H. GANSSLEN.

MACHINE FOR MAKING WIRED EDGES.

APPLICATION FILED JUNE 29, 1909.

976,353. Patented Nov. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

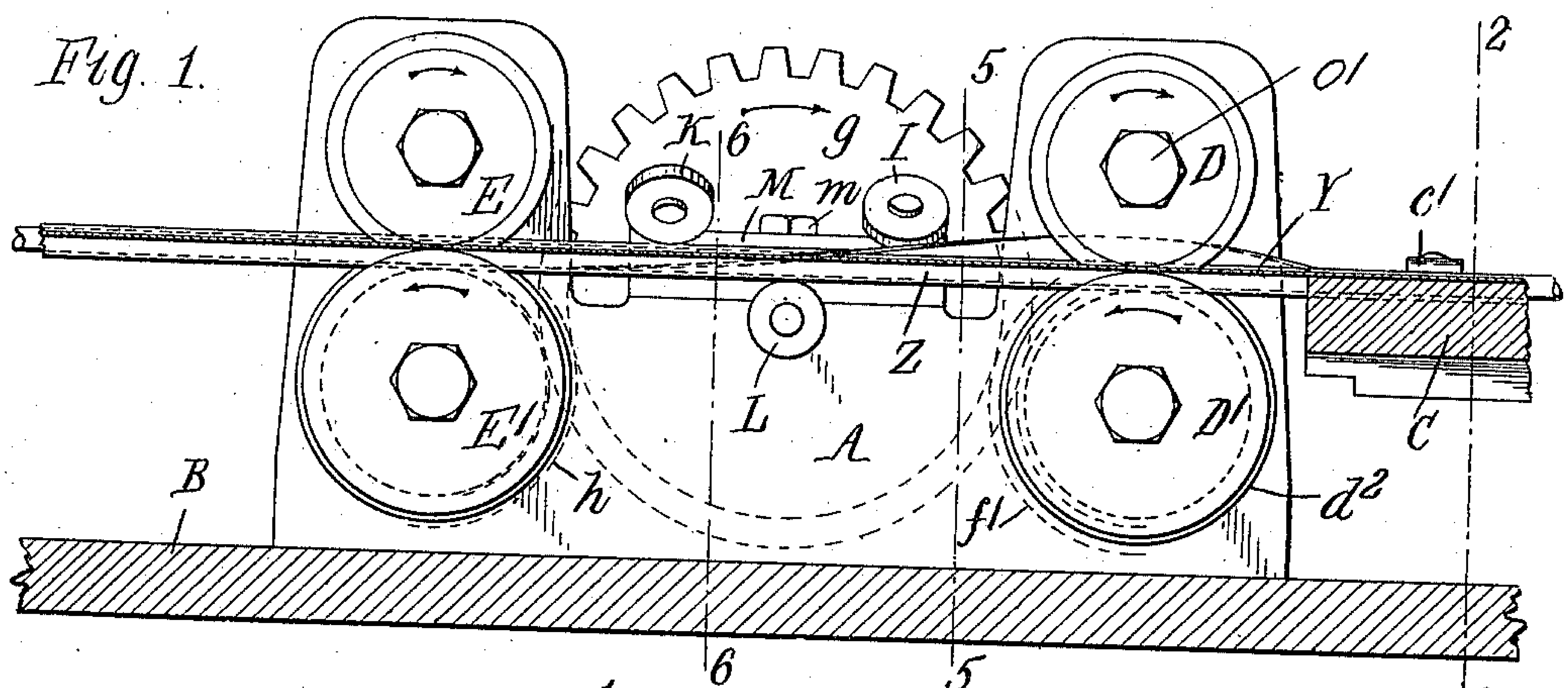


Fig. 2.

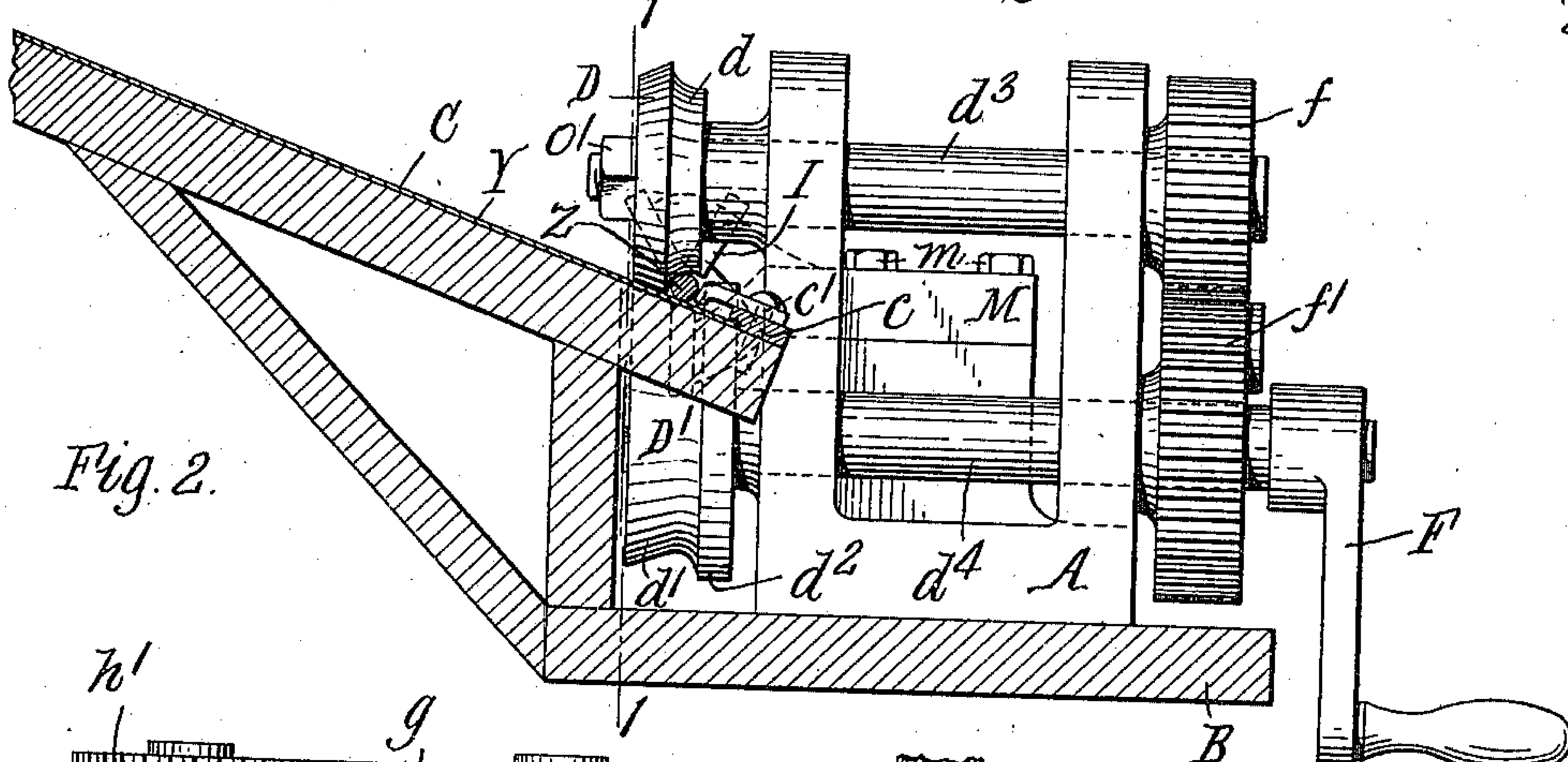
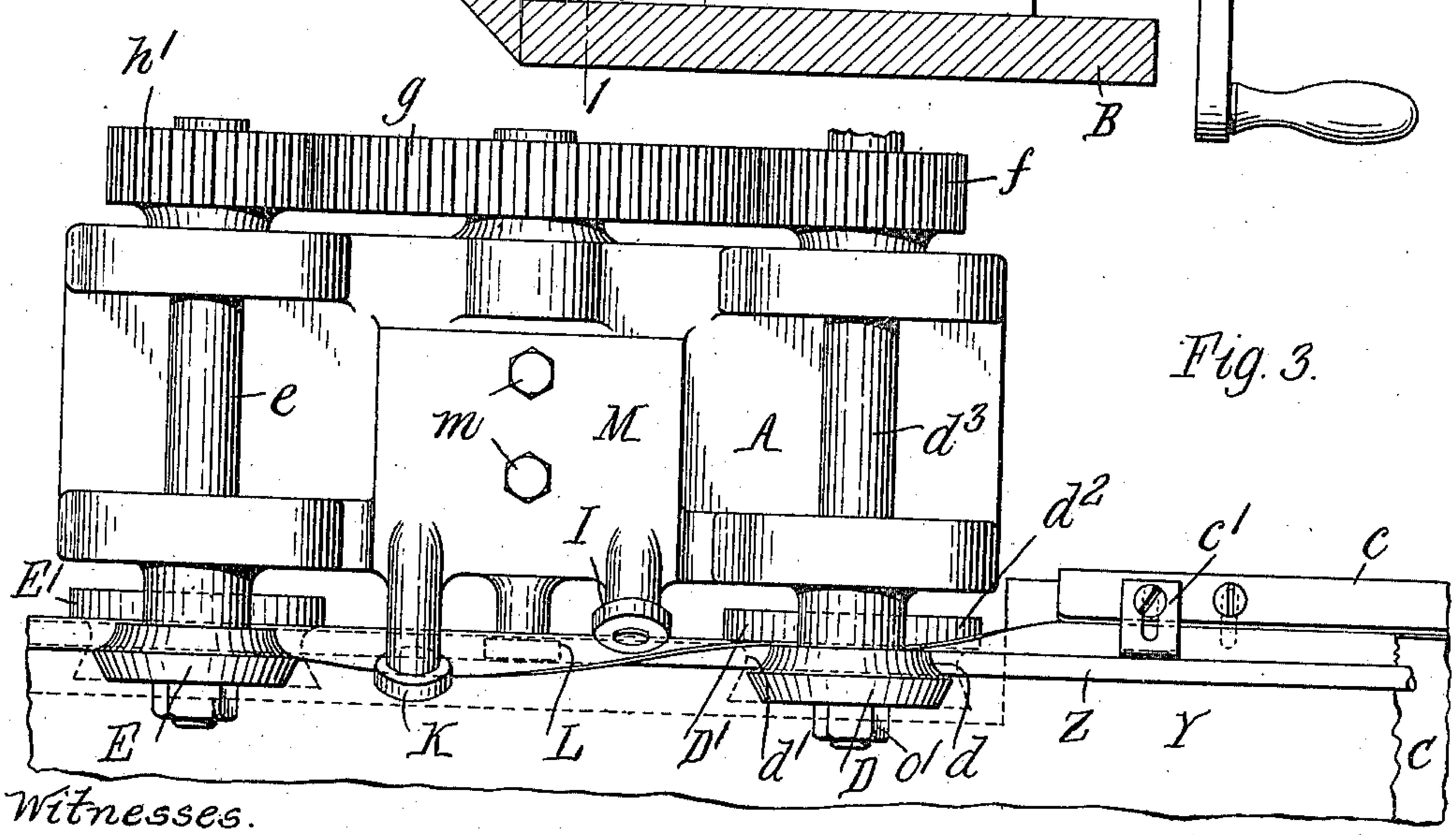


Fig. 3.



Witnesses.

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2 SHEETS—SHEET 2.

Fig. 4.

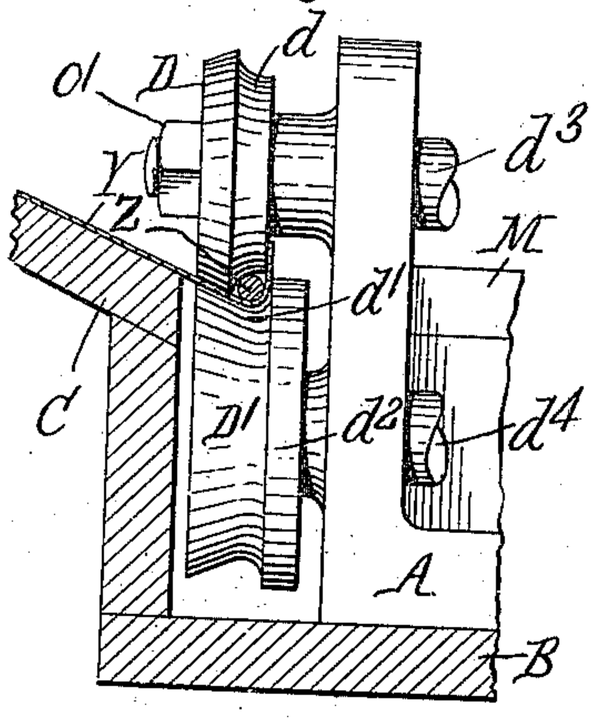


Fig. 5.

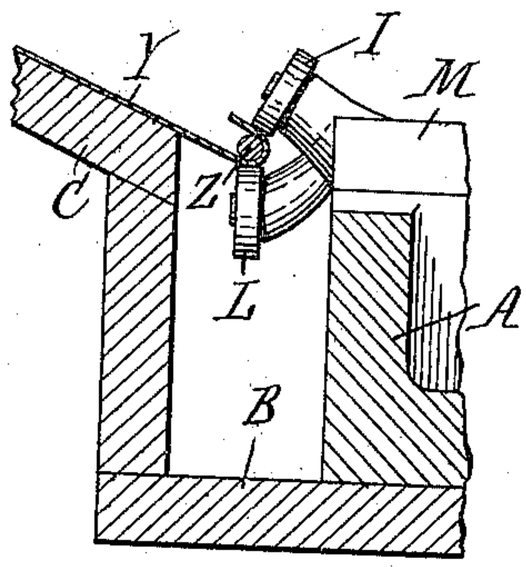


Fig. 6.

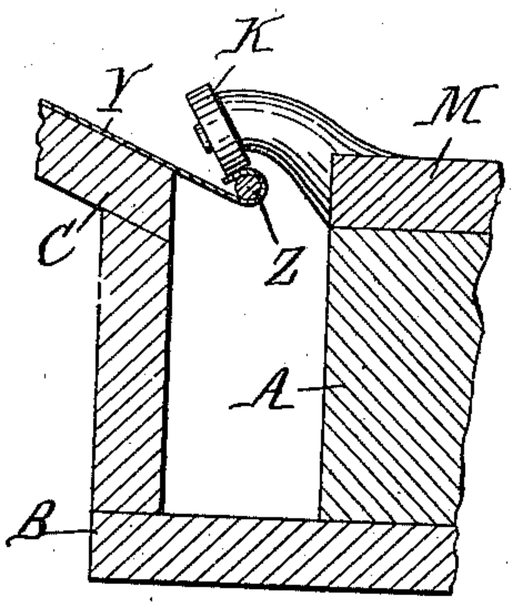


Fig. 7.

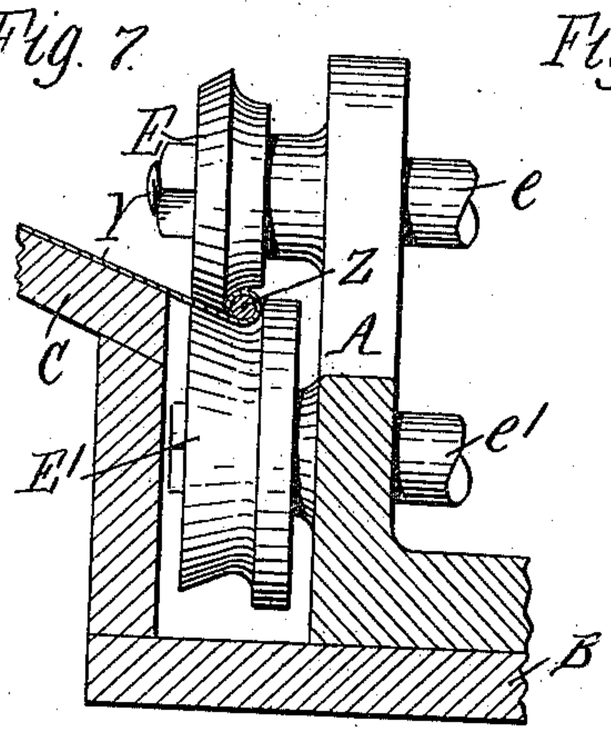
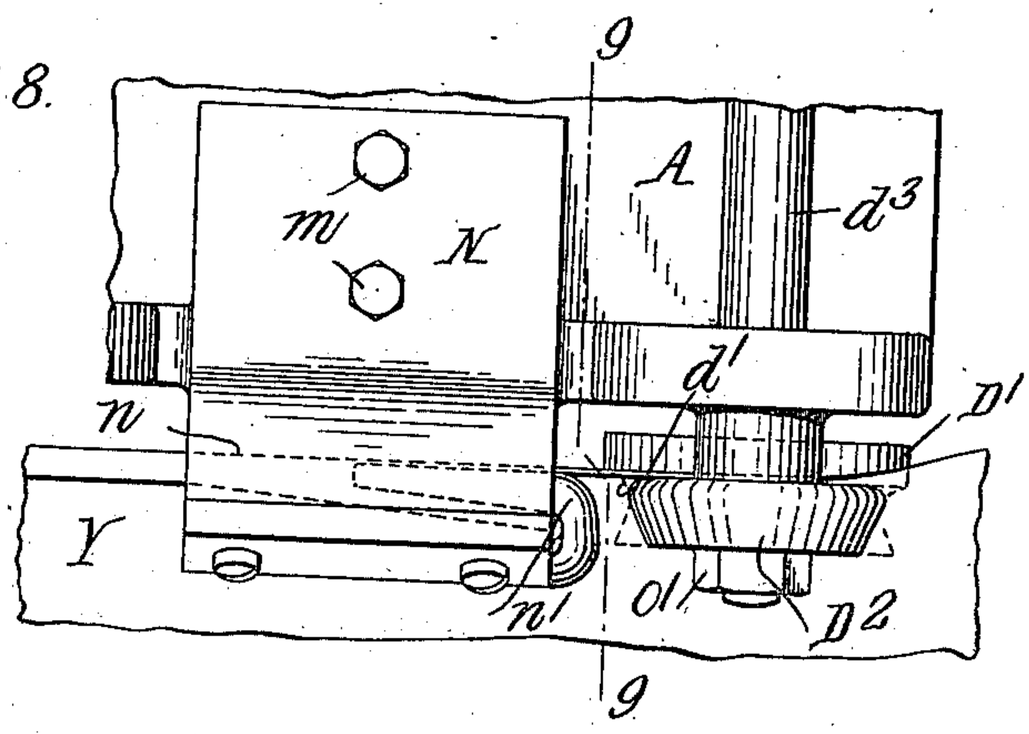


Fig. 8.



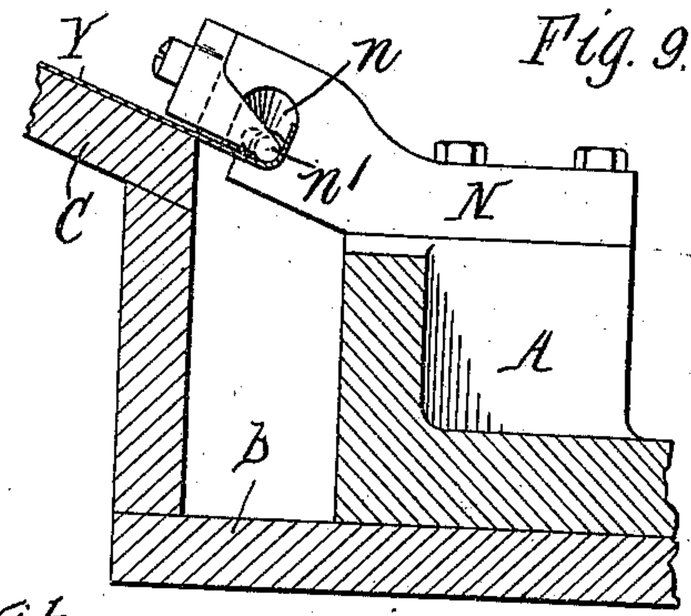
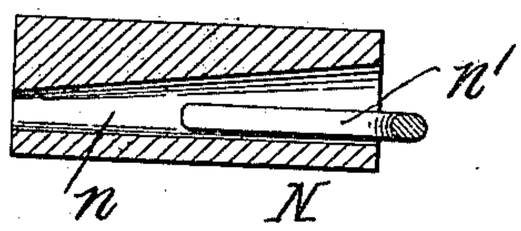


Fig. 9.



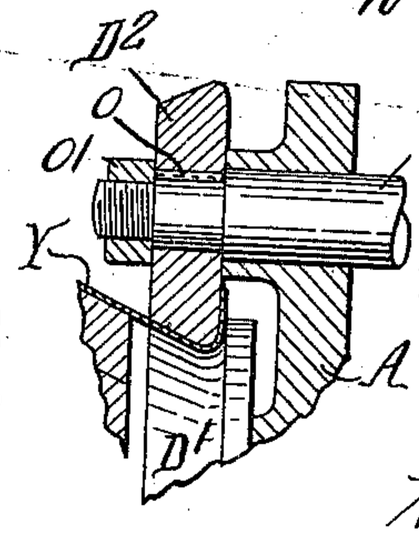


Fig. 10.

Fig. 11.

Witnesses.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING WIRED EDGES.

976,353. Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed June 29, 1909. Serial No. 504,989.

To all whom it may concern:

Be it known that I, HERMANN GANSSLEN, a subject of the Emperor of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Machines for Making Wired Edges, of which the following is a specification.

This invention relates to improvements in machines for forming wired edges and hollow or false wired edges on sheet metal used in making tanks, pails and other receptacles.

One object of the invention is to produce a practical and efficient machine of simple and inexpensive construction by which either a wired edge, or a false wired edge can be expeditiously and easily formed on metal sheets of any length in a single continuous operation, *i. e.*, by a single passage of the sheet through the machine.

Other objects of the invention are to construct the machine so that it can be adapted quickly and with little trouble for forming either a wired edge or a false wired edge; and so that, without complicating the construction of the machine, it will produce an edge which is almost perfectly round in cross-section.

In the accompanying drawings, consisting of two sheets: Figure 1 is a front elevation, partly in section in line 1—1, Fig. 2, of an edging machine embodying the invention. Fig. 2 is a transverse sectional elevation thereof in line 2—2, Fig. 1. Fig. 3 is a plan thereof. Fig. 4 is a fragmentary sectional elevation showing the primary forming or feeding rolls. Figs. 5 and 6 are fragmentary sectional elevations in lines 5—5 and 6—6, respectively, Fig. 1. Fig. 7 is a fragmentary sectional elevation showing the finishing rolls. Fig. 8 is a fragmentary plan showing the forming device used for making false wired edges. Fig. 9 is a sectional elevation in line 9—9, Fig. 8. Fig. 10 is a longitudinal section of the forming device shown in Figs. 8 and 9. Fig. 11 is a fragmentary sectional elevation of the primary rolls used in making false wired edges.

Like reference characters refer to like parts in the several figures.

A represents the frame of the machine, which may be of any suitable construction and which is bolted or otherwise secured on a work bench or other suitable support B.

C represents a feed table on which the metal sheet is laid and which supports the sheet in its passage through the machine. This feed table is supported on the bench B in front of the frame A, and preferably extends forwardly at an upward inclination for a purpose hereinafter explained. A gage strip *c* is provided along the rear edge of the feed table at the feed end of the machine against which the edge of the metal sheet Y is placed, and a wire gage *c'* extends forwardly from this sheet gage *c* over the metal sheet against which the edge wire Z, which is laid on the metal sheet, is placed. The sheet and wire gages are adjustably secured on the feed table in any convenient manner which enables them to be adjusted as required to properly position sheets and wires of different gage.

D and D' represent a pair of coöperating primary rolls for feeding the metal sheet and edge wire rearwardly through the machine and bending the edge of the sheet upwardly back of the wire, as shown in Fig. 4. The upper roll D has a grooved or concaved portion *d* and the lower roll has a grooved portion *d'* which is opposite to and forms with the grooved portion of the upper roll a pass for the wire and metal sheet, and the lower roll has a flange d^2 located inwardly beyond the groove of the upper roll, which bends the edge of the sheet upwardly back of the wire, as shown in Fig. 4. Outwardly beyond the grooved portions the rolls are preferably shaped, as shown in Fig. 4, to bear flat against and grip the sheet lying on the inclined feed table. The primary rolls D and D' are secured to the front ends of shafts d^3 and d^4 which are journaled in suitable bearings on the frame at the feed end of the machine.

E and E' represent a pair of final forming or finishing rolls which are secured to shafts *e* and *e'* journaled in suitable bearings on the frame at the opposite end of the machine. These finishing rolls can be of substantially the same form as the primary rolls. One of the roll shafts, for instance, the shaft d^4 of the lower primary roll, is provided with a crank F or other means for turning the shaft, and the shafts of the primary rolls are connected by gear wheels *f* and *f'*, and the shaft of one of the primary rolls is connected by a gear wheel *g* to a gear wheel *h* on the shaft of one of the finishing rolls, which latter rolls are geared together by the wheel *h*

and an intermeshing gear wheel h', so that both the primary and finishing rolls are positively turned together in a direction to feed the sheet and the wire through the machine. Any other suitable train of gears could be employed for thus causing the primary and final rolls to be positively driven together.

I and K represent idle rolls arranged between the primary and finishing rolls so as to engage the edge of the sheet, which is bent upwardly by the primary rolls, and turn the same farther around the wire. The first idle roll I is journaled on an upwardly inclined axis and turns the edge of the sheet forwardly over the wire from the upright position, as shown in Fig. 5, and the second idle roll K is journaled on a downwardly inclined axis and further turns the edge of the sheet around the wire, as shown in Fig. 6. The edge of the sheet and the wire are supported adjacent to the idle rolls I and K by an idle roll L arranged between the bending rolls I and K and beneath the path of the sheet and wire. The three idle rolls I, K and L are preferably journaled on a bearing block or piece M which is detachably secured by bolts m, or in any other suitable manner, on the frame A so that the idle rolls can be readily disconnected and removed. The several rolls can, of course, be adjustably mounted so that they can be properly set to operate on sheets and wire of different gages.

In the operation of the machine, the metal sheet Y is placed on the feed table against the sheet gage c and the wire Z is laid on the sheet against the wire gage c'. The crank F is then turned to drive the primary and finishing rolls and the sheet and wire are moved by hand into the bite of the primary rolls, which grasp the sheet and wire and feed or advance them through the machine. The primary rolls D and D′ bend the edge of the sheet upwardly behind the wire and the idle rolls I and K turn the edge forwardly over the wire, as explained. In passing between the finishing rolls E and E′ the upper roll E engages the edge of the sheet turned over by the idle rolls and closes it down tightly around the wire against the body of the sheet. As the sheet is held in an inclined plane while the finishing rolls rotate in a vertical plane, the edge of the sheet is turned under the wire beyond a perpendicular to the plane of the sheet, which makes the edge more nearly round and gives a better finish than if the edge were simply bent down perpendicularly to the plane of the sheet, as would be the case if the sheet were held in a horizontal plane. The entire operation of forming the wired edge is completed by a single passage of the sheet and wire through the machine, and sheets of any length can be thus provided with the wired edge.

When it is desired to produce a hollow or false wired edge, the bearing block M, with the idle rolls I, K and L thereon, is detached and replaced by a block N, Figs. 8–10, which is provided with a tapering curling cavity n in line with the primary rolls D and D′, into which cavity extends a forming finger or mandrel n' which is connected by a hooked shank to the block N. In making the false wired edge, the wire is of course omitted, and the upper primary roll D is removed from the end of the shaft d^3 and replaced by a roll D^2, Figs. 8 and 11, which is of proper peripheral contour to turn up the edge of the sheet, as shown in Fig. 11, without the edge wire. The roll D or D^2 may be removably secured on the reduced end of the shaft d^3 by the key o and nut o', shown in Fig. 11, or in any other convenient way. The primary rolls bend the edge of the sheet upwardly as before, and as the sheet is drawn through the curling cavity n this bent-up edge of the sheet is curled forwardly around the mandrel n'. The finishing rolls act to close the curled-over edge of the sheet tightly down against the body of the sheet.

When working on thin or light sheets, the block N having the curling cavity can be used without the mandrel n' in place of the idle rolls I, K and L for making wired edges. The curling cavity n will then operate to bend the edge of the sheet around the wire as the sheet and wire are moved through the curling cavity by the primary and final rolls.

I claim as my invention:

1. In a machine for the purpose stated, the combination of a primary pair of feeding and forming rolls which bend the edge of the sheet upwardly, means for turning over the upturned edge of the sheet, a final pair of rolls which close the turned-over edge of the sheet against the body of the sheet, means for positively driving said primary and final rolls, and a feed table on which the sheet is supported and which is arranged at an inclination to the plane of rotation of said rolls, substantially as set forth.

2. In a machine for the purpose stated, the combination of a primary pair of feeding and forming rolls which bend the edge of the sheet upwardly, means for turning over the upturned edge of the sheet, a final pair of rolls which close the over-turned edge of the sheet against the body of the sheet, and a feed table on which the sheet is supported and which is arranged at an inclination to the plane of rotation of said rolls, substantially as set forth.

3. In a machine for the purpose stated, the combination of feeding and forming rolls which are journaled in fixed position for turning over the edge of the sheet

against the body of the sheet, means for driving the rolls, and a stationary feed table on which the sheet is supported and moved past the rolls, said feed table being arranged at an inclination to the plane of the rolls, substantially as set forth.

4. In a machine for the purpose stated, the combination of a primary pair of feeding and forming rolls which bend the edge of the sheet upwardly at one side of the edge wire, idle rolls arranged one in advance of the other for turning the upturned edge of the sheet over the wire, a single support on which the several idle rolls are journaled and which is removably secured in the machine, a final pair of rolls which close the turned-over edge of the sheet around the wire against the body of the sheet, and means for positively driving said primary and final rolls to feed the sheet and wire between them and past said idle rolls, substantially as set forth.

5. In a machine for the purpose stated, the combination of a table on which the sheet is supported, a primary pair of feeding and forming rolls which are arranged with their axes at an angle to said table and which have peripheral portions adapted to engage the sheet in lines parallel with the plane of said table and flanges arranged at an acute angle to said table whereby said rolls receive the edge of the sheet and bend it upwardly at an acute angle to the sheet, means for turning over the upturned edge of the sheet, a final pair of rolls arranged with their axes at an angle to the sheet which bend the turned-over edge of the sheet against the body of the sheet, and means for positively driving said primary and final rolls to feed the edge of the sheet between them and past said turning over means, substantially as set forth.

Witness my hand, this 26th day of June, 1909.

HERMANN GANSSLEN.

Witnesses:

E. C. HARD,

C. B. HORNBECK.