2 Sheets—Sheet 1.

A. P. BENJAMIN.

Horse-Power.

No. 217,047. Patented July 1, 1879.

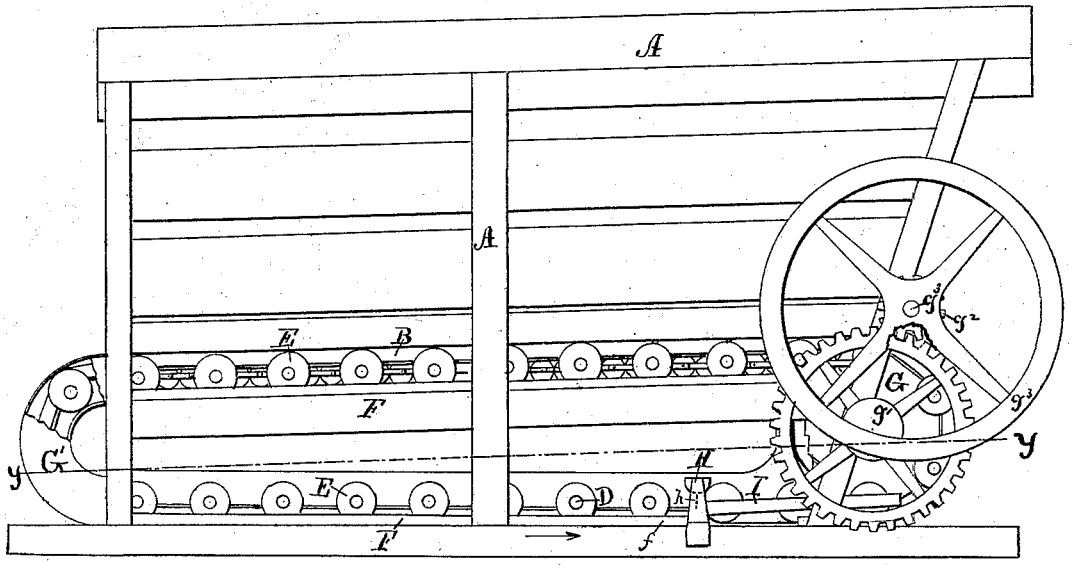

Fig. 1.

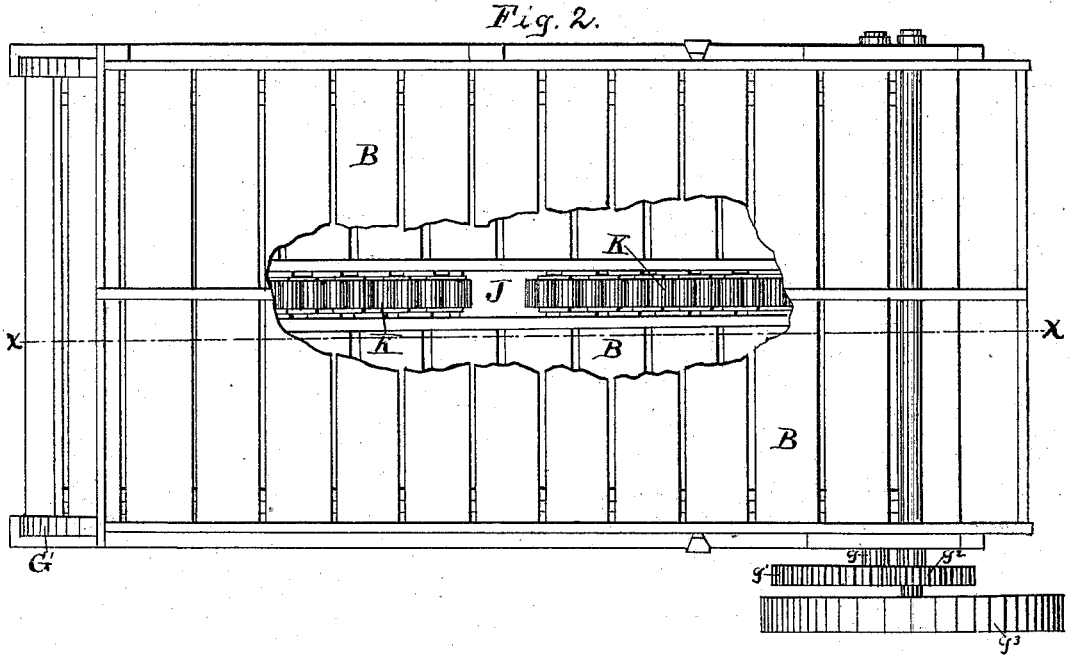

Fig. 2.

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2 Sheets—Sheet 2.

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Fig. 3.

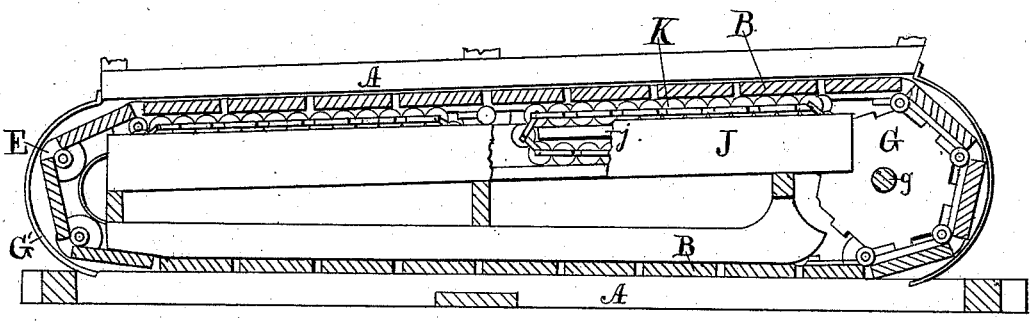


Fig. 4.

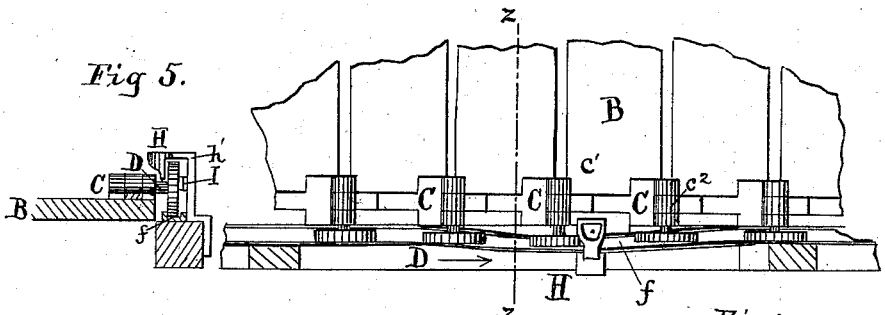


Fig 5.

Fig. 6

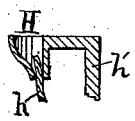


Fig. 7

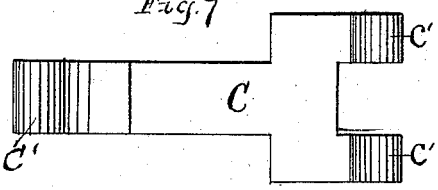
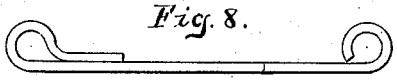


Fig. 8.



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UNITED STATES PATENT OFFICE.

ALBION P. BENJAMIN, OF WEST WATERVILLE, MAINE, ASSIGNOR TO BENJAMIN & ALLEN, OF SAME PLACE.

IMPROVEMENT IN HORSE-POWERS.

Specification forming part of Letters Patent No. **217,047**, dated July 1, 1879; application filed December 30, 1878.

To all whom it may concern:

Be it known that I, ALBION P. BENJAMIN, of West Waterville, in the county of Kennebec and State of Maine, have invented certain new and useful Improvements in Horse-Powers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable other skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of drawings represents a side elevation of my horse-power. Fig. 2 is a top view or plan of same. Fig. 3 is a part section through *x x* of Fig. 2. Fig. 4 is a part section through *y y* of Fig. 1. Fig. 5 is a section through *z z* of Fig. 4. Fig. 6 is a detail section through oil-cup H. Fig. 7 is a plan of link C. Fig. 8 is a side elevation of same.

The nature of my invention consists, first, in a new device for connecting the lags of a horse-power by means of a chain, which, besides acting as a chain for connecting the lags, serves to hold firmly in place the axles on which the trucks are hung; secondly, in a device for automatically oiling the axles by means of an oil-cup, from which hangs a wick, in such a manner that it is drawn across the axles as they pass under it, the truck meanwhile being partially removed from its axle by the use of a flanged rail of U-shaped cross-section, which is curved laterally for the purpose; third, in the manner of supporting the middle of the lags by a bridge, on which runs an endless chain of surface-rollers, these rollers forming an even bearing for the lags, which run on them with little or no friction.

My horse-power is constructed as follows: Within a suitable frame-work, A A, is an endless bed or chain, constructed and arranged in the following manner, viz: B B are lags extending entirely across the machine. At either end of these lags, and on their under or inner sides, are secured the links of the iron chain C C. The links of this chain C C are made of single wrought-iron plates, of the required size and shape, their ends C^1 C^1 being turned over the pin or axle D, forming a joint with it in the same manner as in an ordinary hinge.

At the sides of the joint C^1 C^1 the pin or axle D is held tightly in place by suitable means; but at the center of the joint C^2 the link C is turned over the axle rather loosely, thus allowing a free hinge motion to the chain.

On the outer ends of the axles D D are placed the trucks E E, which run on the rails F F above and below, and through the guard G′ at the back end of the machine. The rails F F are flanged on their outer edge or on both edges.

At the forward end of the machine are two rag or sprocket wheels, G G, on a shaft, *g*, and over these wheels G G the chains C C pass, the surface of the wheels conforming to the irregularities of the chain C C. On the end of the shaft *g* is the cogged wheel g^1, which engages the smaller cogged wheel g^2, placed on the shaft with the large driving wheel or drum g^3.

At some part of the circuit of the trucks E, as at *f*, Fig. 4, the rail F, on which the trucks run, being of a U-shaped cross-section, is curved laterally outward, and then inward upon its original line. At the point where the rail curves outward the greatest is placed the oil-cup H, having a nozzle extending downward directly over the line of the axles D D. Through this nozzle is passed the wick *h*, which is allowed to hang down below the level of the axles, and the cup H is filled with oil when the machine is in operation.

From the standard h^1 of the oil-cup H to the point where the curved rail becomes straight the bar I extends, following the general direction of the curved rail, and suitably fastened at the height of the axles D.

When the rail begins to curve out the truck comes against the inner flange, the effect of which is to slip the truck gradually from its axle, and force it to follow the curve of the rail up to the point where it begins to curve back toward the original line, which is the point where the oil-cup is placed. At this point the truck is partially removed from the axle, across which is drawn the wick. Now, as the truck passes this point it is made to follow the curve of the rail as it comes back upon the original line, and consequently to slide inward upon its axle, by the action of the bar I,

which bears on the center of the wheel or truck as it passes on, for this bar is parallel to and directly above the outside edge of the rail, as it (the rail) curves in. Its action is the same as an outside flange would be in slipping the truck back into place, save that the flange would act on the bottom of the truck, causing a bind on the axle, while the bar I pushes the truck in from its center, therefore avoiding this binding action.

Under the middle of the lags B, in their upper circuit, and running from end to end of the machine, is the bridge J, having the deck *j*, on which runs, in the form of an endless chain, surface-rollers K, passing over and under the deck *j*. Two sets of rollers may be used, as shown in the drawings; or one set may extend the entire length of the bridge. On these surface-rollers K rest the middle part of the lags B.

Having thus shown the manner of constructing my machine, I now proceed to describe its method of operation.

The action of my machine is, in general, that well-known movement of the horse-power. The lags, resting on trucks E at each end and surface-rollers K in the middle, are in the position of an inclined plane, where the horse stands on top, and his weight causes them to move downward, thus setting in motion the entire chain formed by the links C C. The motion is imparted to the rag-wheels G G by the chain C C, and thence, through *g*, g^1, and g^2, to the driving-wheel g^3.

The oiling device acts as follows, viz: As the trucks E E move upon the curved rail in the direction shown by the arrow, they are moved outward on their axles by the action of the inner flange of the rail *f*, thus leaving a portion of the axle exposed. Over this exposed portion, as it passes under the oil-cup H, is drawn the oiled wick *h*, which lubricates the axles D D in the most regular and complete manner. The truck E, as it passes the oil-cup H, comes against the inner side of the bar I, which, acting upon its center, gradually presses it back to its former position as it reaches the straight part of the rail.

By a different arrangement of parts the rail *f* might curve inward instead of outward, as described.

Most horse-powers hitherto in use have made use of a long axle extending the whole width of the machine, and consequently it was difficult to provide an efficient support for the middle of the lags, which support is a most essential feature in such machines, particularly in those where two horses are used.

By the use of short axles, used in conjunction with my link C, I am enabled to use the common friction-rolls K for the support of the middle of my lags—a result not hitherto attained in machines using trucks.

The advantage of my machine over other horse-powers is its easy motion produced by the oiling device described, its simple, strong, and economical chain C C, and the efficient support of the middle of the lags by means of the surface-rolls K.

I claim as my invention and wish to secure by Letters Patent—

1. In a horse-power, the combination of link C, having joints C^1 C^2, with axle D, truck E, and rag-wheels G, substantially as described.

2. In a horse-power, the combination of the oil-cup H, the curved and flanged rail *f*, and bar I, substantially as shown and described.

3. In a horse-power, the combination of oil-cup H, curved rail *f*, and bar I with link C, axle D, and truck E.

4 In a horse-power, the combination of the link C, axle D, and truck E with bridge J and rollers K.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ALBION P. BENJAMIN.

Witnesses:
F. A. WALDNER,
S. W. BATES.