A. E. CUMMINGS
Stump and Stone Extractor.

No. 216,082. **Patented June 3, 1879.**

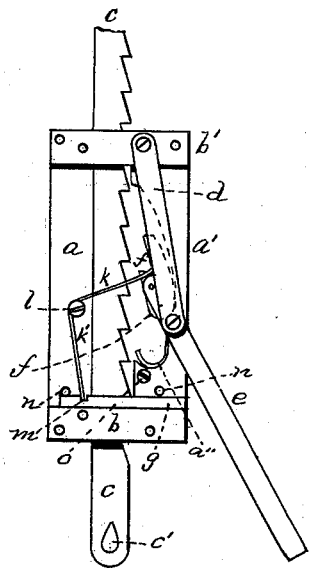

Fig. 3.

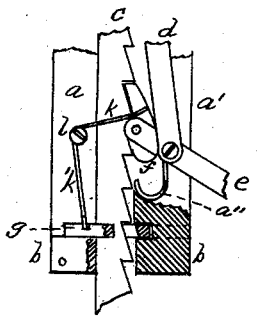

Fig. 4.

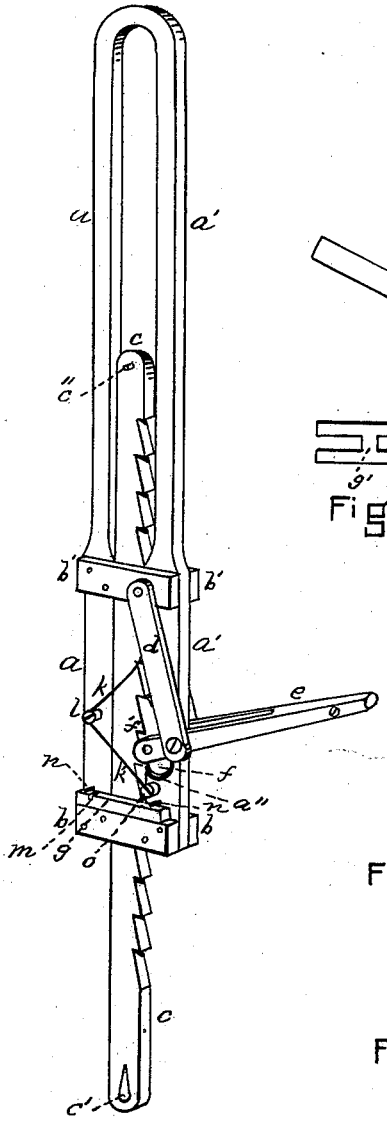

Fig. 1.

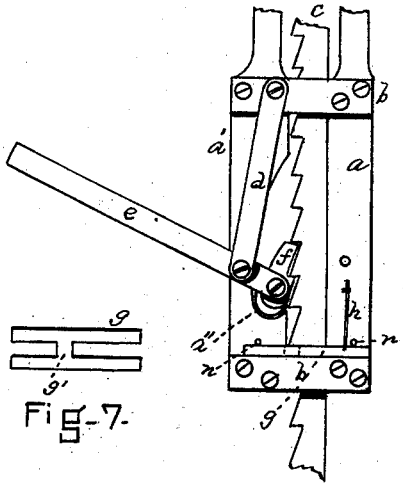

Fig. 2.

Fig. 7.

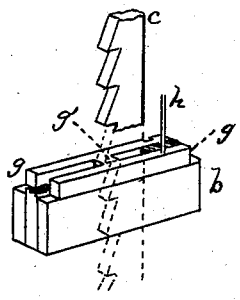

Fig. 5.

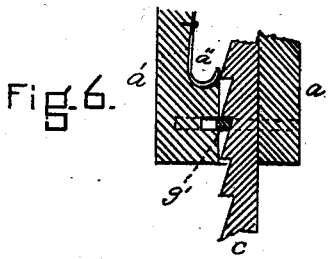

Fig. 6.

WITNESSES

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IMPROVEMENT IN STUMP AND STONE EXTRACTORS.

Specification forming part of Letters Patent No. **216,082**, dated June 3, 1879; application filed December 20, 1878.

To all whom it may concern:

Be it known that I, ALBERT E. CUMMINGS, of Ashburnham, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Stump and Stone Extractors, of which the following is a specification.

This machine may be applied wherever great lifting power at small cost is desired, such as in stone-quarries, &c., or it may be applied horizontally, as in moving buildings. For example, I propose to use it for lifting or moving any load or weight where it may be of service, although its primary use is for stump and rock extracting.

The nature and construction of the invention are described below.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a view, in perspective, of my improved machine in the act of lifting a load. Fig. 2 is a rear view of the central or principal portion of the same. Fig. 3 is a front view of the same while in the position assumed while dropping the ratchet-bar preparatory to attaching to a load. Fig. 4 is a front view while in the act of lowering an extracted rock one notch at a time to any desired spot. Fig. 5 is a perspective sketch from the rear, showing the shape and operation of the sliding pawl while lifting or holding a load. Fig. 6 is a vertical section, showing the same. Fig. 7 is a plan view of said pawl.

a a' are parallel iron bars, united at the top, (or provided with a cross-piece there, if desired,) forming, with the two cross-pieces *b' b*, a frame, in which slides the ratchet-bar *c*. This ratchet-bar is provided at its lower end with a hole, *c'*, or other suitable means for securing a chain thereto, and at its upper end with a projection, *c''*, to prevent its slipping down farther than the cross-piece *b'*.

d d are a pair of swinging connecting-bars, swinging from the cross-pieces *b'* and supporting the bifurcated lever *e*, to the short arm of which is hinged the dog *f*, which, by means of a notch or seat, *f'*, Fig. 1, cut therein, engages two teeth in the ratchet-bar.

A steel spring, *a''*, set in the bar *a'* of the frame, regulates the position of the dog as it approaches the ratchet-bar.

g is a sliding pawl, provided with the bridge *g'*, held in place upon the cross-pieces *b* by suitable projections *n n*, and slotted so as to admit of the passage of the bars *a a'* through it. A spring, *h* is secured to the rear side of the bar *a*, and rests in a hole in said pawl; and an elbow-spring, *k k'*, is secured to a pin or screw, *l*, its lower end resting in the notched rest *o* or the hole *m* in the pawl, as occasion requires.

The following is a description of the operation of the machine: The first thing to be done after suspending the frame *a a'* from a tripod, as in rock and stump pulling, is to drop the ratchet-bar the required distance. To do this, place the lower end of the elbow-spring *k'* into the hole *m* in the front side of the pawl *g*, as in Fig. 3. The end *k* of said spring will then rest on the short arm of the lever *e*. Raise the long arm of the lever *e* until the dog *f* catches into the notches in the ratchet-bar; then depress the lever, and the short arm will raise the end *k* and carry forward the end *k'* of the elbow-spring, and, it being stiffer than the rear spring, *h*, the latter is overcome, and the pawl *g* is moved toward the bar *a'*, and thus, the bridge *g'* of said pawl being removed from beneath the teeth, the ratchet-bar *c* drops until the pins *c''* strike the cross-pieces *b'*, unless checked by lifting the lever *e* again.

The position of the machine with the ratchet-bar released and about to drop is shown in Fig. 3. When the ratchet-bar has dropped, raise the lever *e*, and the rear spring, *h*, being free to act, will carry the pawl back with the bridge under the teeth, as in Figs. 1, 2, 5, and 6. Remove the end *k'* of the elbow-spring from the hole *m* in the pawl, and place it in the notched rest *o*, where it is inoperative.

After attaching the stump or rock to the chain, fastened to the lower end of the ratchet-bar *c* by means of the hole *c'*, then, the machine being in the position shown in Figs. 1 and 2, in order to lift the load, bear down the lever *e*, the spring or guide *a''* having guided the dog *f f'* into its two notches, and the dog will lift the ratchet-bar a notch, and the pawl, which has been pressed back by the rising tooth pressing against the bridge, will be instantly sprung into its position under the tooth by means of the rear spring, *h*, thus supporting

the load while the dog engages the next two teeth. This action is continued until the load is sufficiently lifted.

After the load has been raised to a sufficient height the next step is to gradually lower it to the desired position. To accomplish this, place the elbow or lowering spring in the position shown in Fig. 4, the part *k'* into the hole *n* in the pawl, and the part *k* resting on the short arm of the lever *e*. Then, by means of the lever, place the dog *f* into the upper set of teeth before it—*i. e.*, press it down before engaging it, as in Fig. 4. Then lower the lever slightly, thus slightly raising the ratchet-bar and allowing the pawl to be sprung forward by the spring *k k'*. Then allow the ratchet-bar to drop one notch, raising the lever so as to allow the pawl to fly back under the next notch, and proceed as before.

In Fig. 4 the ratchet-bar has been slightly lifted, as above described, and the pressure upon the pawl having been removed it has sprung forward, and the ratchet-bar is ready to be lowered one notch.

One great advantage possessed by this invention is that there is no possibility of the kinking or bending of the ratchet-bar, it being placed between two bars, and there being a perfectly straight draft, the ratchet-bar passing through the center of the frame. By means of this straight draft and the simple action of the pawl, the machine can be worked at any angle—as, for example, in extracting a rock, the center of the tripod may be over the place by the side of the rock where it is to be laid, and the rock may be lifted out at an angle, and then the rock dropped under the center of the tripod.

The lever motion is a straight motion, the dog having a rolling motion, and, setting evenly into two notches, gives an opportunity for the exercise of great power without danger of breaking the teeth, as is the case where "hooked" teeth are used. The hold of the dog in the teeth is a stationary one, not a movable and friction-producing one, and the liability of breakage of teeth is reduced one-half by the dog engaging two teeth instead of one.

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

1. In a machine for lifting or drawing heavy loads, the combination of the ratchet-bar *c*, having straight teeth, and the double frame *a a'*, provided with cross-pieces *b* and *b'*, substantially as and for the purposes set forth.

2. In combination with the ratchet-bar *c*, the double dog *f f'*, lever *e*, swinging arms *d*, and cross-pieces *b'*, substantially as and for the purposes specified.

3. The combination of the pawl *g g'*, elbow-spring *k k'*, and lever *e*, substantially as and for the purpose set forth.

4. The hereinbefore-described machine for moving heavy loads, consisting of the frame *a a' b b'*, ratchet-bar *c*, arms *d*, lever *e*, and dog *f f'*, the slotted pawl *g g'*, and springs *k k' h*, all arranged and constructed substantially as and for the purposes herein specified.

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Witnesses:
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