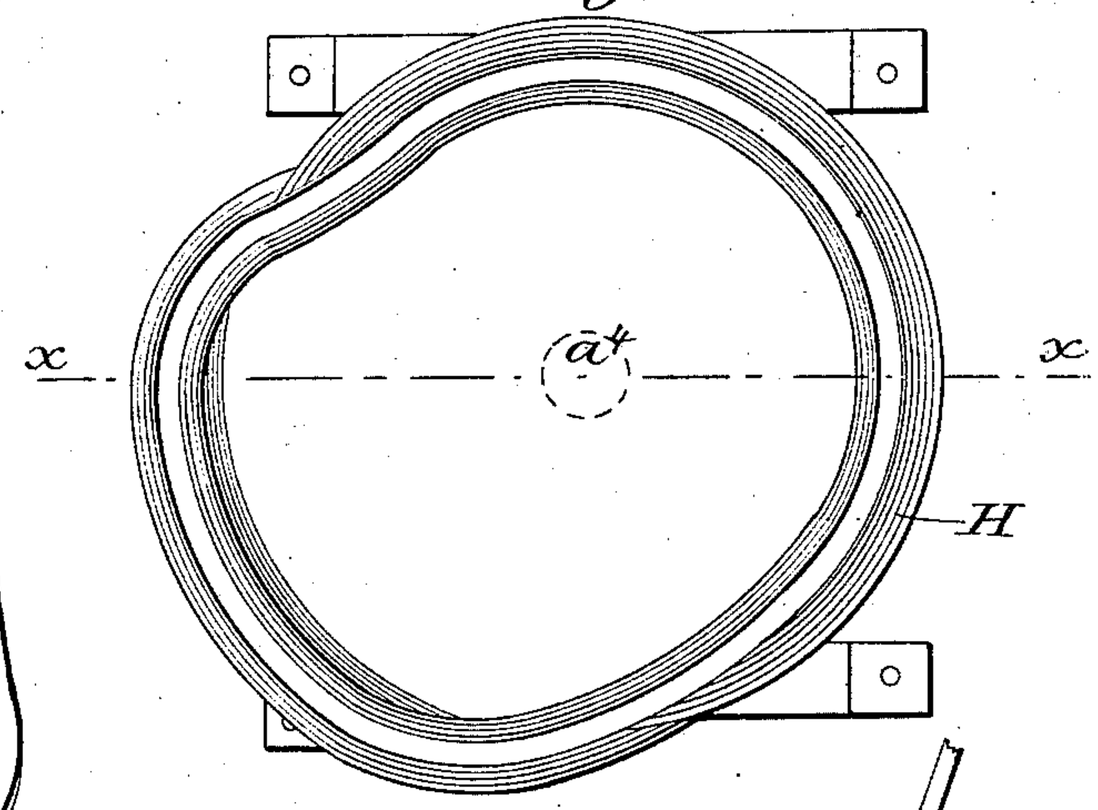


Fig 8.

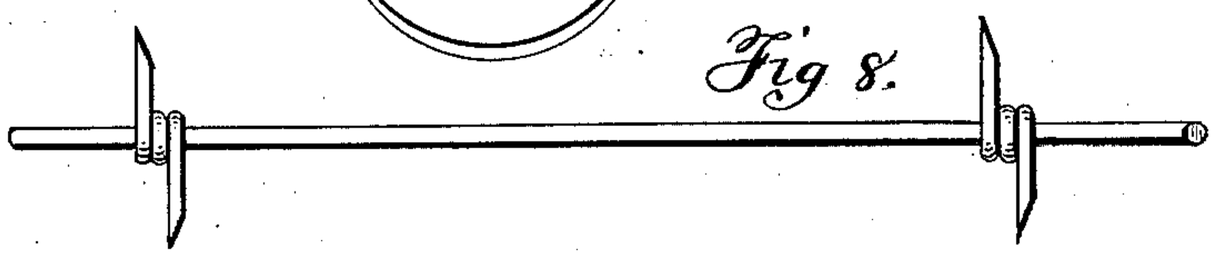
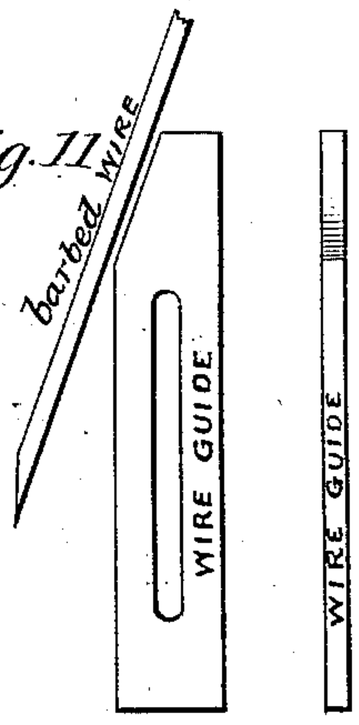


Fig. 9

Fig. 11



Witnesses

Wm. A. Park
W. D. Christy

Inventor.

James H. Coon

UNITED STATES PATENT OFFICE.

JAMES H. COON, OF DES MOINES, IOWA.

WIRE-BARBING MACHINE.

SPECIFICATION forming part of Letters Patent No. 285,016, dated September 18, 1883.

Application filed June 18, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. COON, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a new and useful Improvement in Wire-Barbing Machines, of which the following is a specification.

My invention relates to improvements in wire-barbing machines; and the object of my improvement is, first, to combine the barb-applying mechanism with a rotating wheel; second, to apply barbs to a fence-wire by operating upon a series of barbs simultaneously and continuously; third, to mount the barb material upon said rotating wheel and to feed forward the barb-wires across the path of the main fence-wire at regular intervals of time and successively and continuously; fourth, to operate the barb-feeding, the barb-cutting, and the barb-coiling mechanism so mounted upon a rotating wheel by stationary cams; fifth, to apply barbs to a fence-wire at a greater speed than has heretofore been accomplished. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of my wire-barbing machine. Fig. 2 is a vertical longitudinal section taken on the dotted line *x x*, Fig. 1, looking in the direction indicated by the arrow *v*. Fig. 3 is an enlarged view of the barb-feeding, barb-coiling, and barb-cutting devices, as shown at the right in Fig. 2. Fig. 4 is an elevation of the devices shown in Fig. 3, looking from the right of said figure. Figs. 5, 6, and 7 are enlarged views of detail parts, which will be fully described in connection with the barb-coiling mechanism. Fig. 8 shows the style of barbed fence-wire formed on this particular construction of my invention before said wire has entered the cable-forming device. Fig. 9 shows the same after it has passed through the cabling device and has been combined by twisting with a plain wire.

A is a bed-plate, supported upon suitable legs, B, upon which the barb-applying mechanism is mounted.

C is an auxiliary frame, provided with legs B′, and is attached to the forward end of the main frame.

D′ and D are brackets attached to the main frame, and furnish bearings for the twister or cabling device. These brackets may also be provided with legs to support their outer ends.

a is a shaft mounted in bearings *d d′ d″*, provided on the main frame or bed-plate.

a″ is a shaft mounted in bearings d^3 d^4, attached to the under side of the bed-plate. This shaft lies directly beneath the shaft *a*, and parallel thereto.

a^3 is a vertical shaft at right angles to *a″*, and in line therewith, and is mounted in a bearing, d^5, resting upon and extending through the bed-plate, to which it is rigidly attached.

a^4 is a vertical shaft parallel with a^3, and rigidly secured in the bearing d^6, the flange of which rests upon and is rigidly attached to the bed-plate, and the boss is projected through the bed-plate and extended some distance below the same, for the purpose of maintaining the shaft a^4 firmly in position.

E is a wheel provided with a long sleeve, made integral therewith, and is mounted upon shaft a^4, around which it rotates.

E′ E′ are a series of irregular standards mounted upon the wheel E at equal distances from each other, and near to and extending over beyond the circumference of said wheel, and are employed to support the barb-wire, the barb-feeding devices, and the barb-cutting tools, as hereinafter more fully described.

E^2 E^2 are a series of pendent brackets attached to the under side of the rotating wheel, equidistant from each other and near to and extending over and beyond the circumference of said wheel, and are employed to support the barb-coiling devices, as hereinafter described.

H (see Fig. 10) is a cam consisting of two parts, having grooves extending entirely around them near their outer circumference. These grooves coincide with each other throughout their whole extent, and the two parts of the cam, when adjusted for operation, are securely attached to each other and to shaft a^4. At one point these grooves approach nearer the circumference, to provide a throw of about one-half of one inch, as required to operate the movable barb-cutting tools.

H′ is a cam-wheel having an annular groove adapted to raise and lower the ends of the barb-feeding levers, as required to feed the barb-wire. H′ is also rigidly attached to the shaft a^4.

H″ is a cam extending entirely around shaft a^4, and provided with a continuous groove adapted to operate the pendent arms g^6 of the segmental gears g, which are employed to operate the barb-coiling pinions g'. Motion is communicated to the several parts from a driving-pulley, m^4, attached to the twister, as follows: by spur-gear b, attached to the twister, and its mating gear b', attached to shaft a; thence through spur-pinion b^2 on shaft a to its mating gear b^3 on shaft a''; thence through bevel-pinion b^4 on shaft a'' to its mating bevel-pinion b^5, attached to shaft a^3; thence through b^6 to its mating gear b^7, attached to sleeve of wheel E. Shaft a' is driven by bevel-pinion b^8 on shaft a through bevel-pinion b^9, and the right-and-left-hand screw-shaft a^5 is driven by a belt from flanged pulley o on shaft a' to flanged pulley o' on shaft a^5, which is journaled in a box, d^9, attached to the auxiliary frame C, as hereinafter described. When power is applied to the driving-pulley m^4 in the direction indicated by the arrow in Fig. 1, wheel E will be rotated in the direction of the arrow v' in said figure. The main fence-wire to be barbed is mounted on any suitable spool, as shown in Fig. 1 at i, and is then passed between the grooved tension and guide rollers $l'\,l''\,l'''$, and thence around the rotating wheel in a series of openings, k, provided for its reception preparatory to being barbed, then passed through between the skeleton guide-wheels k', and thence through the twister, as hereinafter described, and attached to the receiving-reel; or, in the absence of a twister, the wire passes directly from the wheels k' to the receiving-spool. And when a twister is not used in connection with the barbing mechanism, power may be applied by a pulley located on shaft a, prolonged to the rear, or upon shaft a', prolonged at the side, of the machine, as preferred.

The barb-feeding mechanism is constructed and operated as follows: The standards E′ are provided with dovetailed projections. (Shown in Fig. 1 at f^5, and in Figs. 2 and 3.) f^6 are carriages or sliding tables fitted to and adapted for sliding up and down on said projections f^5. These tables are operated up and down by means of the studs f^{13}, lever f^{10}, provided with a slot to engage said stud, and pivoted at f^{11}, and receiving motion from cam H′. f^{14} is a friction-roller surrounding the end of lever f^{10}, and working in the groove of cam H′. The carriages f^6 are provided with projecting flanges, to which are pivoted dogs f^7, held to their work by springs f^8, secured in sockets f^9. These dogs are adapted to grasp the barb-wire h' in their downward movement, and hold said wire firmly between the points of the dogs and shoulders y on said carriages, and thus carry the barb-wires down at each downward movement of the carriages a distance required to form the barbs. When, however, the carriages are raised, the dogs glide easily over the surface of the barb-wires; but to prevent the barb-wire from being raised upward from any cause, another dog is provided on each standard E′ at f^3, and provided with a spring, f^4, in a socket, f', and grasps the barb-wire between the point of the dog and the shoulder y'. Thus the barb-wire is allowed to pass down easily, but cannot be withdrawn. The barb-wire is first placed upon suitable spools, and these spools are mounted on suitable bearings projecting from the upper ends of standards E′, and this end should extend outward, so as to afford ample room for the entire series of spools required. The end of the barb-wire is then passed through a guide constructed at y^4, and thence through a loop on the carriage at y^5, between the end of the dog f^7 and shoulder y, then through a loop, y^6, and between the end of dog f^2 and shoulder y', thence down past the line of passage of the main fence-wire and in front of the coiling-lug h. Here it will impinge against a wire-guide, h^{10}, and will be deflected to the left toward the barb-coiling pinion, as shown in Fig. 4, and will lie across the line of passage of the main fence-wire at an oblique angle to said main wire. The arrangement of the cam H′ should be such as to feed the barb-wire just the length required to make a complete barb, and the adjustment of said cam should be such as to commence the downward feed of the carriage f^6 at or near the point indicated in Fig. 1 by 5, and to complete the feed at or near the point marked 1 in said figure. It will thus be seen that several barbs will be in process of being fed down simultaneously. The carriage may return upward and take a new hold on the barb-wire at any part of the revolution from 1 to 5 that may be desirable.

The construction and operation of the barb-coiling mechanism are as follows: A pinion, g', (shown in Figs. 3, 4, and 6,) is provided with a radial slot, extending a little past its longitudinal axis, and is sufficiently large to allow the free ingress and egress of the main wire, and said pinion is provided at one end with a barb-coiling lug or pin, h. (Shown in Fig. 4.) This pinion is mounted in a case arranged on the top or upper end of bracket E″, and the pinion is held in position by a cap, g^4, attached to said case by suitable cap-screws. This pinion is constructed with journals, which extend through the case and cap, respectively, as shown in Fig. 4. The case and cap are each provided with a slot, k, to admit the free ingress and egress of the main fence-wire, and are also cut away on the under side of the pinion, so as to leave the teeth of the pinion project therefrom. The segmental gear g is pivoted to the lower end of bracket E″ in such a manner as to engage the pinion g', and by moving the lower arm, g^6, of this segmental gear in and out the pinion is rotated first in one direction and then in the opposite direction. The arrangement of cam H″ is such that at the point marked 1 in Fig. 1 the slot in the pinion g' will coincide with the slot in the case

and cap, and the main wire, guided by the tension and guide rollers l' l'' l''', will pass directly into this slot as this particular device reaches in its rotation around a^4 the tangent line occupied by the main fence-wire, and said wire will rest in the axis of revolution of pinion g'. To hold the main wire in place while the barb is being coiled around and upon the same, there is provided a series of wire-holders, f^{30}. These holders are attached to the brackets E′, and rest upon the fixed cutting-tool, and are slotted to receive the main wire, and this slot is arranged in front of the coiling-pinion, and the bottom of the slot is arranged at such a distance from the axis of revolution of wheel E that the main wire will extend from one of these holders directly to the next adjacent holders, and in so doing will pass through the axis of revolution of the coiling-pinions g'. When the mechanism is in operation, and the lower end of arm g^6 reaches that point in its revolution around a^4 indicated by 2 in Fig. 1, cam H″ commences to swing the arm g^6 inward toward shaft a^4, and pinion g' is rotated, carrying the point of the barb-wire out, up, over, and around the main wire, and as the rotation of wheel E is continued the barb is coiled around the main wire, and said coiling operation is completed at or near the point indicated by 3 in Fig. 1. In completing the coiling of the barb, so as to leave the ends projecting from the main fence-wire in opposite directions, a little more than two full revolutions of the coiling-pinion are required. Therefore, in going from the point 3 to the point 4, Fig. 1, this pinion is slightly rotated backward to make the slot in the pinion coincide with the slots in the case and cap, to permit the free egress of the barbed wire from said slots the same as it entered them. After leaving 5, cam H″ carries the arm g^6 rapidly outward, so as to bring the pinion g' in position to receive another barb in front of the coiling-lug, when the same is fed down, and so as to make the slot in said pinion again coincide with the slot in the case, ready to again admit the main fence-wire.

The barb-cutting mechanism is constructed and operates as follows: The standard E′ has provided on its outside a pendent projection, f^{18}, grooved to receive a fixed cutting-tool, f^{19}. This tool is constructed with a slot for adjustment, and is held in position by cap-screws and set-screw f^{20}, in the usual manner. The cutting-edge of this tool extends obliquely across the line of passage of the barb-wire. Immediately beneath this cutting-tool there is fitted a wire-guide, which extends upward and along the right-hand side of the barb-wire, (see Fig. 11,) and terminates at the end of the cutting-tool f^{19}. This guide is employed to hold the barb-wire in its proper position with reference to the cutting-edge of the fixed cutting-tool during the act of cutting off the barb. f^{21} f^{22} are guideways provided on the standard E′, and lie on a radial line of the revolving wheel E. f^{15} is a sliding head fitted to operate in said ways, and is held in adjustment by a gib, f^{23}, and set-screws in f^{21}. The inward end of f^{15} is flattened and provided with a stud, f^{16}, which extends above and below, and each projecting end is provided with a friction-roller adapted to operate in the grooves of cam H, and the flanges of cam H are so arranged as to admit of the free travel of the end of f^{15} between said flanges, and without undue friction or vibration or vertical play. f^{17} is a cutting-tool held in a groove constructed in f^{15}, and is provided with a slot and set-screw adjustment. The outward and cutting end of this tool is beveled off to leave room for the free passage of the point of the barb-wire as the same is being coiled around the main wire, and is fitted to coact with the fixed tool in cutting off the barb of suitable length and bevel. When the cutting-tools have reached a point in their rotation around a^4 indicated in Fig. 1 by 6, the cam-grooves in H slide the head f^{15} out, and the cutting-edges of f^{17} and f^{19} sever the barb from the barb-wire, leaving both the barb attached to the fence-wire and the free end of the barb-wire sharpened. It will be observed that as the cutting-tool f^{17} advances it pushes the end of the newly-cut barb forward in front of it, while at the same time the opposite projecting point of the barb is held from rotating around the fence-wire by the coiling-pin. This movement of the cutting-tool f^{17} therefore is, when properly regulated, adapted to cause the points of the barb-wire to project from the main fence-wire in opposite directions after the barb has been coiled just two full turns around the same by the coiling-pin. Cam H should be so constructed as to withdraw the cutting-tool f^{17} before it is time to feed down another barb. The operation of applying barbs is performed on all the barb-forming devices mounted on the rotating wheel E in the manner hereinbefore described, and all of these devices are constructed alike and are duplicates of each other. Any suitable number of these devices may be mounted on a rotating wheel and operated by cams H H′ H″. I prefer, for ordinary spaces of four and a half inches between the barbs, to employ sixteen, and arrange the relative speeds of the wheel E and twister so as to put two twists between each pair of barbs. When there are sixteen barb-forming devices mounted on rotating wheel E, there will be a series of nine barbs constantly and simultaneously forming, and the various functions of the barbing mechanism are performed continuously as the rotation of the wheel proceeds, and without jar, clatter, or undue strain upon any of the parts of the mechanism. When the barb-wire leaves the skeleton guide-wheels K′, it enters the cabling mechanism over a sprocket-wheel secured to the inner surface of the wheel m' at k^{10}, Fig. 1, thence passes through the funnel-shaped opening in guide m^{10}, and in pass-

ing through this guide the barbs are held in position, while the plain wire from spool m^{13} is combined with the barb-wire by twisting, and thence passes through the hollow journal m^7 of the rotating twister-frame, over the sprocket-wheel m^8, and on the reel O^7. The construction and operation of this twisting-machine are such as to combine a plain fence-wire with a barbed wire at some point after the barbed wire has left the barbing mechanism, and before reaching the receiving-spool, and without rotating the receiving-spool to form the twisted cable, and in this twister the mechanism and the wires are balanced in the axis of revolution of said twister, so that said twister can be run at a high speed without jar or tremble.

Inasmuch as I now have a separate application for a patent for said twister pending in the United States Patent Office, I do not consider any further description here necessary.

a^5 is a right-and-left-hand screw-shaft, supported in bearings d^{10} d^{11}, and in the hollow axis of flanged pulley O′. A spline, O^8, is secured in this shaft, and a corresponding groove constructed in the hollow journal of O′.

d^{12} is a forked dog pivoted in the cap of box d^{11}, and employed in connection with the double screw-threads and cams on shaft a^5, near the extreme ends of said threads, to communicate reciprocal longitudinal motion to said shaft, as required to distribute the wire on the receiving-reel, in the usual manner. Motion is communicated to this shaft from pulleys O and O′, as hereinbefore stated.

O^3 is a bell-crank pivoted to the main frame, and provided with suitable means for adjustment, and carries a loose pulley on the lower arm, employed as a tightener to secure proper tension on the belt extending from O to O′.

In Fig. 1, r and r' are guideways attached to the upper surface of the bed-plate, and r'' is a table fitted to slide back and forth in said ways, and is operated by a lever, r^3, pivoted to the bed-plate at one end at r^5, and having a slot which engages a stud in r'' at r^4, and is secured in adjustment by a segment, r^6, through a pawl, spring, and lever-handle, in the usual manner. From the inner end of this table there rises a standard, on which guide-roller l'' is mounted, and on which said roller rotates. By sliding the table out this roller impinges against the main fence-wire, and the said wire is held firmly in the grooves provided for its reception in guide-rollers l' l'' l''', and by moving the table still farther out the wire is more or less bent in its passage to the wheel E between said rollers, and any desirable tension may thus be secured on the main fence-wire in its passage from the delivery-reels to the barbing mechanism. Rollers l' l''' are mounted on standards rising from the bed-plate.

The operation of my machine will be readily understood from the description already given of the operation of the several parts thereof. During the process of applying barbs the main fence-wire will be carried forward around wheel E by the hold obtained upon it by the series of barbing devices which are constantly operating, and when the main wire leaves the barbing mechanism it must be carried forward through the skeleton guide-wheels K′ and twister by the receiving-reel. The standards E′, as shown in the drawings, stand at right angles to the face of wheel E, and the barb-wire is fed in a line at right angles to the main wire. These standards may, however, incline, as shown by plain line x' x' in Fig. 4, and the barb-wire fed at an oblique angle to the main fence-wire.

I have now described one successful way of applying my invention; but I do not intend to limit myself to the specific details of construction herein shown, as these details may be varied largely to suit the taste of the builder without departing from the characteristic features of my invention.

What I claim as my invention is—

1. The combination of means for supporting the barb-wire and mechanism for feeding the barb-wire, both mounted on a wheel, means for rotating the wheel in the direction of the movement of the main fence-wire, and a stationary cam for actuating the barb feeding mechanism, substantially as and for the purpose set forth.

2. The combination of means for supporting the barb-wire and mechanisms for feeding the barb-wire and for coiling it upon the main wire, all mounted on a wheel, means for revolving the wheel in the direction of the movement of the main wire, and stationary cams for actuating the barb feeding and coiling mechanisms, substantially as and for the purpose set forth.

3. The combination of means for supporting the barb-wire and for holding the main wire and mechanisms for feeding the barb-wire, for coiling the barb upon the main wire, and for cutting off the barb, all mounted on a wheel, means for rotating said wheel in the direction of the movement of the main wire, and stationary cams for actuating the feeding, coiling, and cutting mechanisms, substantially as and for the purpose set forth.

4. The combination of means for supporting the barb-wire, mechanisms for feeding the barb-wire, for coiling the barb-wire around the main wire, and for cutting off the barb-wire, all mounted on a wheel, means for rotating said wheel continuously in the direction of the movement of the main wire, and stationary cams for actuating the feeding, coiling, and cutting mechanisms, substantially as and for the purpose set forth.

5. The combination of means for supporting the barb-wire and mechanisms for feeding the barb-wire, for coiling the barb-wire around the main wire, and for cutting off the barb-wire, all mounted on a wheel, means for revolving said wheel continuously in the direc-

tion of the movement of the main fence-wire, and at the same speed therewith, and stationary cams for actuating the feeding, coiling, and cutting mechanisms, substantially as and for the purpose set forth.

6. The combination of two or more sets of devices for feeding, coiling, and cutting a barb-wire, all the sets being mounted on a wheel, means for revolving the wheel in the direction of the movement of the main wire, and means for operating the several devices of each set, whereby the barbs may be successively applied to the main wire, substantially as and for the purpose set forth.

7. The combination of means for supporting three or more barb-wires and three or more sets of devices for feeding, coiling, and cutting the barbs, all mounted on a wheel rotating in the direction of the movement of the main wire, and means for rotating the wheel and for operating said sets of devices simultaneously at different points on the circumference of said wheel, substantially as and for the purpose set forth.

8. The combination of means for supporting the barb-wire, the several devices for feeding, coiling, and cutting the barb, all mounted on a wheel, with the stationary cams for operating said devices and means for rotating the wheel in the direction of the movement of the main wire, whereby said devices are actuated successively at different points on said wheel and the main wire is carried forward continuously, substantially as described.

9. The combination of means for supporting the barb-wire, the several devices for feeding, coiling, and cutting the barb-wire, all mounted on a wheel, means for rotating the wheel in the direction of the movement of the main fence-wire, stationary cams whereby the said devices are actuated, and mechanism for delivering the main fence-wire to the rotating devices, substantially as described.

10. The combination of means for supporting the barb-wire, the several devices for feeding, coiling, and cutting the barb-wire, all mounted on a wheel rotating in the direction of the movement of the main wire, means for rotating the wheel, stationary cams, whereby the said several devices are actuated, and mechanism for delivering the main wire to the rotating devices, and mechanism for automatically winding and distributing the barbed wire upon a receiving-reel, substantially as described.

11. The combination of means to support the barb-wire, the several devices for feeding, coiling, and cutting the barb-wire, all mounted on a wheel, means for rotating said wheel in the direction of the movement of the main wire, stationary cams whereby said devices are actuated, and mechanism for delivering the main fence-wire continuously to said rotating mechanism, and mechanism for receiving the barbed wire as it passes from the barbing devices, and for combining therewith a plain fence-wire to form a cable fence-wire, substantially as and for the purpose set forth.

12. In a wire-barbing machine, a barb-coiling pinion provided with a coiling-lug, said pinion being slotted to receive the main wire in its longitudinal axis, and inclosed in a case or bearing, also slotted, and attached to a wheel which rotates in the direction of the passage of the main fence-wire, in combination with a segmental gear actuated by a stationary cam, substantially as described.

13. In a wire-barbing machine, a reciprocating carriage provided with mechanism for grasping the barb-wire, and mounted on a standard attached to a wheel which rotates in the direction of the passage of the main fence-wire, in combination with an oscillating lever actuated by a stationary cam, for the purpose of feeding the barb-wire across the line of passage of the main fence-wire, substantially as described.

14. In a wire-barbing machine, a fixed cutting-tool secured to a standard attached to a wheel which rotates in the direction of the passage of the main fence-wire, in combination with a reciprocating cutting-tool, mounted in radial ways or guides provided on said standard or rotating wheel, and actuated by a stationary cam, substantially as described, and for the purpose set forth.

15. In a wire-barbing machine, a series of equidistant wire-holders attached to a rotating wheel or auxiliary part thereof, in combination with a series of barb-coiling devices actuated by a stationary cam, substantially as described.

16. In a wire-barbing machine, the combination of a series of barb-feeding devices, a series of barb-coiling devices, and a series of barb-cutting devices, all arranged to operate on one and the same wire, and means for operating the several devices of each series in succession, substantially as and for the purpose set forth.

JAMES H. COON.

Witnesses:
WM. A. PARK,
W. D. CHRISTY.

Correction in Letters Patent No. 285,016.

It is hereby certified that in Letters Patent No. 285,016, granted September 18, 1883, upon the application of James H. Coon, of Des Moines, Iowa, for an improvement in "Wire-Barbing Machines," errors appear requiring correction, as follows:

On page 1, line 87 of the specification, the words "see Fig. 10" should read "*see Fig. 2.*"

In Figure 1 of the drawing, the dotted lines showing the groove in cam H should have been placed so that the part of the groove farthest from shaft a^4 would be opposite the space between points *6* and *5*.

In Figure 10 of the drawing the reference letter "H" should read *H''*.

In Figure 11 of the drawing the words "barbed wire" should read *barb wire.*

And that the specification and drawing forming part of said Letters Patent should be read with these corrections therein to make the patent conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 20th day of November, A. D. 1883.

[SEAL.]

M. L. JOSLYN,
Acting Secretary of the Interior.

Countersigned:

BENJ. BUTTERWORTH,
Commissioner of Patents.