

No. 681,243.

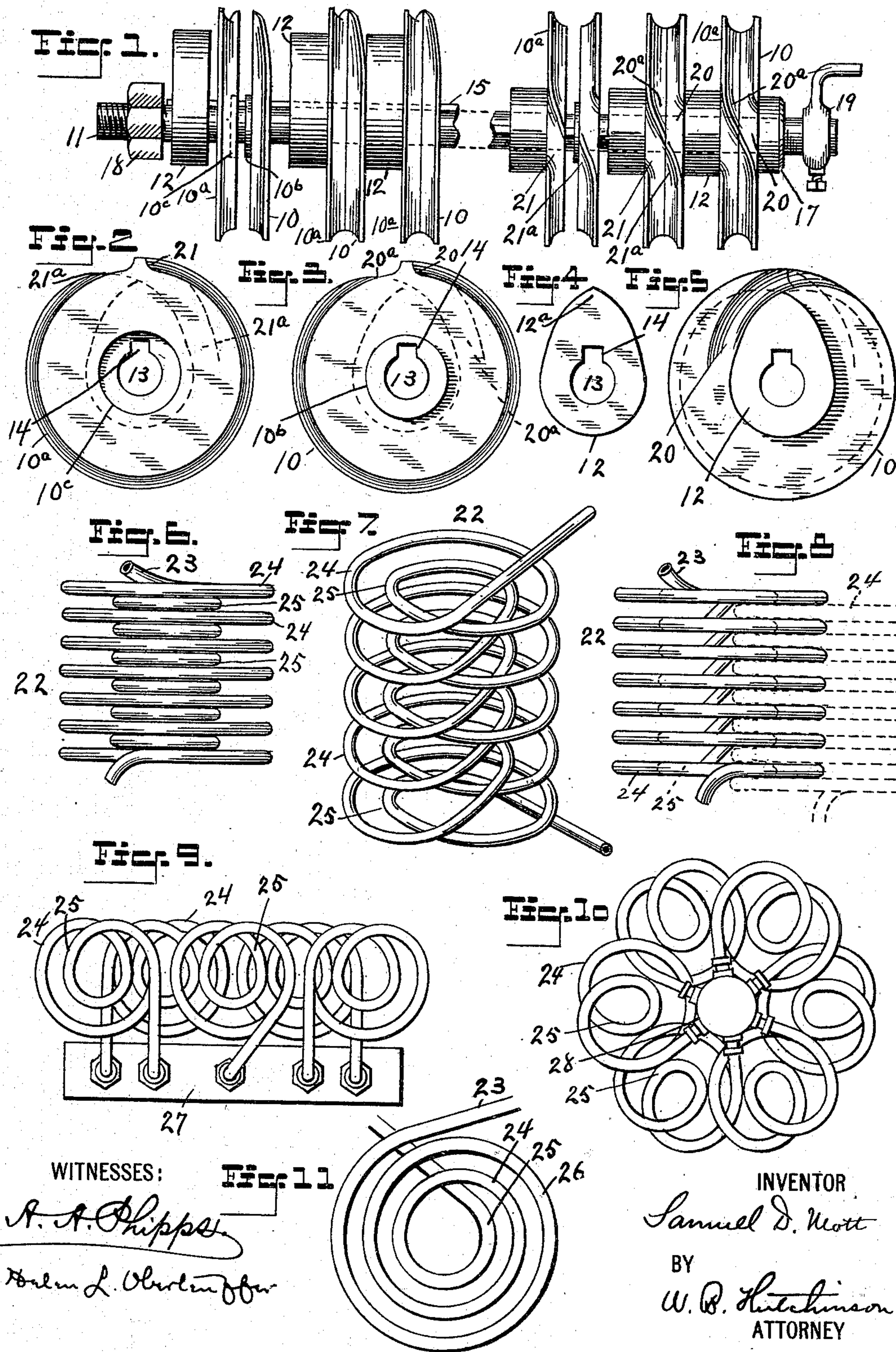
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S. D. MOTT.

APPARATUS FOR MAKING BOILER COILS.

(Application filed Dec. 4, 1900.)

(No Model.)



WITNESSES:

A. A. Phipps
Edwin L. Oberlander

INVENTOR

Samuel D. Mott

BY

W. B. Hutchinson
ATTORNEY

UNITED STATES PATENT OFFICE.

SAMUEL D. MOTT, OF PASSAIC, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MOTORMOBILE COMPANY, OF JERSEY CITY, NEW JERSEY.

APPARATUS FOR MAKING BOILER-COILS.

SPECIFICATION forming part of Letters Patent No. 681,243, dated August 27, 1901.

Application filed December 4, 1900. Serial No. 38,698. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL D. MOTT, of Passaic, Passaic county, New Jersey, have invented certain new and useful Improvements in Apparatus for Making Boiler-Coils, of which the following is a full, clear, and exact description.

My invention relates to improvements in apparatus for making coils, and especially duplex or compound coils for steam-boilers. I have invented a coil for boilers in which the tube forming a coil is made into a series of loops of different diameters, which may be essentially concentric and disposed so that a great heating-surface is produced, to the end that steam may be quickly made. Coils of this class, which I have illustrated in this application to make my invention clear, cannot be easily produced by ordinary means; and to this end the object of my present invention is to produce a very simple and inexpensive apparatus which is adapted to work easily and rapidly and to produce duplex or compound coils of the kind referred to.

With these ends in view my invention consists of an apparatus for making boiler-coils the construction and arrangement of which will be hereinafter specifically described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar figures of reference refer to similar parts throughout the several views.

Figure 1 is a broken front elevation of my improved apparatus, the disks being in part separated to show more clearly their mode of operation. Fig. 2 is an inside elevation of one of the half-disks. Fig. 3 is an inside elevation of a half-disk adapted to be opposed to the disk shown in Fig. 2, so that when the two are combined they will make a complete disk. Fig. 4 is a detail elevation of one of the collar-disks which are made to alternate with the combined disks shown in Figs. 2 and 3. Fig. 5 is an inside elevation of a combined disk collar and disk. Fig. 6 is a side elevation of one of the duplex or compound coils as it leaves the apparatus. Fig. 7 is a perspective view of such a coil when opened out slightly, as for practical use. Fig. 8 is a

side elevation of a compound coil and shows in dotted lines how a second coil may be compactly combined with it. Fig. 9 is a plan view illustrating one mode of connecting to a header coils of the kind referred to. Fig. 10 is a plan view illustrating another form of arranging the coils in connection with a central header, and Fig. 11 is a plan view of a modified form of coil.

In carrying out my invention it is necessary not only to provide means for coiling a pipe into loops of different sizes, but the apparatus must be easily separable, so as to permit the removal of the coil from the forming apparatus. To this end I use a series of disks, each made up of the two half-disks 10 10^a, as shown in Fig. 1, and the half-disks are concaved on the inner sides of their faces, so that when two of them are placed together, with their concaved parts adjacent, an essentially semicircular-faced groove will be produced, as the drawing clearly shows. This enables the pipe to lie snugly in the groove. These disks 10 10^a are used in alternation with disk-collars 12, which have the combined function of guiding-disks and of collars for spacing the disks 10 10^a, and the whole series of disks are mounted on a mandrel 11, the disks and disk-collars each having a central hole or bore 13 to fit the mandrel and having also a key-seat 14 to fit the key 15 on the mandrel. This arrangement enables the whole series of disks and disk-collars to be easily slipped on and off the mandrel, while the whole will turn in unison with the mandrel. Of course other means may be substituted for permitting the removal of the disks and disk-collars and for preventing them from turning; but the arrangement shown is simple and advisable. To permit the half-disks 10 10^a to come together snugly and to fit nicely, one can be provided with a hub 10^b and the other with a corresponding socket 10^c, as shown at the left hand in Fig. 1. The disks and disk-collars are held on the mandrel 11 between a suitable collar 17 and a nut 18, which fits the thread on the mandrel. In arranging them on a mandrel a complete disk made up of the two half-disks 10 10^a is placed on the mandrel, then a collar 12, then another

complete disk, then another disk-collar, and so on, when the whole may be clamped tightly together. The mandrel may also be provided with a suitable lathe-dog 19, so that the whole
5 affair may be placed in an ordinary machine-lathe.

It is obvious that means must be provided for guiding the pipe to be coiled on and off the several disks. To this end the part 10 of each
10 complete disk has a guide-groove 20 leading from the outside and winding gradually into the main groove, and a similar part 20^a is produced on the inner side of the half-disk 10^a, so that the parts 20 and 20^a may register
15 and a complete winding guide-groove be provided. On the other hand, after a loop is made around the complete disk 10 10^a means must be provided for the easy discharge of the pipe to the disk-collar 12. To this end
20 the guide-grooves 21 on the disk 10^a and 21^a on the disk 20 when brought into registry form a continuation or extension winds inward toward the disk-collar 12, as shown in Fig. 1 and by the dotted lines in Figs. 2 and 3.

25 The disk-collar 12 is preferably somewhat oval or elliptical in shape, as shown in Fig. 4, although it will be understood that any reasonable departure from circular shape may be made in all the disks and disk-collars, if
30 desired; but when of the shape described the high part 12^a of the disk-collar is made to come opposite the guide-grooves 20 20^a and 21 21^a of the disks, so as to make an easy transition from a disk to a disk-collar or from
35 a disk-collar to a disk.

The apparatus illustrated and described above is intended to produce the coil 22. (Shown in Figs. 6 to 10.) This is made up of
40 a pipe 23, which is formed into a series of greater and smaller loops 24 and 25. In carrying out the invention one end of a pipe 23 is made fast in some way, as by an ordinary clamp, to the collar 17 or to the mandrel 11, and the operator as the mandrel revolves
45 guides the pipe, which of necessity in boilers of this kind is light and flexible, into the guide-groove 20 of the first disk 10 10^a, and so on into the main groove of the disk, and as the disk revolves the first loop 24 will be
50 made and the pipe, which is held taut by the operator, guided through the grooves 21 21^a upon the first disk-collar 12, which it will circle and be again guided to the next disk 10 10^a, and so on, until the whole series
55 of disks have been traversed and the coil is complete. In this connection it will be understood that any necessary number of disks can be used to make a coil of the desired length. It will be seen that after a coil is
60 made it will lie snugly on the disks and disk-collars, and if they were immovable the coil could not be removed without injury; but as constructed the nut 18 may be removed and the mandrel pulled from out the disks and
65 disk-collars, which can then be easily separated, thus leaving a complete coil, which will be substantially as shown in Fig. 6. The coils

will necessarily be separated a little to remove the several half-disks 10 10^a, and before it is used it will be separated rather more, so
70 as to assume the shape illustrated in Fig. 7; but it will be understood that as coils of this kind are of light tubing they may be made to assume any more or less open shape desired,
75 while still preserving its general characteristics—that is, a double series of loops 24 and 25.

In some cases it may be necessary to combine several of the coils. In such case they can be very compactly arranged as shown in Fig. 80
8, in which the loops 25 are pressed within the loops 24, thus making the two concentric, and then the loops 24 of an adjacent coil can be made to slip between the loops 24 of the first coil, as shown by dotted lines in Fig. 8.
85 A series of these coils can be arranged with many different styles of header. This is illustrated clearly in Figs. 9 and 10, which show two of such styles. In Fig. 9 the ordinary rectangular header 27 has the pipe ends of
90 the several coils connected to it, and in Fig. 10 a central header 28 is illustrated, to which the several coils are connected, these being grouped around the header.

In Fig. 11 I have illustrated a coil like that
95 shown in Figs. 6 to 10, except that it has one more loop 26, and it will be understood that in producing such a coil another series of disks, like the disks 10 10^a, would be necessitated, which disk should be still larger than
100 the disks 10 10^a.

I claim the coil illustrated in Figs. 6 to 11 as my invention; but do not claim it in this application, although it is completely illustrated to show fully the use of the invention
105 which is set forth in Figs. 1 to 5. In the claims, as in the specification, I shall refer to the parts 10, 10^a, and 12 as "disks" and "disk-collars;" but it will be understood that by such terms I mean any equivalent devices
110 which will produce the effect described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus of the kind described, comprising a mandrel and a series of alternating guide-disks and disk-collars mounted on the mandrel so as to turn therewith, the disks having grooved faces with side extensions
115 leading toward the collars. 120

2. In an apparatus of the kind described, the guide-disks having a grooved face, each complete disk formed of two half-disks, and each half-disk having a lateral groove curving toward the center and merging into the
125 main groove of the face.

3. An apparatus of the kind described, comprising a supporting-mandrel and a series of disks and disk-collars held to slide on and turn with the mandrel, each disk having a
130 grooved face and being formed of two half-disks and each half-disk having a grooved guideway curving from the main groove of the face toward the center of the half-disk.

4. An apparatus of the kind described, comprising a mandrel and a series of alternating guide-disks and disk-collars mounted on the mandrel so as to turn therewith, the disks
- 5 having grooved faces with side extensions leading toward the collars and being separable centrally in a plane perpendicular to their axes.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL D. MOTT.

Witnesses:

JOHN D. GRIFFEN,
W. B. HUTCHINSON.