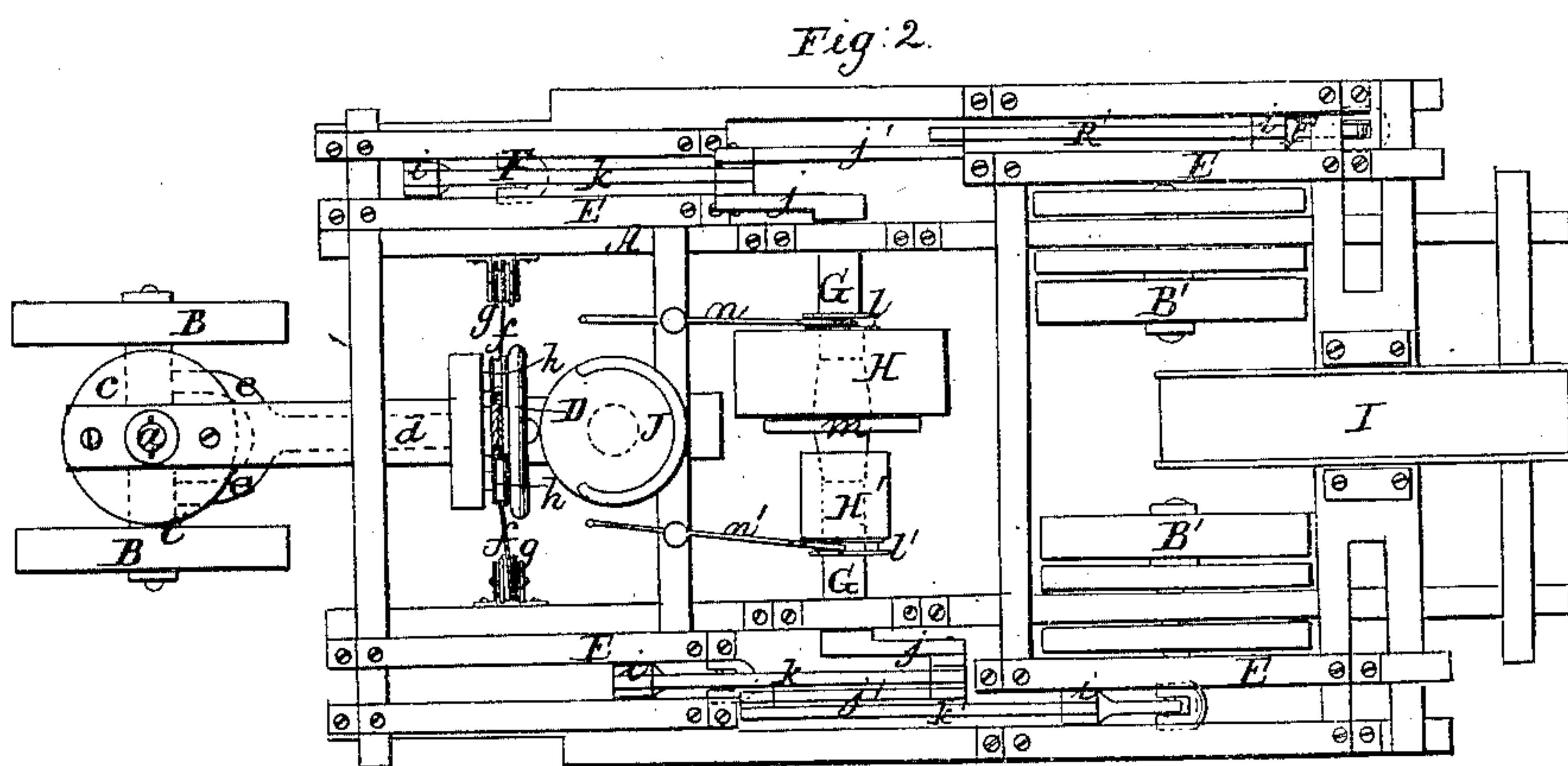
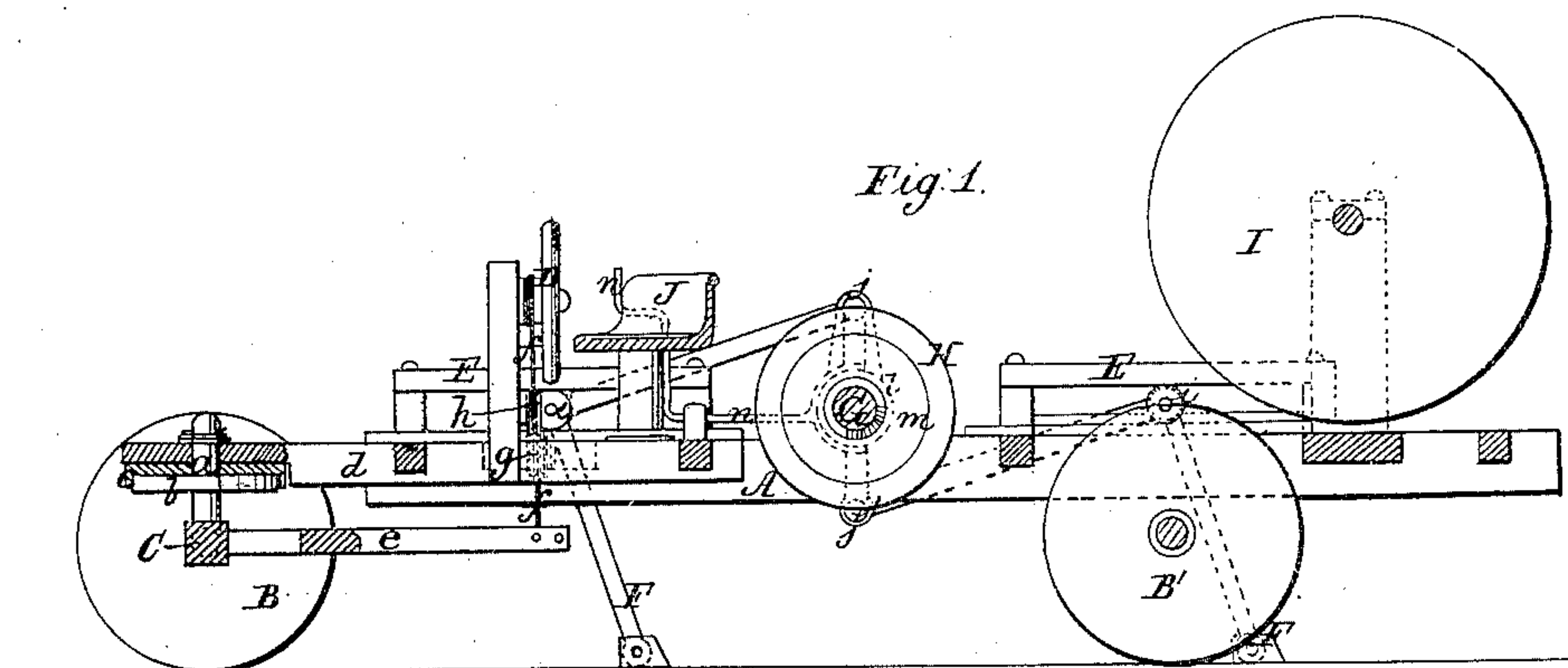


A. J. GRAHAM.
LOCOMOTIVE ENGINE.

No. 29,879.

Patented Sept. 4, 1860.



Witnesses;
A. W. Lusk
J. J. W. Lusk.

Inventor;
Alex. J. Graham

UNITED STATES PATENT OFFICE.

ALEXANDER J. GRAHAM, OF PORTLAND, OREGON.

LOCOMOTIVE-ENGINE.

Specification of Letters Patent No. 29,879, dated September 4, 1860.

To all whom it may concern:

Be it known that I, ALEXANDER J. GRAHAM, of Portland, in the county of Washington and State of Oregon, have invented
5 certain new and useful Improvements in Locomotive-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a
10 part of this specification, in which—

Figure 1 represents a longitudinal vertical section of my invention. Fig. 2 is a plan or top view of the same.

Similar letters of reference in both views
15 refer to corresponding parts.

To enable those skilled in the art to make and use my invention I will proceed to describe it.

A is a frame constructed of timber or any
20 other suitable material, and supported by four wheels, B and B'. The fore wheels, B, are secured to an axle, C, which has a pivot or bolt, *a*, fastened in its center; and attached to this is a disk, *b*, which turns in
25 a cap, *c*, that is rigidly attached to the beam, *d*. An arm, *e*, extends from the axle, C, under the frame, A, and said arm connects by means of a rope, *f*, with the steering
30 wheel, D. Both ends of said rope are secured to the arm, *e*, and it (the rope) extends over pulleys, *g* and *h*, to the hub of the wheel D, being wound several times around
35 said hub, so that by turning the wheel the arm, *e*, together with the axle, C, and wheel, B, is turned in one direction or in the other.

Secured to the top of the frame, A, on each side of the same are the slides, E, two pairs in front, and two in the rear of the frame, and these slides form the guides for
40 cross-heads, *i*, which carry the yielding foot-pieces, F. A sliding motion is imparted to the cross-heads, *i*, from the driving axle, G, by means of double cranks, *j* *j'*, and rods, *k* *k'*. The foot pieces, F, are hinged to the
45 cross-heads, and they hang down to the ground by reason of their own gravity, their length being such that they remain in an inclined position as clearly shown in Fig. 1.

The axle, G, is rotated by means of pulleys, H H', of unequal diameter, so that the
50 speed of the rotary motion may be changed

at pleasure. Each of these pulleys is furnished with a flanged disk, *l* *l'*, and they are forced toward a collar, *m*, in the center of the axle by means of forked levers, *n* *n'*.
55 The holes in said pulleys are reamed out conical on the sides toward the collar, *m*, and the central part of the axle nearest to said collar, and on each side of the same, is made conical so as to correspond to the
60 conical part of the holes in the pulleys. Motion is imparted to the pulleys, H H', by means of belts from a large wheel, I, and if the pulley H, being the largest of the two, is forced up to the collar, *m*, the motion of
65 the foot pieces, F, is slower than it would be if the pulley, H', were made stationary. The levers, *n* *n'*, as well as the steering wheel, D, are operated from the driver's seat, J, which is secured to the top of the
70 beam, *d*, in a convenient position.

When the axle, G, is rotated, the foot pieces, F, on each side of the frame, A, receives a reciprocating motion in opposite directions, so that one of the foot pieces on
75 each side of the machine serves to propel the same, while the other two foot pieces are drawn forward ready for a fresh hold. The foot pieces are made of such a length that they adapt themselves to the inequalities of the ground without coming into a
80 perpendicular position, and they serve to propel the machine equally well on even or rugged ground. The form of the lower part of the foot pieces is such that the same take
85 a firm hold on the ground, and that my machine will run up hill without difficulty.

What I claim as new, and desire to secure by Letters Patent, is:—

1. The arrangement of the yielding feet
90 F, and slides E, E, in combination with the double cranks *j*, *j'*, rods *k*, *k'*, and central shaft G, as and for the purpose herein shown and described.

2. The employment of the double beveled
95 collar *m*, in combination with the shaft G, and sliding pulleys H, H', as and for the purpose herein shown and described.

ALEXR. J. GRAHAM.

Witnesses:

WM. TUSCH,
J. W. COOMBS.