W. R. MAGIE.

MACHINE FOR WIRING SHEET METAL.

APPLICATION FILED JULY 8, 1909.

943,118. **Patented Dec. 14, 1909.**

2 SHEETS—SHEET 1.

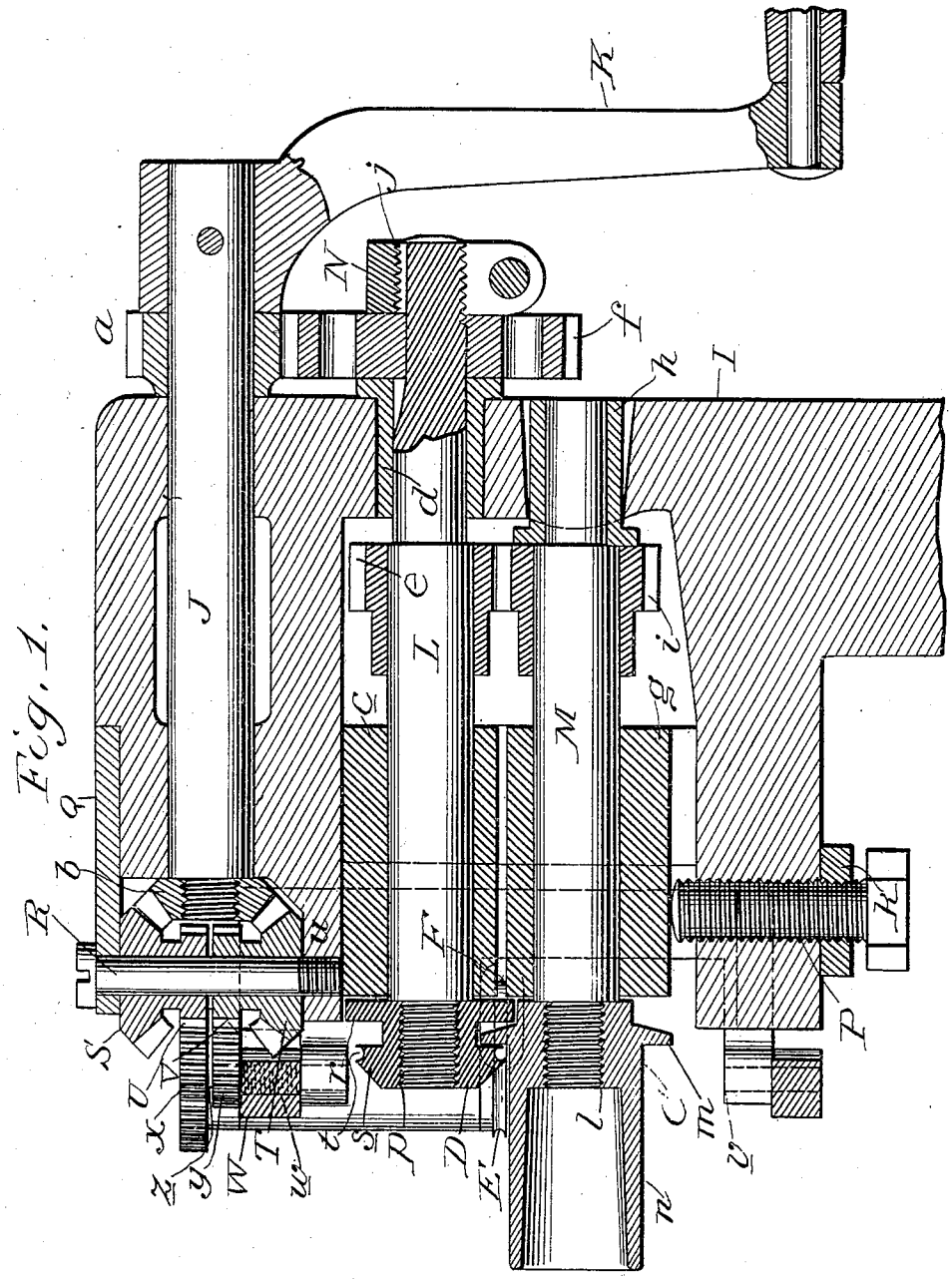

Fig. 1.

WITNESSES

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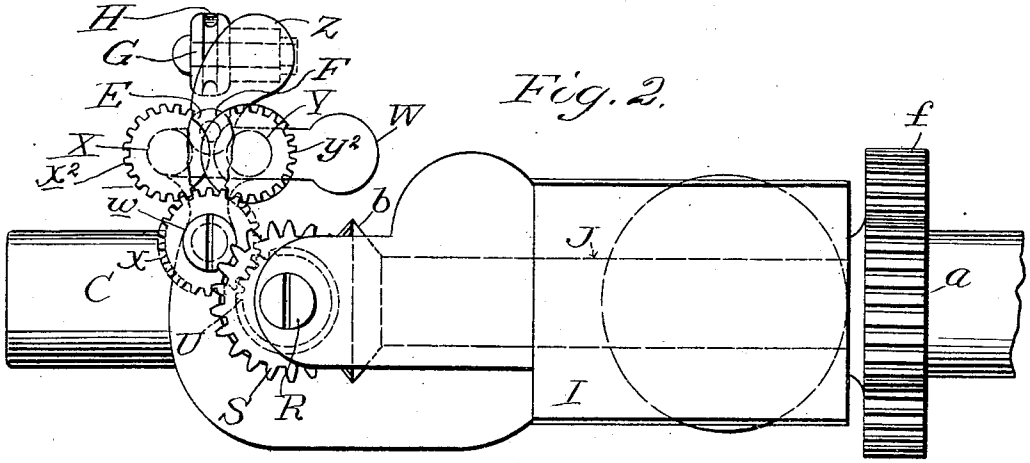

Fig. 2.

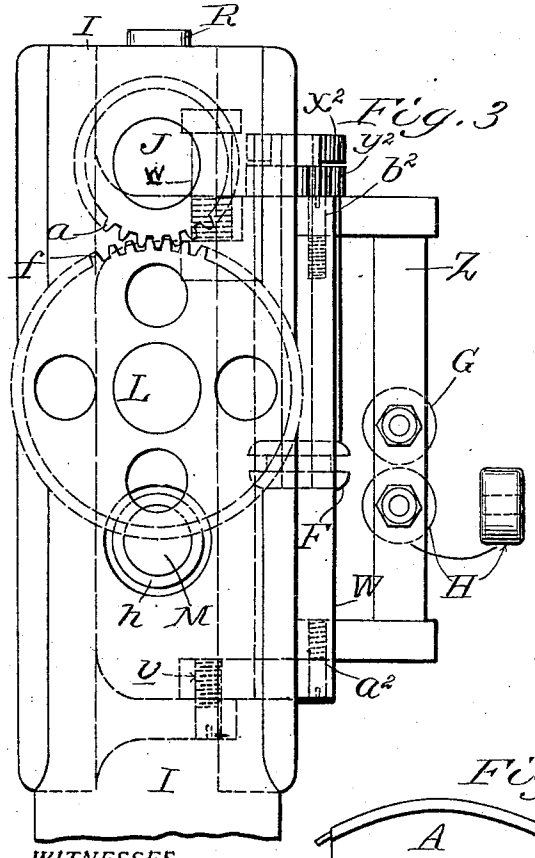

Fig. 3

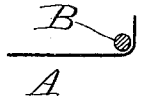

Fig. 4.

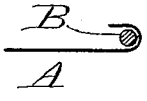

Fig. 5.

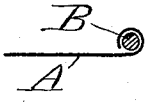

Fig. 6.

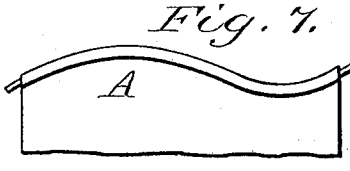

Fig. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

WILBER R. MAGIE, OF INDIANAPOLIS, INDIANA.

MACHINE FOR WIRING SHEET METAL.

943,118. Specification of Letters Patent. Patented Dec. 14, 1909.

Application filed July 8, 1909. Serial No. 506,526.

To all whom it may concern:

Be it known that I, WILBER R. MAGIE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Machines for Wiring Sheet Metal, of which the following is a specification.

My invention has to do with the wiring of sheet-metal; and it contemplates the provision of a machine adapted to expeditiously inclose a wire in the edge portion of a piece of sheet-metal by operations following one upon another incidental to the continuous feed of the sheet-metal and wire through the machine, and this irrespective of whether the edge of the piece of sheet-metal is curved or is straight.

With the foregoing in view the invention will be fully understood from the following description and claims when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a longitudinal vertical section of the machine constituting the present and best practical embodiment of my invention of which I am cognizant. Fig. 2 is a plan view of the same. Fig. 3 is a rear end elevation of the machine with the crank omitted. Figs. 4, 5 and 6, are diagrammatic views showing the manner in which the edge portion of the sheet-metal is bent step by step about the wire. Fig. 7 is a detail view showing in plan a piece of sheet-metal wired by my novel machine.

Similar letters of reference designate corresponding parts in all of the views of the drawings.

In Figs. 4 to 7, A is a piece of sheet-metal, and B is a wire inclosed in the edge portion of the same. My invention provides a machine embodying a set of rolls C and D for bending the sheet-metal relative to the wire, as shown in Fig. 4, a set of rolls E and F, disposed at a right angle to the rolls C and D and adapted for bending the sheet-metal relative to the wire, as shown in Fig. 5, and a third set of rolls G and H disposed vertically and adapted for bending the piece of sheet-metal, relative to the wire, as shown in Fig. 6, and thereby finishing the inclosing of the wire and the wiring of the sheet-metal.

In addition to the three sets of rolls referred to, my novel machine comprises a main frame I, a longitudinal shaft J bearing in said frame and designed to be rotated through a crank K or other means, and equipped with a spur gear *a*, a miter gear *b*, a longitudinal shaft L disposed below and in the same vertical plane as the shaft J and journaled in boxes *c* and *d* and equipped with spur gears *e* and *f*, and a longitudinal shaft M journaled in a vertically movable box *g* and also in a box *h* and equipped with a spur gear *i*. The spur gear *a* on shaft J is intermeshed with the spur gear *f* on shaft L, and the spur gear *e* on said shaft L is intermeshed with the spur gear *i* on the shaft M. From this it follows that when the shaft J is rotated, the shafts L and M will be rotated in opposite directions. A split nut N is mounted on the rear threaded end *j* of shaft L, and hence it will be manifest that the said shaft L may be drawn rearwardly and adjustably fixed against forward movement. It will also be manifest by reference to Fig. 1 that the box *g* of the lower shaft M rests on a screw P which bears in the main frame I and is equipped with a jam-nut *k*. By virtue of these provisions, the traction exerted by the rolls C and D may be nicely regulated as occasion demands. The roll C is preferably threaded at *l* upon the forward reduced end of the shaft M, and is provided with a circumferential flange *m*. I would also have it here understood that I prefer to provide the roll C with a forwardly extending tubular portion *n* which may be utilized, when desired, as a support for the work. The roll D is preferably threaded at *p* upon the forward reduced end of the shaft L, and is provided with an inner flange or gage portion *r* and an outer main portion *s*, the two being separated by an intervening circumferential groove which receives the flange *m* of roll C, after the manner illustrated in Fig. 1. It will also be seen by reference to said Fig. 1 that the perimeter of the roll portion *s* is opposed to the corner recess of the roll C, and that in said perimeter is formed a groove *t* for accommodating the wire used in the wiring operation.

Fixed to the main frame I and arranged flush with the upper side thereof is a steel plate Q, and in said plate Q is mounted a bolt-like shaft R which is threaded at its lower end in a projection *u* on the main frame. Loosely mounted on said shaft R are miter gears S and T, disposed above and

below the gear *b*, respectively, and designed to be synchronously rotated in opposite directions by the said gear *b*. The miter gear S is integral with a spur gear U, and the miter gear T is integral with a spur gear V.

Fixed to lower and upper vertically disposed pins *v* and *w*, Figs. 1 and 3, journaled in the lower and upper forward portions of the main frame I is a horizontally swinging sub-frame W, and loosely mounted on the pin *w*, above the said upper portion of the main frame, are spur gears *x* and *y*, separated by an interposed washer *z* and intermeshed with the spur gears U and V, respectively.

Journaled in the upper portion of the sub-frame W are parallel vertical shafts X and Y, which carry the rolls E, and F, respectively, and fixed on the upper ends of the said shafts X and Y are lapped spur gears x^2 and y^2, intermeshed with the spur gears *x* and *y*, respectively. It will thus be seen that the sub-frame W is free to swing to the right or left as the operator feeds the sheet-metal against the gage *r* while turning the crank *k*. It will also be manifest that the driving connections comprising the miter gear *b*, the miter gear S, the spur gear U, the spur gear *x*, and the spur gear x^2, on the one hand, and the miter gear *b*, the miter gear T, the spur gear V, the spur gear *y* and the spur gear y^2, on the other, will not be affected by the swinging movements of the sub-frame W, and consequently the rolls E and F will be rotated in opposite directions so long as the crank K is rotated. The rolls E and F are shaped and opposed to each other as best shown in Fig. 1, and consequently they are adapted to bend the sheet-metal relative to the wire as shown in Fig. 5 incidental to the passage of the sheet-metal edge portion and the wire between said rolls.

Pivoted at a^2 and b^2 to lower and upper portions of the sub-frame W is a second horizontally swinging sub-frame Z, and by this latter sub-frame are carried the rolls G and H for completing the inclosing of the wire in the sheet-metal edge portion, as shown in Fig. 6. The roll G is circumferentially grooved as shown in Fig. 2, while the periphery of the roll H is plain as is made clear by the projected view of said roll H at the right of Fig. 3. Said rolls G and H are not driven, the traction of the previous sets of rolls being depended upon to feed the work forwardly between the rolls G and H. It will be noticed, however, that by reason of the swinging capacity of the second sub-frame Z on the first sub-frame W and with respect thereto, the rolls G and H are free to accommodate themselves to curvature of the edge portion of the sheet-iron.

It will be gathered from the foregoing that through the medium of my novel machine, a piece of sheet-metal may be expeditiously and easily wired, and all that the operator has to do incidental to the said operation is to see that the shaft J is turned, and that the work is properly fed against the gage *r* and between the rolls C and D.

The construction herein illustrated and described constitutes the best practical embodiment of my invention that I have as yet devised, but it is obvious that in the future practice of the invention such changes, in the form, construction, and relative arrangement of parts, may be made as do not involve departure from the scope of my claimed invention.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

1. A machine for wiring the edges of sheet-metal, comprising a main frame, a sub-frame pivotally connected therewith and thereby adapted to swing thereon to accommodate itself to curves in the edge of a piece of sheet-metal, and pairs of opposed rolls adapted to receive and hold the sheet-metal and the wire between them and to gradually bend the metal around the wire to hold the latter within the folded edge of the metal; one of the said pairs of rolls being carried by the main frame, and another pair being carried by the sub-frame.

2. A machine for wiring the edges of sheet-metal, comprising a main frame, a sub-frame connected with and adapted to swing on the main frame, and a second sub-frame connected and movable with the first sub-frame and adapted to swing independently thereof, and pairs of rolls adapted to receive and hold the sheet-metal and the wire between them and to gradually bend the metal around the wire to secure the latter within the folded edge of the metal; the first of said pairs of rolls being carried by the main frame, the second of said pairs of rolls being carried by the first sub-frame, and the third of the pairs of rolls being carried by the second sub-frame.

3. A machine for wiring the edges of sheet-metal, comprising a main frame, a primary driver therein, a sub-frame connected with and adapted to swing on the main frame, pairs of opposed rolls adapted to receive and hold the sheet-metal and the wire between them and to gradually bend the metal around the wire to hold the latter within the folded edge of the metal; one of the said pairs of rolls being carried by the main frame, and the other pair being carried by the sub-frame, a driving connection intermediate the primary driver and the pair of rolls in the main frame, and a driving connection intermediate the primary driver and the pair of rolls in the sub-frame and adapted to accommodate itself to the swinging movements of said sub-frame.

4. A machine for wiring the edges of sheet-metal, comprising a main frame, a primary driver therein, a sub-frame connected with and adapted to swing independently of the main frame, a second sub-frame connected with and adapted to swing independently of the first sub-frame, pairs of opposed rolls adapted to receive and hold the sheet-metal and the wire between them and to gradually bend the metal around the wire to secure the latter within the folded edge of the former, the first of said pairs of rolls being carried by the main frame, the second by the first sub-frame, and the third by the second sub-frame, driving connections intermediate the primary driver and the first pair of rolls for rotating the latter in opposite directions, and driving connections intermediate the primary driver and the second pair of rolls for rotating the latter in opposite directions, the last named driving connections being adapted to accommodate themselves to the swinging movements of the first sub-frame.

5. A machine for wiring the edges of sheet-metal, comprising a series of pairs of suitably supported rolls constructed to receive and hold the sheet-metal and the wire laid there against and to gradually bend the metal around the wire to secure the latter within the folded edge of the metal; one of the first pair of rolls being provided with a circumferential flange, and the other being provided with a circumferential groove which receives said flange and being also provided, at the inner side of said groove, with a gage flange, and in its portion at the outer side of the groove with a circumferential groove that is opposed to the corner recess formed between the major portion and the circumferential flange of the first-named roll.

6. A machine for wiring the edges of sheet-metal, comprising a main frame, a primary driver therein, a sub-frame connected with and adapted to swing independently of the main frame, pairs of opposed rolls adapted to receive and hold the sheet-metal and the wire between them and to gradually bend the metal around the wire to secure the latter within the folded edge of the metal; the first of said pairs of rolls being carried by the main frame and the second being carried by the sub-frame, driving connections intermediate the primary driver and the first pair of rolls for rotating said rolls in opposite directions, shafts journaled in the sub-frame and fixed to the rolls of the second pair, a miter gear fixed to the primary driver, suitably supported miter gears intermeshed with the first-named miter gear and each having fixed thereto a spur gear, spur gears intermeshed with the first named spur gears and suitably supported about the center of movement of the sub-frame, and spur gears intermeshed with the second named spur gears and fixed on the shafts of the rolls of the second pair.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILBER R. MAGIE.

Witnesses:
PEARL MAGIE,
T. J. MOLL.