

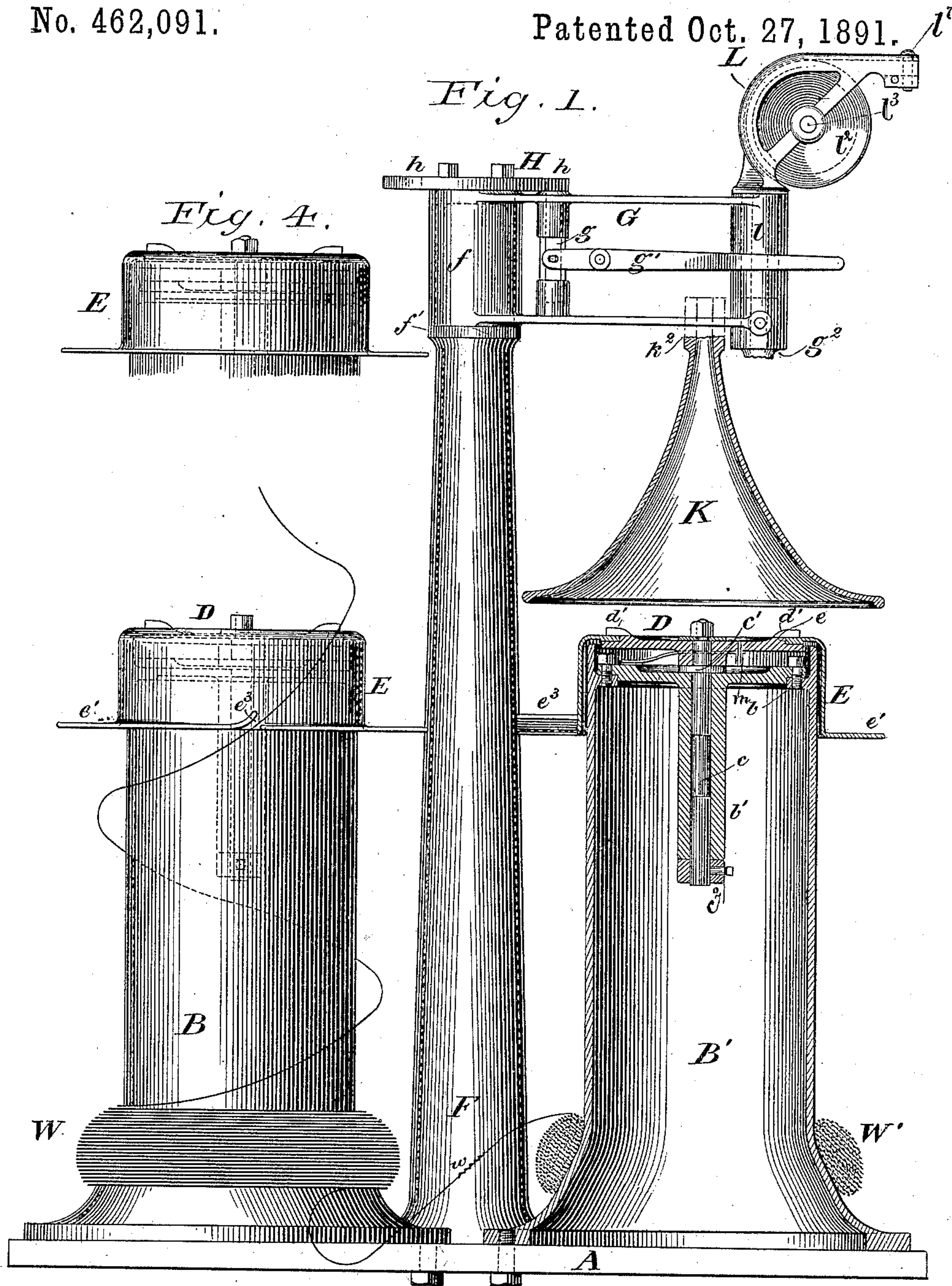
(No Model.)

3 Sheets—Sheet 1.

J. COFFIN, Dec'd.
E. F. COFFIN, Executrix.
REEL FOR PAYING OFF WIRE.

No. 462,091.

Patented Oct. 27, 1891.



Witnesses
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E. F. Burkhardt.

Inventor
John Coffin

(No Model.)

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Fig. 2. Patented Oct. 27, 1891.

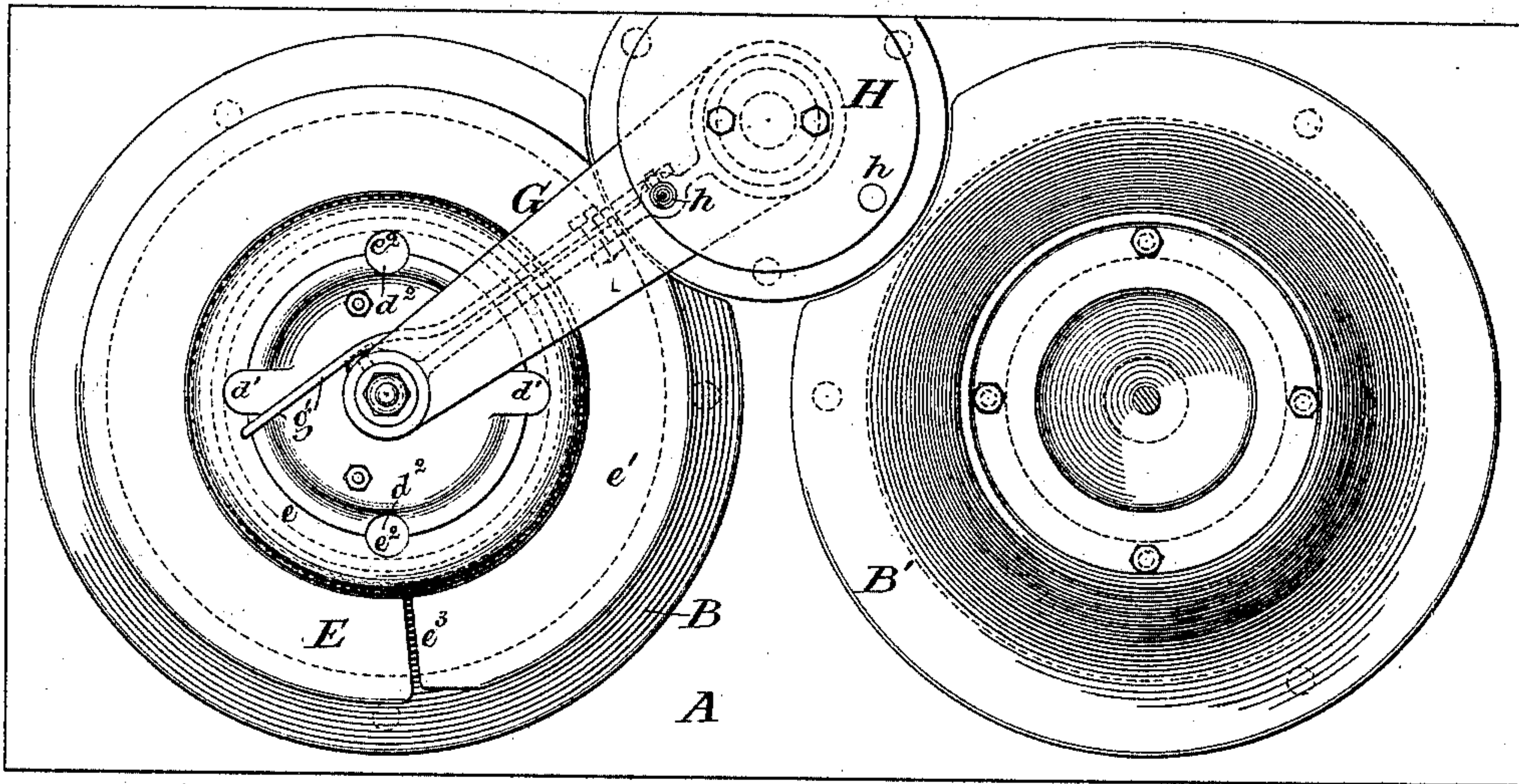
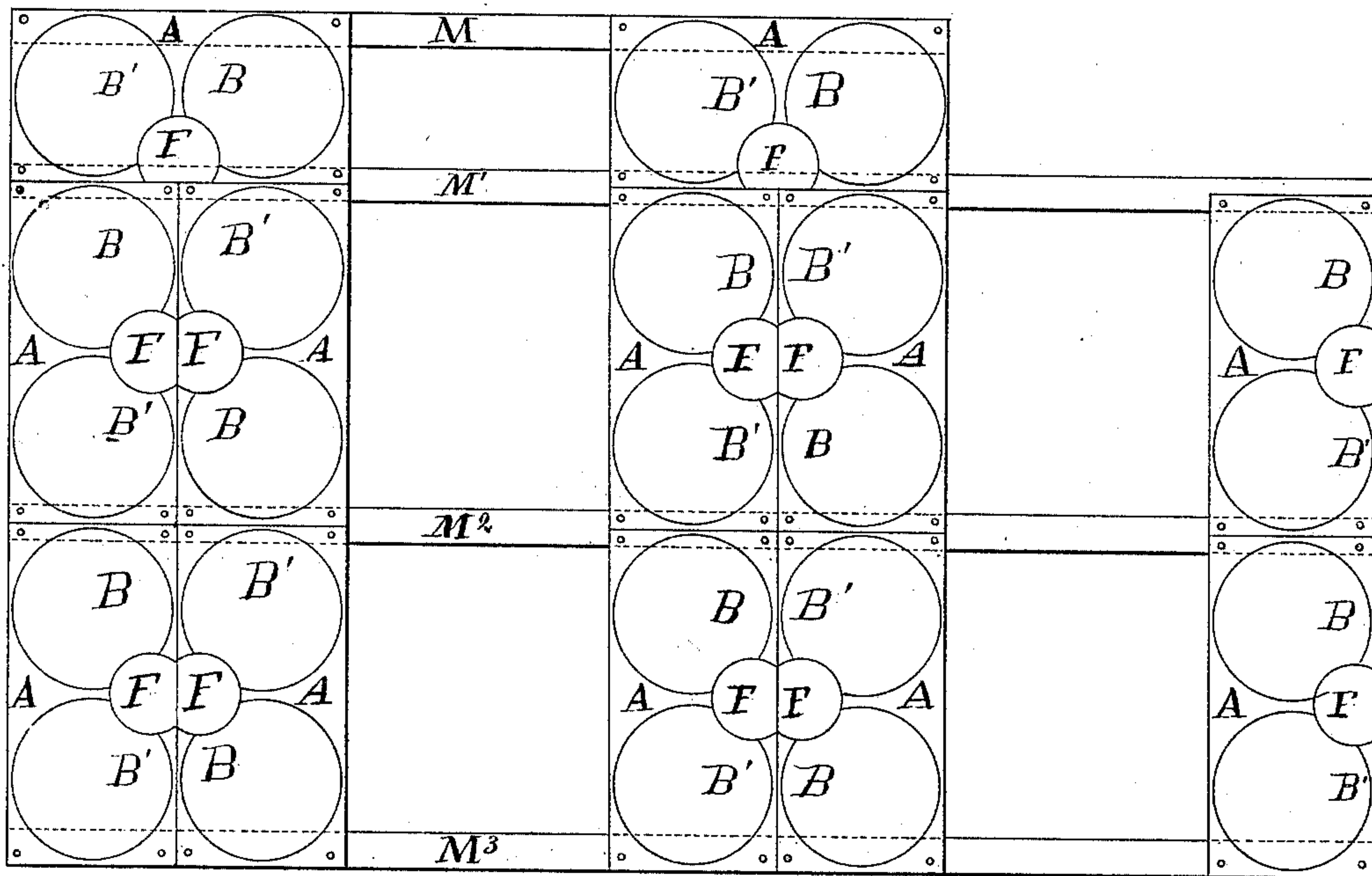


Fig. 3.



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Fig. 6.

Fig. 8

Fig. 5.

Fig. 7.

Fig. 9.

Fig. 10.

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UNITED STATES PATENT OFFICE.

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REEL FOR PAYING OFF WIRE.

SPECIFICATION forming part of Letters Patent No. 462,091, dated October 27, 1891.

Application filed May 20, 1889. Serial No. 311,451. (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 Reels for Paying Off 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," by continuous operation, it is necessary to the successful working of the process that the wire be kept in constant motion through the apparatus. To do this it is necessary to have the paying-off reels so arranged that the joints between the successive bundles of wire can be thoroughly made while the jointed portion of the wire is at rest, and the paying-off operation must continue from coil to coil without being arrested.

My invention relates to an improved apparatus for accomplishing this result.

The object of my invention is to facilitate galvanizing and other continuous operations on wire by providing suitable paying-off reel which will permit of making careful joints and also permit the wire to be constantly paid off from the reel.

My paying-off reel consists in two fixed vertical stands, around which the coils of wire are placed and over the top of which the wire pays in coils. While it is paying from the top of one of these vertical stands a new bundle is placed on the other and the joint properly made. A suitable guide for the outgoing wire is located over these stands and adapted to be moved from one stand to the other as the paying-off operation changes from one stand to the other. The bundles being at rest, the last end, commonly termed the "back end," of the bundle which is being paid off is jointed to the first or front end of the coil, which is placed on the other stand, and when the coil is all paid off from one stand the guiding arrangement is shifted,

so as to commence paying off from the other stand.

A general description of my invention is as follows:

Upon the flat foundation-plate is bolted two upright stands, made of hollow castings of a diameter something less than the inside diameter of the coils. These stands flare at the bottom and terminate in flanges for receiving the bolts which bolt them in place. The object of the flare at the bottom is to support the bundle of wire on a conical surface, which will assist in evening up the bundle and prevent the coils from becoming entangled with each other. Located between these upright stands, but not on the line joining their centers, is an upright column, which is also bolted to the foundation-plate. This column is higher than the paying-off stands, and its upper part is turned cylindrical. At the lower part of this cylindrical-turned portion is a collar cast integral with the column. A swinging arm is bored to fit over the cylindrical-turned portion and rest upon the collar spoken of. The outer end of this arm carries a flaring trumpet-shaped casting, which I will call a "hood." The axis of this hood may be made to coincide with either of the paying-off stands at the will of the operator by swinging the arm spoken of to proper positions. The upper part of the column above the cylindrical portion is faced, and upon this face is bolted a disk, which extends over a portion of the swinging arm. This disk is provided with holes adapted to receive a sliding bolt located in the swinging arm. The bolt is fitted to slide vertically into the retaining-holes in the disk, and is actuated by a hand-lever. The retaining-hole is drilled in the disk in such position that when the bolt in the swinging arm is engaged with either of them the hood will be vertical over one or the other of the paying-off stands. The wire from the paying-off stands passes up through the hood and through a hole in the outer end of the arm. The hood, having an outside turned portion, is held by a set-screw in the bored portion of the swinging arm.

The wire after passing through the swinging arm passes around a pulley, which is held in a swinging frame, which is free to revolve on a turned portion, which fits the outer end of the swinging arm, the axis of this turned portion being coincident with the axis of the hood. By means of this pulley supported by this swinging frame the wire may be led from the reel in any direction. Sometimes one coil of the wire becomes entangled with another coil and it is necessary to have some device to open out this tangle. I employ for this purpose a casting, which I call a "spreader." This spreader is shaped some like a hat and rests over the top of each of the paying-off stands. It is connected to a short vertical shaft located within the paying-off stand, so that it can turn on this shaft, and it has in the rim portion, which extends over the upper part of the paying-off stand, a slot, through which the wire passes and by means of which snarls are taken out of the wire.

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

Figure 1 is an elevation of my improved reel, one of the paying-off stands being shown in section. Fig. 2 is a plan of the same. Fig. 3 is a plan showing the arrangement of twelve of my improved reels to serve wire to a galvanizing plant of twelve-wire capacity. Fig. 5 is a detail showing a modification of my spreader. Fig. 5 is an elevation of the guide-pulley and frame attached to the upper part of the swinging arm. Fig. 6 is a sectional plan on line 6 6 of Fig. 5; Fig. 7, an elevation of the pulley-frame with the pulley omitted; Fig. 8, a section of pulley-frame on line 8 8 of Fig. 5; Fig. 9, a plan of a detail of the spreader attachment, and Fig. 10 an elevation of the same.

Like letters of reference refer to like parts throughout.

Referring to Figs. 1 and 2, A represents the foundation-plate of my reel. B and B' represent the vertical paying-off stands. These stands are flared at the bottom to properly support the bundles of wire W and W'. The stand B' is shown in section in Fig. 1, and it will be noticed that it is hollow and has formed near its upper part an internal rib, (represented by b.) The upper surface of this rib is faced, and upon it is bolted the bearing-piece b', which is bored throughout its length to receive freely the shaft c, the shaft c being turned smaller in its central part to reduce the bearing-surface. The shaft c has near its upper part a collar, (marked c',) which is adapted to bear upon a suitable faced portion of the bearing-piece b'. c² represents a collar fastened by means of a set-screw on the lower end of the shaft c. The detachable collar c² and the fixed collar c' hold the shaft c endwise in proper position. Secured to the upper end of the shaft c and

clamped between the collar c' and the nut on the end of the shaft is the disk D.

Referring to Figs. 9 and 10, which show a detail of this disk, d represents a turned portion. d' represents two lugs extending over this turned portion, and d² represents recesses formed in the turned portion d, as is clearly shown in the drawings. m represents a small pipe fastened in a hole in the disk D, through which oil may be fed into the annular space on the top of the bearing-piece b', whence it flows in grooves cut in the bottom of the annular space toward the center of the shaft c for the purpose of lubricating its bearings.

E, Figs. 1 and 2, represents the spreaders, one of which is placed over each paying-off stand. These spreaders have a bored portion, (indicated by e,) which is adapted to fit loosely on the turned portion d of the disk D, and when placed in position on the disk D the spreader E is held in place by the lugs d'.

e², Fig. 2, represents two recesses formed in the bored portion of the spreader E. The spreader E may be turned on the disk D until these recesses e² coincide with the lugs d' of the disk D. The spreader E may then be removed by lifting it from its seat. When attached to the disk and turned to the position shown in Fig. 2, the recesses e² coincide with the recesses d², and a loose piece of iron—such as a nut or small disk—may be dropped into the circular recess formed by the union of the recesses in the disk D and spreader E, whereupon the disk and spreader are held from turning upon each other. When locked in this position, the spreader E may revolve with the disk D and shaft c. The rim of the spreader (indicated by e') has in it a slot e³, as shown in Figs. 1 and 2. Through this slot the wire passes, and as the several coils of wire are paid off from the stand the spreader E turns around, and if the wire becomes slightly entangled the rim e' retains back the entangled coil, allowing the proper coil to be paid off through the slot e³. It may sometimes occur that there, will be a little catch or obstruction in the passage of the wire, which, when it is relieved, will allow the wire to pay so rapidly from the stand that the spreader will be revolved at too high a rate of speed. Its inertia would then, if there was no provision against it, cause the accelerated revolution of the spreader to continue and more wire would be delivered through the slot e³ than would properly pass through the hood without becoming tangled. To prevent this continuance of a too rapid movement of the spreader E, a friction-brake is applied to it. This brake is shown in Fig. 1 and also more clearly in Figs. 9 and 10. It consists of a U-shaped spring attached to the under side of the disk D, and is represented by d³.

d⁴ represents a friction-pad which is adapted to bear on a suitable-faced portion of the fixed bearing-piece f'.

Passing through the disk D and accessible from the upper side are screws (indicated by

d^5) by means of which the tension of the spring d^3 may be regulated.

I will now describe the means of guiding the wire after it leaves the paying-off stands.

5 Referring to Fig. 1, F represents a column, the position of which is shown in Fig. 2. Its upper portion f is turned to receive a bored portion of the swinging arm G. The turned portion f terminates at its lower part with the shoulder f' . Bolted to the top of the column is a disk H. The arm G is retained endwise by means of the disk H and the shoulder f' . The fit of the arm G for the turned portion f is free, so that it may be readily swung from
 15 one position to another. g represents a vertical bolt sliding in suitable bearings in the arm G and actuated by the hand-lever g' . This bolt is adapted to be thrown upward into the holes h in the disk H. The swinging
 20 arm G is not represented in its true position in Fig. 1, but is conceived to be swung past its position over stand B', so as to be viewed squarely for the sake of more clear representation in the drawings. K represents the hood,
 25 which is of trumpet-mouthed shape, and is adapted to receive the wire from the paying-off stands in its large end and deliver it properly freed from kinks through its small end. The outer end of the arm G is bored at g^2 , so
 30 as to receive a turned portion of the hood K, (represented by k^2 .) A set-screw in the arm G retains the hood K in position. The hole g^2 , through the outer end of the arm G, extends entirely through the arm G and is of uniform
 35 size throughout. The upper portion of this bored hole receives loosely a turned portion of the pulley-frame L, as represented at L. In Fig. 2 the arm G is represented in proper position over the stand B. By releasing the
 40 bolt g by means of the hand-lever g' the arm G may be swung so as to come in proper position over the stand B'. The hood K, being attached to the arm G, is carried with it and will assume a position such as is shown in
 45 Fig. 1. In Fig. 2 the hood K is omitted for the purpose of making the drawings more clear.

I will now describe the pulley-frame L with its pulley.

50 Referring to Figs. 5, 6, 7, and 8, L represents the pulley-frame; l , the turned cylindrical portion, which fits freely in the arm G. l' represents a hole extending through the cylindrical portion l . l^2 represents the pulley in place, which is supported and free to
 55 turn on the pin l^3 . The pulley l^2 is an ordinary grooved pulley. The peculiarity of the frame and pulley considered together is in the construction of the pulley-frame, whereby the wire is properly guided into the pulley-groove and retained therein. Referring to Fig. 6, it will be seen that the pulley-frame has two ribs or flanges represented by l^4 ,
 60 which extend partly around the pulley l^2 , concentric with it. These flanges extend into the groove of the pulley and have embraced between them the groove l^5 . Thus it will be

seen that the ordinary arrangement is reversed. A groove in the pulley-frame concentric with the pulley and extending part
 70 way around it is embraced by the rims of the pulley itself. The hole l' , extending through the cylindrical portion l , terminates in this groove l^5 , so that wire cannot come out of the hole l' without coming into the groove l^5 , and
 75 being in the groove l^5 it must be in the groove of the pulley l^2 , because the groove of the pulley l^2 embraces the groove l^5 of the frame. l^6 represents an extension of the pulley-frame to serve as a guide to permit the outgoing
 80 wire to more effectively change the direction of the pulley by swinging the frame upon its cylindrical bearing l . l^7 represents rivets dropped in suitable holes. The object of these rivets is to form contact-points for the
 85 wire, which are easily replaced when worn by the running wire.

To be effective on all kinds of wire I have found a modification of my invention is necessary. Fig. 4 represents such modification
 90 and consists in having the spreader E constructed without the slot, (represented by e^3 in the other figures.) In this modification the wire passes around the outer edge of the rim of the spreader and the spreader itself
 95 need not revolve. The spreader acts to prevent more than the proper coil of wire from being paid off, because it is too large in outside diameter to permit the passage over it of
 100 a coil which has not previously been somewhat enlarged. This enlargement takes place on the coil which is immediately being paid off, and is not possible on any of the other coils of the bundle. On the smaller sizes of
 105 wire I have found this modification to give the best results.

Referring now to Fig. 3, which is a plan showing the arrangement of twelve of my improved reels to serve wire to a galvanizing-
 110 plant of twelve-wire capacity, B and B' represents the stands, F represents the posts, and M M' M² M³ represent the foundation-frame, to which the stands are attached by their bases A.

Having fully described my invention, I will
 115 now proceed to describe the manner of operating the same.

Let us imagine the arm G in the position shown in Fig. 2 and securely locked in this position. Wire from the bundle
 120 W is being paid off and is either passing through the slot in the spreader, as shown in Fig. 1, or around the edge of the modified form of spreader, as shown in Fig. 4. It passes up through the hood K and through
 125 the hole l' in the pulley-frame around the pulley l^2 and between the rivets l^7 . It will progress in this manner until the bundle W is exhausted. While the bundle W is being paid off the operator removes the spreader
 130 upon the stand B' and places a new bundle of wire W' upon this stand and replaces the spreader. He then joints the front end of this bundle to the back end of the bundle

which is being paid off. This joint is represented by *w*. As the last coil comes off the operator raises the hand-lever *g'*, thus releasing the bolt *g* from the hole *h* in the disk H, and swings the arm G to its new position over the stand B', when the weight of the lever *g'* causes the bolt *g* to engage with the other hole *h* of disk H. The loop of the wire now falls over and rests upon the outside of the spreader-rim, around which it travels until it coincides with the slot in the spreader-rim, when it falls in this slot, and the operation continues. If the modified form of spreader is in use, there being no slot in the rim, it continues to pass around the edge of the rim. While swinging the arm G from one position to the other the pressure of the outgoing wire upon the rivets *l'* swings the pulley-frame on its bearing, so that the pulley is always parallel to the direction which the wire takes.

Having fully described my improvement and the manner of operating the same, what I claim as my invention, and desire to secure by Letters Patent, is--

1. A wire-paying-off apparatus consisting of two fixed stands for holding the bundles of wires, a guide having an opening located in the direction of lines parallel to the axes of the stands, and means for movably supporting the guide and permitting it to be shifted to the end of either stand for the purpose of changing the paying-off operation from one bundle to another while the wire is continuously being paid off, substantially as set forth.
2. In a wire-paying-off reel, the combination of two vertical paying-off stands, a vertical column extending above the top of these stands, an arm swinging on a bearing formed on this column, power or other means for swinging said arm, the outer end of said arm carrying a guide consisting in a hood of trumpet-mouthed shape at its lower end and having an opening at its upper end for the passage of the wire, through which the wire can pass while being paid off, a pulley-frame pivotally connected to the outer end of the swinging arm at a point vertically over the axis of the hood for the purpose of changing the direction of the wire being paid off, so that it may be led to the proper place, and bolt mechanism whereby the swinging arm may be bolted in position, so as to bring the outer end of the arm vertically over one or

the other of the paying-off stands, and power or other means for leading the wire from the stands, substantially as and for the purpose set forth.

3. In a paying-off reel, two vertical paying-off stands adapted to receive each a bundle of wire, a guide for the outcoming wire, which may be changed by the operator from a position over one stand to a position over the other stand, and detachable spreaders attached to the top of each of the paying-off stands, each of these spreaders being provided with a horizontal rim of greater diameter than the main part of the paying-off stands, substantially as and for the purpose set forth.

4. In an apparatus for paying off wire continuously, a pair of fixed bundle-holding stands, a movable guide having an opening located in the direction of lines parallel to the axes of the stands, means for movably supporting the guide and permitting it to be shifted to the end of either stand for guiding the wire as it is being paid off, and spreaders attached to each of the paying-off stands for the purpose of opening the coils of the wire and preventing them from becoming tangled with each other, substantially as set forth.

5. In a wire-paying-off reel for paying off a single wire, a pair of vertical bundle-holding stands, a movable guide located over these stands and adapted to be moved from a position over one stand to a position over the other, and a detachable spreader located at the upper part of each paying-off stand, this spreader being circular in form and having a cylindrical portion of larger diameter than the stand, the lower part of this cylindrical portion terminating in a rim extending outward from the cylindrical portion, this rim having in it a slot in which the wire may rest which is being paid off, the spreader being detachably connected to a revoluble disk located at the upper part of each stand, whereby the spreader may revolve as the wire is paid off from the stand, substantially as and for the purpose set forth.

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

JOHN COFFIN.

Witnesses:

E. J. BURKHART,
H. A. SHIELDS.