No. 717,480. Patented Dec. 30, 1902.

A. J. WHITE.

VULCANIZER.

(Application filed Mar. 21, 1902.)

(No Model.) 3 Sheets—Sheet 1.

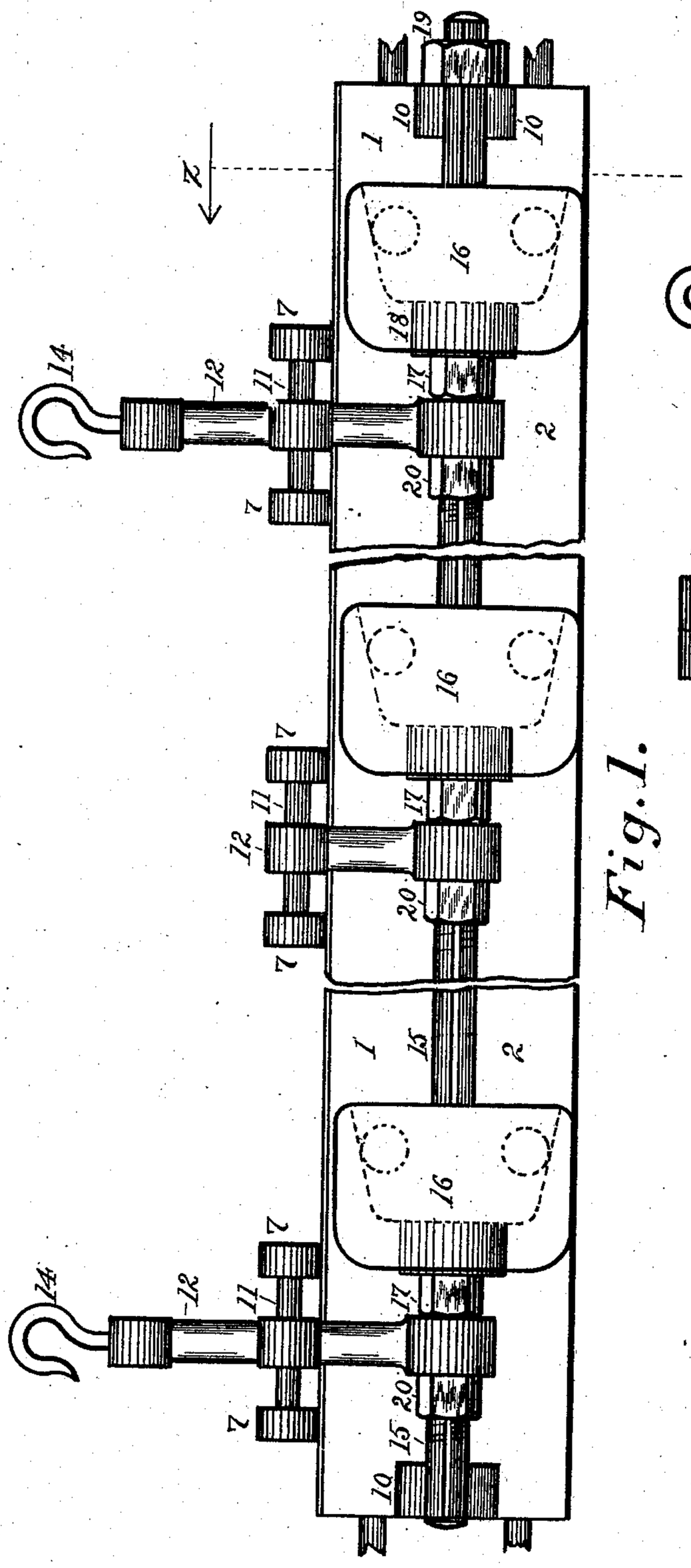

Fig. 1.

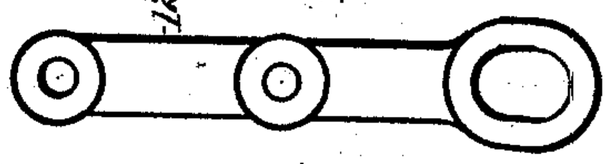

Fig. 4.

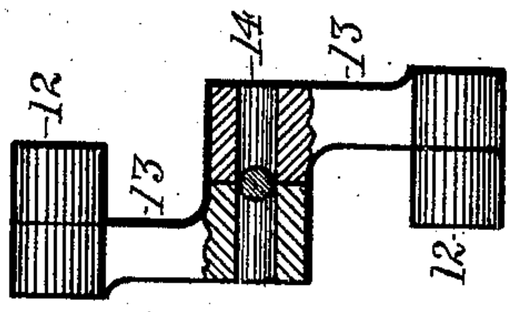

Fig. 3.

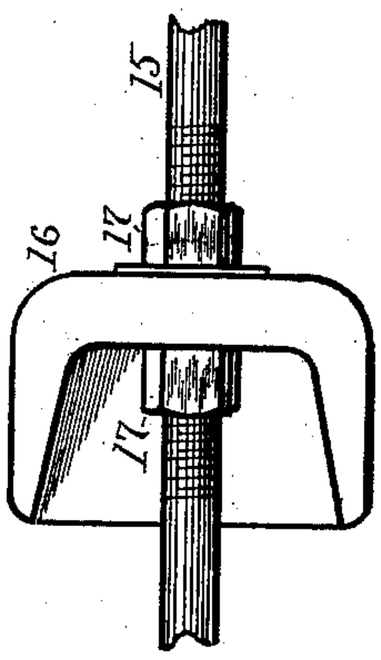

Fig. 2.

Witnesses:
Walter Bowman
Maude Gwisler.

Inventor:
Alfred J. White.
by Humphrey & Humphrey,
Attorneys.

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VULCANIZER.

(Application filed Mar. 21, 1902.)

(No Model.) 3 Sheets—Sheet 2.

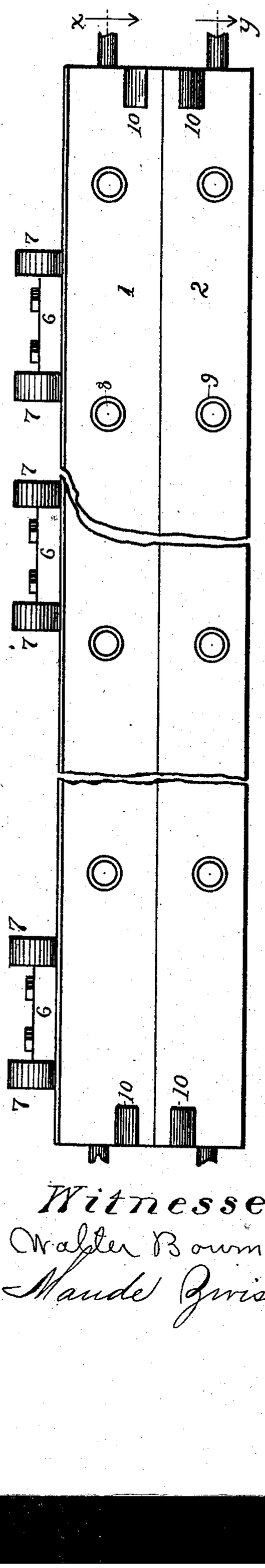

Fig. 5.

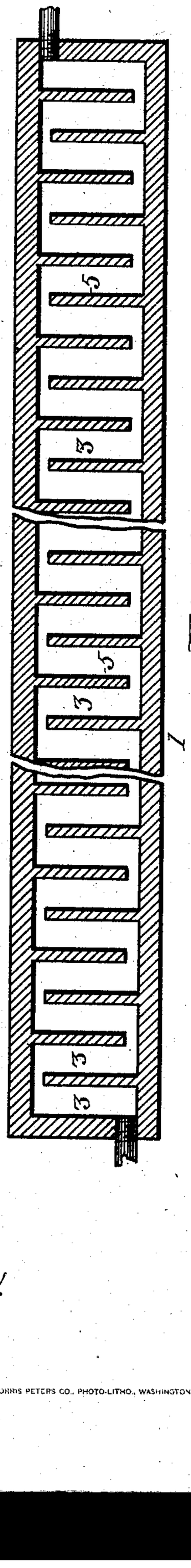

Fig. 6.

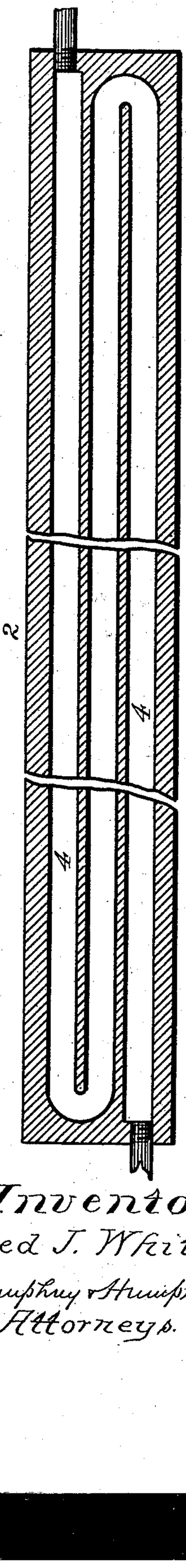

Fig. 7.

Witnesses:
Walter Bowman
Maude Grisler.

Inventor:
Alfred J. White:
by Humphrey & Humphrey,
Attorneys.

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A. J. WHITE.

VULCANIZER.

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(No Model.) 3 Sheets—Sheet 3.

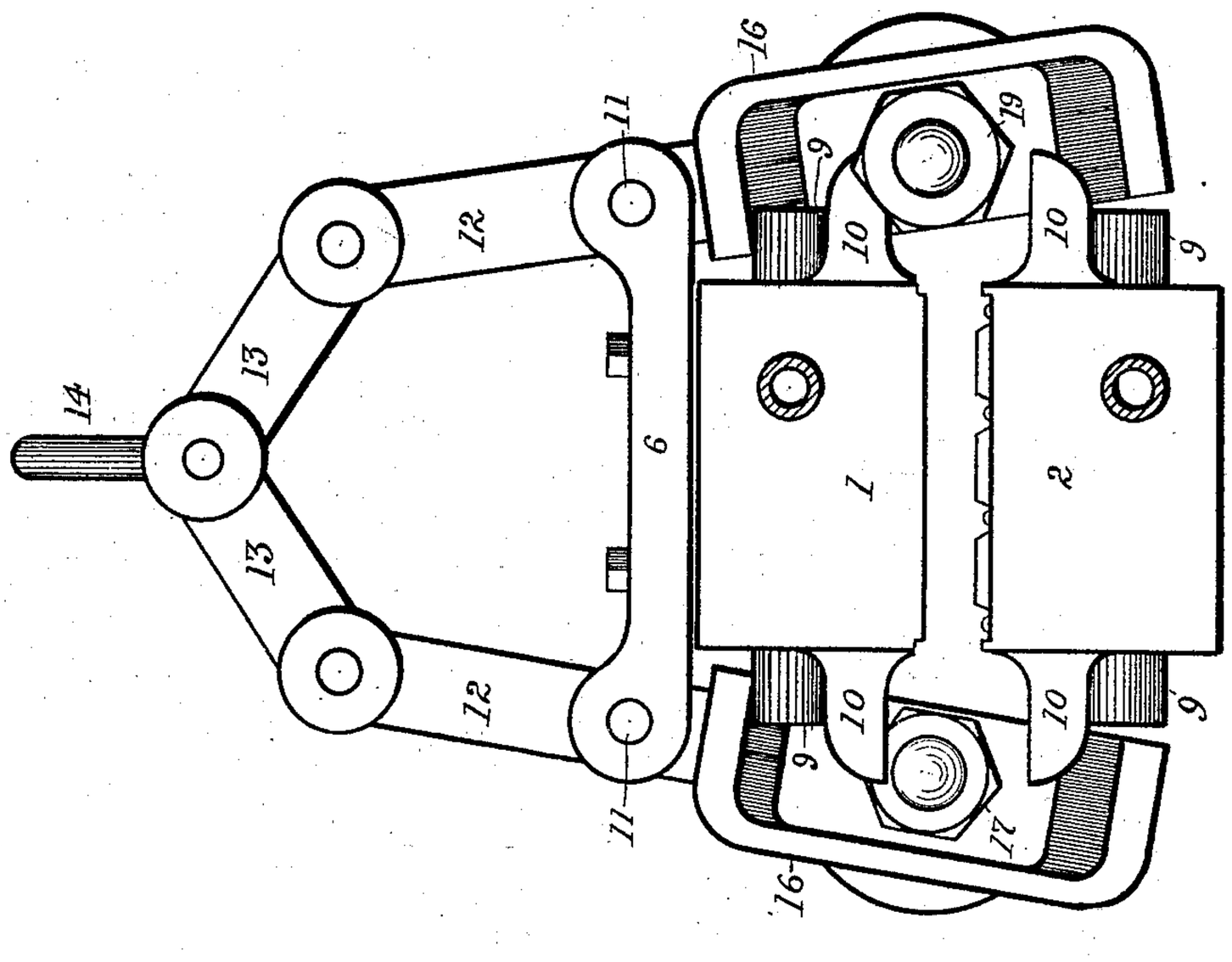

Fig. 9.

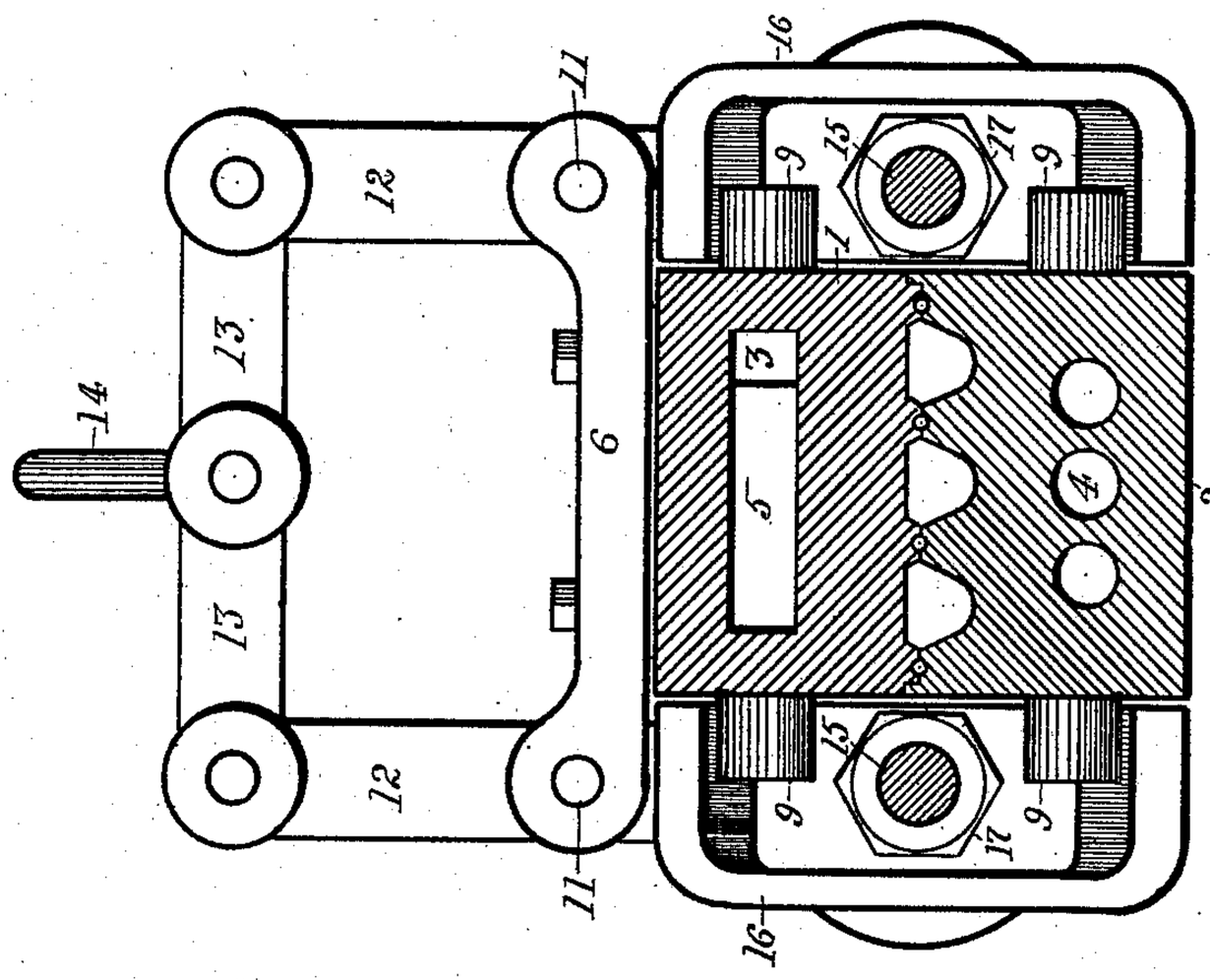

Fig. 8.

Witnesses:
Walter Bowman
Maude Grisler.

Inventor:
Alfred J. White:
by Humphrey & Humphrey,
Attorneys.

UNITED STATES PATENT OFFICE.

ALFRED J. WHITE, OF AKRON, OHIO, ASSIGNOR TO THE WILLIAMS FOUNDRY AND MACHINE COMPANY, OF AKRON, OHIO.

VULCANIZER.

SPECIFICATION forming part of Letters Patent No. 717,480, dated December 30, 1902.

Application filed March 21, 1902. Serial No. 99,317. (No model.)

To all whom it may concern:

Be it known that I, ALFRED J. WHITE, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Vulcanizers, of which the following is a specification.

My invention has relation to improvements in vulcanizers for manufacturing rubber goods, and has especial relation to the means whereby the parts constituting the vulcanizer are locked together and unlocked.

Heretofore the vulcanizers in use for long articles are retained together by a large number of ordinary bolts, whose tightening and loosening involves time and labor to such a degree as to render the operation thereof exceedingly expensive.

The object of my invention is to provide means whereby the parts constituting the vulcanizer may be rapidly, easily, and accurately clamped together and as easily separated when desired.

To attain the aforesaid objects, my invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described and then specifically pointed out in the claims, reference being had to the accompanying drawings, forming a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts in the different figures, Figure 1 is a side elevation of my improved device; Figs. 2, 3, and 4, details used in my improved device and which will be described later; Fig. 5, a side view of the vulcanizer-body with the clamping devices removed; Fig. 6, a section at the line *x* of Fig. 5; Fig. 7, a section at the line *y* of Fig. 5; Fig. 8, a section at the line *z* of Fig. 1, and Fig. 9 an end elevation of the complete machine just after the parts of the vulcanizer have been separated and the clamping devices released.

In the drawings, 1 is the upper half of a vulcanizer adapted to be used in the vulcanization of rubber tires. This upper half will hereinafter be described as the "cope," and 2, the lower portion of the vulcanizer, as the "drag." These two parts 1 and 2 when united form a long rectangular box and in ordinary cases usually exceed fifteen feet in length, and they have on their inner adjacent faces longitudinal indentations of the required shape to produce the article to be vulcanized.

In the main body portions of both the cope 1 and the drag 2 are steam-chambers 3 and 4. These steam-chambers 3 and 4 may be of any preferred or desired pattern, the one in the cope being shown as substantially a square chamber into which project integral baffle-plates 5, by which means the steam is deflected from side to side in order to more evenly distribute the heat which is used in vulcanizing articles in the device. In the lower portion of the drag 2 the steam-chamber consists of longitudinal pipes separated by narrow septums, by which means the steam is compelled to traverse backward and forward the entire length of the device for the same reason as is explained in connection with the upper part 1. These steam-chambers both have induction and eduction pipes for the inlet and outlet of live steam.

Fastened on the upper face of the cope 1 are a plurality of plates 6, extending transversely across the top of the cope and provided at each corner with ears 7, perforated centrally. On both sides of the vulcanizer are pairs of studs 8, projecting from the body portion of the vulcanizer and each inclosed by a friction ring or sleeve 9. These sleeves are placed in pairs directly above one another, and the number of pairs used on each vulcanizer is determined by the quality of work to be performed by the device, as well as the length of the vulcanizer. At each end of the vulcanizer, on both sides, are projecting lugs 10, integral with their respective parts. Extending between the ears 7 and revolubly journaled therein are shafts 11. Mounted and slidable lengthwise on the shafts 11 are rocking arms 12. The rocking arms 12 at each end of the vulcanizer extend vertically above the shaft 11, and at each end, extending between each pair, are short links 13, united in the center by a pin, from which extends vertically a hook 14. The rocking arms 12, intermediate of the end arms, have no vertical portion extending above the shaft 11, but simply depend therefrom. The lower ends of the arms 12 are slotted and are ar-

ranged to inclose a longitudinal horizontal shaft 15. This shaft 15 is designed when the rocking arms 12 are substantially vertical to lie along the sides of the vulcanizer substantially parallel and central with the joint between the cope and the drag. This shaft 15 is splined and screw-threaded throughout its entire length. Mounted on this shaft 15 are clamps 16, held from rotating on said shaft by means of the spline and held in place longitudinally between clamping-nuts 17, by which their longitudinal position is determined. The outer faces of these clamps are substantially flat, excepting a boss 18 on each, placed thereon for strength. On the inside face of these clamps (see Fig. 2) is an opening having flaring sides. The diameter of this opening is such that it will inclose the outer peripheries of the sleeves 9 on the studs 8, and as the clamps are moved in one direction they will engage the studs 8, and consequently cause the halves of the vulcanizer to more closely approach and press against one another. This shaft 15 when the rocking arms 12 are vertical will pass between the lugs 10 on the ends of the vulcanizer, and in order to cause the clamps 16 to engage the sleeves 9 on the studs 8 a nut 19 is placed on the shaft 15 outside of the lugs 10. As before stated, the lower ends of the rocking arms 12 are slotted and inclose the shaft 15, and the positions of the rocking arms 12 are located by adjusting the nuts 20, meshing on the threads of the shafts 15.

The operation of the vulcanizer is as follows: Green material, such as unvulcanized rubber, is placed in the mold portions of the drag, and the cope 1 is placed in position on top of the drag and the rocking arms then placed in a vertical position, by which movement the clamps swing closely up against the sides of the vulcanizer, but not in engagement with the sleeves 9. The nut 19 is then revolved, drawing the shaft 15 and the clamps 16 to the right in Fig. 1, causing each clamp to engage with the flaring sides of its interior, opening the sleeves 9, and if for any reason one clamp does not perform its peculiar function accurately at this time its position may be adjusted by means of the adjusting-nuts 17, so that each clamp will bear evenly and firmly on the sleeves 9. The description which has been heretofore given has been more with a reference to the mechanism on one side of the vulcanizer; but as both sides are identical the pressure will be uniform over the entire device. Steam is then turned into both steam-chambers for a desired and predetermined length of time to effect the necessary vulcanization of the green products in the molds. When this has been accomplished, the steam is shut off and the tightening-nuts 19 released, allowing the clamps to free themselves from engagement with the sleeves 9. The hooks of a crane are then inserted in the hooks 14, and power being applied to the crane the cope is lifted free from engagement with the drag. In effecting this last operation attention is directed to Fig. 9, wherein it is seen that the raising of the hook 14 breaks the joint between the links 13, thereby drawing inwardly the upper ends of the rocking arms 12 on their pivots, the shafts 11 swinging outwardly the clamps 16 from contact with the sleeves 9 on the drag 2.

It will be noticed in Fig. 9 that the tightening-nut 19 is omitted from the shaft 15 at the left of the device to more clearly show the shaft and position of the lugs 10.

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

1. In a vulcanizer of the kind specified the combination of sections to hold the article to be vulcanized, studs projecting from said sections, clamps arranged to engage said studs, and means to cause said clamps to engage said studs and further means to cause said clamps to simultaneously swing free from engagement with said studs, substantially as shown and described.

2. The combination in a vulcanizer of the class specified consisting of sections to hold the article to be vulcanized, studs projecting from the sides of said sections, clamps to engage said studs, means to adjust the relative position of said clamps with respect to said studs, and means to cause said clamps to engage said studs, substantially as shown and described.

3. In a vulcanizer of the kind described, the combination of sections to hold and retain the article to be vulcanized, steam-chambers in each of said sections, means on said sections to receive clamps, clamps mounted on said vulcanizer to engage said last-named means, and means to cause the operation of said clamps, substantially as shown and described.

4. In a vulcanizer of the kind described, the combination of sections to hold and retain the article to be vulcanized, one of said sections provided with a steam-chamber, transverse baffle-plates in said steam-chamber to deflect the heating medium, studs mounted on the sides of said sections, clamps mounted on said vulcanizer, and means to cause said clamps to engage said studs, substantially as shown and described.

5. The combination in a vulcanizer of the kind designated of sections to hold and retain the article to be vulcanized, one of said sections being provided with a steam-chamber, consisting of longitudinal separated pipes to distribute the heating medium, studs mounted on the sides of said vulcanizer, clamps mounted on said vulcanizer to engage said studs, and means to cause said clamps to engage said studs.

6. The combination in a vulcanizer of the kind described consisting of sections to hold and retain the article to be vulcanized, steam-chambers in each of said sections arranged to receive a heating medium, said steam-cham-

bers being different in configuration from one another, studs mounted on the sides of said sections, clamps mounted to engage said studs, and means to cause said clamps to engage said studs, substantially as shown and described.

7. The combination in a vulcanizer of the kind specified of sections to hold and retain articles to be vulcanized, steam-chambers in said sections to receive a heating medium, rocking arms mounted on one of said sections, a longitudinal shaft mounted on the ends of said rocking arms, clamps mounted on said shaft, studs on the sides of said sections, and means to cause said clamps to engage said studs.

8. In a vulcanizer of the kind specified of sections adapted to receive, hold and retain articles to be vulcanized each of said sections being provided with steam-chambers to receive a heating medium, rocking arms mounted on one of said sections, a longitudinal shaft hung in one of the ends of said arms, links attached to the upper ends of said rocking arms, means to cause said rocking arms to rock in unison, clamps mounted on said shaft, studs mounted on the sides of said sections, and means to cause said clamps to engage said studs.

9. The combination in a vulcanizer of the kind specified of two sections adapted to hold the article to be vulcanized, a plurality of means to clamp said sections together arranged to be simultaneously actuated, steam-chambers in each of said sections to receive a heating medium, substantially as shown and described.

In testimony that I claim the above I hereunto set my hand in the presence of two subscribing witnesses.

ALFRED J. WHITE.

In presence of—
C. E. HUMPHREY,
C. P. HUMPHREY.