

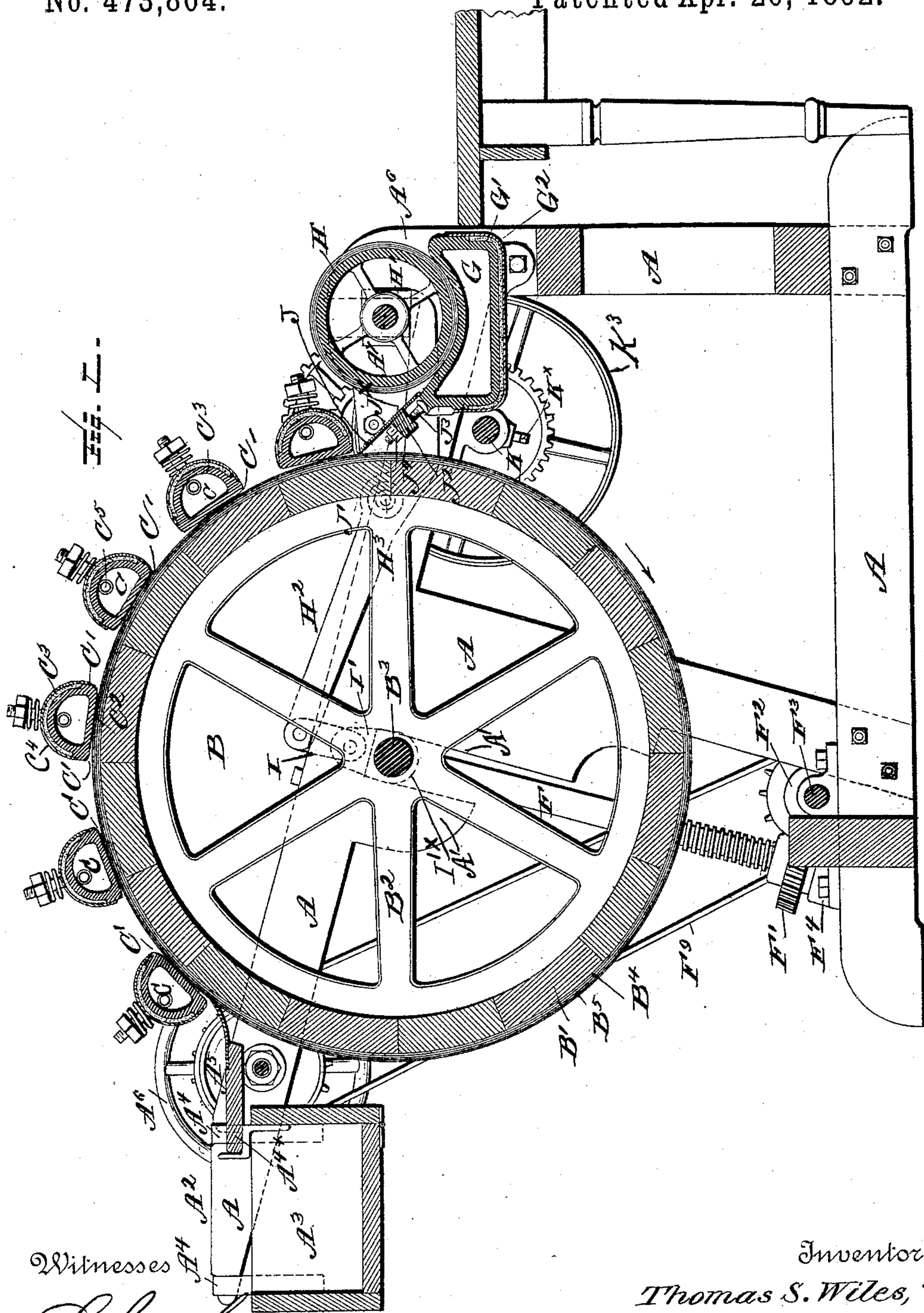
(No Model.)

3 Sheets—Sheet 1.

T. S. WILES & M. E. WENDELL.
MANGLE.

No. 473,804.

Patented Apr. 26, 1892.



Witnesses

L. C. Wills.
H. Sutherland.

Inventors

Thomas S. Wiles, and
Mexzo E. Wendell.
by *E. B. Stocking* Attorney

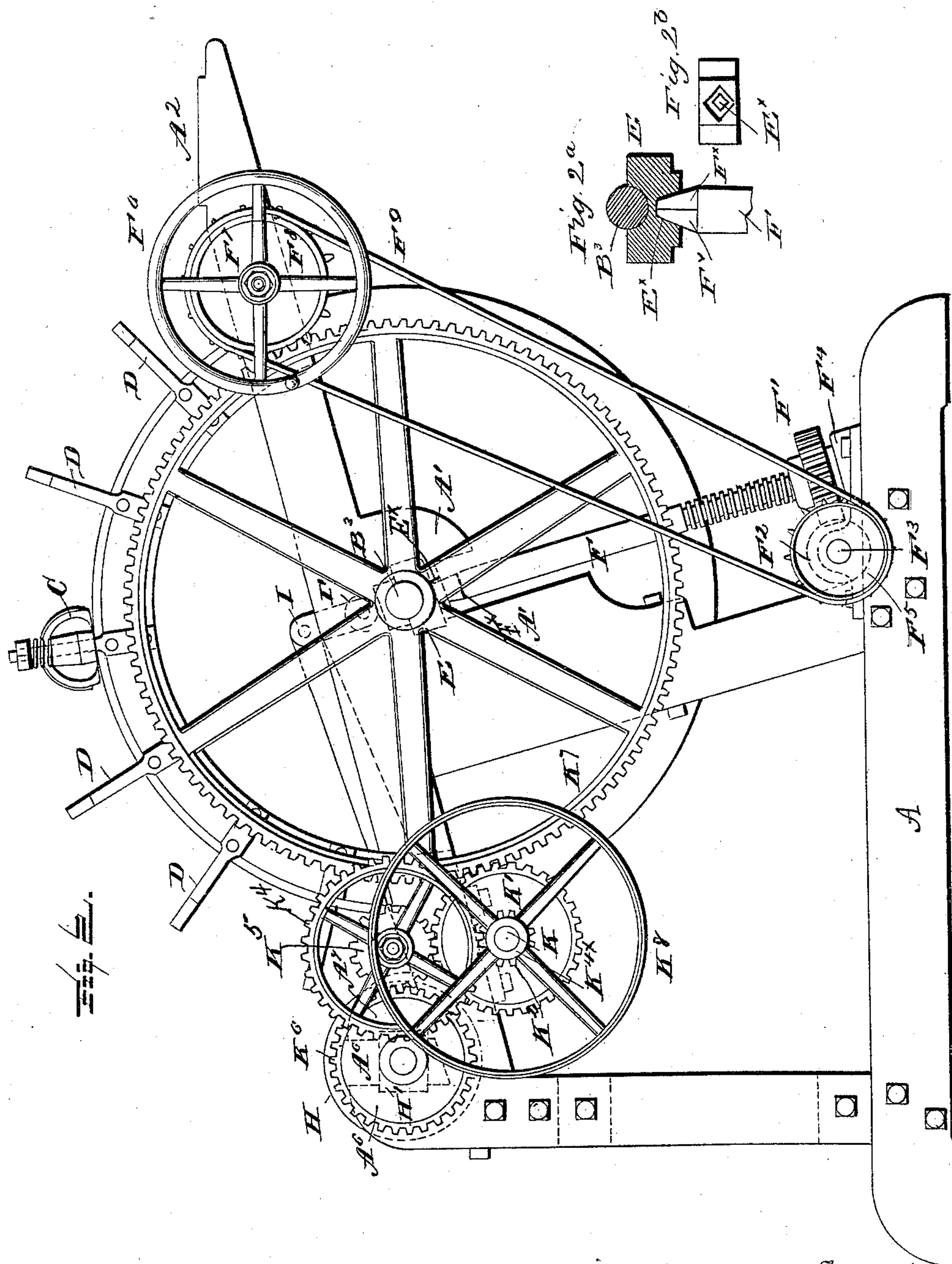
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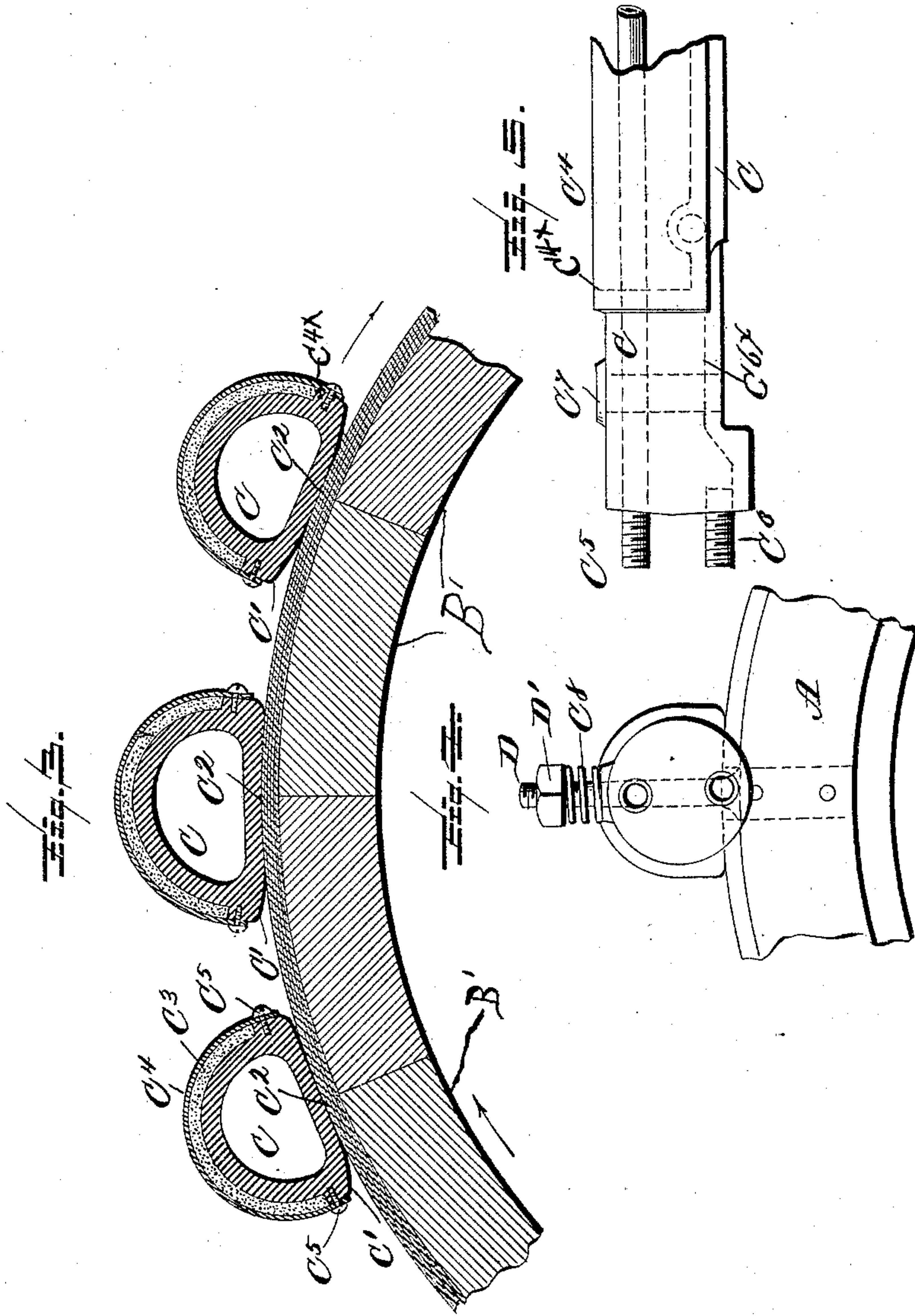
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UNITED STATES PATENT OFFICE.

THOMAS S. WILES, OF ALBANY, AND MENZO E. WENDELL, OF TROY, ASSIGNORS TO THE TROY LAUNDRY MACHINERY COMPANY, LIMITED, OF TROY, NEW YORK.

MANGLE.

SPECIFICATION forming part of Letters Patent No. 473,804, dated April 26, 1892.

Application filed March 12, 1891. Serial No. 384,769. (No model.)

To all whom it may concern:

Be it known that we, THOMAS S. WILES, residing at Albany, in the county of Albany, and MENZO E. WENDELL, residing at Troy, in the county of Rensselaer, State of New York, both citizens of the United States, have invented certain new and useful Improvements in Mangles, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to mangles; and among the objects and advantages secured thereby in ironing or finishing bed and table linen, towels, and articles of apparel are to cause the product of the machine to possess in a high degree the desirable qualities of the best hand-work, in that the fabrics are not hardened and compressed, the seams and hems are not cut nor strained in the slightest degree, the figures in damask textures stand out brilliantly, the finish is almost identical on both sides of the fabric, and is necessarily more uniform than could possibly be produced by hand.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a central vertical longitudinal section of a machine embodying our improvements. Fig. 2 is a side elevation of the same. Fig. 2^a is a section of the box E with the head of the screw shown in side elevation. Fig. 2^b is a bottom view of the box E, showing the square socket E^x for the reception of the head of the screw F. Fig. 3 is a longitudinal vertical section, on an enlarged scale, of portions of the machine; and Figs. 4 and 5 are respectively an end and a side elevation of a heating-bar.

Like letters of reference refer to like parts in all the figures.

A represents the frame-work of the machine, which may be of any suitable form and material.

B represents the drum, consisting, in this instance, of staves B', mounted on a series of spiders B², which are fixed to a shaft B³. If desired, the periphery of the drum may be of metal and either formed integrally with or

separate from the spiders. The drum is provided with an elastic covering B⁴, with a surface B⁵ of muslin or other textile fabric, which will absorb and discharge water. In fact the clothing of the drum may be such as is described in United States Patents Nos. 177,908 and 384,487.

C C represent a series of hollow bars, which are arranged at intervals around a portion of the periphery of the drum B in contact with the muslin or cloth covering and parallel with the axis. These bars are adapted to be internally heated and their surfaces at or immediately adjacent to the periphery of the drum are polished, and to increase their areas of contact with the periphery of the drum are somewhat flattened or conformed thereto.

Referring to Fig. 3, other different conformations of the flattened surfaces are shown. The bar at the left has a beveled entrance C' and a flat or plane working face or surface C², while the working face or surface C² of the central bar is concave with the curvature approximating the curvature of the periphery of the drum, except at its beveled entrance C', while at the right of said Fig. 3 the bar C is convex on the first and last thirds of its working surface. The preferred form is that shown at the central bar, as it affords a larger area of contact of the bar with the clothed periphery of the drum, thereby increasing the heating efficiency of the bars and distributing the pressure more equally. The differences between the working faces are merely extent of contact. The unemployed surfaces of these bars C are, as far as practicable, covered with asbestos, felt, or other non-conducting material C³, which is retained in place by jackets C⁴ of sheet metal secured by screws C⁵ or in any other desired manner.

Dotted line C^{4x}, Fig. 5, represents a flange or rib on the margin of the heated bar C, and this rib produces a recess on the upper portions of the bar and the metal jacket C⁴ completes the inclosure of the non-conducting material C³.

Each of the bars C is mounted in position in such a manner that they remain stationary while the drum rotates in the direction indicated by the arrows, and each bar is

adapted to be heated by any means that would serve to heat an ironing or calendering roller—for example, by gas, according to the specification of United States Patent No. 165,775, or by electricity by transmitting a current of suitable tension and quantity through resistances contained in the cavities of the bars suitably arranged and insulated in accordance with the well-known principles of electrical heating devices and with the skill of persons conversant in applying the same to various mechanisms. Steam may advantageously be employed as the heating agent, in which case each of the bars is provided with an inlet-pipe C^5 and an outlet-pipe C^6 , which is so arranged slightly below the floor C^{6x} of the chamber of the bar as to receive and convey from the bar the water of condensation. The inlet-pipe C^5 is preferably extended for some distance within the bars, so as to insure a more even circulation and distribution of the steam and the heat derived therefrom.

Any suitable arrangement of steam connections may be employed between the various bars. If desired, flexible hose may be employed to conduct steam thereto. In this instance the bars are sustained in operative relation to the drum by being mounted upon arms D , formed on or secured to the frame of the machine and projecting radially at or near each end of the drum. These arms pass through apertures C^7 in the bar C , and coiled springs C^8 are interposed between the bars and the nuts D' , which are screw-threaded on the arms D . In this manner the bars are prevented from moving circumferentially, but are permitted to have a slight movement radially away from and toward the surface of the drum for the purpose of adjusting the pressure of the bars upon the goods during the process of ironing the same. It is apparent that the bars may be supported operatively by other details than the arms D , and while such arms are the preferred form our invention is to be understood as in no sense being limited to said arms.

The drum B is supported in open or any other well-known form of boxes E , Fig. 2, fitted to the shaft B^3 and to slide between jaws A' , formed by slotting the frame of the machine, the boxes being supported on the upper ends of screws F , there being one at each side of the machine, which screws engage with gear-nuts F' , adapted to mesh with the worms F^2 , mounted on a transverse shaft F^3 , extending across the machine. The geared nuts F' rest in sockets or steps F^4 , bolted to the frame, which steps are apertured for the passage of the screw F therethrough. The upper ends of the screws F are connected with the boxes E in such manner that said screws cannot rotate by being fluted or squared, as seen at F^x , Figs. 2^a and 2^b, and fitted in corresponding sockets E^x in the boxing or in any other manner known to skilled mechanics. The shaft F^3 carries a sprocket-wheel F^5 . A hand-wheel F^6 , mounted on a stud F^7 and operatively connected with

a companion sprocket-wheel F^8 , is located at the feed end A^2 of the machine. A sprocket-chain F^9 connects the sprocket-wheels F^5 and F^8 with each other, so that an operator, by turning the hand-wheel F^6 , may rotate the shaft F^3 and the worms thereon, whereby the nuts F' are turned so as to elevate or depress the screws F , and thus raise or lower the drum B , and regulate the pressure thereof against the hollow heated bars. By lowering the screws sufficiently the drum may be completely removed from the machine for any desired purpose.

A^3 represents a trough or box in which goods may be laid preparatory to feeding them to the mangle. This box or tray is suspended from the ends of the frame by hooks A^4 , so that it may be easily removed. The frame may be notched at the points of bearing of the hooks thereon to prevent accidental displacement of the tray.

A^{4x} is the feed-table of the machine, one end of which bears slightly upon the clothing of the drum and acts to guide the goods between the drum and the first-heated bar of the series. Any other form of guiding appliance may be used.

As thus far described, it will be seen that the drum B constitutes an immense ironing-table. There is also ample opportunity for the escape of moisture from the clothing of the drum by evaporation after the clothing passes the last-heated bar of the series and before it comes again under the first bar of the series.

Furthermore, the impairment of the elasticity or resiliency of the clothing of the drum and its general deterioration will be inversely as its extent. The heated bars are like so many heated flat-irons in their action on the goods under treatment, and especially so when the preferred form of ironing-surface (shown on the central bar of Fig. 3) is employed. The pressure is distributed over a large area, in consequence of which the finish imparted to the goods is soft, the fibers are not compressed, the hems and seams are not crushed and cut, and damask designs are brought out brilliantly.

It is obvious that the advantages arising from a diffusion of pressure extend not only to the goods under treatment, but in equal degree to the clothing of the drum, tending to its conservation.

With our present improvements goods taken from the hydro-extractor and fed directly under the heated ironing-bars of our machine on the periphery of the large drum receive in the machine illustrated six successive heats with intervals for evaporation and issue under the last-heated bar nearly dried. In fact, if the heat and speed of rotation of the drum are suitably adjusted there will remain in the goods just enough dampness for the ironing of the reverse side of the clothing, which is performed by the mechanism hereinafter described.

For finishing the goods upon one side only

the machine thus far described is complete, suitable gearing of any kind and constructed in accordance with a mechanic's skill in the art being provided for rotating the drum. The machine subjects the goods while upon an extended ironing-surface to the successive action of heated bars and provides between the bars for the escape of generated vapor from the surface of the goods and between the last and first bars of the series for evaporation from the clothing of the drum.

When it is desired to iron the goods upon both sides, we employ a steam-chest G, which extends from side to side of the machine and is provided with an asbestos protective jacket G' and metallic covering G², similar to those employed on the bars C, while its working face is concave, adapting it to fit the periphery of the clothed roll H. As the steam-chest is permanently mounted in the frame-work, the boxes H' of the clothed roll H are mounted to slide in jaws A⁶ A⁷ of the frame A, and beneath the boxes extend levers H², pivoted at H³ to the frame at each side of the machine. The opposite end of each of the levers H² is connected by a link I to a link I', (see dotted lines, Fig. 1,) which encircles the shaft B³ of the drum. The shaft-embracing portion of the link I' is shown by the dotted line I'^x, Fig. 1. Now it will be noted that by means of the connections just described, extending from the clothed roll H to a shaft B³ of the drum B and the further connecting devices extending from said shaft to the hand-wheel F⁶, the separation of the drum B from the bars C, caused by the lowering of the screws F by means of the hand-wheel F⁶ and sprocket-chain F⁹, acts through the links I I' and levers H² to elevate the clothed roll H away from the steam-chest G, thus separating the heated ironing devices from the clothed devices of the machine.

In practice when the clothed roller H is of metal its weight affords sufficient pressure for the work to be done by it. Pressure may be increased, if desired, by any of the well-known devices.

When the specific actuating mechanism, hereinafter described, is employed, that end of the roller H to which the gear K⁶ is secured is depressed by the action of the gear K⁵ and the pressure of that end increased. This inequality may be corrected by the duplication of gearing, as hereinafter set forth, or by means of a complementary weight, spring, or other pressure device applied to the bearing at the opposite end of the roller H—for instance, such as is illustrated in connection with the heating-bars C.

J is a doffer supported at each end by screws or bolts J', which pass through ears J^x, projecting from the doffer and into the frame of the machine and extending from side to side thereof transversely and from the surface of the drum to the entrance between the steam-chest G and clothed roll H, for the purpose of transferring the goods from the drum

to the steam-chest and roll, whereby they are ironed or finished upon the side opposite that acted upon by the heated bars. This doffer may be variously constructed and mounted in the machine. In this instance it consists of a piece of polished steel plate similar to that used for making saws and is of suitable dimensions and has its receiving-edge properly beveled to conform somewhat to the curvature of the drum and is secured to a bearing J², which extends from one end to the other of the plate. The bar is pierced by two screw-threaded holes, into which the screws J³ are seated and held in any desired position by jam-nuts J⁴. The heads of the screws rest on lugs or projections formed on the steam-chest G and permit of a desired careful adjustment of the receiving-edge of the doffer along its whole length on the clothed periphery of the drum B. Ordinarily the gravitative action of the doffer along its edge bears sufficiently hard against the drum B, while the adjusting-screws serve to prevent any undue pressure of the doffer on the drum as well as to properly and accurately determine the relative position of the receiving-edge of the doffer as regards the surface of the drum.

As before indicated, any suitable system of gearing may be employed to give motion to the moving parts of the machine; but we have shown herein one form which answers all the necessary requirements of the machine.

K represents a stud or shaft supported in suitable bearings and prevented from rotation by means of set-screws K^x. If desired, the shaft K may extend completely across the machine and be rotatable, if, for example, it is desired to gear it to the roll H at both ends. On the stud or shaft K there are rotatably mounted, first, and next to the frame, the simple intermediate gear K'; second, the pinion K² and the driving-pulley K³, which are rigidly connected together; third and last, the loose pulley K⁸, all being retained in position by the collar K^{4x}. The pinion K² meshes with the larger member K⁴ of the compound K⁴ and K⁵, the smaller member K⁵ of which meshes with the gear K⁶, made fast to the journal of the clothed roller H. The compound gear K⁴ K⁵ is mounted on a stud projecting from the frame of the machine, as clearly shown. The smaller member K⁵ of the compound K⁴ K⁵ also meshes with the intermediate gear K', which in turn engages with the gear K⁷, which is made fast upon the shaft B³ of the drum B. These gears are so proportioned that the surface speeds of the drum B and the clothed roller H are the same. If it is desired that the surface of the roller should have a slightly-greater speed than that of the drum, it may be accomplished by somewhat increasing the thickness of the clothing of the former. If it is desired to drive the roller H at both ends to avoid increase of pressure by the action of the gearing at one

end, the shaft should be extended to the other side of the machine, should be free to rotate the gear K', should be made fast to the shaft K, and the gears K', K⁵, and K⁶, with a stud to carry K⁵, should be duplicated at the other side of the machine.

In the particular combination of a final-ironing mechanism which involves a stationary heating-chamber which gives the action of a sad-iron on one side of the goods and which is satisfactory in its working, providing opportunity for evaporation has been afforded to the goods in the preliminary drying of the opposite surface, we consider a series of rolls in place of the fixed ironing-bars as an equivalent of said bars, so that while a series of rolls with evaporating-spaces between each two of the series would prepare the goods for final ironing upon the opposite side, such ironing could not be accomplished successfully by ironing devices, both of which are rotated. Therefore we secure the sad-iron effect on the under side of the fabric by a single passage thereof when the opposite side has been ironed by devices (either bars or rolls) which provide for intermediate evaporation. The equivalency therefore of the rolls to the ironing-bars exists only in combination with the particular final-ironing mechanism shown, described, and claimed.

We deem it proper to state that in the combination of the different ironing devices employed in this machine as a whole an advantageously co-operative action is had, in that the evaporation of moisture from the goods between the successive heated bars or rolls gives that preliminary drying of the goods in such a degree as to present them to the final-ironing devices comprising a continuous heated surface in the proper condition for final ironing, so that the inherent fault of such latter form of ironing devices is not present by reason of said preliminary drying in part and the presentation of the goods to such final mechanism with about the required amount of dampness therein insures satisfactory results. In other words, satisfactory results are produced with the final-ironing mechanism by reason of the prior operation on the goods of the separated heated ironing bars or rolls of that portion of the machine which first operates upon the goods. Therefore by combining in one machine ironing mechanism of the characters specified an efficient satisfactory machine for finishing both sides of fabrics in a satisfactory manner is secured.

We do not wish to be understood as limiting our invention to the exact details of construction herein shown and described, nor to the exact relative arrangement of the parts, nor to the particular frame-work herein shown and described, either in design or specific construction, as these matters may be changed in any regard and to any extent within the expected skill of the mechanic conversant in

the art of constructing machinery of this character.

Having described our invention and its operation, what we claim is—

1. The combination, with a clothed drum, of a series of separate stationary ironing-bars, substantially as specified.

2. The combination, with a clothed drum, of a series of separate ironing-bars capable of slight radial movement, substantially as specified.

3. The combination, with a clothed drum, of a series of hollow stationary bars adapted to be heated and means for separating the drum from the bars, substantially as specified.

4. The combination, with a clothed drum adapted to be rotated, of a series of separated hollow ironing-bars over a portion only of the drum, whereby goods carried by the drum and between it and the bars are uniformly and successively pressed and freed from the vapor produced, substantially as specified.

5. The combination, with a clothed drum, of a series of stationary separated bars adapted to be heated and mounted to yieldingly bear upon the periphery of the drum, substantially as specified.

6. The combination, with a clothed drum and co-operating separated ironing devices, of a steam-chest and a superimposed clothed roller, substantially as and for the purpose specified.

7. The combination of a clothed drum, a series of separately-stationary ironing devices arranged about a portion of the periphery of said drum and a steam-chest and coacting clothed roller arranged and operating to finish the opposite side to that acted upon by the drum and ironing devices, substantially as specified.

8. The combination of a rotative clothed drum, a series of heated ironing devices, a rotative clothed roller, a stationary steam-chest, means for elevating and depressing the drum, and connecting devices for elevating and depressing the roller, substantially as specified.

9. The combination, with an arched series of stationary separated ironing-bars, a clothed drum mounted in reciprocative bearings, and means for elevating and depressing said bearings, substantially as specified.

10. The combination, with a series of stationary ironing-bars, a clothed drum mounted in reciprocative boxes, screw-threaded standards for the boxes, rotative nuts mounted on the screws, and gearing for rotating the nuts for the purpose of elevating and depressing the drum, substantially as specified.

11. The combination, with a drum mounted in sliding boxes, of screw-threaded standards non-rotatably connected with the boxes, steps perforated for the passage of the standards and adapted to receive worm-gearred nuts fitted to the threads of the standards, a worm meshing with the nuts, and sprocket-and-chain

connections between the gear and a hand-wheel, arranged in convenient access to an operator, substantially as specified.

12. The combination, with a drum and its shaft and drum elevating and depressing devices comprising screw-threaded standards, of shaft-embracing links, levers, and a clothed roll mounted for reciprocation by the levers, substantially as specified.

13. The combination, with a rotative drum, of a series of hollow stationary ironing-bars, each having a face conforming more or less to the periphery of the drum and having a receiving-bevel, substantially as specified.

14. The combination, with a rotative drum,

of a series of bars, each provided with a beveled receiving edge on its working face and each having said working face more or less conforming to the periphery of the drum and each having its remaining portions protected by a non-conductive covering, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS S. WILES.
MENZO E. WENDELL.

Witnesses:

THOMAS CALDWELL,
CHAS. F. WILES.