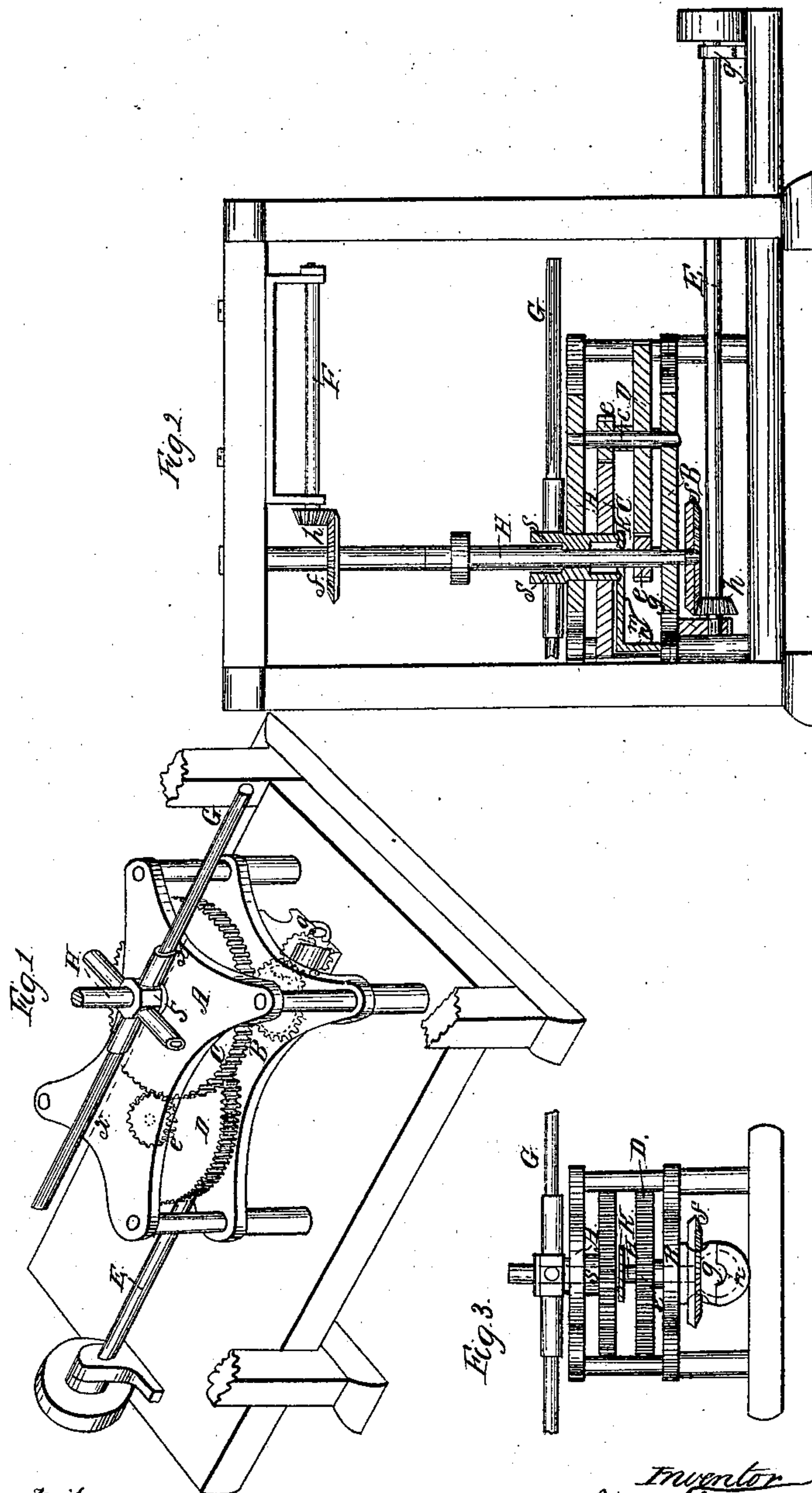


W. Field.

Horse Power.

N<sup>o</sup> 24,291.

Patented June 7, 1859.



Witnesses.  
J. S. Smith  
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# UNITED STATES PATENT OFFICE.

WILLIAM FIELD, OF PROVIDENCE, RHODE ISLAND.

## HORSE-POWER MACHINE.

Specification of Letters Patent No. 24,291, dated June 7, 1859.

*To all whom it may concern:*

Be it known that I, WM. FIELD, of the city and county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Horse-Powers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, represents a perspective view of a horse power embracing my improvements. Fig. 2 represents a sectional elevation of the same, on the line  $x x$  of Fig. 1. Fig. 3 represents an end elevation of the same.

The utility of horse powers as an economical motor, depends in a great degree on their simplicity, upon the perfection of the arrangement of the moving parts, and upon sustaining and connecting these parts with the frame and with each other, so that they will not be easily displaced and bind upon each other, and thus create friction and rapidly wear out.

In the general arrangement and construction of the horse powers heretofore invented, these prerequisites to their perfection have to a great degree been overlooked; hence few of these machines have been found available as an economical motor, because in their construction and arrangement, those parts on which there is the greatest strain, are so arranged as to render it impossible to give them an adequate support. Therefore these machines are continually getting out of order after being a short time in use, and the friction between the moving parts becomes so great, that a large portion of the power applied to operating the machine, is expended in overcoming the friction.

The object of my improvements in horse-powers is to remedy these defects, and my invention for effecting this object consists in so arranging the main driving shaft, that the driven shaft passes through and turns in the same direction as the driver, while at the same time the driver is supported permanently by boxes at both ends, and the bearing of the interior shaft is only on that point of the driver, directly opposite the bearing of its journal in the top plate of the frame, by which the main shaft is fully supported, so that it cannot be easily displaced, and the shaft passing through so arranged that any slight yielding of either shaft will not cause them to bind upon each

other so as to increase the friction of the machine.

By reference to the accompanying drawings, my improvements as applied to horse-powers will be fully understood.

The horse power embracing my improvements consists of a strong iron frame composed of two plates—A and B—placed at convenient distance apart to accommodate the mechanism, and supported by columns at the four corners the extension of which below the bed plate, forms the feet on which the machine stands. The ends of the frame are partially closed by a panel ( $n$ ) to give to it greater strength and stiffness.

The opposite parts of the machine consist of a main driving cog wheel (C) which is fast to a hollow shaft or sleeve (S) having its upper bearing in the top plate and its lower bearing on a step ( $k$ ) in the end of a bracket ( $m$ ) extending from the end panel; and through the bottom of this step is an opening of the same diameter as the interior of the sleeve. A second shaft ( $c$ ) the end bearings of which are in the top and bottom plates, has attached to it a pinion ( $e'$ ) which gears into the main driving wheel, and it also carries a driving cog wheel (D) which gears into a pinion ( $e$ ) on a shaft (H) which passes through the step ( $k$ ) and through the center of the hollow main shaft, and extends some distance above it. The lower bearing of this shaft is in the lower plate through which it extends below the bottom plate of the frame, and also carries at its lower end a beveled toothed wheel ( $f$ ). Thus the power to drive machinery may be taken from either or both ends of this shaft.

The interior diameter of the main driving shaft (S) and also the opening through its step is greater than the diameter of the driven shaft passing through it, with a free space between both shafts, except directly opposite the bearing of the journal of the hollow shaft in the upper plate, at which point the interior diameter of the hollow shaft is contracted to form the bearing to the shaft passing through it. Thus the interior shaft only bears on the exterior at the point directly opposite the bearing of the journal of the exterior, which is the point least liable to displacement so as to cause the sleeve to bind on the interior shaft.

Two horizontal shafts (E) (F), the one



(E) above and the other (F) below the frame are supported by proper boxes (g) and carry at one end a beveled pinion (h') which gears into the beveled toothed wheels  
5 on either side of the vertical shaft passing through the main driver, and transmits motion in a horizontal direction from the horse power. The upper end of the main driver is provided with sweeps (G) to which the  
10 horses or other draft animals employed to turn the machine are harnessed.

It will be seen from the arrangement of the gearing for multiplying the power that the shaft from which the power is taken  
15 passes through the main driving shaft, and that both turn in the same direction. This arrangement not only simplifies the machine, but from both shafts turning in the same direction the friction is materially diminished.  
20 In arranging the upper bearing for the shaft passing through the center of the main driving shaft opposite the bearing of the driver in the upper plates of the frame, and leaving free space between both shafts  
25 below, and also supporting the lower end of the main driver by the hollow step, the liability of either of these shafts, which are

subjected to heavy strains, especially the main drivers being displaced so as to bind on each other, is greatly diminished. 30

Having thus described my improvements in horse powers, what I claim therein as new, and desire to secure by Letters Patent is—

Arranging and supporting a hollow driving shaft and the driven shaft passing  
35 through the driver substantially as described, whereby both driver and driven shaft turn in the same direction, and both ends of the driver are fully supported by boxes, independent of the shaft passing through it,  
40 while at the same time the bearing of the shaft passing through the hollow driver, will be on the driver only at a point directly opposite its journal, so that any slight displacement of either shaft will not cause them  
45 to bind on each other so as to increase the friction of the machine.

In testimony whereof I have subscribed my name.

WM. FIELD.

Witnesses:

WM. BINNEY,  
ARTHUR F. DEXTER.