No. 879,759. PATENTED FEB. 18, 1908.

H. C. FRENCH.

LAWN CLEANER AND CULTIVATOR.

APPLICATION FILED OCT. 6, 1906.

3 SHEETS—SHEET 1.

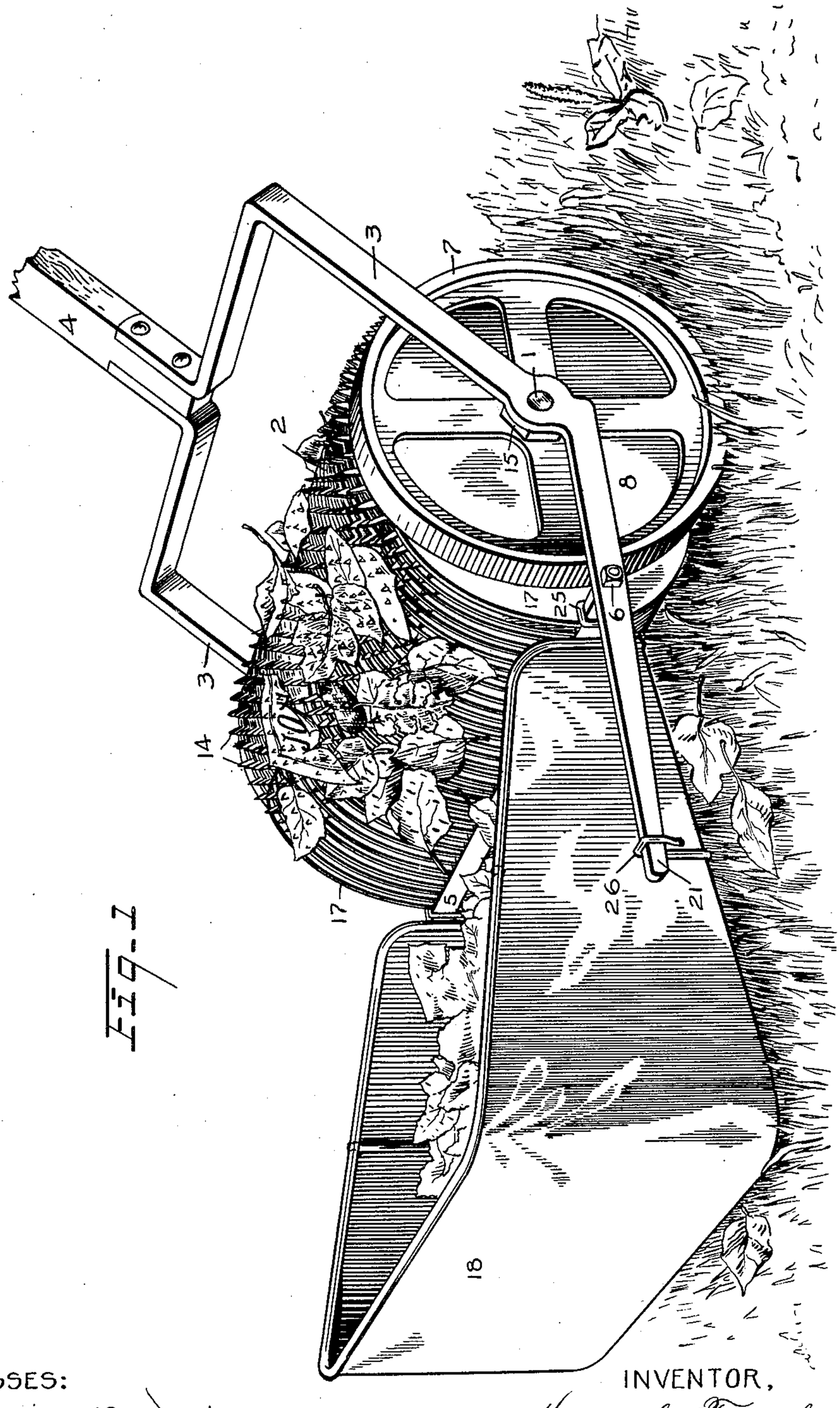

Fig. 1

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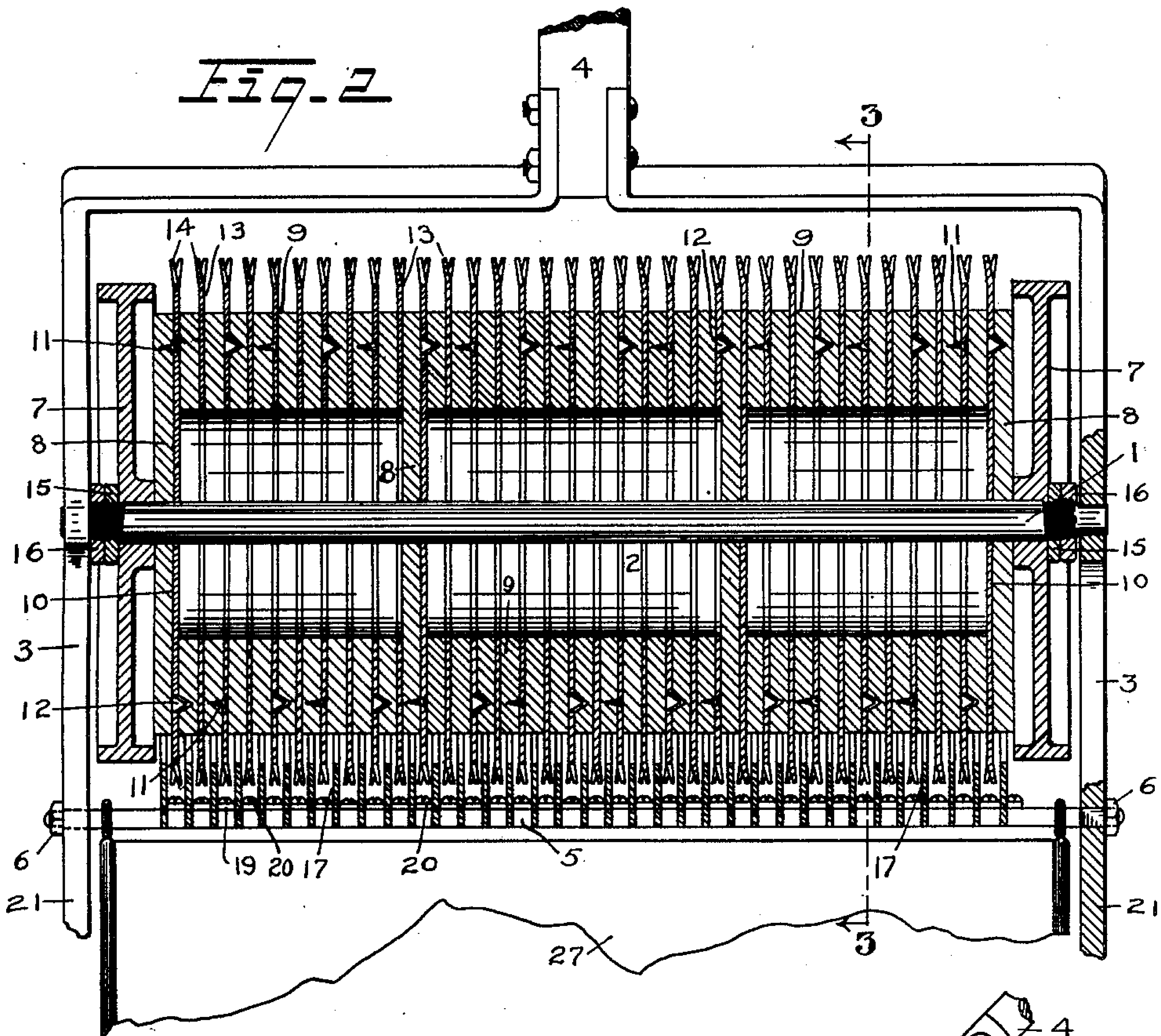
3 SHEETS—SHEET 2.

Fig. 2



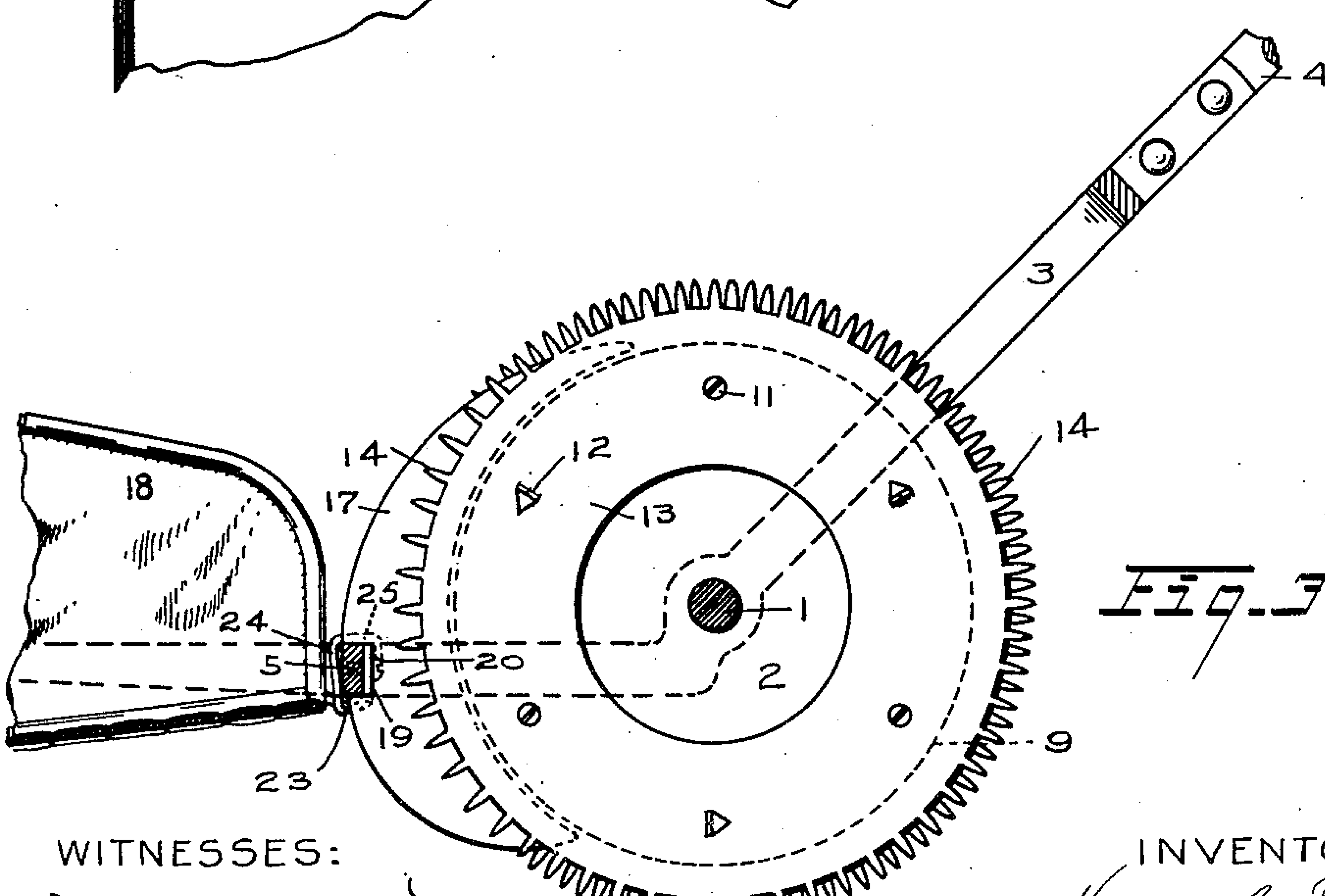


Fig. 3

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3 SHEETS—SHEET 3.

Fig. 4

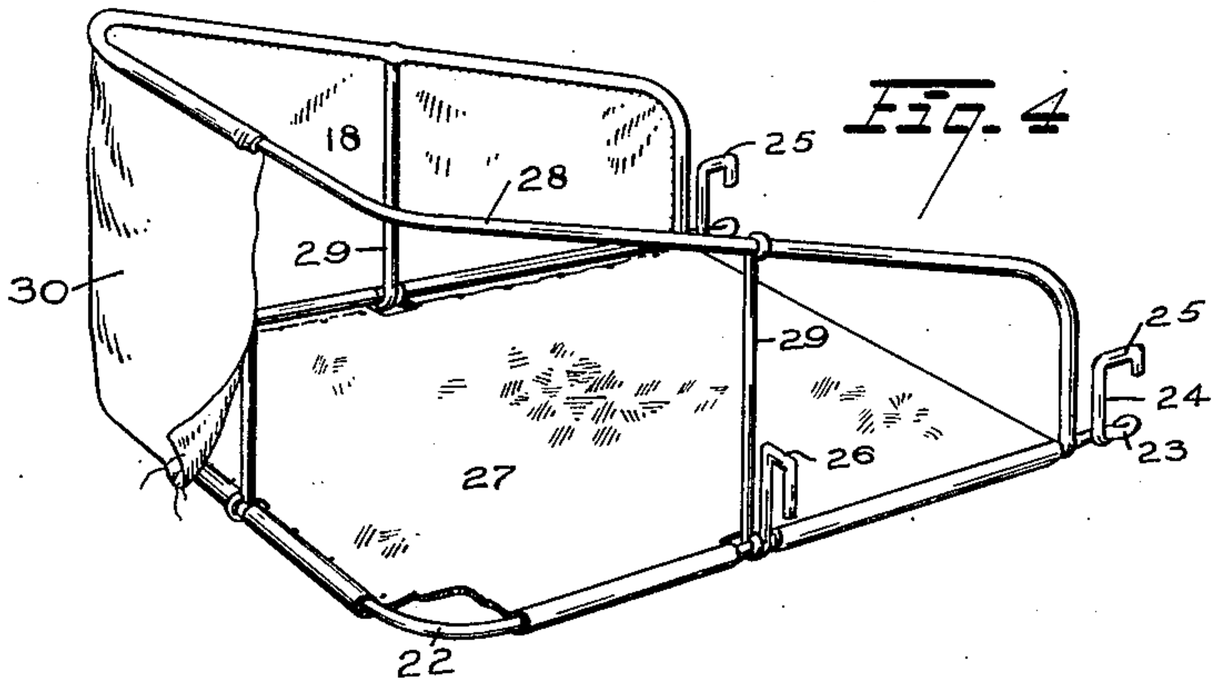
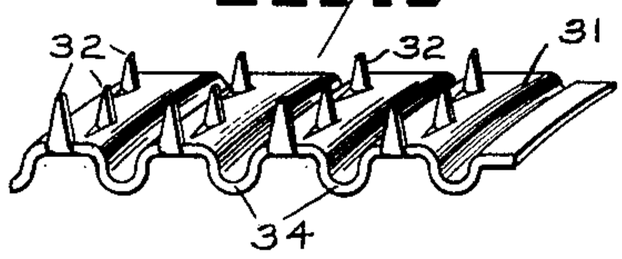


Fig. 5



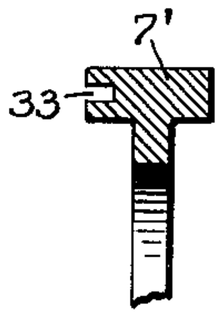


Fig. 8

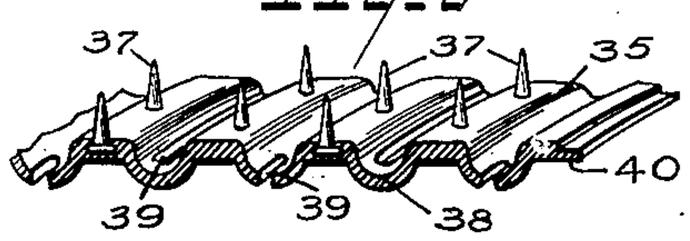


Fig. 7

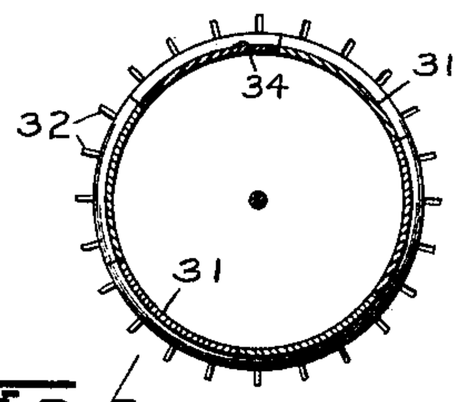


Fig. 6

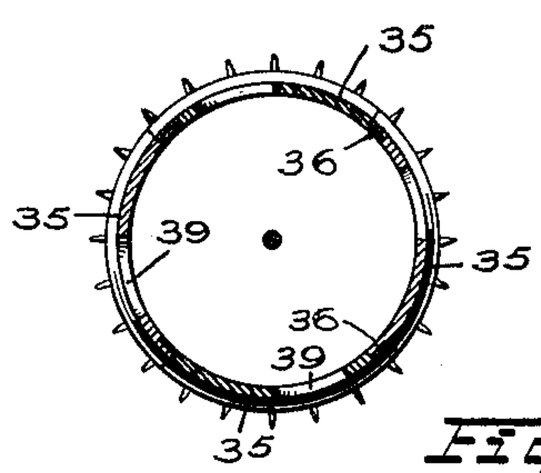


Fig. 9

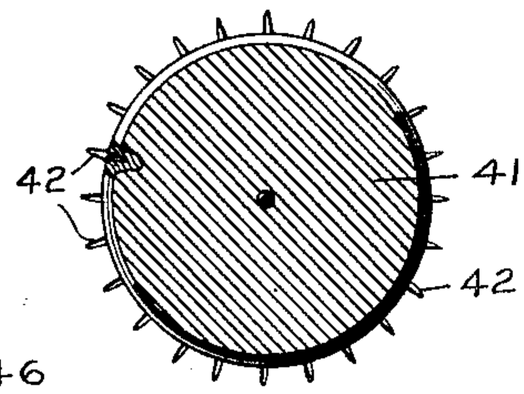


Fig. 10

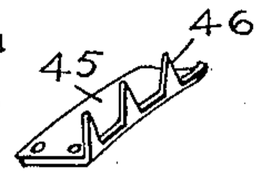
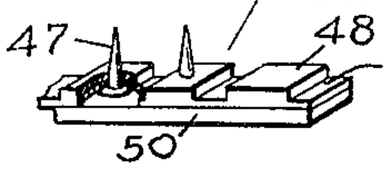


Fig. 13



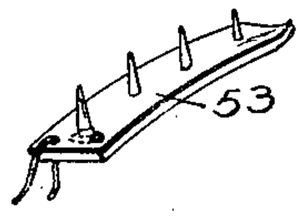


Fig. 11

Fig. 12

Fig. 15

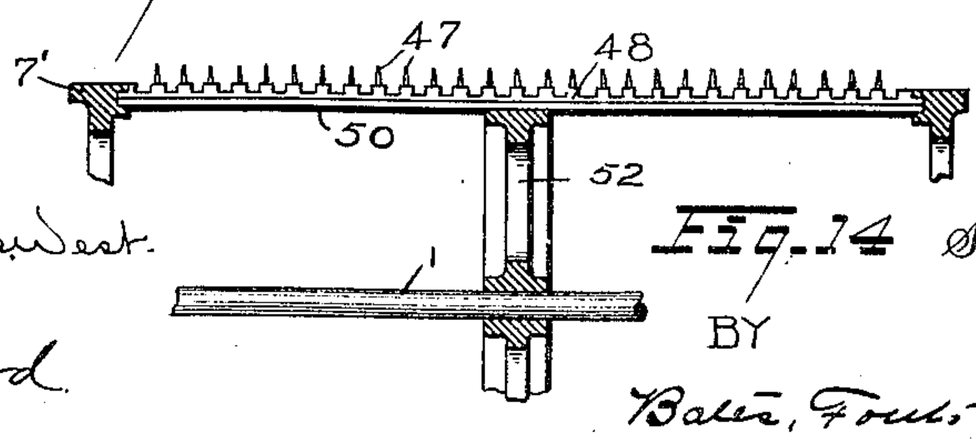


Fig. 14

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UNITED STATES PATENT OFFICE.

HARRY C. FRENCH, OF CLEVELAND, OHIO.

LAWN CLEANER AND CULTIVATOR.

No. 879,759. Specification of Letters Patent. Patented Feb. 18, 1908.

Application filed October 5, 1906. Serial No. 337,501.

To all whom it may concern:

Be it known that I, HARRY C. FRENCH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Lawn Cleaners and Cultivators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to machines for cleaning and cultivating lawns and has for its object the production of a machine of this character which will be simple and economical in construction, easy of operation, and which will be efficient in use.

Heretofore, as far as I am aware, machines for this purpose have operated upon the principle of rotary brushes, or upon the principle of rotary fans, in both of which cases the leaves and other foreign matter upon the lawn are brushed or blown into a receptacle carried by the machine. These types of machines are expensive in construction, are difficult of operation, and are liable to get out of order. Furthermore, when the lawns are wet or the leaves and other matter have lain for a time upon the grass, they are either too heavy or are too deeply embedded in the grass to be removed.

My machine operates upon the principle of collecting the leaves and other matter upon and around points carried by a rotating drum, said leaves or matter being stripped from said drum and deposited in a receptacle. It is immaterial in the use of this machine how wet or how deeply embedded in the grass the leaves may be, as the points on the drum will penetrate the same and carry them around to the receptacle. In fact, the points will penetrate the earth about the roots of the grass, which will loosen up the dirt or mold about the grass and thus serve to cultivate the lawn.

The principle of my invention may be embodied in various forms,—some practical forms being illustrated in the accompanying drawings, in which

Figure 1 is a perspective view of a lawn cleaner and cultivator showing the form of construction which I at present prefer to employ. Fig. 2 is a longitudinal section through the center of the impaling drum taken on a horizontal plane,—the yoke arms and the handle being shown in elevation. Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2. Fig. 4 is a perspective view of the catcher or receptacle showing the manner in which I prefer to build the same. Fig. 5 is a perspective view of a modified form of construction, in which the impaling points are struck from a continuous sheet of metal. Fig. 6 is a transverse section through an impaling drum having the construction shown in Fig. 5. Fig. 7 is a sectional detail of a portion of one of the end wheels showing the groove for the reception of the edge of the sheet shown in Fig. 5. Fig. 8 is a perspective view of a portion of one of the plates for use in another modified form of construction,—the impaling points being cast into said plates. Fig. 9 is a transverse section through a drum made in accordance with Fig. 8. Fig. 10 is a transverse section through another modified form of impaling drum. Fig. 11 is a perspective view of a portion of a metallic strip which may be extended about the drum and secured thereto, the impaling points being struck from said strip. Fig. 12 is a perspective view of a portion of a metallic strip which may be extended about the drum and secured thereto, the impaling points being formed on the edge of said strip and turned outwardly at an angle thereto. Fig. 13 is a view showing a still further modification of my invention in which the impaling points are carried by longitudinal strips, said points being backed by a second longitudinal strip, and the strips being screwed or otherwise secured together. Fig. 14 is a fragmentary sectional view taken longitudinally through a drum having the construction shown in Fig. 13, and Fig. 15 is a perspective view showing a portion of a strip of leather or like material through which strip impaling points are driven, said strip being laced or otherwise secured to the drum.

Referring to the drawings for a more detailed description, 1 represents a shaft passing through the center of the impaling drum 2, said shaft being journaled at its opposite ends in the yoke frames 3. These yoke frames pass around the rear of the impaling drum and are bolted or otherwise secured to the operating handle 4. In front of the shaft 1, the yoke frames are secured together by a transverse bar 5, said bar having screw threaded portions at its ends for the reception of nuts 6.

As is shown in Figs. 1 to 3, the impaling drum is provided at each of its ends with wheels or disks 7, through the centers of

which passes the shaft 1. Mounted centrally upon this shaft just inside the hubs of the wheel 7 are disks 8, which are made of wood or similar material for a purpose hereinafter set forth. Also surrounding said shaft and concentric therewith, are a series of rings 9, said rings having the same diameter as the disks 8, so that said disks and rings form a continuous cylinder. The disks 9 are also preferably made of wood. Between the disks 8 and the adjacent rings 9, I mount upon the shaft 1 a metallic disk 10, and secure said disks 10 to the said disks 8. These disks may be secured together in any suitable manner, as by screws 11, which penetrate the wooden disks 8. To one side of each of the rings 9, I secure metal rings 13, said rings having preferably, the same internal diameter as the rings 9, but projecting beyond the outer circumference of the latter and for some distance beyond the circumference of the wheels 7. The rings 9 and 13 are held together by screws 11 and by spurs 12, the screws entering the ring 9 on one side of a ring 13 and the spurs projecting into the ring 9 on the opposite side thereof. The outer peripheries of the rings 13 are provided with impaling points 14, said points being adapted, as the impaling drum is rolled upon the lawn, to penetrate the leaves thereon, and carry the same about, as the drum rotates. As will be seen from Fig. 2, the adjacent points 14 on the rings 13 are staggered or are bent laterally one from the other in the nature of the teeth of a saw,—said points thus being adapted to more certainly penetrate every particle of foreign substance that may be upon the lawn. For the purpose of strengthening the drum 2, disks 8 with their metallic disks 10 may be employed at intervals along the length of the shaft 1. At the ends of the shaft and between the wheels 7 and the yoke arms 3, the shaft is provided with screw threads upon which I place nuts 15, by means of which the wheels 7 may be forced toward each other and thereby securely clamp together all the various disks and rings forming the impaling drum. These nuts are prevented from loosening by jam nuts 16, in a manner well understood.

From the above description it will be understood that, as the drum 2 is pushed over the lawn, all loose leaves and other matter will be collected by the points 14 and will be carried about upon the surface of the drum. In order to remove these leaves and other matter from the drum, I employ a series of stripping fingers 17, which are mounted upon the cross bar 5 and extend in a crescent shape about the forward side of the impaling drum, the ends of said fingers extending into the spaces between the adjacent rings 13. Intermediate said ends, the stripping fingers extend outwardly beyond the ends of the points 14 so that the leaves, in being carried about the drum, will be cammed off of the ends of the points by these stripping fingers, and will be deposited in a receptacle or catcher 18. As the leaves, especially when damp, will tend to adhere to the stripping fingers, in which case they will not be deposited in the receptacle, hereinafter described, but will be torn into bits and again scattered on the lawn, the forward, or stripping edges of the fingers extend outwardly from the drum on a gradual and slight curve. In other words, the curvature of said stripping edges is only slightly eccentric to the axis of the drum. By this construction the leaves are prevented from adhering to the stripping fingers, and the downward inclination of the fingers at the stripping line is so great that the leaves will drop immediately into the receptacle. These stripping fingers may be made in various ways; but, as shown, and as I prefer to use them, they are made of sheet metal having tongues 19 stamped therefrom and turned at right angle so as to permit the fingers to be attached to the bars 5, which is preferably done by means of screws 20 passing through said tongues and into said bar. The rear surface or edge of the fingers 17 is concaved to approximately conform to the circumference of the disks 9 opposite thereto, so that the lower end of the finger also projects into the space between the disks 13. These fingers serve, therefore, to strip the leaves from the impaling drum when the latter is rolled backwardly over the lawn. Said leaves would, in this case, be simply picked up and dropped again in substantially their original places.

The receptacle or catcher 18 is carried on the front of the machine by the cross bar 5, and by the extended arms 21 of the yoke frames 3. This catcher, as shown in Fig. 4, is formed of a member 22, that is bent substantially into a U-shape, and at its rear ends is twisted back about itself at 23, and is then bent upwardly at 24, and carried around so as to form a hook at 25, said hook resting upon the bar 5, and engaging with the rear side thereof. Near the center of the side portions this member carries a hook 26 that engages over the extended arms 21 of the yoke frames 3. The bottom 27 of the receptacle is preferably formed of metal, which is turned at its edges about the member 22. Secured to the member 22 adjacent the hooks 25 is an upper member 28, which forms the upper edge of the receptacle, said member 28 being spaced from the member 22 by braces 29, the ends of which are looped about said members. The sides of the receptacle are formed of canvas or other suitable material, 30, secured at its edges to the members 22 and 28.

By attaching the receptacle to the bar 5, its rear end is in position to receive the

leaves or other matter that is carried over by the drum, and is stripped therefrom by the fingers 17, as hereinbefore described. In attaching the receptacle to the machine, it is only necessary to tip the front end upwardly and place the hooks 25 over the bar 5, when the receptacle can be dropped into place, the hooks 26 engaging the arms 21. When in this position the twisted portions 23 will rest under the bar 5, which will prevent the removal of the receptacle except when its forward end is again lifted. When the receptacle is in place, the bottom slants downwardly toward the front end in order that the matter therein will automatically move away from the drum.

The adjacent rings 13 and the points 14 on said rings are placed so close together that very small particles of leaves or other matter will be picked up thereby; and as they penetrate into the earth at points so close together, it will be understood that the earth about the roots of the grass will be loosened up thereby, without injury to the root, which will cultivate the lawn and assist and promote the growth of the grass.

In the construction shown in Figs. 5 and 6, the perimeter of the drum is formed of strips of sheet-metal 31 from which the impaling points 32 are stamped or struck and then bent outwardly at right angles. The adjacent points 32 in the same circumferential row are staggered in arrangement for the purpose referred to in the description of the points 14. As shown in Fig. 6, six sheet-metal strips are employed, the same being curved transversely so as to abut at their edges and to form, when assembled, a continuous drum. The ends of the strips project into circumferential recesses 33 on the adjacent faces of the wheels 7′, as shown in Fig. 7, said recesses holding the strips 31 into drum formation. Between the adjacent circumferential rows of points 32 the metal of the sheet 31 is depressed as at 34, into which depressions or grooves the stripping fingers 17 project.

In the form shown in Figs. 8 and 9 the perimeter of the drum is composed of a number of plates 35, Fig. 9 showing four of these plates, the adjacent edges of which meet in a lap joint at 36. These plates 35 are formed of cast metal and the impaling points 37 have their inner heads or ends cast therein. Between the adjacent circumferential rows of points 37, the metal of the plates is depressed at 38 to accommodate the stripping fingers,—as described in connection with the form shown in Fig. 5. For lightening the drum, I preferably form slots 39 in the bottom of the recess 38, said slots being narrower than the thickness of the stripping fingers so as to avoid all danger of said fingers engaging in said slots. The outer ends of the plates 35 are of diminished thickness at 40, the ends 40 projecting into the circumferential grooves 33 of the wheels 7′ that are shown in Fig. 7.

The form of drum construction shown in Fig. 10 consists of a plain cylinder 41, into which are driven the impaling points 42. This forms a very efficient impaling drum and one that can be easily manufactured, although for building in quantities, I prefer the construction shown in Figs. 1, 2 and 3.

The form shown in Fig. 11 consists of a metallic strip 43, from which the impaling points 44 are stamped or struck and then bent outwardly. An impaling drum constructed in accordance with this figure would carry on its perimeter a plurality of the strips 43 which would be bent around the drum and suitably secured thereto. The stripping fingers would project into the spaces between the adjacent strips 43.

The form of strips shown in Fig. 12 is similar to that just described and is to be used in the same manner. In this case, however, the strips 45 have the impaling points 46 formed at their edges and said points are turned outwardly at right angles to the strip.

In Figs. 13 and 14, the impaling points 47 are driven or otherwise passed through a longitudinal strip of wood or other suitable material 48, said strip being rabbeted at its ends as shown at 49. Secured to said strip beneath the inner ends of the impaling points is a second strip 50. The ends of the strips 50 and the rabbeted portions of the strips 48 are inserted into the circumferential recess in the sides of the wheels 7′, as was described with respect to the form shown in Fig. 5. To prevent the strips 48 and 50 from yielding between their ends, strengthening spiders or frames 52 may be inserted and carried by the shaft 1, the strips 50 resting upon said strengthening frames.

In Fig. 15 I have shown a carrier at 53 for the impaling pins, said carrier consisting preferably of leather through which the impaling points may be driven, after which the strip is secured to the drum by lacing or in other suitable manner.

While I have thus shown a number of ways in which I may form the impaling drum, there are doubtless numerous other practical ways that may be used instead, and I desire it to be understood that the following claims are not intended to be limited to any particular form of drum any further than their express terms necessitate.

Having thus described my invention, I claim:

1. In a lawn cleaner, a drum, a plurality of circumferential rows of points projecting from said drum, a receptacle, a plurality of stripping fingers carried by said cleaner, said fingers having each of their ends projecting into the spaces between the said circumferential rows of points, whereby, when the

drum is rolled in one direction, the matter thereon will be stripped from about the points and guided to the receptacle, and, when the drum is rolled in the opposite direction, the matter on said drum will be stripped from about said points and dropped upon the lawn.

2. In a lawn cleaner, a drum, a plurality of circumferential rows of points projecting radially from said drum, a receptacle and a plurality of crescent-shaped stripping fingers carried by said cleaner, said fingers having one of their ends projecting into the spaces between the said circumferential rows of points above the receptacle and their opposite ends projecting into said spaces below the receptacle, whereby when the drum is rolled in one direction, the matter thereon will be stripped from about the points above the receptacle and guided to the receptacle, and when the drum is rolled in an opposite direction, the matter on said drum will be stripped from about said points below the receptacle and dropped upon the lawn.

3. In a lawn cleaner, a drum, a plurality of circumferential rows of points carried by said drum, a bar extending parallel to said drum, a receptacle attached to said bar and a plurality of stripping fingers carried by said bar, said fingers projecting between the circumferential rows of points and extending downwardly from the stripping line for stripping the matter from the points and for guiding the said matter to the receptacle.

4. In a lawn cleaner, a drum, a plurality of circumferential rows of points carried by said drum, a bar extending parallel to said drum, a receptacle attached to said bar, and a plurality of crescent-shaped stripping fingers carried by said bar, said fingers projecting between the circumferential rows of points for stripping the matter therefrom, the ends of the fingers above the bar serving to guide the said matter to the receptacle, and the ends of the fingers below the bar serving to deposit the matter on the lawn when the drum is rolled backwardly.

5. In a lawn cleaner, a drum, collecting points carried by said drum, yoke arms within which said drum is journaled, said arms having forward extensions, a bar connecting said extensions and extending parallel with the axis of the drum, a receptacle carried by said bar and by said extensions of the yoke arms and a plurality of fingers attached to said bar, said fingers being adapted to strip matter from the said points, the fingers extending downwardly from the stripping line so that the matter will be caught in the receptacle.

6. In a lawn cleaner, a drum, a plurality of circumferential rows of points carried by said drum, yoke arms within which said drum is journaled, said arms having forward extensions, a bar connecting said extensions and extending parallel with the axis of the drum, a receptacle carried by said bar and by said extensions of the yoke and a plurality of stripping fingers attached to said bar, said fingers extending between the said rows of points.

7. In a lawn cleaner and cultivator, a drum, a plurality of circumferential rows of points projecting from said drum, said points being adapted to penetrate the lawn as the drum is rolled thereover, the adjacent points in said rows being staggered for the purpose specified, a receptacle, and means for removing the matter from about said points and for guiding the same to said receptacle said means extending downwardly from the stripping line, for the purpose specified.

8. In a lawn cleaner and cultivator, a drum, a plurality of circumferential rows of points projecting from said drum, said points being adapted to penetrate the lawn as the drum is rolled thereover, the adjacent points in said rows being staggered for the purpose specified, a receptacle, and stationary fingers projecting between the rows of points for removing the matter from about said points and for guiding the same to said receptacle said fingers extending downwardly from the stripping line, for the purpose described.

9. In a lawn cultivator, a drum having a central shaft, wheels at the end of said shaft, a plurality of disk-like members provided with penetrating points, said members being mounted concentric with said shaft and the points thereon projecting beyond the said wheels, means whereby the said members may be clamped between the said wheels, means engaging said shaft for rolling said drum over the lawn, and stripping fingers projecting between the points on said members and extending downwardly from the stripping line so as to strip matter from said points.

10. In a lawn cleaner, a drum comprising a plurality of disk-like members formed of an impressionable material such as wood, a plurality of disk-like members of metal clamped between said members of impressionable material, the metal members projecting beyond the perimeter of the impressionable material and provided on their perimeters with points, the adjacent points on said metal members being staggered for the purpose specified and stripping fingers projecting between the said metal members and extending downwardly from the stripping line for the purpose of stripping material from said points.

11. In a lawn cleaner, a drum comprising end wheels, a plurality of disk-like members formed of an impressionable material such as wood, a plurality of disk-like members of metal between said members of impressionable material, the metal members projecting beyond the perimeter of the wheels and the impressionable material and provided on their

perimeters with points, the adjacent points on said metal members being staggered for the purpose specified, means for forcing the wheels toward said members, whereby all the members are securely clamped together and stripping fingers projecting between the said metal members and extending downwardly from the stripping line for the purpose of stripping material from said points.

12. In a lawn cleaner, a drum provided with a plurality of points on its perimeter, wheels at the ends of said drum, the said points projecting beyond the peripheries of said wheels so as to penetrate the ground as the drum is rolled thereover, yoke frames within which said drum is journaled, said yoke frames having forwardly extending arms, a bar connecting said arms and extending parallel with said drum, a receptacle carried by said bar and by said extended arms, said receptacle having a bottom member, the rearward ends of which are provided with a loop and hook, said loop and hook engaging with the said cross bar, and stripping fingers carried by said bar for removing matter from about the said points and for depositing it in the said receptacle.

13. In a lawn cleaner, a drum composed of a plurality of pairs of disk-like members, one of said members of each pair being made of wood and the other members of the pair being made of metal, said metal disk being secured to the wooden members and having spurs struck from the sides thereof so as to penetrate the wooden member of the next pair, points upon the peripheries of said metal members for collecting matter from the lawn, and means for clamping said pairs of members together.

14. In a lawn cleaner, a drum provided with a plurality of points on its perimeter, wheels at the ends of said drum, the said points projecting beyond the peripheries of said wheels so as to penetrate the ground as the drum is rolled thereover, yoke frames within which said drum is journaled, said yoke frames having forwardly extending arms, a bar connecting said arms and extending parallel with said drum, a receptacle carried by said bar and by said extended arms, said receptacle having a bottom member, the rearward ends of which are provided with a loop and hook, said loop and hook engaging with the said cross bar.

15. In a lawn cleaner, a drum, a plurality of circumferential rows of points projecting from said drum, a receptacle, means carried by said cleaner and projecting between the said rows of points for stripping matter from the drum and for depositing it in the said receptacle, and means projecting between the said rows of points for stripping the matter therefrom, and for depositing it upon the lawn when the drum is rolled in a reverse direction.

16. In a lawn cleaner, a drum that is provided with points, said points being adapted to penetrate the earth and to collect leaves and similar matter on the lawn as the drum is rolled over the same, a receptacle, and stripping fingers having their upper ends extending inside the orbits of the outer ends of said points, and curving outwardly beyond said orbits, whereby the matter will be removed from the collecting points and deposited in said receptacle.

17. In a lawn cleaner, a drum that is provided with points, said points being adapted to penetrate the earth and to collect leaves and similar matter on the lawn as the drum is rolled over the same, a receptacle, and stripping fingers having their upper ends extending inside the orbits of the outer ends of said points, and curving outwardly beyond said orbits, whereby the matter will be removed from the collecting points, the curvature of the fingers at the stripping line being downward so that the matter will be deposited in the receptacle.

18. In a lawn cleaner, a drum that is provided with a plurality of circumferential rows of points, said points being adapted to penetrate the earth, and to collect matter as the drum is rolled over the lawn, a receptacle for said matter, and a plurality of stripping fingers projecting between the said rows of points for removing the said matter from about the points, and for guiding it to said receptacle, the stripping edges of said fingers extending downwardly at a sharp incline below the stripping line in order to prevent the said matter from adhering to the stripping fingers.

19. In a lawn cleaner, a drum that is provided with a plurality of circumferential rows of points, said points being adapted to penetrate the earth, and to collect matter as the drum is rolled over the lawn, a receptacle for said matter, the bottom of the receptacle inclining downwardly from said drum, and a plurality of stripping fingers projecting between the said rows of points for removing the said matter from about the points, and for guiding it to said receptacle, the stripping edges of said fingers extending downwardly at a sharp incline below the stripping line in order to prevent the said matter from adhering to the stripping fingers.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HARRY C. FRENCH.

Witnesses:
S. E. FOUTS,
J. B. HULL.