(No Model.) 3 Sheets—Sheet 1.

G. W. MILTIMORE.

MACHINE FOR DRESSING CAR WHEELS.

No. 347,951. Patented Aug. 24, 1886.

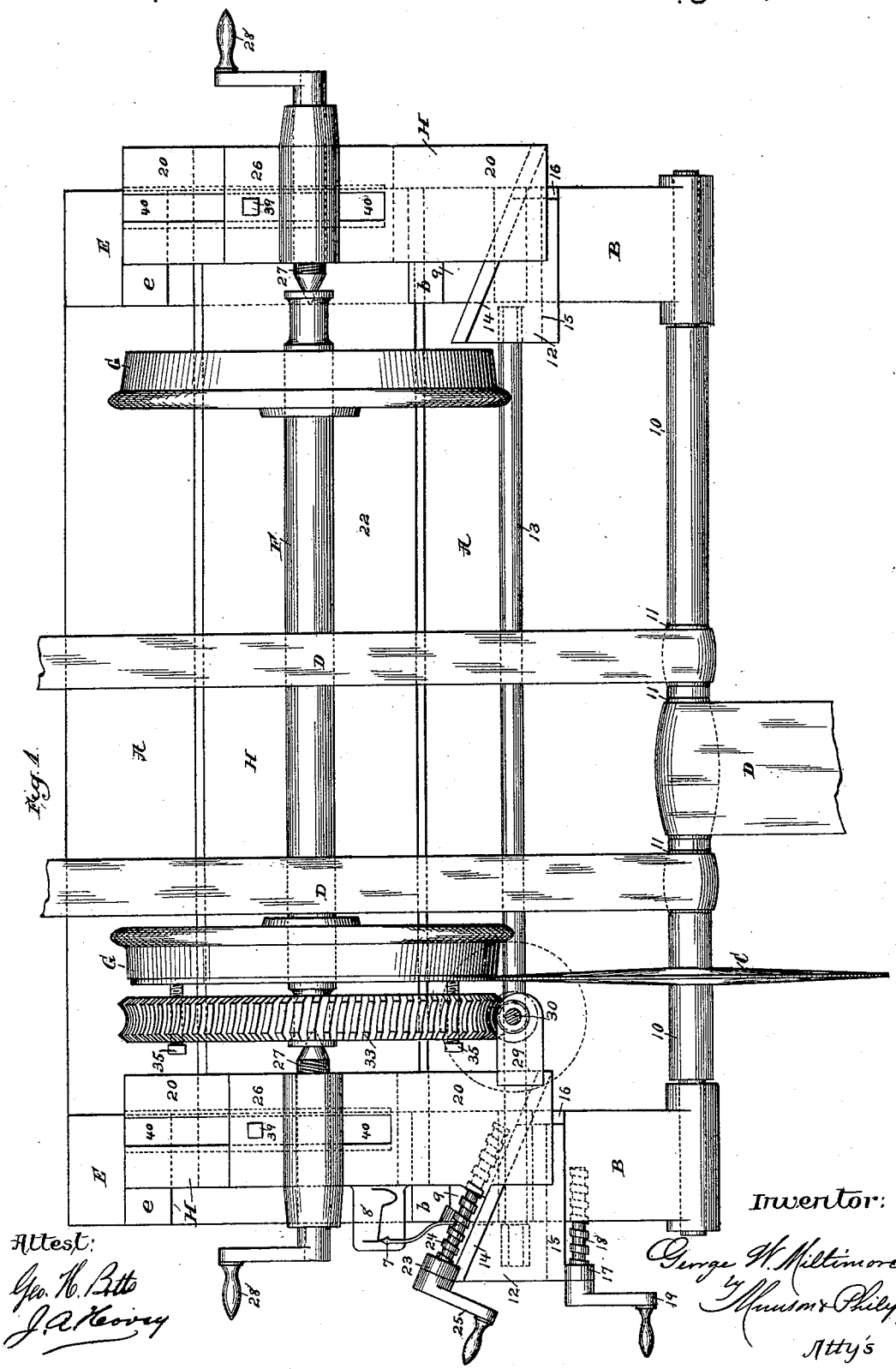

Fig. 1.

Attest:
Geo. H. Bitte
J. A. Keevey

Inventor:
George W. Miltimore
by Munson & Philipp
Atty's

(No Model.) 3 Sheets—Sheet 2.

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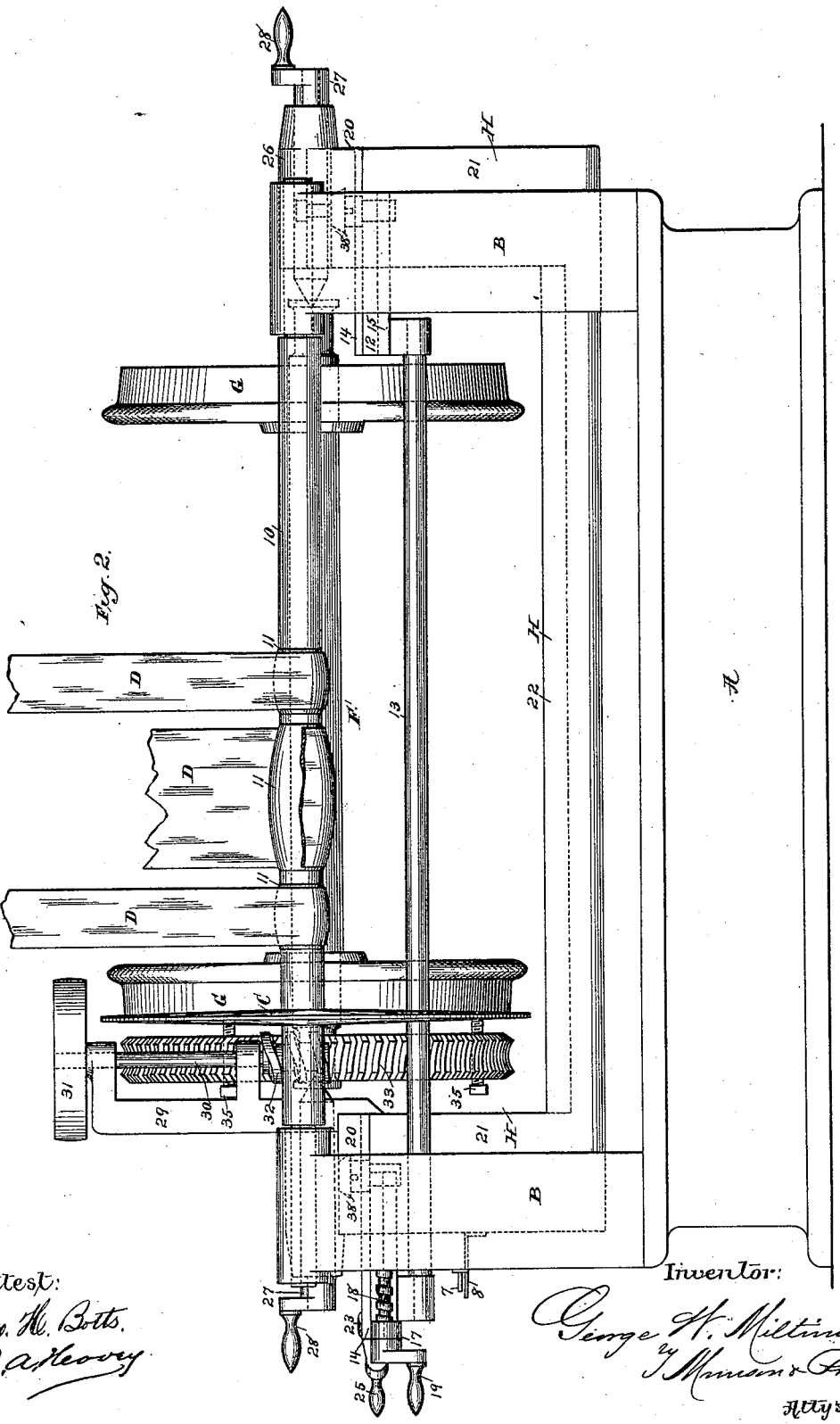

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

G. W. MILTIMORE.

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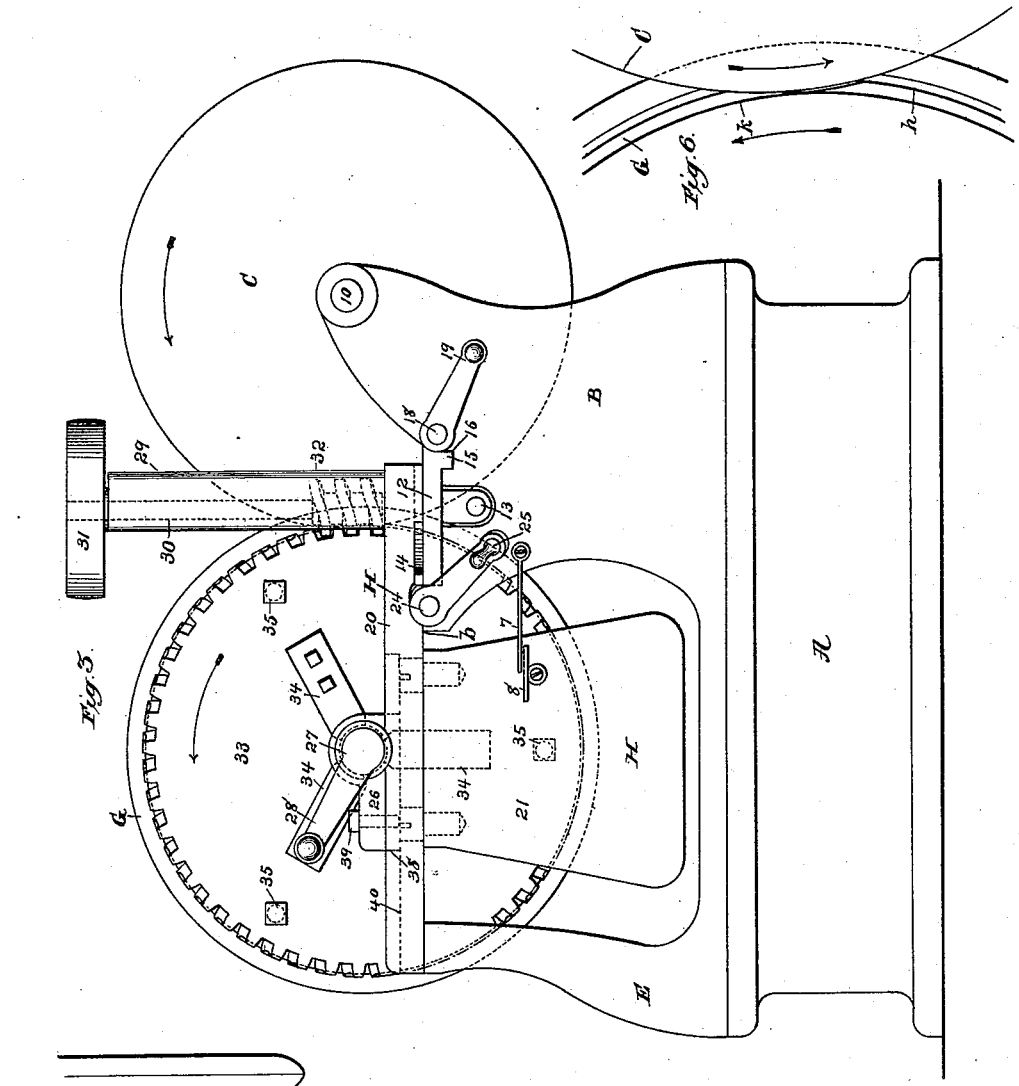

Fig. 3.

Fig. 6.

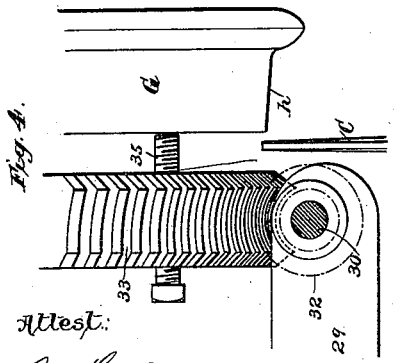

Fig. 4.

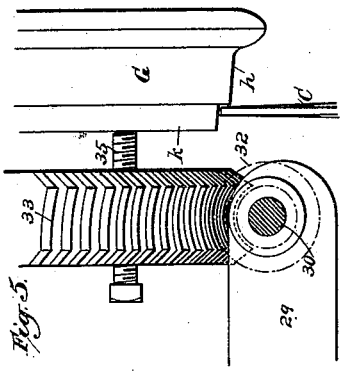

Fig. 5.

Attest:

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Inventor:

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UNITED STATES PATENT OFFICE.

GEORGE W. MILTIMORE, OF ARLINGTON, VT., ASSIGNOR TO THE UNITED STATES CAR WHEEL DRESSING COMPANY, OF CHIAGO, ILL.

MACHINE FOR DRESSING CAR-WHEELS.

SPECIFICATION forming part of Letters Patent No. 347,951, dated August 24, 1886.

Application filed March 13, 1885. Renewed March 26, 1886. Serial No. 196,736. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. MILTIMORE, a citizen of the United States, residing at Arlington, county of Bennington, and State of Vermont, have invented certain new and useful Improvements in Machines for Dressing Car-Wheels and other Cylindrical Bodies, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

In an application for United States Letters Patent filed by me on the 19th day of February, 1886, Serial No. 192,490, I have described and illustrated a method of dressing, or dressing and at the same time hardening, the surfaces of metal bodies, which consists in passing the surface to be dressed in close proximity to the edge of a rapidly-revolving smooth metal disk, whereby the surface is burned and melted away to any desired depth. This method, while applicable to the dressing of the surfaces of metal bodies, generally, is especially applicable to the dressing or turning of car-wheels or other cylindrical bodies, and particularly those wheels or other bodies which are made of chilled iron or highly-hardened steel, and consequently cannot be successfully acted upon by a cutting-tool, and also those wheels and other bodies which are made of soft steel, which cannot be hardened by any of the common processes.

The present invention relates to a mechanism which is designed for use in the dressing or turning of car-wheels and other cylindrical bodies according to the method described in my said former application, it being the object of the invention to provide a simple and reliable mechanism for this purpose.

In the accompanying drawings, Figure 1 is a plan view of such a mechanism. Fig. 2 is a side elevation of the same. Fig. 3 is an end elevation of the same, looking from the left of Fig. 2; and Figs. 4, 5, and 6 are enlarged details illustrating the operation which will be hereinafter referred to.

Referring to said figures, it is to be understood that A is a base of suitable size and weight to properly support the other parts of the machine. This base is provided at its opposite ends with upright portions B, in which are formed bearings for a shaft, 10, upon which is mounted a steel disk, C. The disk C is comparatively thin and has a perfectly smooth edge and is made of a very fine quality of steel, so as to possess great tensile strength and be capable of being revolved at very great speed without danger of bursting by reason of its centrifugal force.

The shaft 10 is provided with one or more pulleys or enlargements, 11, around which pass a belt or belts, D, for transmitting motion to the shaft from any suitable source of power.

In order that the requisite speed may be readily imparted to the disk C the shaft 10 and pulleys 11 will preferably be made of comparatively small size, and consequently in order to relieve the shaft from any strain which might cause it to spring, it will be found most desirable to use more than one of the driving-belts D, and to lead them to the shaft from opposite directions. As shown in the present case there are three of the belts D employed, two of which pass in one direction while the third passes in the opposite or nearly the opposite direction, thus avoiding all liability of springing the shaft and causing the disk to wabble.

In the rear of the journals of the shaft 10 the upright portions B are provided with flat bearings *b*, having recesses 9, in which rest a pair of movable pieces, 12, which are connected together by a rod, 13, and are provided upon their under sides with straight ribs or guides 15, which lie in grooves 16, formed in the bottoms of the recesses 9. The piece 12 at the left of the machine is provided upon its outer end with a lug, 17, in which is mounted a screw-rod, 18, which enters a nut formed in the upright portion B, and is provided at its outer end with a handle, 19, by which it can be worked in and out of its nut, so as to adjust the pieces 12, at the opposite ends of the machine, to different positions. The purpose of this adjustment will be made clear when the operation of the machine is described. The base A is also provided at the rear of the upright portions B with two other upright portions, E, the upper ends of which are provided with flat bearings *e*.

Mounted upon the bearings *e b* is a movable

frame, H, which supports the car-wheel during the dressing operation. This frame consists of two end pieces, 20, which rest upon the bearings *e b*, and are connected by a yoke, 22, the ends 21 of which are bolted to the under sides of the pieces 20 and depend between the upright portions E B.

Inasmuch as it is very difficult to dress car-wheels except when fixed upon their axles, the frame H is made of sufficient length to receive and support a car-axle and its two wheels. The movable pieces 12 are provided upon their upper faces with obliquely-arranged ribs or guides 14, which fit into correspondingly-arranged grooves formed in the under sides of the pieces 20, and the piece 12, at the left-hand end of the machine, is provided at its corner opposite to the lug 17 with a similar lug, 23, in which is mounted a screw-rod, 24, similar to the rod 18, which enters a nut formed in the piece 20, located at that end of the machine, and is provided with a handle, 25, by which it can be turned so as to adjust the position of the frame H. The purpose of this will also appear when the operation of the machine is described. The pieces 20 are provided upon their upper sides with bearings 26, in which are mounted ordinary screw-centering bolts, 27, which are provided with handles 28, by which they can be operated in the usual manner. The bearings 26 are made adjustable upon the pieces 20, so as to carry the centering-bolts to and from the disk C, and thus capacitate the machine to operate upon wheels of different sizes. To effect this adjustment the bearings are provided upon their under sides with dovetail ribs 38, which enter correspondingly-shaped grooves 40, formed in the upper sides of the pieces 20. The bearings 26 are also provided with set-screws 39, by which they can be securely fastened in any position to which they are adjusted. The piece 20, at the left-hand end of the machine, is provided with an upwardly-extending bracket, 29, in which is formed bearings for a vertical shaft, 30, the upper end of which is provided with a belt-pulley, 31, while its lower end is provided with a worm, 32, which engages with a worm-gear, 33, having a central opening and ordinary centering-jaws, 34, by which, during the dressing operation, it is fastened to the end of the axle upon which the wheel which is being dressed is fixed. The gear 33 is also provided with three or more steadying-bolts, 35, which impinge against the outer face of the wheel, so as to hold the wheel and gear steady.

The operation of the mechanism just described is as follows: The worm-gear 33 having been placed upon the end of the axle F of the pair of car-wheels G, which it is desired to dress, and centered and secured thereon by means of the jaws 34, and the bolts 35 having been set up against the face of the wheel, so as to steady the gear and wheel, the axle F, wheels G, and gear 33 will be raised into position between the centering-bolts 27, and the bolts will be screwed inward, so as to center the axle and hold it suspended in the movable frame with the worm-gear 33 in engagement with the worm 32. It will be observed that the screw-rod 18 is arranged to connect the stationary upright piece B with the movable pieces 12, while the screw rod 24 is arranged to connect the pieces 12 with the movable frame which carries the wheels G, gear 33, &c. From this it results that by operating the rod 18 the pieces 12, and with them the frame carrying the wheels, &c., can be moved longitudinally in a right line, while by operating the rod 24 the frame can also be moved longitudinally; but this movement will, by reason of the ribs 14, be in an oblique direction. From this arrangement it will readily be seen that by the combined operation of the two rods 18 and 24 the frame carrying the wheels, &c., can be adjusted in any direction, so as to move the wheel G, which is being operated upon, in any direction or keep it in any desired position with relation to the disk C during the dressing operation. The axle F, wheels G, &c., having been suspended between the bolts 27, as already stated, the screw-rods 18 and 24 will be operated so as to bring the frame H into such position that the edge of the disk C will extend past the outer face of the wheel to a point near the line which it is desired shall be the circumference of the wheel after it is dressed, as indicated in Fig. 4. The disk C will then be set in motion in the direction indicated by the arrow in Fig. 3, and when it has attained a speed of from two thousand five hundred to three thousand or more revolutions per minute, assuming the disk to be from thirty to forty-two inches in diameter, the shaft 30 will be set in motion, so as to turn in wheel G slowly in the direction indicated by the arrow in Fig. 3, and the screw-rods 18 and 24 will be operated so as to gradually move the frame carrying the axle and wheels obliquely to the left, and this being continued and the speed of the disk being maintained, the original surface *h* of the tread of the wheel will be burned and melted away, as indicated in Figs. 5 and 6, thus reducing the wheel to the desired diameter and leaving its new surface, *k*, perfectly smooth and uniform, and very much hardened, and this will be accomplished, no matter how hard or how soft the metal of which the wheel is composed, or whether it is of iron or steel, without any perceptible wear upon, and without imparting any objectionable amount of heat to, the disk, and also without heating the wheel to any considerable extent, except at the immediate point which is being acted upon. One of the pair of wheels G having been dressed in the manner just described it is only necessary in order to dress the other to remove the axle F from between the centering-bolts, turn it end for end, place the gear 33 upon the opposite end, and again center it between the bolts and repeat the op-

eration upon the other wheel. The movable frame H will preferably be provided with a pointer, as 7, which will be so arranged that as the frame is moved it will move over a pattern, as 8, fixed upon the stationary frame, and thus not only indicate the progress of the work, but serve to guide the attendant in operating the screw-rods 18 and 24. The adjustment afforded by the oblique ribs 14 of the pieces 12 is sufficient to permit the machine to operate upon wheels of sizes which vary considerably; but if it should be desired to give the machine a still greater range it may be done by shifting the position of the bearings 26 and using a worm-gear, 33, of a larger or smaller size, the machine being of course provided with several of these gears of sizes to correspond with the different positions of the bearings 26.

By the operation just described wheels made of the hardest chilled iron, which cannot be acted upon by any known cutting-tool, can be perfectly dressed in a very short time and at a very trifling expense; and I have found, as before stated, that after wheels have been so dressed not only do they retain all the hardness imparted by the original chill, but that the surface is even harder after being dressed than it was before. The same is true, even to a greater degree, in the case of wheels made of steel. These facts render the mechanism and operation just described of very great utility and value, not only for the purpose of dressing new wheels before they are put into use, and for giving to them additional hardness and consequent durability, but for the purpose of re-dressing wheels after they have been some time in use and have become so worn out of shape as to be utterly worthless, except for old iron, without re-dressing. This latter use is one of particular importance, because heretofore no means has been known by which chilled car-wheels which have been rendered useless by reason of wear could be redressed without an expenditure of time and money, which rendered such re-dressing impracticable. The speed at which the disk C must be revolved to produce satisfactory results will of course depend to some extent upon the character of the wheel being dressed. With a disk forty-two inches in diameter and revolved at the rate of three thousand revolutions per minute, wheels of the hardest chilled iron can be readily dressed, while steel wheels can be dressed by revolving the disk at a somewhat less speed. The dressing can be more rapidly effected, however, by revolving the disk at a higher rate of speed. If the size of the disk is increased, the same result can of course be accomplished with a proportionately less number of revolutions per minute, and vice versa. The thickness of the disk at its edge may be varied without materially changing the effect produced.

Whether or not during the operation of dressing hereinbefore described, any actual contact exists between the disk and the surface of the wheel I am unable to say, as owing to the very great velocity of the disk and the intense heat and burning that exists at the point where the metal is being removed, it is impossible to make accurate observation; but if any contact does exist it is very slight, as I have found that after long use the disk shows no perceptible evidence of wear, which would certainly be the case if there were any considerable amount of friction between the disk and the metal being acted upon. I have also found that if the speed of the disk (the disk being forty-two inches in diameter) is reduced to one thousand or fifteen hundred revolutions per minute, and the wheel moved up to the disk in the manner already described, so that there is actual contact, the disk and also the wheel will become very highly heated, the disk will wear rapidly away, and no metal, or practically none, will be removed from the wheel. While, on the other hand, if the speed of the disk is increased to from two thousand five hundred to three thousand or more revolutions per minute, and the wheel moved up to it in the same manner, the disk will neither be worn nor heated, while the surplus metal will be rapidly burned and melted off from the surface of the wheel, and the dressing will be accomplished in a rapid and perfect manner, as stated.

In conclusion, it is to be remarked that the mechanism herein shown, although especially designed and adapted for use in dressing or turning car-wheels, may, as will readily be seen, be used for dressing or turning cylindrical or conical bodies of all descriptions. It is also to be remarked that the means for effecting the adjustment and movement of the frame H may be greatly varied from that shown without departing from the invention. Instead of the two screw-rods 18 24 and the movable pieces 12, any other suitable devices may be used for effecting the movement of the frame to properly present the surface of the wheel or other body to the edge of the disk.

The method of dressing or dressing and hardening the surfaces of metal bodies herein described is not herein claimed, because, as before stated, that forms the subject-matter of another application for Letters Patent. Neither is the improved wheel, having its surface dressed and hardened as herein described herein claimed, because that also forms the subject-matter of another application for Letters Patent.

What I claim is—

1. The combination, with the smooth revolving disk C, of the movable frame H, provided with means for supporting the car-wheel or similar cylindrical body, so that in can be revolved freely, and means for imparting a slow longitudinal movement to the frame and a slow rotary movement to the wheel or other body, whereby the entire surface of the wheel or other body is presented to the edge of the disk, substantially as described.

2. The combination, with the smooth revolv-

ing disk C, of the movable frame H, provided with means for supporting the car-wheel or similiar cylindrical body so that it can be revolved freely, the worm-gear 33, provided with the centering-jaws 34, the worm 32, and means for imparting a slow longitudinal movement to the frame, whereby the entire surface of the wheel or other body is presented to the edge of the disk, substantially as described.

3. The combination, with the smooth revolving disk C, of the movable frame H, provided with means for supporting the car-wheel or other similar cylindrical body so that it can be revolved freely, the worm-gear 33, provided with the centering-jaws 34 and steadying-bolts 35, the worm 32, and means for imparting a slow longitudinal movement to the frame, whereby the entire surface of the wheel or other body is presented to the edge of the disk, substantially as described.

4. The combination, with the smooth revolving disk C, of the movable frame H, provided with means for supporting the car-wheel or similar cylindrical body so that it can be revolved freely, the screw-rods 18 24 and pieces 12, and means for imparting a slow rotary movement to the wheel or other body, whereby the entire surface of the wheel or other body is presented to the edge of the disk, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE W. MILTIMORE.

Witnesses:
H. T. MUNSON,
T. H. PALMER.