

impart motion to the sprocket-wheels 38 on the corresponding ends of the shafts 26 of the sandpapering drums through the medium of link chain belts 64, 64. Shaft 58 is driven by the motor through the medium of sprocket-wheel 14, and a chain belt 56, which latter engages a sprocket-wheel 61, mounted and secured on said shaft 58 between gears 65 and 62.

10 This belt 56 also passes around and drives a sprocket-wheel 59, mounted upon and secured to a transverse shaft 60, in line with the gear 61 on shaft 58 and this shaft 60 extends through suitable openings or bearings in the shield and apron and extends through and is journaled in bearings in the drop-frames 2 and 3 and constitutes the drive-shaft through the medium of which the supporting-frame is propelled. In order to perform this function it passes transversely through a suitable housing 67, and within this housing has a worm 72 securely mounted thereon that engages a worm-gear 71 on the adjacent end of a short longitudinal transmission shaft 70, which latter is journaled in the ends of the housing 67 and in a partition, 68, that separates the chamber in which the worm and worm-gear mesh from the remainder of the interior of the housing constituting a chamber 69. Within chamber 69, transmission-shaft 70 has a pair of connected or twin gears 75 securely mounted thereon, and one of the twins is in constant mesh with an idle-gear 76 keyed to an idle-shaft 77 whose ends are journaled in partition 68, and in the end of the housing constituting the opposite wall of chamber 69. Idle-shaft 77 has another idle-gear 78 securely mounted thereon near the partition 68 that, preferably, corresponds in construction and dimensions to idle-gear 76, and this latter gear is adapted to be engaged by a gear 79 that is splined to and is adapted to reciprocate on a longitudinal driven-shaft 73. When reciprocated to the limit of its movement toward the partition gear 79 engages the idle-gear 78, and is driven and imparts motion to shaft 73 in one direction, and when reciprocated to the limit of its movement in the opposite direction, it engages the nearest of the twin gears 75, and is driven and imparts motion to shaft 73 in the opposite direction. Shaft 73, is extended through its bearings in the end wall of housing 67 to and enters the centrally situated enlargement of the tubular casing 74, where its end has a bevelled gear,—secured thereon that meshes with a bevelled gear—mounted on the axle—of the drive-wheels 5, 5.

60 The sliding gear 79 is formed with an elongated hub 80, equipped with a circumferential groove 81, to receive prongs 82 of a block 83, slidable on a rod 84 which latter extends parallel to the driven shaft 70 and slides in bearings provided in one end wall

of the gear casing 67 and in the intermediate wall 68. Block 83 is pivotally connected by a link 85 to the lower end 86 of a hand lever 87, pivotally secured as at 88, and is adapted to shift the block 83 into one of three positions, as indicated in dotted and full lines in Figure 8. The lever 87 is provided with a spring-controlled pawl 97 adapted to enter notches in a quadrant 98 secured to the platform 1. 75

Referring to Figure 8 it will be seen that in the extreme left position shown in dotted lines, the slidable gear 79 meshes directly with the gears 75 while in the extreme right position the gear 79 engages the rear wheel 78, so as to receive rotation from the driven shaft 70 by the agency of the idler gear 76. 80

A vertical steering-post 89 is secured to the center of length of the front axle 6, and its upper end has a horizontal arm 40, projecting therefrom which, at its free end, is formed with a boss 91 in which a spindle 92 has bearings. This spindle has at its upper end, a hand-wheel 93, and at its lower end has keyed thereto a pinion 94 that meshes with a toothed quadrant 95 secured to a standard 96 secured to and arising from the platform 1. 85

Upon manipulation of the hand-wheels 93, the pinion 94 is rotated and, being in mesh with the quadrant 95 the arm 90, is oscillated and the steering post 89 is rotated to impart steering movement to the front-axle 6. 90

For the purpose of removing loosened dirt, shavings and dust from the surface being operated upon, pipes 99 and 100 terminate adjacent to the inner side of each of the abrading drums 27,—the lower ends of the pipes being expanded laterally and bevelled to facilitate the entrance of said debris. Pipes 99 and 100 are connected by branches 101 and 102 to a common riser pipe 103, which latter leads to the inlet opening of the fan 10 and is discharged through the exhaust 104. 100 105 110

The operation of the machine is thought to be obvious from the foregoing description.

The connection of the motor 11 to a source of electric power is controlled by an electric switch generally designated by 105. Upon closing the switch the motor is actuated and thereby the drums 27, the fan 10, and the drive-shaft 60 are simultaneously rotated. The operator stands upon the platform 1 and foot pressure is applied to the headed-pin or treadle 51, to depress the drums 27 and press the same downwards to obtain the desired functional contact with the surface to be smoothed. The drive to the rear wheels will propel the entire machine so that every part of the surface may be reached; the steering means enabling convenient travel in any direction. To reverse 115 120 125 130

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UNITED STATES PATENT OFFICE.

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YORK.

TELEPHONE TRUNK CIRCUITS.

Application filed April 10, 1918. Serial No. 227,687.

To all whom it may concern:

Be it known that we, GEORGE W. KUHN and ERIC R. LUNDIUS, residing at Brooklyn, in the county of Kings and State of New York, respectively, have invented certain Improvements in Telephone Trunk Circuits, of which the following is a specification.

This invention relates to telephone systems and particularly talking circuits such as those between operators at different central offices in a system of associated exchanges.

The invention is here illustrated in a circuit designed to connect a central test desk with the frame men or other operatives in any one of a number of exchanges. While it is especially suitable for this purpose, it is obviously applicable wherever similar conditions obtain. In a circuit of the kind mentioned the test man at the central desk is provided with a standard operator's telephone set. At the other end of the line, however, there may be a number of telephones connected in multiple and distributed along the main frame or elsewhere and for these it is desirable to use the standard central battery subscriber's set. Local battery sets would require special attention for their maintenance and are otherwise less convenient for the purpose. On the other hand, if central battery sets are used, special arrangement must be made to provide the talking current because circuits of the kind mentioned above are not associated with cord circuits carrying the usual equipment for common battery supply, and because the distances of the various exchanges from the central test desk will frequently be too great for efficient energization from the central battery there located.

It is the object of the present invention to produce an improved circuit for service of the character above indicated; to provide for energizing the central battery sets from the battery supply local to the exchanges where the respective sets are used, to arrange the ringing circuits for a plurality of sets of this character so that they may be rung selectively and so that the ringing and talking circuits will not interfere one with the other, and to provide at the same time for the signaling of the central test desk from the various local stations.

The invention will be more fully under-

stood by reference to the accompanying drawing, in which the single figure represents diagrammatically a circuit embodying the invention.

One position of a central test desk is indicated generally on the drawing at 1 and one of a number of telephone sets located at an associated exchange is represented at 2 with line conductors 3 and 4 extending between the exchanges. At the test desk is a key of known form with talking and holding positions 6 and 7 respectively. When the key is thrown to position 6 the line is connected to the operator's telephone set not shown and when thrown to the position 7 the line is "held" while the telephone set is disconnected therefrom. Telephone set 2 at the other station is a standard common battery subscriber's set, the form illustrated being well-known and needing no further description. The terminals 8 and 9 of this set are normally disconnected from the line conductors 3 and 4 but are associated with switch contacts 10 and 11 whereby connection to the line may be made when desired. The signaling device 12 is normally connected to the line conductor 3 through the switch contact 13 and on the other side to ground through the condenser and switch contact 14.

The switches for connecting the telephone set and the signaling device with the line are all under the control of the relay magnet 15, whose windings are of low resistance and are permanently connected across the terminals of the telephone set. Two windings are preferably used in order that they may serve the additional purpose of retardation coils for the battery supply, the battery 16 for supplying the talking current being connected between the two windings of the relay 15 as shown on the drawing.

The leads 17, 18 and 19 represent multiple connections running to other telephones of the same character and with the same system of connections as just described. There may be any convenient number of such telephones located at suitable points, according to the service to be rendered.

At the central test desk end of the line are suitable relays 20, 21 and 22 for controlling the signaling at that end of the line. The relay 20 has two windings normally connected in series across the conductors 3

telephone set, means for connecting the telephone terminals to line conductors upon removal of the telephone receiver from the hook, a signal device associated with the line at a distant station and means responsive to the bridging of said telephone set across said line conductors for operating said signal.

In testimony whereof, I have signed my

name to this specification this first day of April, 1918.

GEORGE W. KUHN.

In testimony whereof, I have signed my name to this specification this 8th day of April, 1918.

ERIC R. LUNDIUS.