A. SHEDLOCK.

WIRE MAKING MACHINE.

APPLICATION FILED NOV. 14, 1908.

1,136,373.

Patented Apr. 20, 1915.

2 SHEETS—SHEET 1.

Fig: 1,

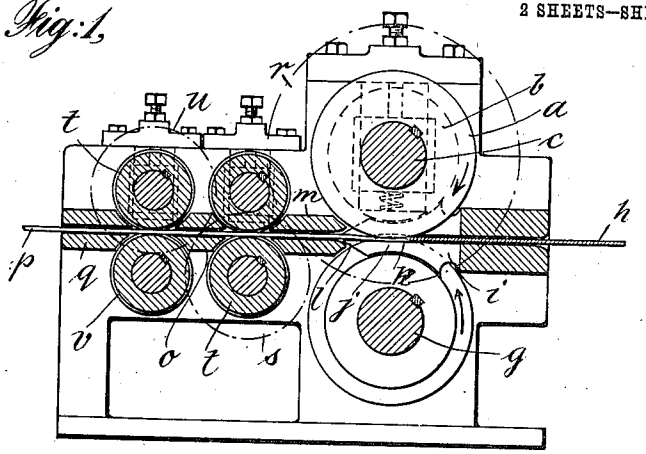


Fig: 2,

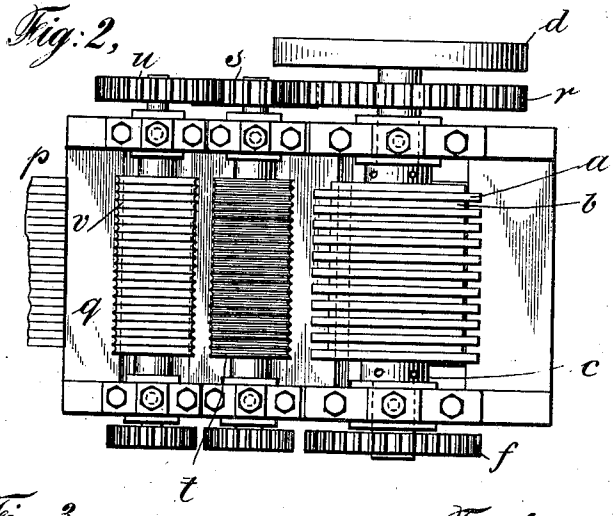


Fig: 2.a

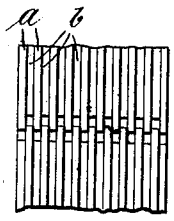


Fig: 3,

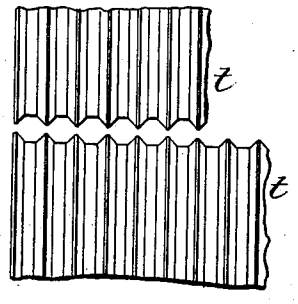
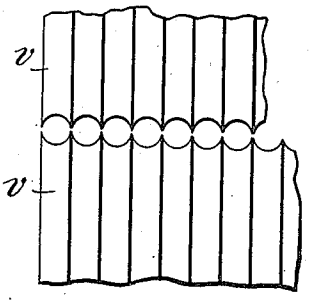


Fig: 4,



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 5,

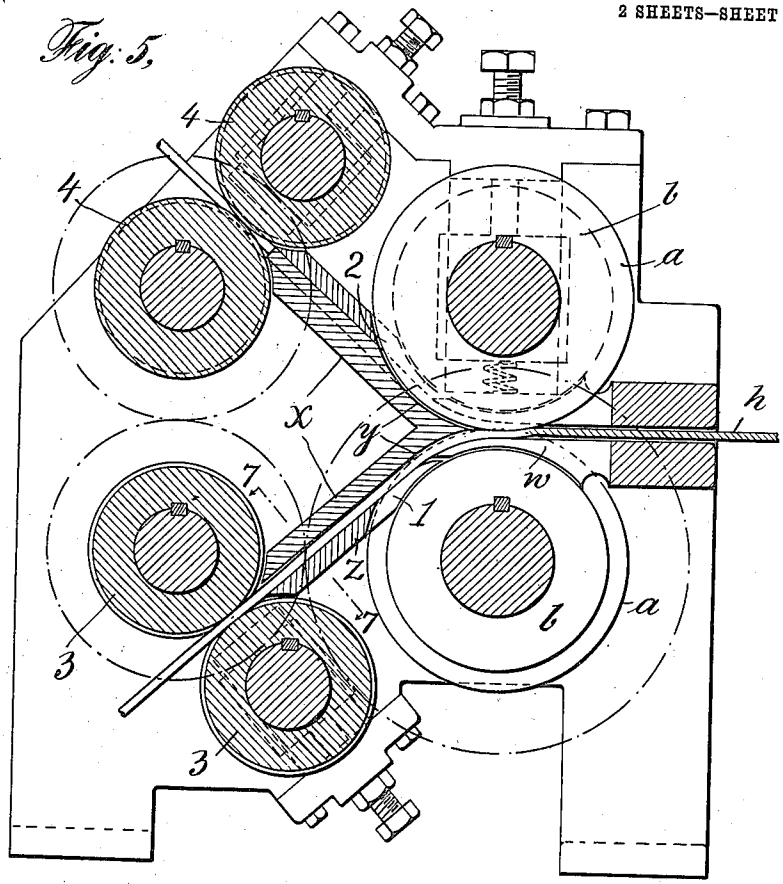


Fig. 6,

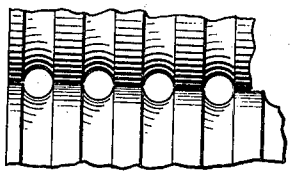


Fig. 7,

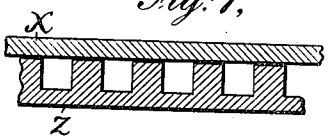


Fig. 8,

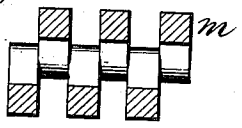


Fig. 9,

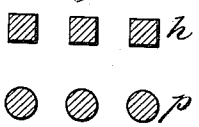
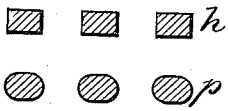


Fig. 10,



WITNESSES

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UNITED STATES PATENT OFFICE.

ALFRED SHEDLOCK, OF CANNON STATION, CONNECTICUT.

WIRE-MAKING MACHINE.

1,136,373. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed November 14, 1908. Serial No. 462,547.

To all whom it may concern:

Be it known that I, ALFRED SHEDLOCK, a citizen of the United States, residing in Cannon Station, county of Fairfield, State of Connecticut, have invented a certain new and useful Wire-Making Machine, of which the following is a specification.

This invention provides for the severance of a sheet of metal by the action of gangs of parallel cutters into a series of strands. The cutters act in the direction of the grain of the metal without material disturbance thereof so that the strands have the same characteristics in respect to toughness, tensile strain, etc., as the metal possesses in the sheet before it is severed into strands. The strands as formed by the parallel cutting action of the gangs of cutters are each then subjected to treatment such as rolling whereby the rectangular or square strand is made round or the sharp edges are reduced and the proper smoothness imparted to it. The strands when cut from the sheet are rectangular, opposite sides corresponding with the top and bottom faces of the sheet, and the remaining opposite sides being determined by the lines of severance. The width of the strands may be equal to the thickness of the sheet, in which event the strands will be square in cross section, or their width may vary from that of the thickness of the sheet, in which event they would be in cross section oblong. In one case, after being subjected to the rolling or drawing operation, the resulting wires may be substantially circular or of other cross section; and in the other case, they may be oval.

In the accompanying drawings: Figure 1 is a longitudinal vertical section showing the sheet severing devices and strand rolling devices: Fig. 2, a plan view thereof: Fig. 2ª, a detail sectional view showing opposed gangs of rotating cutters by which the metal sheet is severed into strands: Figs. 3 and 4, respectively, detail views showing two sets of rolls for reducing sharp edges of the strands: Fig. 5, a detail vertical section on an enlarged scale showing a modification in the general arrangement of the apparatus: Fig. 6, a detail view of the strand-reducing rolls such as may be employed in Fig. 5: Fig. 7, a detail section on the line 7, 7, of Fig. 5: Fig. 8, a detail view showing deflection of the strands as they are cut from the sheet alternated, one set being directed upward and the remaining alternating strands of the other one directed downward. Fig. 9, a detail sectional view showing strands of square cross section as cut from the sheet and circular or approximately circular cross section by rolling: Fig. 10, a detail sectional view showing strands of oblong cross section cut from the sheet and the oval cross section to which they are reduced.

The metal sheet severing apparatus illustrated comprises an upper gang of circular cutters *a* separated by spacing washers *b* of less diameter suitably mounted upon and keyed to a shaft *c* fitted to rotate in bearings in a suitable frame and provided at one end with a driving pulley *d*, or other means, by which it may be rotated; and, at the other end, with a gear *f* meshing with and driving another gear on the shaft *g* of the opposed gang of cutters consisting of similar circular cutters and spacing washers. The cutters in one gang respectively enter and closely laterally fit the spaces between the cutters of the other gang so that the sheet of metal fed to them will be divided into parallel strands by the rolling shearing cutting action of the rotary cutters. A sheet of metal thus to be divided into parallel strands is indicated by *h* and is fed between guiding ends of strippers, of which there are one series for the upper gang of cutters and another series for the lower gang of cutters, there being a stripper for each space between contiguous cutters and one for each outside cutter. Each stripper *i* is curved as at *j* to fit the bottom of the annular space which it occupies. Its opposite guide side or edge *k* is substantially straight, as in Fig. 1, and extends some distance at the front or feeding side of the cutters, the upper and lower series being spaced apart to provide a guide way for the proper presentation of the sheet material to the cutters. The portion of each stripper at the central line of the cutters is sufficiently less in depth than that of the space to permit the free passage of the strand which latter is marked *p*. The inner ends of the curved edges of the strippers contact with the peripheries of the spacing washers and are shaped to act as scrapers to remove dirt, etc., from the grooves of the gangs of cutters. The ends *l*

of the strippers extend beyond the discharge side of the active parts of the cutters and act to deliver the strands to a guide-way *m* by which the strands are directed into grooves of opposed rolls from whence they may pass through a second guide-way *o* to the grooves of a second pair of opposed rolls from which the completed wire *p* is delivered through a guide *q*. A gear *r* on the shaft of the upper gang of cutters meshes with a gear *s* on the shaft of the lower one of the first pair of strand-reducing rolls *t*, and this gear *s* meshes with a gear *u* on the shaft of the upper roll of the second pair *v* as indicated by the broken line circles in Fig. 1. The rolls of each pair are geared together in any appropriate way. The two pairs of strand-reducing rolls *t* and *v* may, by proper proportioning of their driving gears have preferably a speed in excess of the speed of the rotary cutters. The first pair of rolls *t*, is indicated in detail in Fig. 3. The opposed grooves therein are formed to act upon the angles or corners of the strands to reduce them and partially form the strands preparatory to the action of the second pair of rolls *v*, *v*, shown in detail in Fig. 4. The opposed grooves of this pair of rolls are semi-circular in cross section, the rolls tending to reduce the strands to circular cross section, or substantially so, making a wire without sharp edges and of suitable smoothness for the uses to which wire is ordinarily applied.

In Fig. 5 there are, as before, the opposed gangs of rotary cutters and also strippers passing between the cutters beyond the point of cut. In this case, the strippers *w* of the lower gang of cutters have their upper edges straight, and the similarly formed strippers of the upper gang of cutters have their lower edges straight, substantially to the cutting point, and then curved conformably to the cutters. The inner or leading ends of the curved edges of all of the strippers bear on the peripheries of spacing washers and are shaped to remove dirt, etc., from the grooves of the gangs of cutters. The point of the V-shaped guide *x* projects between the delivery ends of the strippers and preferably has its faces curved as shown at *y* and formed with the curve of the cutters. Coöperating with the lower face of this guide is a comb-plate *z* whose fingers 1 fit in the grooves of the lower gang of cutters and constitute a continuation of the strippers; and, coöperating with the upper face of the V-shaped guide, is a similar comb guide plate 2, having fingers similar to those of the comb plate *z* and fitting in the grooves of the upper gang of cutters. The ends of the fingers of the two comb plates *z* and 2 are beveled and seat under reversely formed bevels at the ends of the strippers, so that the cut strands will pass without obstruction from the strippers to the fingers of the comb plates. This arrangement of guide grooves and comb plates for directing the cut alternating strands of the two sections in upwardly and downwardly directions, and with each strand in vertical plane with the groove of the gang of cutters in which it is formed, is the preferred and in many respects the most practical embodiment of the invention. The resultant action of the two coacting gangs of cutters on a thin sheet of metal is to produce a multiplicity of fine strands or filaments arranged side by side as they leave the cutters, and as there is a tendency for such strands or filaments to twist or bend their free passage through a narrow passage way common to them might be somewhat interfered with. By directing the strands of the two sets in different vertical directions through individual passages for each strand all such possible trouble will be avoided. Of course, when comparatively heavier or coarser strands are formed from thicker sheet metal they may all pass through a common passage way as they leave the cutters.

Fig. 7 shows in section, a strand guide formed by the parts *x* and *z*. The comb plate *z* is provided with ribs so as to form guide channels, one for each strand. The comb plate 2 has similarly formed guide channels. With this construction, it will be apparent that the cut strands that occupy the grooves in the lower gang of cutters will be carried downwardly and the cut strands that occupy the grooves of the upper gang of cutters will be carried upwardly, as indicated in Fig. 8. The guides direct one set of strands to one set of reducing rolls 3, 3, the other set of strands to another set of reducing rolls 4, 4. The rolls 3, 3, and 4, 4, are shown in detail in Fig. 6. The opposed grooves therein are shown as semi-circular in cross section so that the tendency is to reduce the strands to circular cross section, as in Fig. 9. Of course, if the openings between the rolls were of oval formation their action would be to reduce the strands to oval cross section and such would be the case where the width and thickness of the strand vary. There may be two or more pairs of reducing rolls, as before described, applied to the construction shown in Fig. 5.

This invention is applicable to the manufacture of soft wires. The length of the wire strands produced depends upon the length of the sheet of the metal fed to the rotary cutters plus increase in length due to the rounding process. It is contemplated that the apparatus is particularly applicable to producing short pieces of wire of a length adapted to special purpose such for instance, as florists' use, wiring bottle stoppers, etc.

Of course a plurality of long pieces of wire may be simultaneously made, their

lengths being limited by the length of the strip or ribbon of sheet metal from which they are cut.

I claim:

1. The combination of opposed gangs of rotary cutters adapted to sever sheet metal into a multiplicity of strands, strippers arranged in the grooves of the gangs of cutters to discharge the cut strands therefrom, and guides for directing each set of strands from the strippers of the respective gangs of cutters in different angular directions relative to the plane of travel of the sheet metal from which they are cut, said strands of each set being guided in vertical parallel planes and leaving the discharge ends of the guides uniformly spaced apart.

2. The combination of opposed gangs of rotary cutters adapted to sever sheet metal into a multiplicity of strands, strippers arranged in the grooves of the gangs of cutters to discharge the cut strands therefrom, guides for directing each set of strands from the strippers of the respective gangs of cutters in different angular directions relative to the plane of travel of the sheet metal from which they are cut, said strands of each set being guided in vertical parallel planes and leaving the discharge ends of the guides uniformly spaced apart and a pair of shaping rollers located at the discharge ends of the guides of each set of strands adapted to change the cross section of the strands.

3. The combination of opposed gangs of rotary cutters adapted to sever sheet metal into a multiplicity of strands, strippers arranged in the grooves of the gangs of cutters to discharge the cut strands therefrom and shaped to act as scrapers to remove dirt, &c., from said grooves, guides for directing each set of strands from the strippers of the respective gangs of cutters in different angular directions relative to the plane of travel of the sheet metal from which they are cut, said strands of each set being guided in vertical parallel planes and leaving the discharge ends of the guides uniformly spaced apart and a pair of shaping rollers located at the discharge ends of the guides of each set of strands adapted to change the cross section of the strands.

4. The combination of opposed gangs of rotary cutters adapted to sever sheet metal into a multiplicity of strands, strippers arranged in the grooves of the gangs of cutters to discharge the cut strands therefrom, and extending at the front or feeding side of the cutters to act as a guide for directing the sheet material to the cutters, the discharge ends of the strippers being undercut, guides having their ends beveled seated under the undercut ends of the strippers for directing each set of strands from the strippers of the respective gangs of cutters in different angular directions relative to the plane of travel of the sheet metal from which they are cut, said strands of each set being guided in vertical parallel planes and leaving the discharge ends of the guides uniformly spaced apart.

5. The combination of opposed gangs of rotary cutters adapted to sever sheet metal into a multiplicity of strands, strippers arranged in the grooves of the gangs of cutters to discharge the cut strands therefrom, guides for directing each set of strands from the strippers of the respective gangs of cutters in different angular directions relative to the plane of travel of the sheet metal from which they are cut, said strands of each set being guided in vertical parallel planes and leaving the discharge ends of the guides uniformly spaced apart and said guides comprising a V-shaped guide piece whose point extends into the discharge side of the two gangs of cutters and a comb plate for each set of strands, the teeth of which constitute continuations of the strippers.

In testimony whereor, I have hereunto subscribed my name.

ALFRED SHEDLOCK.

Witnesses:
L. F. Browning,
E. F. Wicks.