976,716.

F. H. WRIGHT.

FLOOR SURFACING MACHINE.

APPLICATION FILED MAY 29, 1909.

Patented Nov. 22, 1910.

2 SHEETS—SHEET 1.

Fig: 1.

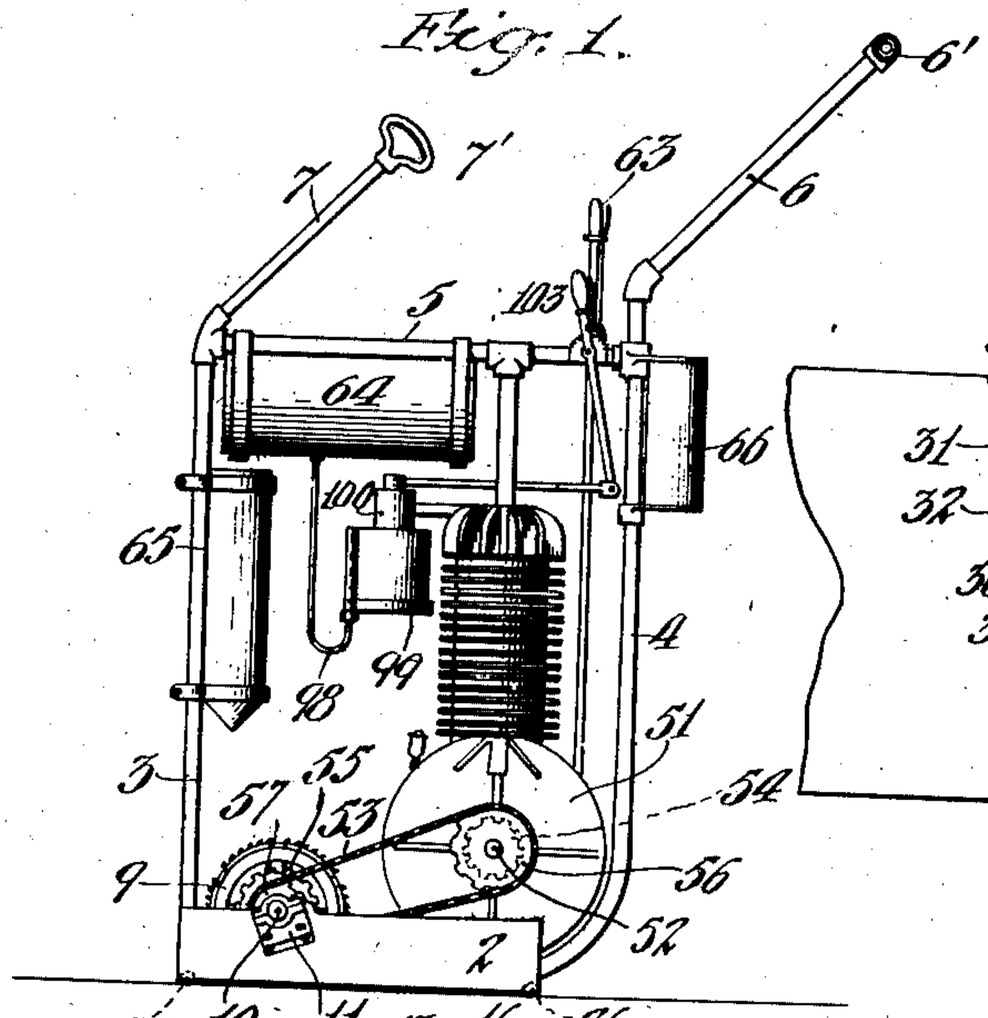

Fig: 2.

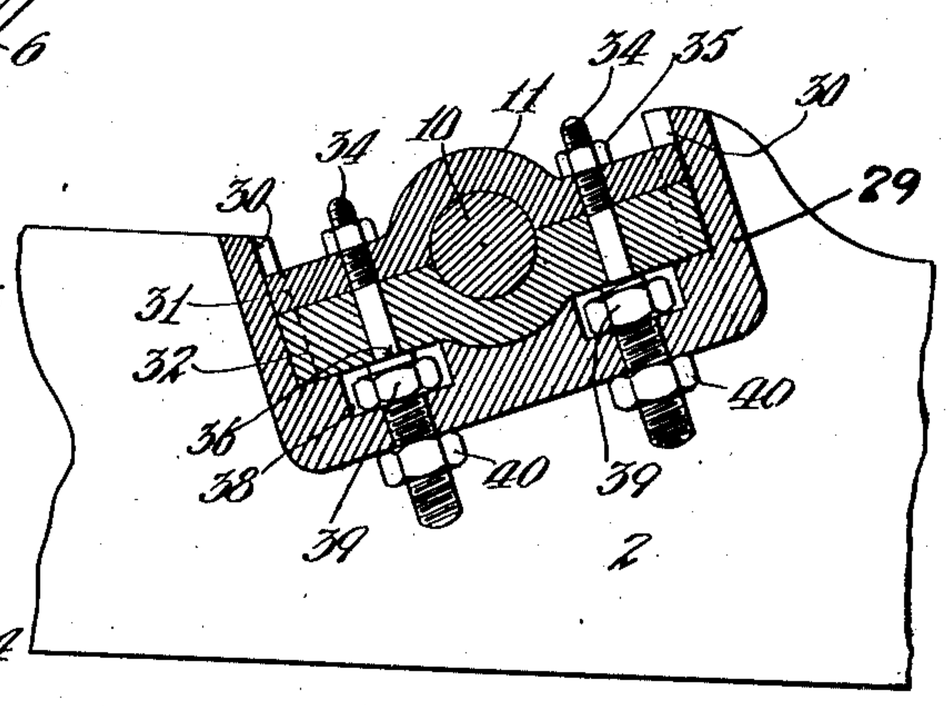

Fig: 3

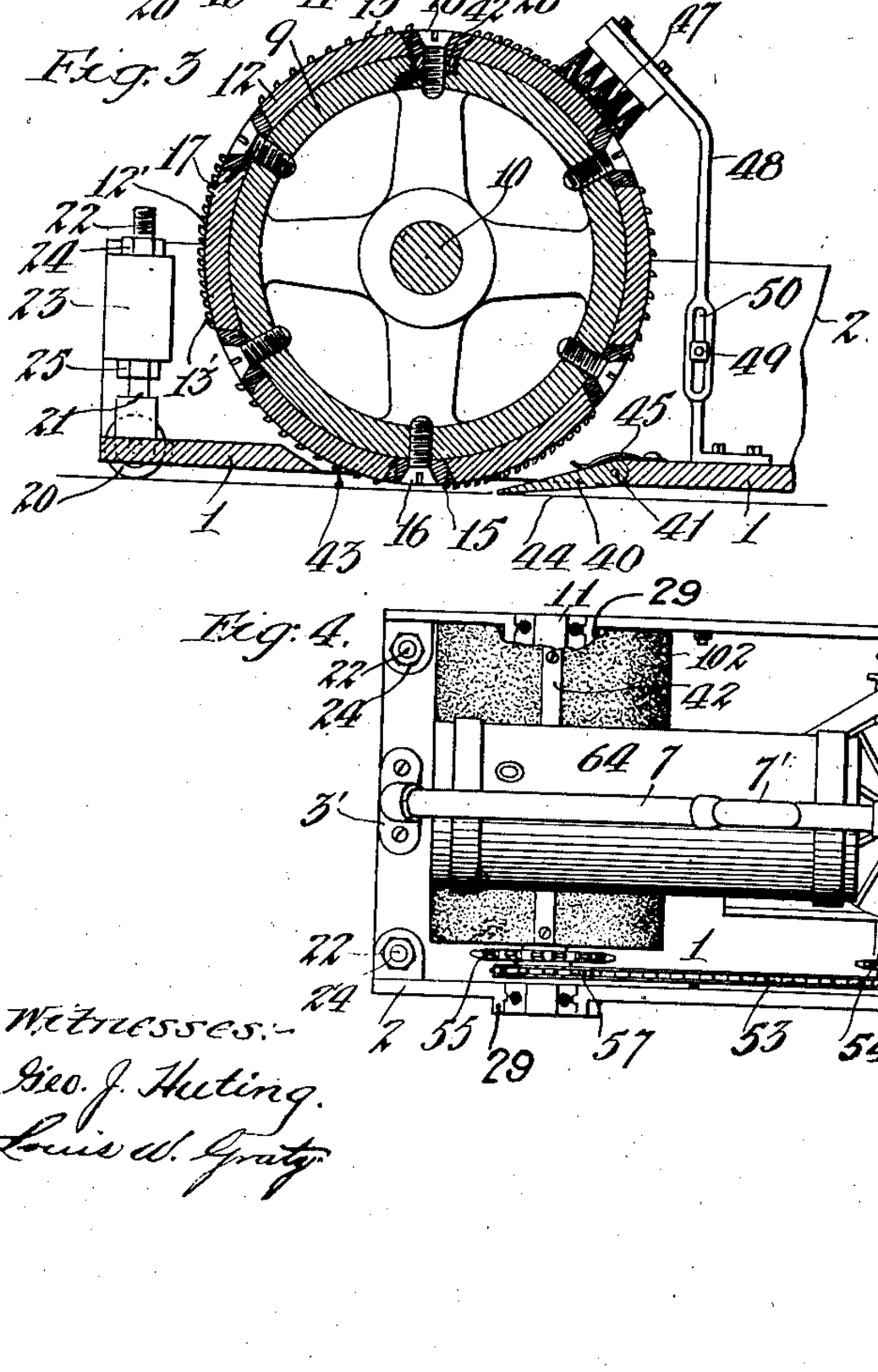

Fig: 8.

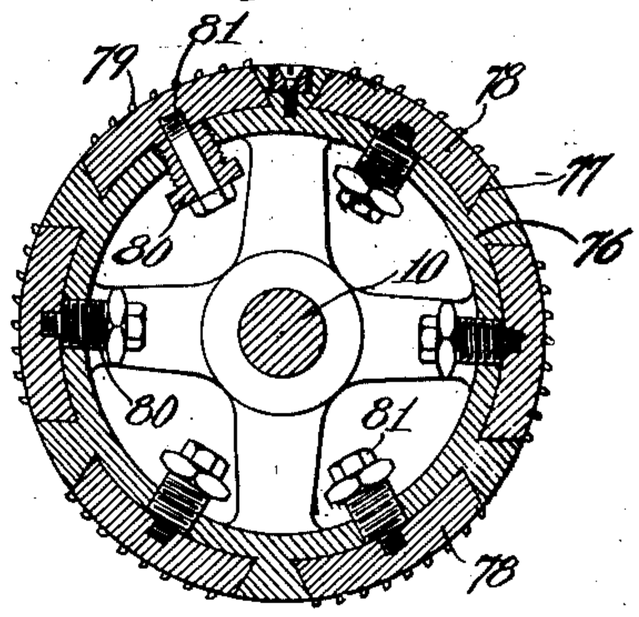

Fig: 4.

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2 SHEETS—SHEET 2.

Fig: 1

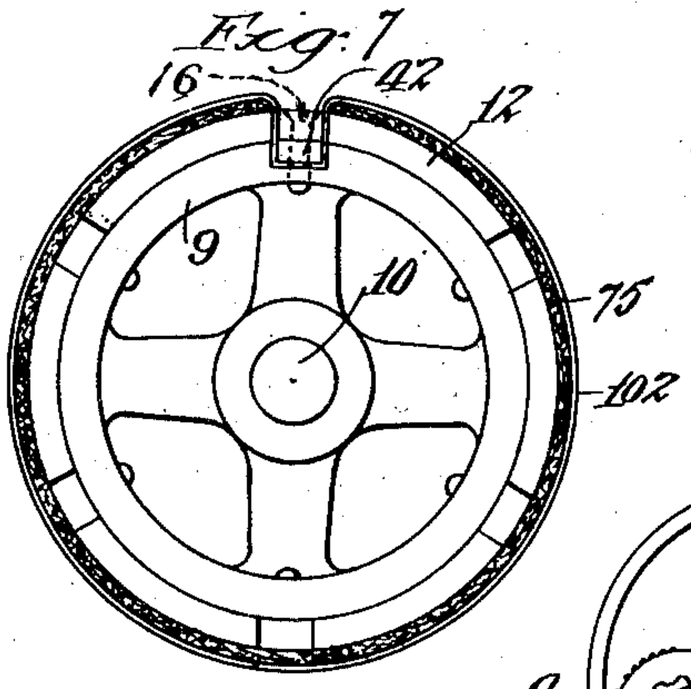


Fig: 10

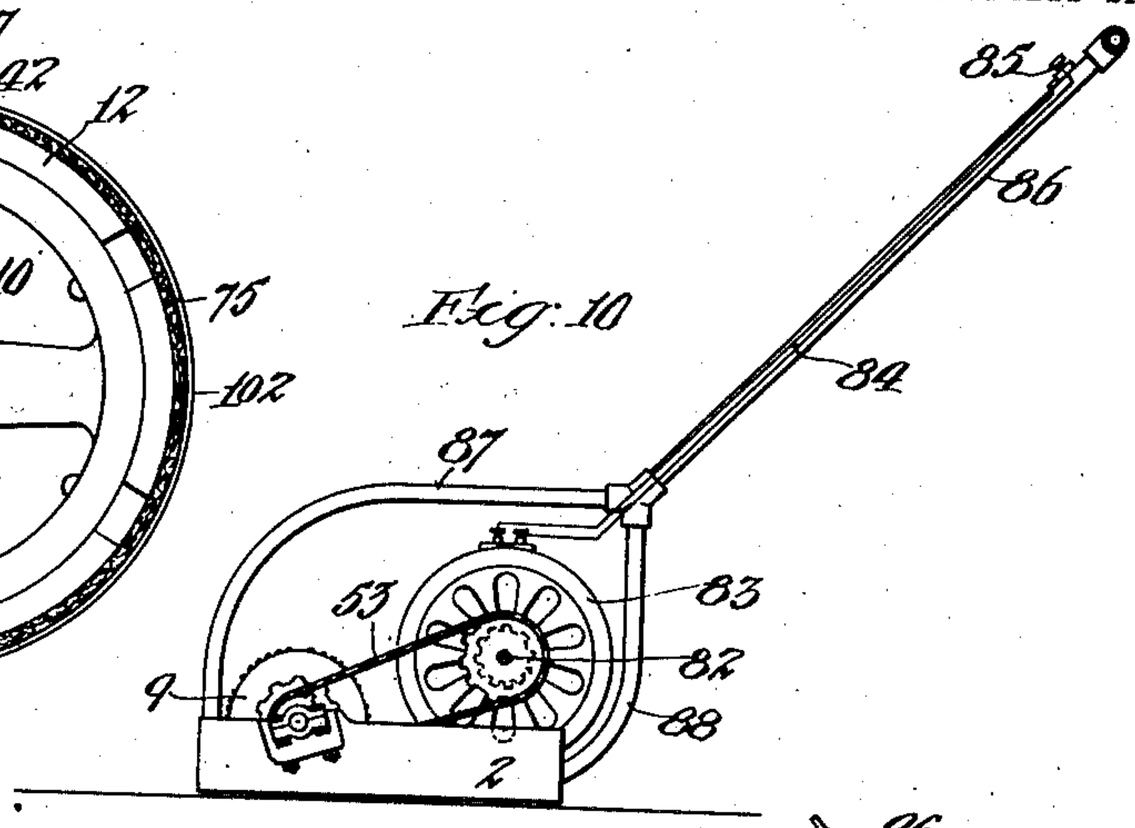


Fig: 11.

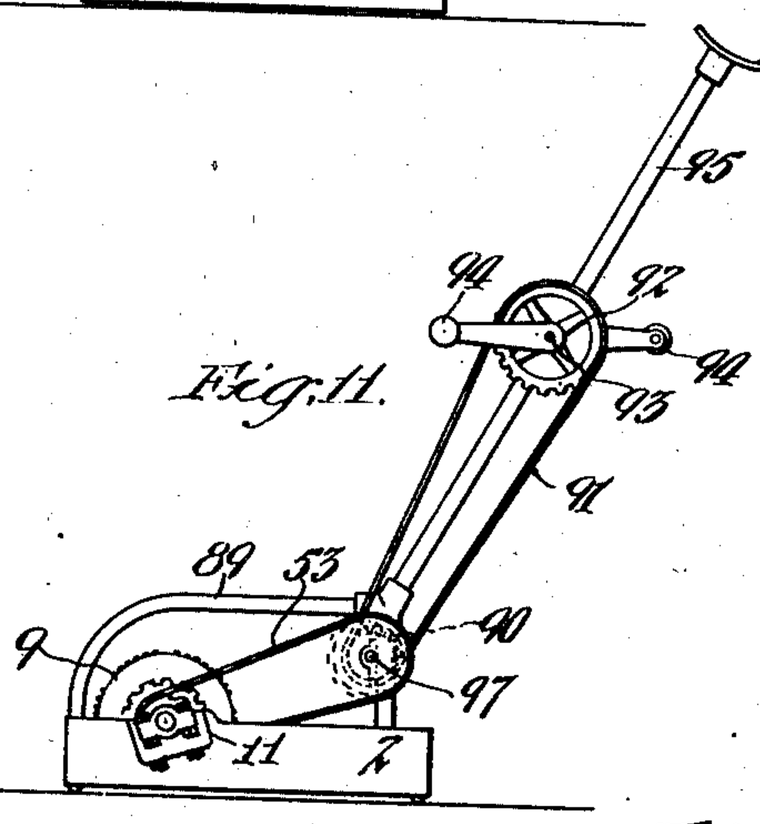


Fig: 9.

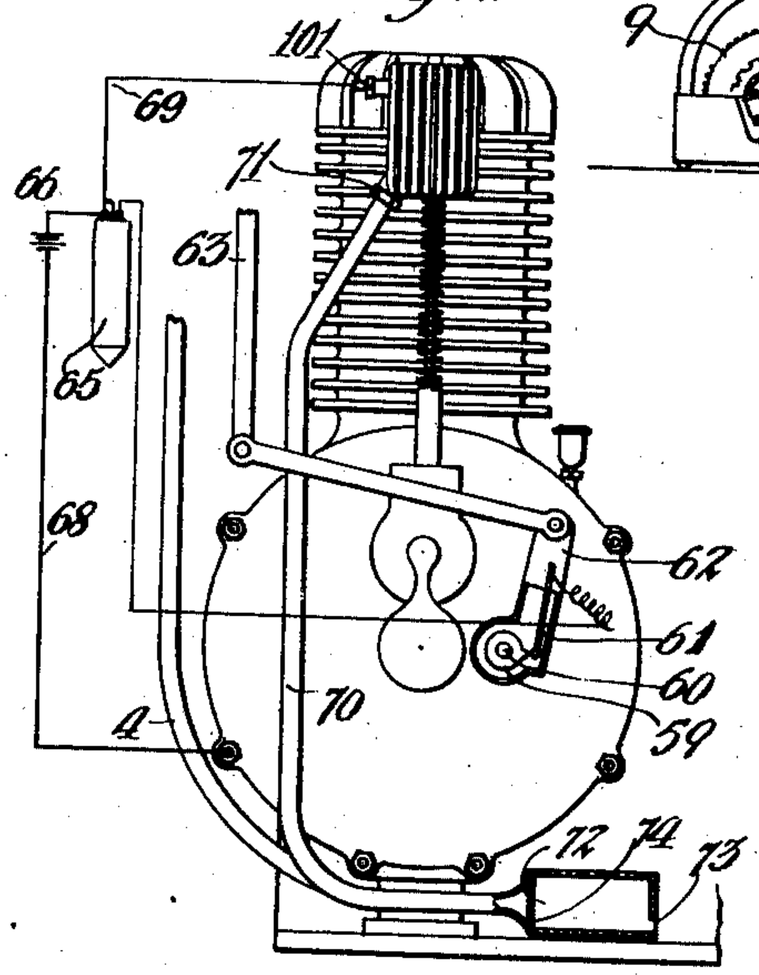


Fig: 5.

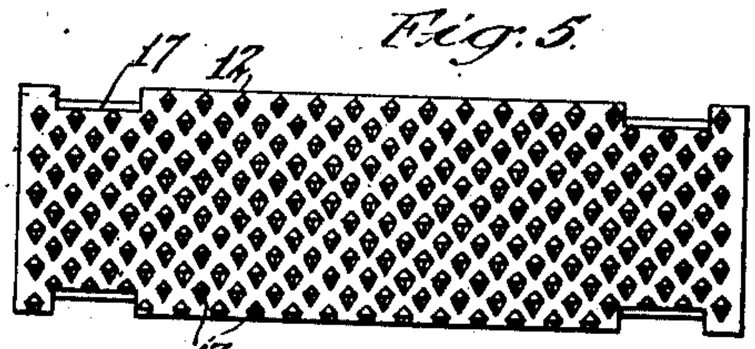
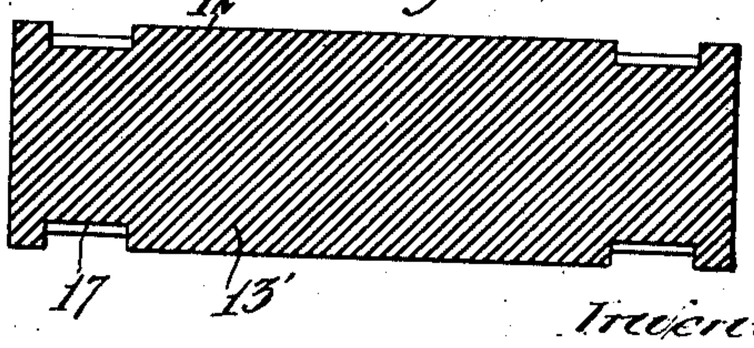


Fig: 6.



Witnesses:-
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UNITED STATES PATENT OFFICE.

FRANCIS H. WRIGHT, OF LOS ANGELES, CALIFORNIA.

FLOOR-SURFACING MACHINE.

976,716. Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed May 29, 1909. Serial No. 499,238.

To all whom it may concern:

Be it known that I, FRANCIS H. WRIGHT, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Floor-Surfacing Machine, of which the following is a specification.

The main object of the present invention is to provide a machine which will smooth or surface a floor in a uniform manner without the production of waves such as are liable to be produced by a planer.

Another object of the invention is to provide a floor surfacing machine in which the same parts can be used for the initial surfacing or cutting and for the sand-papering.

Another object of the invention is to provide improved means for adjustment of the cutting device.

Another object of the invention is to provide for surfacing a floor close to the wall.

Another object of the invention is to provide improved means for disposing of the cuttings or waste from the machine.

Other objects of the invention appear hereinafter.

The accompanying drawings illustrate the invention and referring thereto: Figure 1 is a side elevation of the machine. Fig. 2 is a vertical section through one of the bearings for the rotary cutting means. Fig. 3 is a vertical section through the rotary cutting means. Fig. 4 is a plan of the machine. Figs. 5 and 6 are plan views of two different forms of cutters. Fig. 7 is a vertical section of the drum in condition for sandpapering. Fig. 8 is a vertical section of a different form of rotary cutting means. Fig. 9 is a side elevation on the opposite side to Fig. 1, of the gasolene engine used for operating rotary cutter. Fig. 10 is a side elevation showing the application of the invention in connection with an electric motor as the operating means. Fig. 11 is a side elevation showing the construction of the apparatus for hand operation.

Referring to Figs. 1 and 3, the frame of the machine comprises a base 1 formed with a bottom, and with vertical side walls 2, a standard 3 secured to and rising from the front end of the base plate 1, a standard 4 secured to and extending upwardly from the rear end of the base plate 1 and a longitudinal member 5 connecting the upper portions of standards 3 and 4. A handle member 6 is connected to said frame at the junction of standard 4 and bar 5, said handle member having an operating cross arm 6′ and another handle member or bar 7 is connected at the junction of standard 3 with bar 5 and is provided with an operating stirrup or cross arm 7′.

The cutting means comprises a drum or cylinder 9 on shaft 10, mounted in bearings 11 at each side of the machine, said bearings being carried by the upwardly extending side walls 2 of the base 1, said drum being provided with means for receiving and holding a plurality of cutters. Each cutter 12 consists of a segmental plate of suitable metal, such as steel, formed with teeth or cutting means 13 on its upper faces and with its inner face conforming to the periphery of the drum 9. The segments 12 are fastened in place on the drum by clamping devices which clamp device consists of a wedge 15 fastened to the drum 9 by a screw 16, the outwardly flaring faces of said wedge engaging in correspondingly notched portions 17 of the segments 12 to hold the segments from radial or longitudinal displacement. The cutting teeth 13 of the cutters 12 are preferably formed as rasp teeth, there being a large number of teeth on each segment arranged in staggered or off-set relation so that taken together they cover substantially the entire longitudinal extent of the cutter. Cutters of different fineness or closeness of teeth may be provided for different work, and the same drum may be provided with alternate cutters formed as above described with rasp teeth and intermediate cutters 12′ formed as shown in Fig. 6 with shearing teeth 13′ formed as oblique ridges, to give a final shearing cut after the preliminary operation of the rasp teeth.

Means are provided for maintaining the forward end of the base 1 at a definite level to control the depth of cut of the rotary cutting means. For this purpose a caster or roller 20 may be provided at each forward corner of the base, said roller being jour-

naled on a post 21 having a screw shank 22 passing through an eye 23 on the side wall 2 and held in any desired vertical position by upper and lower nuts 24, 25, screwing on said screw threaded portion. Similar rollers 26 supported by screw bolts 27 may be provided at the rear corners of the base 1, the function of these rear rollers being to provide an automatic friction support for the machine when it is tipped rearwardly in moving from one place to another on reducing the depth of the cut. Bearings 11 for the rotary cutting device 9 are also preferably adjustable to provide for vertical adjustment of the rotary cutting device 9. Thus, as shown in Fig. 2 the lug or extension 29 is provided on each of the side walls 2, said extension being on the inside on one side of the base and on the outside on the other side of the base, and said extension being provided with a way 30 for guiding the upper and lower bearing blocks 31, 32 in which the bearing 11 is formed. Said bearing blocks are clamped together by bolts 34 with a nut 35 screwing on each bolt 34 and pinching the blocks between said nut and the shoulder 36 on said bolt. Below said shoulder said bolt passes freely through a perforation 38 in the lug 29 and is held adjustable in fixed position by upper and lower nuts 39, 40, so that by adjustment of the nuts 39 and 40 the combined bearing blocks 31, 32, can be raised or lowered bodily to adjust the vertical position of the rotary cutting means. The fastening bolts 34 extend perpendicularly to the line of pull from the motor shaft, so that the adjustment does not affect the driving connection.

Means are preferably provided for scraping or clearing the floor directly back of the rotary cutter, said means consisting for example of an apron or scraper 40 pivoted at 41 to the base 1, and extending the entire width of the base between the side walls 2 within the slot 43 in the base through which the rotary cutter extends and operates. The said scraper 40 rests on the floor, indicated at 44, and is preferably held thereon by a spring 45.

Means may be provided for cleaning or clearing the surface of said cutting means, said cleaning means consisting for example of a brush 47 bearing against the surface of the cutter and supported by a standard 48 adjustably mounted by means of a set screw 49 engaging in a slot 50 on said standard to fasten the standard to the side wall 2 at the respective sides of the machine.

The machine can be operated by any suitable power but I prefer to use for this purpose a gasolene engine such as indicated at 51 in Figs. 1, 4 and 9. The shaft 52 of said engine is connected to drive the rotary cutting means 9 preferably by means of a sprocket chain 53, the two shafts 52 and 10 being provided with two sets of sprocket wheels 54, 55, 56, 57, the wheel 54 being smaller than the wheel 55 and the wheel 56 being larger than the wheel 57, so that by shifting the sprocket chain from one set of wheels to the other a difference in speed on the rotary cutting means can be provided for. A further change in speed can be provided for by variation of the speed of the engine, this being accomplished by shifting the spark controlling mechanism in the usual manner. In Fig. 9, the spark controlling mechanism is shown comprising a cam 59 mounted on a shaft 60 operated by the engine, a circuit controller 61 operated by said cam and carried by an arm 62 pivotally mounted on the shaft 60 so that it can be turned to different positions to vary the time of closure of circuit by the cam means, this operation being controlled by a link 63′ and a lever 63 operated by hand in the usual manner to advance or retard the spark and thereby control the speed of the engine. 64 designates the gasolene supply tank for the engine, 65 the spark coil and 66 batteries, the batteries being connected to the spark coil 65 through the circuit controller 61 by a circuit 68 and the spark coil being connected to the spark plug 101 by a circuit 69. One side of battery 66 is grounded by connection to the engine frame, the other side of the battery being connected to the spark coil 65. The gasolene is supplied to the engine from tank 64, through pipe 98, carbureter 99 and throttle valve 100. As a further means of clearing the waste or cuttings from the floor I may provide a pipe 70 from the exhaust valve or outlet 71 of the engine, said pipe leading through a muffler 72 to a nozzle 73 which is expanded laterally at the rear of the rotary cutter and is provided with a plurality of perforations 74 for directing the exhaust blast forwardly at the rear of the cutter to blow the cuttings from the floor, in front of the machine.

The operation is as follows: The machine is held by one or both of the handles 6′, 7′, and the gasolene motor being set in operation the rotary cutter is rotated at a speed sufficient to cause the cutting teeth or rasp teeth 13 to cut and smooth the floor. The rotation is preferably in opposition to the forward direction of movement to the machine, so that the machine has to be pushed against the wood as it is being cut. In this operation each of the rasp teeth cuts a minute section of the wood but the successive action of a multitude of teeth operates to smooth the surface of the wood to a definite plane level and owing to the staggered relation of the teeth and their coming successively into action there is no tendency to form waves such as occurs with a planer.

Such minute irregularities as may be left by the operation of the individual teeth is removed by the subsequent action of the oblique shearing ridges 13′ on the alternate cutters 12′. In this operation with the rotary cutting means, the sprocket chain 53 is placed on the set of gears 54, 56 to give a relatively slow movement to the cutters. When the floor has been surfaced as above described, it may be finished by sand-papering with the same machine. One of the clamping members 15 is removed, the sandpaper being placed around the drum 9 with a layer of felt 75 beneath it to cover the cutting teeth 12′, 13′, the ends of the said paper being inserted beneath a bar 42 extending under said member and the clamping member 15 being then replaced and fastened by the screw 16, so as to hold the sandpaper in place. The sprocket chain 53 is transferred to the other set of sprocket wheels 56, 57 and the machine is speeded up so as to give a high velocity to the drum 9 which now operates as a sandpapering drum to give the final finish to the floor, or I may depend solely upon the high speed of said engine for this purpose.

Fig. 8 illustrates a form of rotary cutting means wherein the cutting members are radially adjustable to enable the same to be cut down when worn and provided with new teeth. The rotary cutting member in this case comprises a drum 76 formed with longitudinal slots 77 in its periphery to receive and guide the cutting members 78 which are formed as above described with rasp teeth 79 and are of sufficient thickness to enable them to be cut down several times and recut with new teeth. These cutting plates or members 78 are supported by thimbles or sleeves 80 which are radially adjustable in the drum 76 by screwing in said drum, the cutting plates 78 being clamped to the sleeve 80 by a clamping bolt or screw 81.

Fig. 10 illustrates the application of electric power to driving the machine. In said figure the rotary cutting means 9 is connected by sprocket chain 53 to the shaft 82 of an electric motor 83, said motor being mounted on the rear part of the base 2 and connected by wiring 84 to a connection plug or binding post means 85. A handle member 86 is connected to the base 2 by frame members 87, 88, extending over the motor and cutting means to the forward of the frame and back of the motor to the rear of the base. The operation is similar to that above described for the gasolene motor.

For some purposes the machine may be operated by hand operated means such as shown in Fig. 11. The rotary shaft 97 is mounted on the rear portion of the frame 89 and connected by a sprocket wheel 90 and sprocket chain 91 to a sprocket wheel 92 on a crank shaft 93 carrying handles 94 for manual operation of the motor, the crank shaft 93 is journaled in the guiding and pushing handle 95 preferably provided at its upper end with a breast plate 96, so that the operator can use both hands in turning the rotary cutting means when pressing forward on the machine by means of plate 96. By providing the rotary cutting drum with this bearing extending to the inside of the supporting frame at one side and longitudinally within the drum at one end, as shown in Fig. 4, I am enabled to bring the drum within one fourth of an inch of the outside of the machine so that the machine can surface the floor to within one fourth of an inch of the wall. The construction of the surfacing machine above described provides a machine of such a light and compact character that it is not only portable in a sense of being shiftable from one place to another on the floor but can be carried easily from one place to another. For convenience in transportation and packing, etc., the parts of the machine are preferably made detachable, the standards 3, 4, being formed as pipe sections and being fastened by screw fastenings 3′, 4′, to the base 1 so that the machine can be quickly taken apart for packing. The handle members 6, 7, 84, 94, are also preferably formed as pipes screwing into the fittings on the frame so that they can be readily removed and can also be turned to any desired position according to the requirements of the operator.

The direction of rotation of the rotary cutting means may be reversed when desired, by reversing the operating means. In the case of the gasolene engine this may be effected by the spark advancing means in well known manner.

What I claim is:

1. A floor surfacing machine comprising a base, a rotary cutter journaled thereon and provided with cutting portions having rasp teeth, and with other cutting portions having oblique ridged teeth, a handle member for said base, and means supported on said base for driving the rotary cutter.

2. In a floor surfacing machine, a base, a rotary cutter journaled thereon, means for driving said rotary cutter, and scraping means movably mounted at the rear of the rotary cutter to engage the floor at the rear of the cutter said scraping means consisting of a plate pivoted at its rear end to the base and having a sharp edge at its forward end to rest on the floor.

3. A floor surfacing machine comprising a base, a rotary cutter, journal bearings for the rotary cutter supported on said base at the respective sides thereof, the bearing at one side extending longitudinally within the rotary cutter, and means supported on the base for driving the rotary cutter.

4. In a floor surfacing machine, a rotary

drum provided with peripheral means having teeth, a cushioning band surrounding the drum and covering the cutting teeth, a sand paper strip surrounding the cushioning means, and a clamp securing the ends of the sand paper strip to the drum.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 24th day of May, 1909.

FRANCIS H. WRIGHT.

In presence of—
ARTHUR P. KNIGHT,
FRANK L. A. GRAHAM.