

(No Model.)

4 Sheets—Sheet 1.

J. COFFIN.

APPARATUS FOR COILING GALVANIZED WIRE.

No. 410,314.

Patented Sept. 3, 1889.

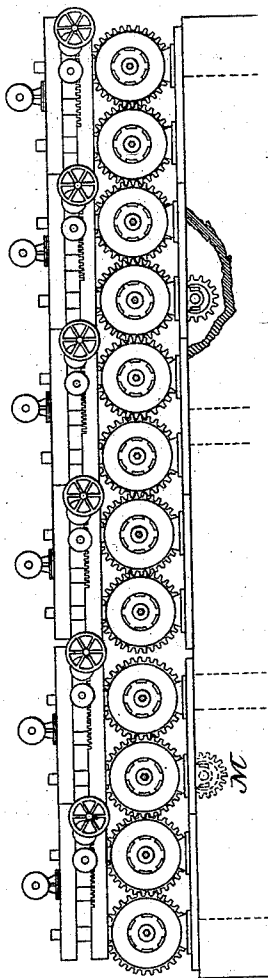


Fig. 1.

WITNESSES. *N. A. Shields*
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(No Model.)

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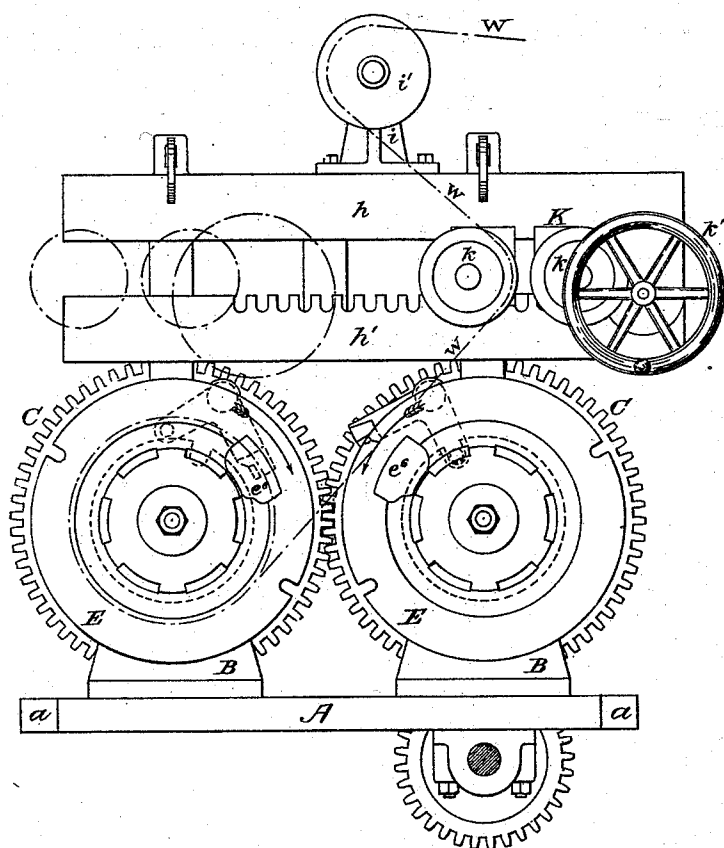


Fig. 2.

WITNESSES.

H. A. Shields
E. E. Click

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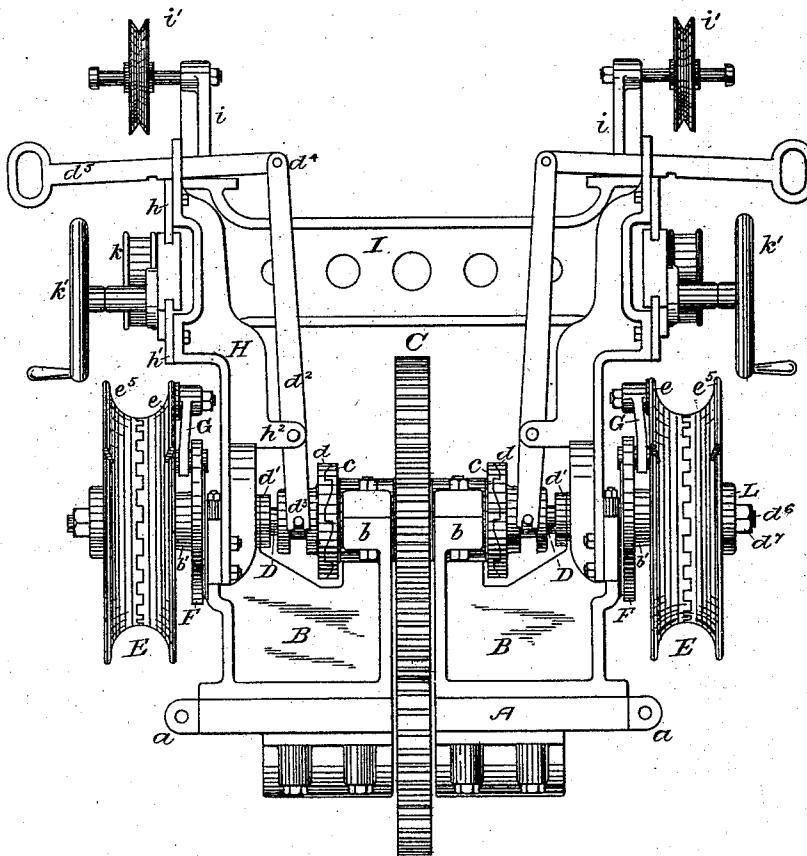


Fig. 3.

WITNESSES.

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(No Model.)

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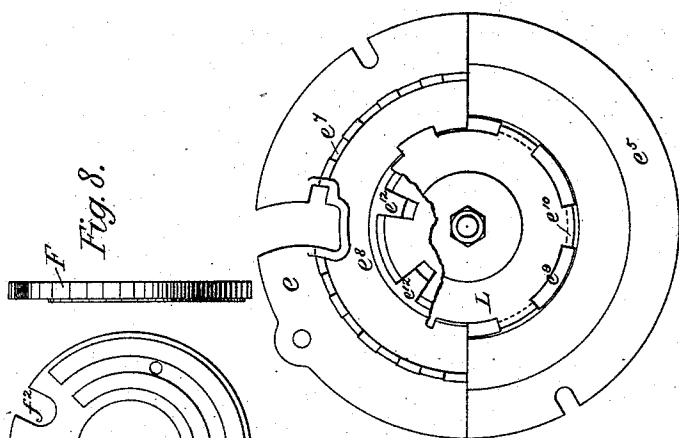


Fig. 6.

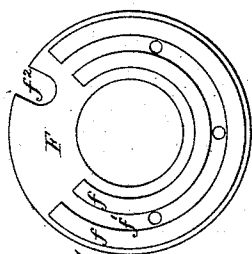


Fig. 7.

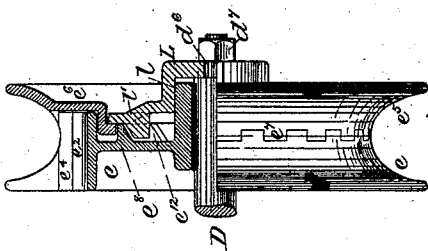


Fig. 5.

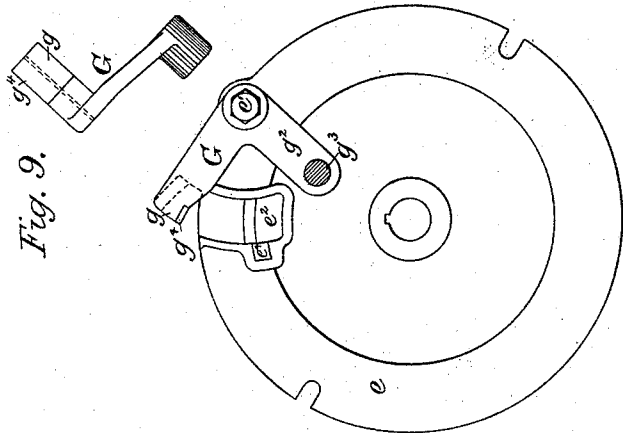


Fig. 4.

WITNESSES. *N. A. Shields* *John Coffin* INVENTOR
E. E. Slack

UNITED STATES PATENT OFFICE.

JOHN COFFIN, OF JOHNSTOWN, PENNSYLVANIA, ASSIGNOR TO THE CAMBRIA
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APPARATUS FOR COILING GALVANIZED WIRE.

SPECIFICATION forming part of Letters Patent No. 410,314, dated September 3, 1889.

Application filed April 22, 1889. Serial No. 308,173. (No model.)

To all whom it may concern:

Be it known that I, JOHN COFFIN, a citizen of the United States, residing at Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Coiling Galvanized Wire; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the art of coating wire with metal, commonly called "galvanizing," the wire, after passing through the plating metal, passes through an appliance for removing the surplus metal, and is then formed into coils on suitable winding-reels. Such reels are usually called "blocks," and I will use this term throughout this specification. Several of these blocks are arranged together on one frame-work, so that several wires may be coiled at the same time, and this aggregation of blocks is usually called a "bench." I will use this term throughout this specification. In the ordinary bench as has heretofore been most generally used there is arranged one block for each wire. After the block is coiled full of wire it is customary to stop the block, fasten the coil of wire together with bands, and remove it from the block, after which the end of the wire is again fastened to the block, the block started, again coiled full of wire, and the process repeated. There are many improvements in the process of coating wire which can be adopted if it is made possible to keep the wire being coated in constant motion. For instance, where continuous annealing and coating are resorted to, lead baths have been used, and also tubular annealing-furnaces. The annealing-furnace is generally more economical; but the objection to its use is, that if the furnace be made hot enough to successfully anneal the wire at a fair running speed it will be so hot that if the wire be stopped long enough to remove a bundle from the block it will become overheated in the furnace; also, where a furnace preheater is used prior to the passage of the wire into the coating-bath, a stoppage of the wire long enough to remove a bundle from the block causes the wire to be heated in the preheater

to a temperature which will prevent its successful coating.

My invention relates to an improved block to be used in a bench for coiling galvanized wire; and it consists in an improvement whereby the wire being galvanized may be kept in constant motion. The blocks I use are of a grooved form capable of holding the coil of wire in the groove similar to those which are now in general use. Each block is made in two sections, with a parting in the center, so that the outer section may be removed to release the bundle of wire. This is the usual arrangement for this kind of block.

My bench is composed of a series of blocks arranged in pairs, one pair of blocks for each wire. While the wire is being coiled on one block the attendant removes the bundle from the still block. When the running block is full of wire, or when a joint in the wire comes along and it is desirable to change the wire to the other block, the attendant starts the empty block, whereupon mechanism attached to the empty block shears off the wire and firmly grips it to the empty block, upon which the wire commences to coil, after which the operation is repeated.

A general description of my improved bench is as follows: A series of spur-gears of somewhat larger diameter than the blocks are arranged to gear together, their axes lying in the same horizontal plane and being parallel to each other. These gears have attached to them large hubs, which are externally turned to form journals, these journals running in suitable bearings which are formed in brackets attached to the bed-plate of the bench. The hubs of these pinions are also bored to receive loose-fitting short shafts. In each of these pinions are placed the ends of two shafts, the two ends of these shafts meeting in the center of the hub. The hub therefore forms a bearing for one end of these shafts. At a short distance from this hub-bearing is a second bearing for each of these shafts, formed by an extension of the bracket which carries the journaled hub of the pinion. Between these two bearings on each of these shafts is arranged a sliding clutch, which is toothed in one face and is adapted to engage with a simi-

larly-toothed face formed on the end of the journaled hub of the before-mentioned pinion. This sliding clutch is feathered to the shaft and is operated by a suitable lever. It will thus be seen that by engaging or disengaging the clutch a shaft may be started or stopped. On the outer end of each of these said shafts is fixed one half of the divided block, the other half being arranged to be attached and detached by the operator. I will call the part of the block which is firmly attached to the end of the shaft the "fixed" half of the block, and I will call the other half of the block the "removable" half of the block, because it is more readily removed than the other, and is, in fact, removed by the operator each time a bundle of wire is taken off the block.

Located near the outer edge of the fixed half of the block is a stud parallel with the shaft and projecting inward toward the pinion. Placed on this stud, and free to swing thereon, is the fulcrum-bearing of a bell-crank lever. One arm of this lever has integral with it a projection which extends partially across the groove of the block, and may be contained in a notch or pocket formed in the fixed half of the block. When this bell-crank lever is in one of its positions, the pocket in the fixed half of the block is closed by this before-mentioned projection, causing the shape of the groove which holds the wire to be nearly uniform throughout its circumference.

Fitted on one edge of the before-mentioned projections of the bell-crank lever is a shear-blade, and fitted at one edge of the pocket in the fixed half of the block is also a shear-blade. These two shear-blades register together to shear off a wire when the projection is swung into the pocket. The other arm of the before-mentioned bell-crank lever extends in a general direction toward the block-shaft. When the projection is swung out of the pocket, the position of the second arm of the bell-crank lever is nearly radial; but when the projection is swung into the pocket the direction of the before-mentioned second arm of the bell-crank lever is tangent to a circle of size something less than the diameter of the block. Attached to this second arm of the bell-crank lever is a stud extending inward toward the driving-pinion.

Fixed to the bracket which carries the bearings of the shaft and driving-pinion of each block is a disk located concentric with the block and in close proximity to it. This disk is of such diameter that when the before-mentioned stud on the second arm of the bell-crank lever rests upon its circumference the projection on the other arm of the bell-crank lever is closed into the pocket of the fixed half of the block. This disk spoken of has formed at a suitable point in its circumference a notch, which may receive the stud on the second arm of the bell-crank lever. Bearing in mind that this notched disk is fixed and does not revolve, it will be seen that if the block be turned so that the stud on the sec-

ond arm of the bell-crank lever will fall in the notch of the disk the projection on the first arm of the bell-crank lever will be opened outward from the pocket in the fixed half of the block. Now, if the block be started to revolve in a proper direction, carrying with it the bell-crank lever, the stud on the second arm of the bell-crank lever being held from advancing, the lever will be turned so as to close the projection down into the pocket, during which operation the stud in the second arm of the bell-crank lever will move out of the notch in the disk toward the circumference of the disk, and at such time as the pocket is entirely closed by the projection the stud on the second arm of the bell-crank lever will be free to pass around the circumference of the fixed notched disk in contact with the same. If a wire be under the projection of the bell-crank lever while it is being closed into the pocket, the said wire will be sheared off, and the shape of the pocket and the projection is such that after being sheared off the end of the wire will be clamped between the projection and the walls of the pocket. Let us now imagine one of my blocks to be empty and in such position that the projection of the bell-crank lever is removed from the pocket. The stud on the second arm of the bell-crank lever will now rest in the notch of the fixed disk. Let us imagine the other block to be running and coiling wire upon it and the direction of the wire as it enters this running block to be such that it passes under the before-mentioned projection of the bell-crank lever of the empty block. When it is desirable to change the coiling wire from one block to the other, let the empty block be started. The act of starting it will cause the bell-crank lever to turn, the projection on its first arm to descend into the pocket, the wire to be sheared off during its descent, and finally clamped firmly at its sheared end between the walls of the pocket and the projection of the bell-crank lever. In order to cause the wire to pay onto the running block in proper direction to be cut off and clamped by the mechanism of the empty block when it is started, deflecting-sheaves are used. These sheaves are two in number, carried on a suitable carriage located over the blocks, free to be moved in a direction longitudinal to the bench, held in slides, and operated by a rack-pinion and hand-wheel.

Having given this general description of my invention, I will now, to make my invention more clear, refer to the annexed four sheets of drawings, which form a part of this specification, and in which—

Figure 1 is a side elevation of my bench complete; Fig. 2, a side elevation of one of the sections of my bench on an enlarged scale; Fig. 3, an end elevation of one of the sections of my bench; Fig. 4, a side elevation of the fixed half of my block, viewed from the center of the bench, looking outward; Fig. 5, an

edge view of one of my blocks, half of the figure being in section; Fig. 6, a side view of one of my blocks, viewed from the outside of the bench, parts being broken away to show the construction; Fig. 7, a side elevation of one of the notched disks, viewed from the center of the bench outward; Fig. 8, an edge view of the same, and Fig. 9 a view of one of the bell-crank levers.

Like letters of reference will refer to like parts throughout.

Referring to Figs. 2 and 3, which represent one of the sections of the bench, A represents the bed-plate; B, brackets bolted to the bed-plate; *b*, bearings formed on the brackets B to support the journals of the driving-pinion; *b'*, the bearings also formed on the bracket B to support the outer end of the block-shaft.

C represents the main driving-pinions.

c represents the extended hubs of the pinions C, these hub-extensions forming first a journal-bearing, outside of which is formed integral with the hub a clutch-face, as represented in Fig. 3.

D represents the block-shafts. Referring to Fig. 3, these shafts are two in number for each driving-pinion, and pass into and have a bearing in the hub-extensions *c*. These shafts meet in the center and are free to turn in the hub *c*.

d represents the sliding part of the clutch, the part *d* being splined to the shaft D.

d' represents a collar formed on the shaft D.

E represents the block.

e represents the fixed half of the block, and *e'* the removable half of the block.

F represents the notched disk, which is attached to the bracket B. Figs. 7 and 8 show a detail of this disk.

Referring to Figs. 7 and 8, *ff* represent concentric ribs formed on the disk F, these ribs containing between them a groove *f'*. This groove fits over a concentric-turned rib on the bracket B, which, together with a series of bolts, holds the disk F firmly in position.

f² represents the notch in the disk F. A large hole is formed in the center of the disk to receive, with suitable clearance, the projected bearing *b'* of the block-shaft.

G represents a bell-crank lever attached to the fixed half of the block, arranged to swing on the fulcrum-stud *e'*. (See Figs. 4 and 9.)

g is the projection carried on the first arm of the bell-crank lever G.

g² is the second arm of the lever G, and *g³* a stud carried by the arm *g²*. This stud *g³* is adapted to travel around the periphery of the disk F in contact therewith or to pass into the notch *f²* of the disk F.

Referring to Fig. 2, the block at the left-hand side of the figure shows in dotted lines the position of the bell-crank lever G when the stud *g³* rests on the periphery of the disk F, and the block on the right-hand side of the figure shows in dotted lines the position of the bell-crank lever when the stud is engaged in the notch of the disk.

Returning to Fig. 4, *g⁴* represents a shear-blade carried on the projection *g* of the bell-crank lever G, and *e⁴* represents a shear-blade carried in the fixed half of the block *e*, arranged on one side of the pocket *e²* of the said block, and adapted to register with the shear-blade *g⁴*, so as to sever a wire when the projection *g* is swung into the pocket *e²*. By inspecting Figs. 4 and 5 it will be seen that the pocket *e²* of the fixed half of the block extends past the center dividing-line of the blocks, and by inspection of Figs. 2 and 5 it will be seen that a pocket is formed in the removable half of the block of suitable size to contain the walls of the pocket *e²*. It will be noticed in Fig. 5 that the pocket *e²* has no end walls; but when the two halves of the block are together an end wall is formed by the end wall of the pocket in the removable half of the block. The pocket in the removable half of the block is represented by *e⁶*.

Referring to Fig. 4, the form of the projection *g* is shown by the dotted lines. It will be seen that this form is similar to the form of the pocket *e²*; but the projection *g* is somewhat smaller than the pocket *e²*, so that there is room for a wire between the projection *g* and the walls of the pocket *e²*, and after the wire is severed by the shear-blades *g⁴* *e⁴* it is bent by the projection *g*, so as to fit the contour of the pocket *e²*, and is firmly held between projection *g* and the walls of the pocket *e²*.

Referring to Fig. 2, the line W represents a wire being coiled on the block on the left-hand side of the figure. The large pinions C mesh together, as shown in the figure, and the arrows represent the direction of revolution of the blocks. The block at the left of the figure is in motion and the block at the right of the figure is stationary, the sliding clutch *b* being disengaged. The block upon which wire is coiled has its bell-crank lever in the position shown, with the projection *g* in the pocket *e²*, and the wire is being coiled outside of this projection. The direction of the wire as it pays onto the block is such that it passes under the projection of the bell-crank lever of the stationary block. The projection of the stationary block has been brought to this position by turning the block backward by hand, allowing the stud to fall into the notch of the disk. When the coil of the running block is complete, the block on the right-hand side of the figure is started, the stud *g³*, engaging with the side of the notch *f²* of the fixed disk F, causes the bell-crank lever G to be turned on the stud *e'*, and the projection *g* is thereby swung down into the pocket *e²*, thus shearing off the wire between the edges of the shear-blades *e⁴* and *g⁴* and clamping the end of the wire between the projection *g* and the walls of the pocket *e²*. After the block upon which the wire has just been started has made one complete revolution from the position shown the stud *g³* will not have reached the notch *f²*, but will be in a position symmet-

rical with that shown in the block at the left of the figure, and before the stud reaches the notch one strand of the incoming wire has been laid outside of the projection *g*. Therefore when the stud *g*³ reaches the notch *f*² it cannot fall into this notch enough to release the clamped wire.

I have given this brief description and mode of operation of the principal working parts of the block in this place to render more clear the description of the details which will follow.

It will be noticed by consulting Fig. 2 that in order to have the wire properly severed and clamped by the mechanism described it is necessary for it to be paid onto the running block in such direction that it will pass between the shear-blades of the empty block. Such a position is shown in Fig. 2, where the left-hand block is the running block and the right-hand block the empty one; but when the right-hand block becomes the running block and the left-hand block the empty one the direction of the incoming wire must be changed so as to be symmetrical with the direction shown in Fig. 2. The mechanism to accomplish this change of direction I will now describe.

H represents a bracket. This bracket is bifurcated at its lower part to pass over the block-shaft bearing, and is firmly bolted to the bracket B. This manner of attachment is not shown in Fig. 2, as it was thought it would confuse the drawing, but will be readily understood from a reference to Fig. 3, and the detail of attachment is not important to the operation of the invention. The bracket H carries bolted to it at its upper part two guides, (represented by *h* and *h'*.) These guides form a sliding support for the carriage K. The carriage K carries on studs two sheave-wheels, (represented by *k*.)

k' represents a hand-wheel attached to the carriage K, this hand-wheel being attached to one end of a short shaft, the other end of this shaft terminating in a pinion. This pinion engages with a rack formed in the edge of the slide *k'*. This pinion is composed of two teeth formed by studs projecting from a disk, so that the carriage is advanced by an irregular motion, the advantage gained by this construction being that pressure on the carriage will not cause the pinion to be revolved. This construction is not shown in the drawings, for it is a well-known mechanical detail, and the peculiar construction is not essential to the working of my invention.

I represents a cross-strut tying the two sides of the machine together and stiffening it thereby. This cross-strut is bolted to the central portion of the slides *h h'*. Fastened to a flattened portion of this cross-strut is the bracket *i*, which carries on a stud at its upper part the sheave-wheel *i'*. The wire being coiled passes over the sheave-wheel *i'*, and thence between the sheave-wheels *k* to the running block. When it is desired to change

the direction of the incoming wire to make it symmetrical with the position shown in Fig. 2, the hand-wheel *k'* is turned, thus causing the carriage to be racked along the slides until the sheave-wheels *k* occupy the position shown by dotted circles at the left of the figure, thus carrying the wire W with them and changing the position as desired. It will be readily understood that while the carriage is being racked along at some point near the center of its course the contact of the wire will change from one to the other of the sheave-wheels *k*.

The mechanism for engaging and disengaging the clutch to start and stop the blocks is as follows: On each of the brackets H is a bifurcated projection *h*², through which passes a stud forming a fulcrum for the shifting-lever *d*². The lower part of this shifting-lever engages with the sliding part of the clutch *d* by some one of the usual forms of connection, (represented by *d*³.) The upper end of the shifting-lever *d*² is pivotally connected at *d*⁴ with the handle *d*⁵. The handle *d*⁵ passes through a slot in the upper part of the bracket H, as shown in Figs. 2 and 3. Notches cut in the lower part of the handle *d*⁵ engage with the bottom wall of the slot in the upper part of the bracket H, so that the gravity of the handle *d*⁵ causes the notches to engage, and thus locks the clutch in either the engaged or disengaged position at the will of the operator. To disengage the clutch, the operator raises the handle *d*⁵, thus disengaging the notch, pushes the handle from him, thus through the mechanism disengages the clutch, and then releases the handle, which falls in the notch, thus locking the clutch in the disengaged position, and by reverse motion the clutch is engaged.

I will now describe more fully the construction of the block and the manner of removing the removable half of it. Referring to Figs. 5 and 6 as the most convenient figures of reference, the two halves of the block do not meet in a plain surface, but meet in a toothed surface. These teeth are represented by *e*⁷. This construction is very clearly shown in Fig. 3. The object of this interlocking surface is to prevent strands of the wire from being wedged between the parts of the block. This is an old construction, and has been in use for many years. In order to make the removable half of the block as light as possible, a large hole is formed in its center. Therefore the part of the block which is removed is merely a rim portion. On the central web of the fixed half of the block is formed integral with it a circular concentric rib *e*⁸. This rib forms a bearing for the central opening in the removable half of the block *e*⁵ while removing and replacing the same. The removable half of the block *e*⁵ does not quite come in contact with the rib *e*⁸ when the removable half of the block is in place, the removable half being held concentric with the fixed half by means of the in-

terlock e^7 . The surface of the inner part of the removable half of the block which comes nearly in contact with the rib e^8 is not a continuous circle, but is formed of alternating lands and notches, as shown in the lower half of Fig. 6, e^9 being a notch and e^{10} a land.

L represents a clamping-piece to clamp the removable half of the block in position. The clamp L is nearly circular in shape and has a loose bearing at l on the hub of the fixed part of the block, which is turned to receive it. The outer edge of the nearly circular clamp L is composed of lands and notches. These lands and notches engage with the lands and notches of the removable half of the block in such manner that when the removable half of the block is held in position a land on the piece L bears against a land on the removable half of the block; but if the clamping-piece L be turned through a part of its circumference a land of the clamping-piece comes opposite a notch in the removable half of the block, and in like manner a notch in the clamping-piece comes opposite a land in the removable half of the block. The notches in both pieces being larger than the lands, when the clamp L is turned in this last position, the removable half of the block may be taken away.

To control and determine the amount of the circular movement of the clamp L, two lugs are formed on the fixed part of the block. These lugs are represented by e^{12} . A lug (indicated by l') is also formed on the clamp L. When the clamp L is in position, the lug l' falls between the lugs e^{12} , and the contact of these lugs arrests it in its circular movement and determines the clamping and releasing positions.

Fastened in the end of the shaft D is a stud d^6 , which passes through a hole in the clamping-piece L and has a nut screwed on its outer end. This nut is indicated by d^7 . To remove the removable half of the block, the nut d^7 is turned, thus releasing the pressure on the clamping-piece L. The clamping-piece L is then turned in the proper direction until the lug l' strikes one of the lugs e^{12} . The removable half of the block may then be taken away. To again attach the removable half of the block, the operation is repeated in the reverse manner.

In my description I have thus far described one section of the bench, and where the construction of parts described is alike throughout I have only described one of them.

Fig. 1 shows a side elevation of the bench complete. The bed-plates of the several sections are bolted together by means of lugs, (marked a in Figs. 2 and 3.) It will be noticed in Fig. 1 that the bench is divided into two sections, which have different driving-power—that is, the first part of the left consists in two sections such as I have described. The large central gears all mesh together and are driven by means of the pinion M, which engages with one of them. M is on a shaft

which extends under the floor. The part to the right consists in four sections such as I have described, geared together in the same manner and driven in the same manner. The object of driving the two parts of the bench independent of each other and having the parts unequal is, that it is required sometimes to run a few wires at a different speed from the others. This may result from having a few very much smaller or a few very much larger wires to coat.

Having fully described my apparatus and the manner of working the same, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a bench for coiling galvanized wire, a series of blocks arranged in pairs, one pair for each wire, a clutch on each block for starting and stopping the same, and a shearing and clamping mechanism attached to each block, whereby, when the coil is completed upon one block, the empty block may be started and the shearing mechanism will automatically sever the wire and clamp the end to the empty block, substantially as and for the purpose specified.

2. In a bench for coiling galvanized wire, a series of blocks on axes parallel to each other, arranged in pairs, one pair for each wire, a swinging arm pivotally attached to each block having at its swinging end a projection extending partly across the block and carrying on this projection a shear-blade, a pocket arranged in the block in which the said projection is adapted to swing, one edge of the said pocket being fitted with a shear-blade adapted to register with the before-mentioned shear-blade, and mechanism to automatically swing the before-mentioned arm simultaneously with the starting of the block for the purpose of shearing off a wire which is being coiled on the other block, and which is being led onto the other block in such direction that it will pass between the two said shear-blades, substantially as and for the purpose set forth.

3. In a bench for coiling galvanized wire, the combination of a series of blocks arranged in pairs, one pair for each wire, a movable shear-blade carrying projection to each block adapted to move into and recede from a pocket in the block, a shear-blade attached to the edge of said projection, a shear-blade attached to the edge of said pocket adapted to register with the aforesaid shear-blade for the purpose of severing a wire which may be brought between them, the movable projection being somewhat smaller than the pocket for the purpose of allowing room for a wire between the projection and the walls of the pocket and for the purpose of clamping the end of the wire firmly between the projection and the walls of the pocket, and mechanism for moving the projection into the pocket automatically and simultaneously with the starting of the block, substantially as and for the purpose specified.

4. In a bench for coiling galvanized wire, a

series of blocks arranged in pairs, one pair for each wire, a bell-crank lever pivotally connected at the outer portion of each block, one arm of the bell-crank lever carrying a projection which extends partially across the face of the block, a shear-blade fitted in this projection, a pocket located in the block adapted to receive the projection, a shear-blade fitted to the side of the pocket for the purpose of registering with the other shear-blade to sever a wire, an arm of the before-mentioned bell-crank lever extending inwardly and having fitted to its end a stud or its equivalent, a fixed disk located concentrically with the block, so that its periphery is in contact with the said stud when the bell-crank lever is in such position that its projection is closed into the said pocket, and a notch formed in the said disk adapted to receive the said stud when the bell-crank lever is in such position that its projection is opened outward from the said pocket for the purpose of severing and clamping a wire simultaneously with the starting of the block, in a manner substantially as has been specified and set forth.

5. In a bench for coiling galvanized wire, a series of blocks arranged in pairs, one pair for each wire, each block being provided with a cutting and clamping device, whereby the wire-coiling operation may be shifted from one block to another without stopping the running wire, in combination with a device for changing the direction of the wire as it is being paid onto the blocks, consisting in a traversable wire-carrying sheave for the purpose of so directing the wire onto one of the blocks that it will be in proper position to be operated upon by the severing and clamping arrangements on the other block, substantially as and for the purpose set forth.

6. In a bench for coiling galvanized wire, a series of blocks arranged in pairs, one pair for each wire, each block being provided with a cutting and clamping device, whereby the wire-coiling operation may be shifted from one block to the other without stopping the running wire, in combination with a device for changing the direction of the wire as it is being paid onto the block, consisting in a carriage located above said blocks, free to slide in guides, and provided with wire-carrying sheaves for the purpose of so directing the wire onto one of the blocks that it will be in proper position to be operated upon by the severing and clamping arrangement of the other block, substantially as and for the purpose set forth.

7. In a bench for coiling galvanized wire, a series of blocks, each block being composed of a fixed and removable half, the removable half having a large central opening on which inwardly-projecting lands are formed, in combination with a clamp for holding said removable half, said clamp being of circular shape and having outwardly-projecting lands to reach over and bear against the inwardly-projecting lands of said removable half, the

notches between the said lands being greater than the lands themselves for the purpose of allowing the removable half to be removed when the said clamp is turned so that its lands register opposite the notches of said removable half, and a stud attached to the block-shaft, extending through said clamp, and provided with a nut bearing against said clamp, by means of which said clamp may be made to bear firmly against said removable half when said removable half is in its attached position, substantially as and for the purpose specified.

8. In a bench for coiling galvanized wire, a series of blocks arranged in pairs, one pair for each wire, in combination with a pocket on each fixed half of the blocks for the purpose of receiving a movable cutting and clamping projection, said pocket extending past the center joining-line of said block, and a pocket formed in the removable half of the block of size great enough to contain the pocket of the fixed half of the block, substantially as and for the purpose set forth.

9. In a bench for coiling galvanized wire, the combination of a series of blocks arranged in pairs, one pair for each wire, driven by a series of spur-gearing meshing with each other, so that adjacent blocks will run in opposite directions, the said driving-gear having formed with it large journaled hubs, on the face of each hub being a clutch, short block-shafts entering each of the said hubs and free to turn thereon, sliding clutches splined on each of said shafts adapted to engage with the clutches on the said driving-gears, a bearing for each of said shafts outside of said splined clutch, a fixed half of a block attached to each of said block-shafts outside of said last-mentioned bearing, a circular disk attached to the frame-work of the bench on the inside of each block, its periphery being concentric with the block, a bell-crank lever pivotally connected to the outer edge of the fixed half of each block, a stud formed on one arm of said bell-crank lever adapted to pass around the periphery of the said disk, or to engage in the notch cut in the periphery of said disk, an arm attached to said bell-crank lever extending in a general direction nearly tangential to said block, a projection on the end of said last-mentioned arm extending partially across the face of said block, a shear-blade fitted in the edge of said projection, a pocket formed in the fixed half of the block adapted to receive the said projection when the said bell-crank lever is in such position that its said stud will rest on the periphery of the said fixed disk, a shear-blade attached to the edge of said pocket adapted to register with the before-mentioned shear-blade for the purpose of severing a wire, the said pocket extending outward past the center line of the block, a removable half to each of said blocks, a pocket in said removable half adapted to embrace and contain the extending walls of

the aforesaid pocket in the fixed half of the block, the removable half of the block being provided with a large central opening adapted to nearly fit a concentric rib formed with the fixed half of the block, the part of the removable half of the block which nearly comes in contact with the said concentric rib of the said fixed block being formed by lands with intermediate notches, a circular clamping-piece having a bored central portion which loosely fits an externally-turned portion of the extending hub of the said fixed block, this clamping-piece being fitted at its outer edge with lands and notches for the purpose of engaging with the said removable half of the block and for the purpose of being readily disengaged by turning through a small arc, thus permitting the lands of the said clamping-piece to come opposite the notches of the said removable half of the block, a stud fastened in the end of each block-shaft, extend-

ing through each of said clamping-pieces, and having a nut on its outer end for tightening and loosening the said clamping-piece upon the removable half of the block, slides located above said blocks, carriages adapted to move on said slides in a direction longitudinal to the bench, wire-deflecting sheaves carried on studs attached to said carriages, two sheaves being attached to each carriage, and racking mechanism for moving the carriages on said slides for the purpose of changing the direction of the wire, all arranged substantially as specified, and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN COFFIN.

Witnesses:

H. A. SHIELDS,
E. E. SLICK.