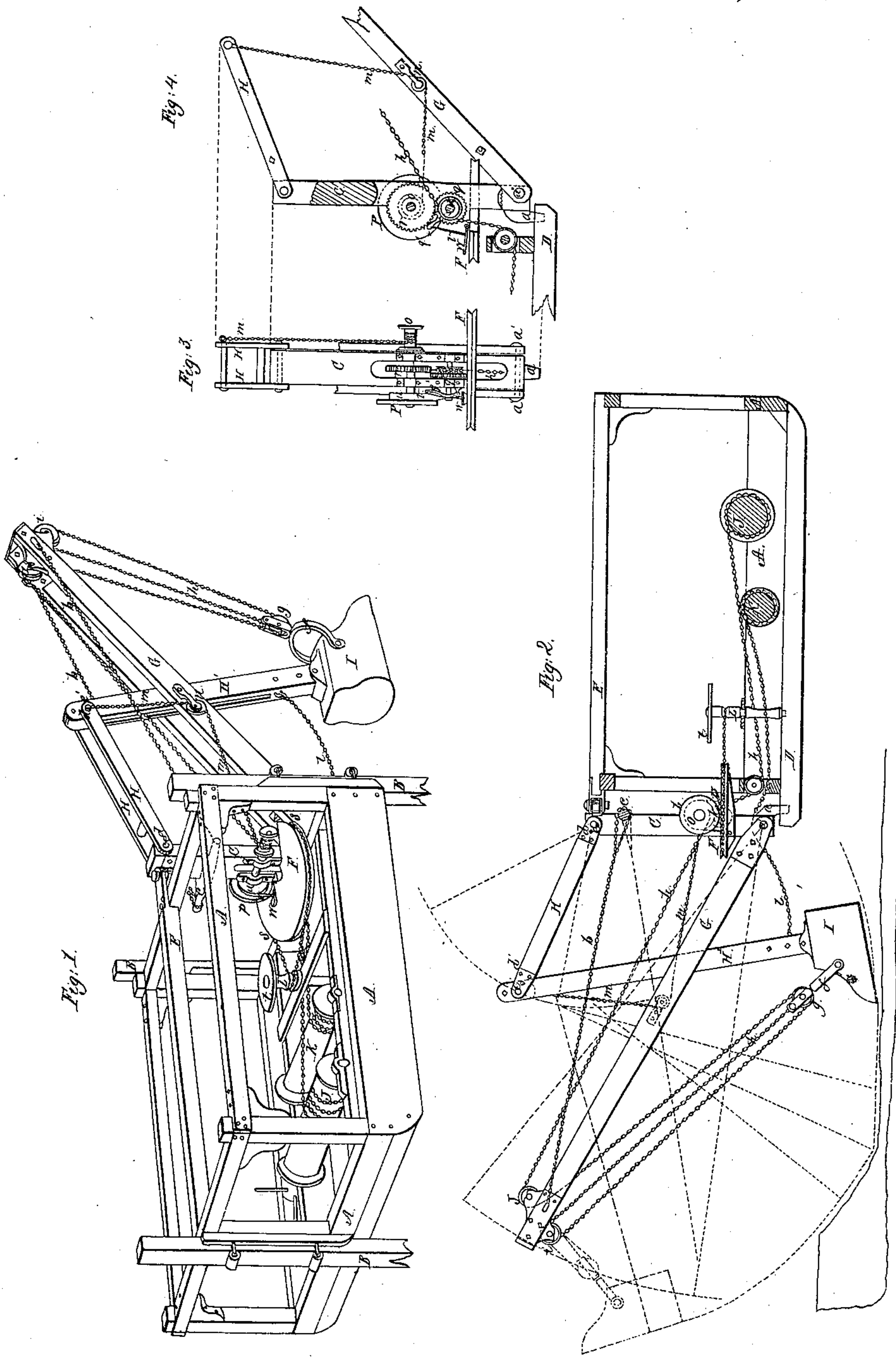


*J. J. Savage.*

*Dreijer.*

N<sup>o</sup> 14,068.

*Patented Jan. 8, 1856.*





# UNITED STATES PATENT OFFICE.

J. J. SAVAGE, OF NEW YORK, N. Y.

## EXCAVATING-MACHINE.

Specification of Letters Patent No. 14,068, dated January 8, 1856.

*To all whom it may concern:*

Be it known that I, J. J. SAVAGE, of the city, county, and State of New York, have invented certain new and useful Improve-  
5 ments in Excavating Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specifica-  
10 tion, in which—

Figure 1 is a perspective view of the machine, Fig. 2 is a side elevation partly in section, and Figs. 3 and 4 detached views of the arrangement for driving the scoop  
15 downward simultaneously with its excavating motion forward by means of the drawing chain sheave pulley and its combinations, the same letters referring to like parts in each of the figures.

20 The nature of my invention and that which distinguishes it from other inventions in excavating machines consists, first, in forming a stationary and a variable or a rising and falling bearing point or fulcrum for  
25 the scoop staff of excavating machines by attaching said staff to the swinging post by vibrating or oscillating connecting bars or links, which by their vibratory motions permit the scoop staff to rise or fall, shorten or  
30 extend its scope or range, as may be found necessary in operating the machine in practice; secondly, in combining an excavating scoop and staff with a boom having its  
35 outer end or head made adjustable, at will, to different heights, by lengthening or shortening the guy braces which support said boom, thereby allowing the end to rise or  
40 fall; also, in combining the vibratory connecting arms of the scoop staff with the feed chain, windlass, gearing, and pulley wheel, for the purpose of driving, when desired, the  
45 scoop and staff downward simultaneously with its forward movement, by the friction or force of the drawing chain upon the intermediate devices arranged for transmitting and using said force for the purpose  
above stated.

The peculiar advantages of my invention consists in its being extremely well adapted  
50 for use upon canals or on places where it is necessary to pass through locks or under bridges or operate under bridges. By using an adjustable boom and the vibrating or oscillating arms with the excavating  
55 scoop and staff my machine will pass through locks and under bridges, as well as

operate under bridges without difficulty, also the scoop staff and boom can be unshipped and stowed upon deck, when necessary, with  
60 very little labor or trouble, and furthermore the machine can be built at less expense than other single scoop machines.

In order to enable others to build and use my invention, I will proceed to describe its construction and operation. 65

(A, A) is a float or frame work, (B B) are spud posts, all built in the manner well known to builders of excavating machines and of timber of suitable strength.

(C) is a swinging post having a hinge or  
70 journal (*a*) at the bottom, turning upon the keelson or sleeper (D). At the top it is also hinged to the end of the center girt timber (E). Built onto this swinging post is a wheel shaped platform (F) which  
75 swings with the post.

(G) is an adjustable boom having its lower end supported by and working upon  
journals (*a' a'*). Its upper end or head is supported in the desired position by the guy  
80 braces (*b b*), one of the ends of which are attached to the head of the boom, and the other ends pass around and are secured to a bar (*c*) bolted onto the swinging post. These braces are arranged so that they can  
85 be shortened or lengthened in order to elevate or lower the boom head, as desired.

(H H) are vibrating or oscillating bars or arms, being attached at one end by means of hinges or boxes (*d d*), to journals  
90 (*e e*) at the head of the swinging post. The other end of this vibrating bar is hinged to the scoop staff (H<sup>1</sup>) by hinge and journals (*d' d'*) and (*e' e'*). (This hinge and journals can be made adjustable, so that the dis-  
95 tance of the bearing point on the scoop staff from the scoop can be varied by shifting the journal box along the staff.) Secured to the end of the staff is the scoop (1) with a drop bottom closed by a spring catch constructed  
100 in the way well known to builders of excavating machinery. Attached to the scoop is a yoke (*f*), having a sheave pulley (*g*). To this pulley block or frame is attached one  
105 end of the drawing chain (*h*), which then passes up to the head of the boom and over a sheave pulley (*i*), then down under pulley (*g*) and up over pulley (*j*), then down and over sheave pulley (*k*), which has its bear-  
110 ings on the swinging post and swings with it, then under a pulley in frame of the machine and back and around the drawing



drum (J), which is operated in any of the known ways.

(l) is a backing chain attached to the scoop staff and passing through a slot in the swinging post, thence back and around the backing drum (K), which is operated by any of the known methods.

(m) is a feed chain having one end of it attached to the vibrating bars (H H), the other passing down under a pulley wheel (n) on the adjustable boom, thence back and around a windlass (o). This chain and windlass is for the purpose of driving or feeding the scoop downward into the place to be excavated. It can be operated by hand by the hand wheel (p) or can be made to act automatically by attaching to the shaft of the sheave pulley (k), as shown in Figs. 3 and 4, a spur gear pinion (q), which may be so arranged as to be thrown in and out of gear by the lever (q\*) with a spur gear wheel (r) arranged upon the shaft of and turning the windlass (o). This combination is operated by the friction or force of the drawing chain (h) in passing over the pulley wheel (k).

The swinging post and booms, staff and scoop, are swung to the right or left by means of the wheel platform (F), which has a chain or belt attached at each of its ends (s s) to the platform and passing around a capstan (L), which is turned by the hand wheel (t), or can be arranged to turn by other power, in the manner well known to builders of excavating machines. When desired to keep the scoop and staff from rising, it can be done by means of the friction wheel (u), which has a friction strap (v) passing over it and one end attached to the platform and the other to a foot lever (w), which is operated by the foot of the scoopman in the way well known to operators of excavating machines.

The vibrating or oscillating arms could be attached to the head of the adjustable boom instead of the swinging post, and the scoop would operate to a certain extent, but it would not be so advantageous an arrangement as when attached to the head of the swinging post.

The operation of my machine is as follows: The machine having been placed in position and held there by spud posts or

otherwise, the scoop is allowed to drop by slacking on the drawing and backing chains until it is in the place to be excavated. The drawing chain is now made to act upon the scoop and draws it forward. As the scoop staff passes on from its perpendicular position its tendency is to rise in the direction of an arc of a circle, but that tendency is counteracted and the scoop made to elongate its cut in the ground in the manner as shown by the dotted red lines by forcing the scoop downward by means of the feed chain, windlass and hand wheel, or by other arrangements, as above described, until the scoop is filled, when the feed chain is slackened, and the scoop drawn up to the boom head in readiness for swinging around and discharging its load.

In having fully described my invention I have described old parts in connection with my invention, in order to show clearly my invention and its connection with those old parts, and also to show a mode of putting it into practical use. Therefore I wish to be understood as laying no claim to those old parts; but

What I claim as my invention and desire to secure by Letters Patent is:

1. I claim the connecting of the scoop and staff of excavating machines to the swinging post, by vibratory or oscillating arms or links (H H) or their mechanical equivalents, in the manner and for the purposes substantially as herein described and shown.

2. I claim the adjustable boom (G) in combination with the excavating scoop and staff, combined in the manner and for the purposes of an excavating machine, substantially as herein set forth and shown.

3. I also claim the combination of the vibratory or oscillating connecting arms or bars (H H) of the scoop staff, with the feed chain (m), windlass (o), gearing (q and r), and sheave pulley (k), for the purpose of automatically feeding the scoop downward simultaneously with its forward motion, as herein described.

J. J. SAVAGE.

Witnesses:

N. S. VEDDER,  
EZRA RIPLEY.