

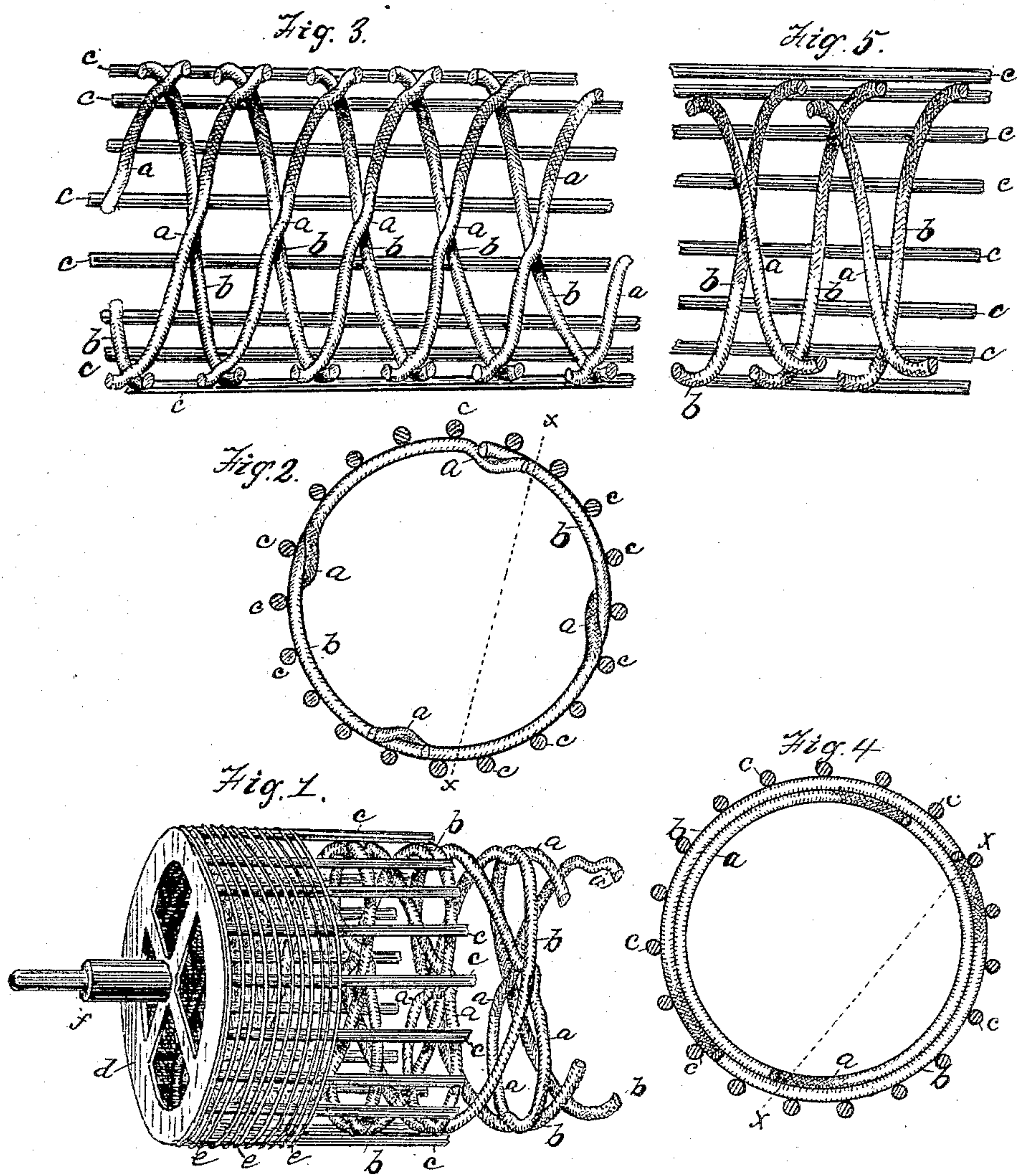
(No Model.)

A. CARPENTER & A. B. CROSBY.

ROLL FOR PAPER MAKING MACHINES.

No. 412,162.

Patented Oct. 1, 1889.



WITNESSES:

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APOLLOS CARPENTER AND ALBERT B. CROSBY, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNORS TO C. H. SMITH & CO., OF SAME PLACE.

ROLL FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 412,162, dated October 1, 1889.

Application filed February 16, 1886. Serial No. 190,534. (No model.)

To all whom it may concern:

Be it known that we, APOLLOS CARPENTER and ALBERT B. CROSBY, both citizens of the United States, residing in Springfield, in the county of Hampden and State of Massachusetts, have jointly invented new and useful Improvements in Rolls for Paper-Making Machines, of which the following is a specification and description sufficiently full, clear, and exact to enable those skilled in the branch of machinery, art, or manufacture to which the invention most nearly relates to make and construct the same, reference being had to the accompanying drawings and letters of reference marked thereon.

The object of our invention is to construct a roll which, while being light and strong and of simple construction, shall be free from the objections heretofore existing.

Our invention consists in the formation or construction of a frame for rolls for paper-making machines of a spirally-formed cylinder or cylindrically-formed spiral having spiral, curved, or annular braces which stiffen and brace the frame.

Our invention further consists in the construction of a frame of spirally-formed cylinders, one being coiled in a direction opposite the coil of the other, whereby a braced cylinder or trestle-work is formed, doing away to a large extent with the tendency to spring or flatten or to be otherwise altered from its original form.

Our invention further consists in so crimping or bending the wire as to bring it in contact with the longitudinal wires and to strengthen the roll; and, further, our invention consists in the general construction and arrangement, as herein set forth, whereby the objects of our invention are attained and the objectionable features heretofore existing are overcome.

In the accompanying drawings, in which like letters of reference indicate like parts, Figure 1 is a perspective view of a portion of a dandy-roll constructed in the manner we deem best. Fig. 2 is a sectional end view of the frame and longitudinal wires. Fig. 3 is a side sectional view of a section of a roll-frame (with longitudinal wires attached) as

seen through lines xx , Fig. 2, the view being of that portion at the left of said lines xx . Fig. 4 is a sectional end view of a section of a roll-frame (with longitudinal wires attached) wherein neither of the curved wires forming the frame is crimped. Fig. 5 is a side sectional view of the same through line xx , Fig. 4, that portion being shown at the left of said line xx .

In the drawings the cover is not shown. It is, however, of the usual well-known fine, woven, or laid wire-cloth, and is applied in the usual manner.

The winding-wires, or, in other words, the wires which support and are in immediate contact with the cover, are shown in Fig. 1 as wound upon the roll for a short distance only from the end of the roll in the foreground. The longitudinal wires are shown in this figure as extending a short distance beyond the point where the winding-wire is broken and discontinued, and the spiral frame-work formed as we deem the best is shown extending a short distance beyond the point where the longitudinal wires are broken off, the spiral wires being also broken off, so that a whole roll is not shown, but the plan of construction is fully illustrated.

In Figs. 2 and 3 nothing is shown except the longitudinal wires and an inner and outer spiral, the inner one of which is crimped where it passes the outer, a portion of the wire forming the inner spiral being brought to the same curved plane with the wire forming the outer spiral, so that the longitudinal wires will be in contact with the wires forming both spirals.

In Figs. 4 and 5 the crimping is omitted, and the inner spiral does not come in contact with the longitudinal wires, and therefore the wires of the inner spiral are not united directly to the longitudinal wires. If, however, it is desired to use plain spirals and to support the longitudinal wires directly at other points than where they are in contact with the wire of the outer spiral, then pieces may be interposed between the wire of the inner spiral and the longitudinal wires where they cross, and these pieces, (which should be only sufficiently large to give the desired strength

and holding surface,) being soldered or otherwise secured in place, will give greater rigidity and strength to the structure.

Referring now to the parts of the drawings indicated by letters of reference, the same are designated as follows:

a represents an inner coil or spirally-formed cylinder of wire, and *b* represents another coil of like construction, except that the coil is in the opposite direction and that it is of larger diameter, being wound upon the circumference of the inner spiral or cylinder.

c indicates longitudinal wires, which are secured with solder or otherwise to the spirally-formed frame, and may be of any convenient form. We prefer to use plain straight wire, the size of which is dependent upon the size of the roll and work or strain to which it may be subjected.

d indicates a roll head or end, having journal *f*. The shape, form, or construction of the head may be of the well-known and usual shape or construction, or may be varied as circumstances may direct. The heads are secured to the frame-work with solder or otherwise, after which the roll is prepared or trued up, if necessary or desirable, in the usual way by being placed in a lathe and recesses cut in the longitudinal wires for the reception of the winding-wires.

We term the wires *e*, which support the cover and are in immediate contact with it, "winding-wires."

Although there are various ways in which the spirals or cylinders may be formed, (in this respect we refer to the number of wires, amount of gain or inclination, distance of separation, and number of spiral cylinders,) we prefer to wind two wires parallel to form each spiral or cylinder. The distance of separation between the parallel wires of each cylinder should be the same, and we prefer for ordinary dandy-rolls that the slant or gain of the outer and inner spirals be the same, except, however, as before stated, the spirals being wound in opposite directions, so that each outer wire in traversing the circumference of the inner spiral once will be brought in contact with an inner wire four times. It will be observed, however, that the inner coil may be coiled in the same direction as the outer coil, and if the slant be greater then the wires will cross those of the other, and thus brace and support them, though not to the same extent as if coiled in the opposite direction. The outer and inner spirals are then secured together at the points of contact with solder or otherwise, thus forming a cylindrical frame-work, which is braced throughout its whole extent, and any tendency to sag, spring, or crush of one spiral is counteracted by the other, thus forming a light frame-work having greater strength and rigidity than the frames heretofore made having a spiral coil in one direction only.

To render the frame still more rigid and firm throughout, we prefer in many cases to

crimp or bend the wires to bring the wires of both spirals to the same curved plane at the points not in contact with each other.

We prefer to confine the crimping to the inner spiral and to bring the wires to the outer surface of the outer spiral.

It will be seen that the size of wire, distance of separation, gain and number of spirally-formed cylinders, one within the other, as well as other details of construction, will depend upon the work to which the completed device is to be subjected. The construction, however, as before stated, which we deem the best is to make the roll of a plain outer spirally-formed cylinder and a crimped inner spirally-formed cylinder.

The crimping may be done in various ways, either before the forming of the crimped spiral cylinder by bending the wire at the requisite points, or at the time of forming this cylinder by bending or forcing the wire into indentations in the "log" upon which the spiral is being formed. We prefer to form up the inner spiral and wind the outer one upon it before being removed from the log or former, after which the points of contact are united, the longitudinal wires secured in place, as before stated, and the log (which is made separable to render it easily removable) is removed and the heads secured in the usual manner.

It will also be seen that curved or spirally-formed braces or sections, either crimped or without crimp, might be used to brace or stay a spirally-formed cylinder, and an approximately like result attained without departing from our invention—that is, if the wires forming a portion of the elementary frame be not in a continuous coil or spiral, but consist of annular braces united to the adjacent annular frame-work wires, and inclined in a direction opposite thereto or in manner to cross and brace the same, then it will be seen that the same result may be attained, though not so advantageously as if the wires were continuous; or, in other words, to make this more clear, if, after the formation of the spiral, sections of it were removed and such sections or the remaining portions used to brace the frame-work as we brace it, then it will be seen that the principle of our invention will not be departed from.

We are aware that dandy-rolls have heretofore been made, as shown in United States Letters Patent to J. and R. McMurray, dated October 12, 1858, and numbered 21,268, and we make no claim to the construction therein shown, as it is the common and well-known method of construction to make the frame of a single coil or spiral, to which are secured parallel longitudinal wires, and upon which longitudinal wires winding or cover-supporting wires are wound.

We are also aware that dandy-rolls have heretofore been made having a shaft extending through the whole of the roll from end to end, from which central shaft supports or braces ra-

diate to strengthen the frame. The objections to the latter-described construction of roll are many and well known to paper-manufacturers, among which objections may be stated 5 the great weight and liability to spring, crush, or bend. The objection also to a roll having a frame made of a single coil not braced as we have set forth is the readiness with which they are gotten out of true and the great liability to sag, spring, and flatten, which objections, to which may be added the great increase of the cost of manufacture, apply also to a construction of frame of A-shaped material in single coil and without annular braces, 15 though the liability of a frame made of A-shaped material to be gotten out of shape is not as great as with the older style of manufacture.

It will be seen that the winding or cover-supporting wires, being extremely small as compared to the wire forming the frame-work of the roll, and being wound about the circumference of the frame proper and outside of the longitudinal wires, have no part in the 25 bracing of the frame-work of the roll, their function being simply to form an open bed for the cover to rest upon.

Any matter herein shown and not claimed is not hereby abandoned, but is made the subject-matter of another application, filed August 6, 1889, Serial No. 319,916.

Having therefore described our invention, what we claim as new, and desire to secure by Letters Patent, is—

35 1. A roll-frame for paper-makers' use, having two spiral coils wound or coiled in opposite directions, substantially as shown.

2. A dandy-roll frame formed of two coils of wire, one coiled in a direction opposite the 40 other and being within the coil of the other and having the larger part of points of contact united, substantially as shown.

3. The combination of spirally-formed cylinders *a b*, having longitudinal wires *c* secured thereto, with heads *d*, journals *f*, and 45 cover-supporting wire *e*, wound upon the longitudinal wire *c*, and a cover, substantially as shown.

4. A dandy-roll having suitable heads and an open-work metal frame therebetween, consisting of a series of wires wound spirally 50 upon each other in reverse directions and having their ends secured to said heads, and a series of rods extending between the latter by the sides of said wires, substantially as set forth. 55

5. A dandy-roll having suitable heads and an open-work metal frame therebetween, consisting of a series of wires wound spirally upon each other in reverse direction, and a 60 series of rods extending between said heads by the side of said wires, substantially as shown.

6. In a roll, the combination of two or more spiral coils, one within the other, and coiled 65 in the opposite direction, with longitudinal wires, winding-wires, and cover, substantially as shown.

7. A paper-maker's roll having two spirally-formed cylinders, one within the other, one or 70 both being crimped, substantially as shown.

8. A paper-maker's roll having its supporting-body made of two or more spirally-formed cylinders, one within the other, the wires of the inner one being bent or crimped to bring 75 it to the surface of the outer cylinder, substantially as shown.

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