(No Model.) 2 Sheets—Sheet 1.

E. C. RICE.

APPARATUS FOR BURNING PRAIRIE GRASS.

No. 419,559. Patented Jan. 14, 1890.

Fig. 1.

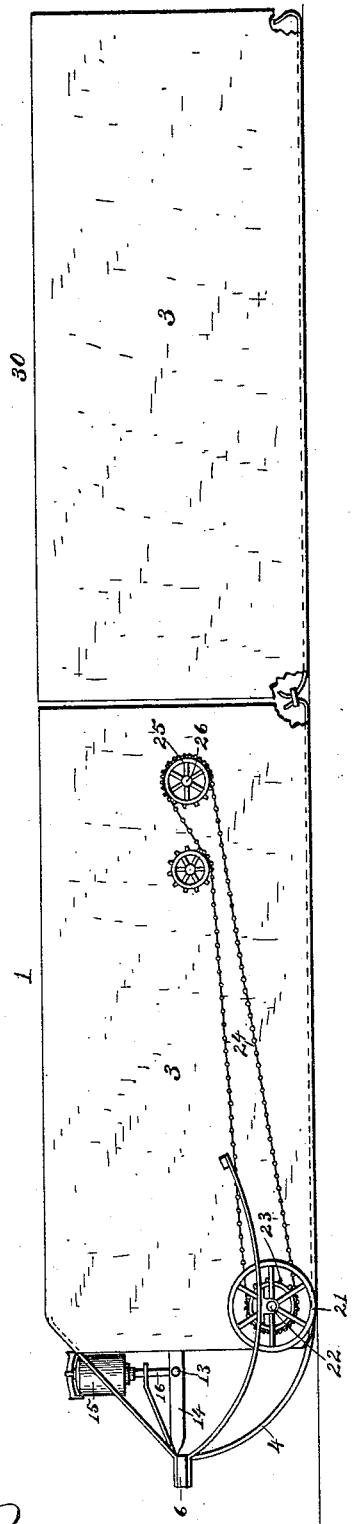
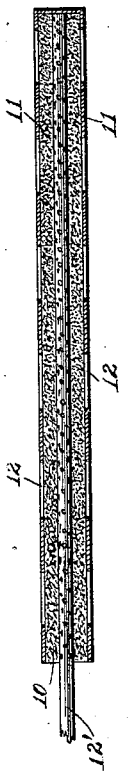


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

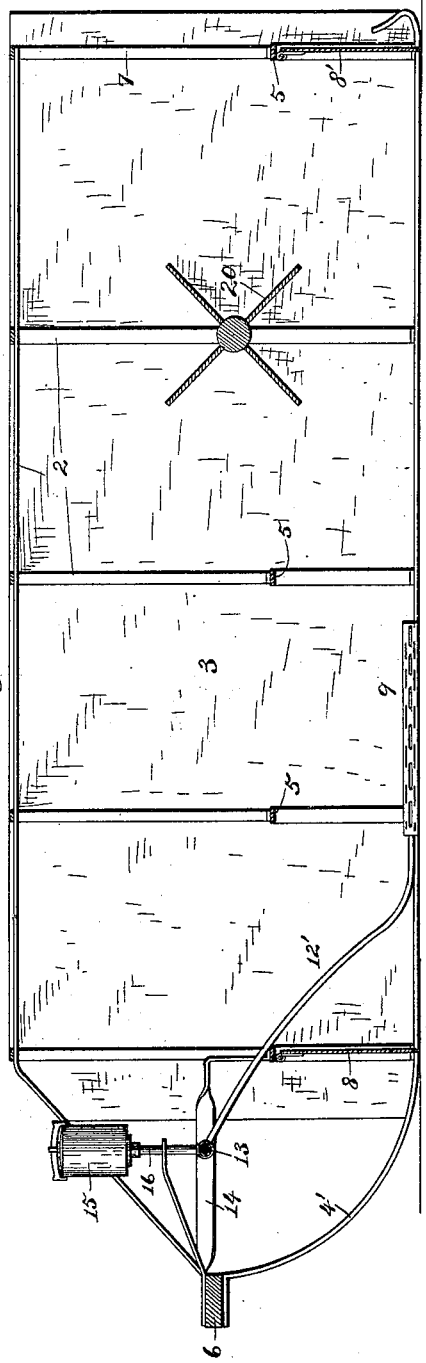
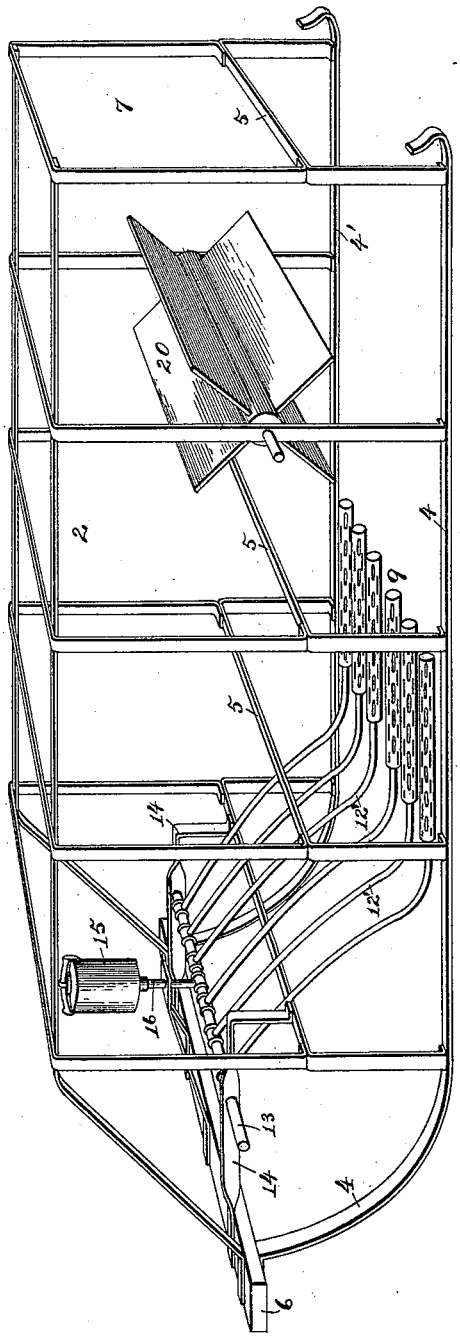


Fig. 3.



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EZEKIEL C. RICE, OF MANDAN, (DAKOTA TERRITORY,) NORTH DAKOTA.

APPARATUS FOR BURNING PRAIRIE-GRASS.

SPECIFICATION forming part of Letters Patent No. 419,559, dated January 14, 1890.

Application filed September 28, 1889. Serial No. 325,411. (No model.)

To all whom it may concern:

Be it known that I, EZEKIEL C. RICE, a citizen of the United States, residing at Mandan, in the county of Morton and State of North Dakota, have invented certain new and useful Improvements in Machines or Apparatus for Burning Prairie-Grass; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to a machine or apparatus for burning or destroying prairie-grass within a specified limit or area; and the primary object of the invention is to provide means for economically and expeditiously destroying the grass on a limited area of prairie-land to form a belt or "brake," which arrests the progress of prairie-fires, which, as is well known, are very destructive.

With this primary end in view and such others as pertain to my invention it consists of a movable inclosure adapted to be drawn or moved across the prairie-ground and a burner or burners carried within said inclosure and adapted to move or travel upon or in close proximity to the ground when the inclosure is drawn forward, whereby the burner or burners ignite or set fire to the grass within the area inclosed within the movable inclosure, so that the grass is destroyed and the fire prevented from spreading beyond the inclosure as the latter is drawn over the ground, thus making a brake or burnt belt or area, across which the prairie-fire cannot pass.

As a practical embodiment of my invention I contemplate the use of a metallic skeleton frame of suitable length and width, which is incased with sheet metal or other suitable material to form an inclosure which will prevent the escape of the fire within the same, and in this inclosure, preferably at the forward part thereof, I locate one or a series of burners, which are supplied with oil or other fuel from a tank carried by the movable inclosure. When a series of burners are employed, they may be arranged parallel with each other longitudinally of the machine and adapted to rest and travel on or in close proximity to the ground; but it is evident that a single transverse burner of large capacity may be employed in lieu of the series of longitudinal burners. The burners may be of any desired kind; but I prefer to employ an absorbent porous tube, preferably of clay or similar material, which is surrounded by a metallic perforated sleeve or pipe through which the flame escapes, and fuel is supplied to each burner by a pipe, the several supply-pipes of the series of burners being connected to a common transverse pipe which receives the fuel from the tank or reservoir, so as to uniformly distribute the fuel to the several pipes and burners.

In order to expedite the consumption or burning of the grass, increase the draft in the inclosure, and confine the flame from the burning grass within said inclosure, I have provided a blower or fan in the rear part of the inclosure and in rear of the burner or burners, which blower operates to create or force a current of air which travels through the inclosure from the rear toward the front end thereof and downward upon the burning grass, whereby combustion and the consumption of the grass by the flames are promoted, and the flames of the burning grass at the rear of the machine or inclosure are forced toward the front thereof, which serves in a great measure to confine the flames within the inclosure. This fan or blower is preferably of the rotary kind, and it is arranged transversely across the inclosure above the plane of the burner or burners, the shaft of said fan being suitably journaled in bearings on the frame of the inclosure.

As a means for rotating the fan or blower I have provided a ground-wheel, which is suitably journaled on the frame of the inclosure in such position as to be rotated by contact with the ground when the machine is drawn forward, and this ground-wheel is geared or belted to an idle-wheel, which in turn is geared to the fan or blower, preferably by a sprocket-chain, so as to rotate the

fan or blower in the proper direction to create a current of air which travels from the rear toward the front of the movable inclosure. I do not desire, however, to restrict myself to the precise means described for rotating the fan or blower, nor to the use of any particular kind of fan, as it is evident that another kind of blower and a different driving mechanism therefor can be employed without departing from the spirit of my invention. The inclosure may be made of such width as to burn an area or space wide enough to prevent the flames of a prairie-fire from leaping across the burned district or "brake," as it is commonly called, and the length of the inclosure is such that the grass within the same is effectually consumed before the inclosure leaves the same. If it is found impracticable to construct a single inclosure which will effectually burn the grass before the latter is exposed, the inclosure may be constructed in two or more sections, according to the condition of the grass to be burned, which sections of the inclosure may be flexibly and detachably coupled together.

To enable others to more readily understand my invention, I will now proceed to a detailed description thereof in connection with the accompanying drawings, in which—

Figure 1 is a side elevation showing the movable inclosure constructed in two sections. Fig. 2 is a longitudinal sectional view through the main or front section of the movable inclosure. Fig. 3 is a perspective view of the movable inclosure with the metallic casing thereof removed, in order to clearly show the arrangement of the several parts. Fig. 4 is a detail longitudinal sectional view through one of the burners.

Referring now more particularly to the accompanying drawings, in which like numerals of reference denote corresponding parts in all the figures, 1 designates the movable inclosure of my machine or apparatus for burning or destroying prairie-grass within a specified limit. The movable inclosure consists, essentially, or an open or skeleton frame 2, made of metal, and a sheet-metal case or shell 3, which is placed over and secured upon the metallic skeleton frame, so as to form an inclosure which will not be affected by heat.

To adapt the inclosure to be readily and easily drawn over the ground, I have mounted it on runners 4 4′, upon which the skeleton frame 2 is erected; but this frame may be supported by rollers or wheels instead of the runners, as is obvious. The frame is braced in any suitable manner, as by cross-bars 5, and at the front thereof I provide a stout transverse bar 6, to which can be attached a draft pole or tongue (not shown) to adapt the machine to be conveniently drawn by horse or other power. At the rear end of the inclosure 1 an opening 7 is left in the upper part of the case or shell 3 to admit air into the inclosure to support combustion, and swinging doors 8 8′ are arranged at the front and rear ends of the inclosure to permit ready access to the interior thereof for repairs, &c., when the apparatus is not in use.

Within the inclosure, at the front thereof, I arrange a burner or series of burners 9. I preferably employ a series of burners, which are arranged close together, with their longitudinal axes in the direction or line of movement of the machine, because they provide a large flame-surface and are therefore adapted to more quickly and uniformly set afire the grass through which they (the burners) pass; but it is obvious that a single transverse or longitudinal burner having a large flame-surface and capacity for burning fuel could be substituted for the series of burners without departing from the spirit of my invention, the essential feature of which is a movable inclosure having a burner located or arranged within the same for setting fire to the grass over which the inclosure passes, said inclosure being so proportioned that the flames consume the grass within a specified limit before the burned district or brake is exposed to the air by the inclosure passing over the ground.

When the series of burners are employed, as shown in Figs. 2 and 3, they are arranged parallel with and in close proximity to each other, the series extending transversely across or from side to side of the inclosure, while the individual burners of the series are arranged longitudinally of the inclosure. The burners are arranged to rest or travel upon the surface of the ground, or they may be suitably supported in close proximity to the ground, and they are located at the front end of the inclosure, in order that the area of burning grass which is set on fire by the flame from the burners may be confined within the inclosure, and thus prevented from spreading beyond the same.

Each burner preferably consists of a porous absorbent tube or cylinder 10, (see Fig. 4,) which is inclosed within a metallic sheath or jacket 11, said metallic jacket being slotted longitudinally or provided with transverse openings 12, through which the flame from the burning fuel (preferably gasoline or oil) is free to escape and ignite the grass through which the burner is drawn.

In practice the burner is made by mixing fire-clay with sawdust or like material, which mixture is then molded into shape and the mass burned or baked, the effect of which is to harden the clay and eliminate the sawdust, thus producing a porous absorbent tube or cylinder which is capable of being charged or saturated with an inflammable liquid hydrocarbon, that can be readily ignited by simply applying a lighted match to the same. The liquid fuel is supplied to the series of burners by means of metallic pipes 12, one end of each of which terminates within the porous absorbent burner, and these supply-pipes are bent upwardly from the burners and communicate with a common transverse pipe 13,

that is supported in an elevated position at the front end of the inclosure by means of suitable brackets 14, fixed on the skeleton frame 2 of the inclosure, said transverse pipe 13 communicating with an elevated tank or reservoir 15 by means of an intermediate pipe 16, as clearly shown in Figs. 2 and 3.

20 designates the fan or blower, which is arranged in rear of the burner or burners, and is driven to force a current of air from the rear toward the front of the inclosure and downward upon the flames of the burning grass, in order to promote combustion and thus quickly consume the grass and confine the burning grass within the limits of the inclosure.

The fan or blower may be of the ordinary well-known form, and the shaft thereof is journaled in bearings secured to the skeleton frame of the inclosure. At the forward end of the machine I provide a driving-wheel 21, which is fitted on a shaft or axle 22, suitably supported on the inclosure or the skeleton frame thereof in such position as to contact with the ground and be rotated as the machine is drawn forward. This driving ground-wheel carries a sprocket-wheel 23, around which passes a sprocket-chain 24, that drives an elevated idle-wheel 25, mounted on a shaft or axle 26, and said idle-wheel is in turn geared to the shaft of the rotary fan or blower, whereby the fan or blower is rotated, so as to create a current of air that travels from the rear toward the front end of the inclosure and downward upon the burning grass.

The inclosure may be constructed of any desired length and width, so as to confine the burning grass within the same. If the grass is very dry and light, it is obvious that it will burn very fiercely and quickly under the forced draft produced by the rapidly rotating blower or fan, and under such circumstances only a single inclosure is necessary to confine the flames and prevent it from spreading; but should the grass be green or moist it will not burn so quickly, and hence there is liability that the grass will burn after the inclosure has passed over the same, and thus set the grass adjoining the brake or burning district on fire. To obviate this difficulty a second or third inclosure or section 30 may be coupled to the front inclosure or section 1, so as to confine the flames of burning grasses within a fire-proof structure which will inclose the same until they subside to such an extent as to be free from the danger of setting fire to the adjoining grass. These second and third sections of the inclosure may consist solely of the skeleton frame and metallic inclosing-jacket without the burners and appliance for producing a forced draft; but it is evident that each section of the inclosure may be provided with said burners and draft appliances.

The operation and advantages of my invention will be readily understood and appreciated from the foregoing description, taken in connection with the drawings, and I do not deem it necessary to repeat the same here.

I am aware that changes and alterations can be made in the details of construction and form and proportion of parts of the mechanisms herein shown and described as an embodiment of my invention without departing from the spirit or sacrificing the advantages of the same, and I would therefore have it understood that I hold myself at liberty to make such modifications as fairly fall within the scope of my invention.

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

1. A machine for burning or destroying prairie-grass within a specified area, consisting, essentially, of a movable bottomless inclosure having closed sides, ends, and top, and a burner or burners housed within said inclosure, substantially on the plane of the lower open portion thereof, and operating to ignite the grass and other material within the limits of the inclosure, for the purpose described, substantially as set forth.

2. A machine for burning or destroying prairie-grass within a specified area, substantially as herein described, consisting, essentially, of a movable or traveling fire-proof bottomless inclosure having the closed sides, ends, and top, and a burner or burners housed within said inclosure, arranged in the lower part thereof, and having the flame-surfaces exposed to ignite the grass and other material within the limits of the inclosure, for the purpose set forth.

3. A machine for burning or destroying prairie-grass within a specified area, consisting, essentially, of a movable fire-proof bottomless inclosure having the closed sides, ends, and top, a burner or burners carried within the inclosure and having the flame-surfaces thereof exposed to ignite the grass within the limits of the inclosure, and a forced-draft appliance independent of the burner and carried by the inclosure for directing a blast of air upon the burning area within the inclosure and promoting combustion of the burning grass, substantially as described, for the purpose set forth.

4. A machine for burning or destroying prairie-grass within a specified area, consisting, essentially, of a movable bottomless inclosure, a burner or burners housed within said inclosure at the forward end thereof and arranged upon or in close proximity to the surface over which the inclosure moves, and a rotary fan or blower located within the inclosure above and in rear of said burner, for the purpose described, substantially as set forth.

5. A machine for burning or destroying prairie-grass within a specified area, consisting, essentially, of a movable bottomless inclosure having the skeleton frame to form

the inclosing side and end walls and the top of said inclosure and the metallic covering secured to said frame, a burner housed within said inclosure, and means for conveying fuel to the burner, substantially as described.

6. A machine for burning or destroying prairie-grass within a specified area, consisting of a movable fire-proof inclosure, a series of burners arranged within the inclosure, and each individual burner being arranged longitudinally of said inclosure, and distributing-pipes for conveying fuel to said burners, substantially as described, for the purpose set forth.

7. A machine for burning or destroying prairie-grass within a specified area, consisting of a movable fire-proof inclosure, a series of burners arranged within the same, each burner consisting of a porous absorbent block housed within a perforated jacket, a tank or reservoir, and distributing-pipes for conveying fuel to said burners, substantially as described.

8. A machine for burning or destroying prairie-grass within a specified area, consisting of a movable fire-proof inclosure, a series of absorbent porous burners arranged longitudinally within the inclosure and in close proximity to each other, the series of supply-pipes communicating with the burners, a tank or reservoir, and a common transverse pipe communicating with the tank and the series of pipes, substantially as described, for the purpose set forth.

9. A machine for burning or destroying prairie-grass within a specified area, consisting of a movable fire-proof bottomless inclosure, the burner housed within the same, a rotary fan or blower arranged within the inclosure and in rear of the burner and operating to force a blast of air upon the burning area or surface within the inclosure, and a driving-wheel geared to said fan or blower, substantially as described.

10. A machine for burning or destroying prairie-grass within a specified area, consisting of a movable fire-proof bottomless inclosure, the burner housed within said inclosure at the front thereof, a rotary fan or blower arranged within the inclosure in rear of the burner above the same and operating to force a blast of air upon the burning area or surface within said inclosure, a driving-wheel located at the bottom of the inclosure and adapted to be rotated by contact with the ground, and an idle-wheel geared to the fan or blower and the driving-wheel, substantially as described.

11. A machine for burning or destroying prairie-grass within a specified area, consisting of a movable fire-proof inclosure carrying a burner or burners which are arranged within the inclosure, for the purpose described, and another inclosure arranged in rear of and connected to the first-mentioned inclosure, substantially as described.

12. A machine for burning or destroying prairie-grass within a specified area, consisting of a movable bottomless fire-proof inclosure, substantially as herein described, having the closed sides, ends, and top, whereby the burning grass is confined within the boundary-walls of the inclosure, and a brake is made in the prairie as the inclosure is drawn over the ground, as set forth.

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

EZEKIEL C. RICE.

Witnesses:
VOLNEY V. DRAPER,
HENRY VAN VLECK.