

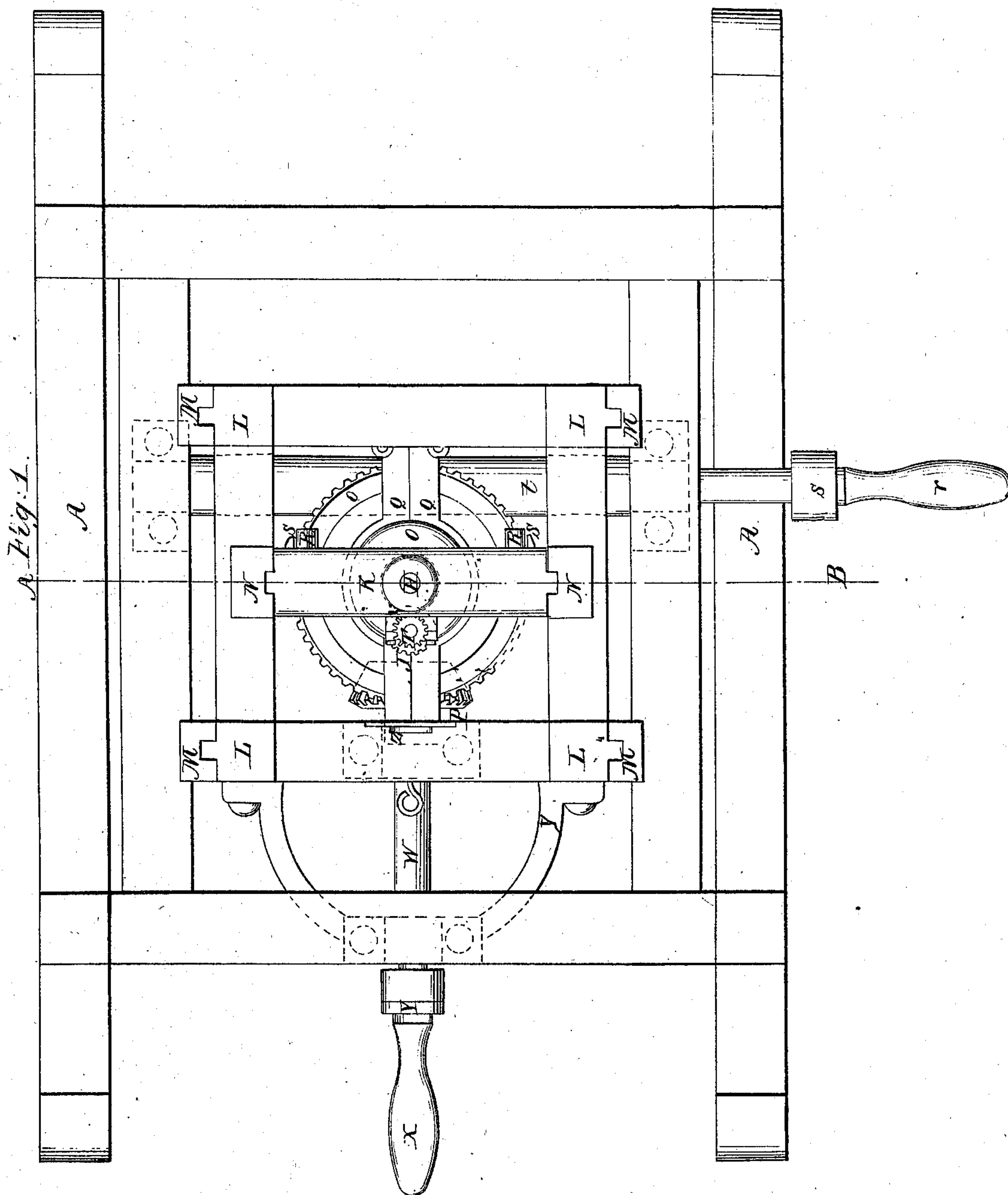
Sheet 1-3 Sheets.

J. F. Morrison.

Earth Auger.

Nº 12,688.

Patented Apr. 10, 1855.



J. F. Marshall

Earth Auger.

N^o 12,688.

Patented Apr. 10, 1855.

Fig: 2.

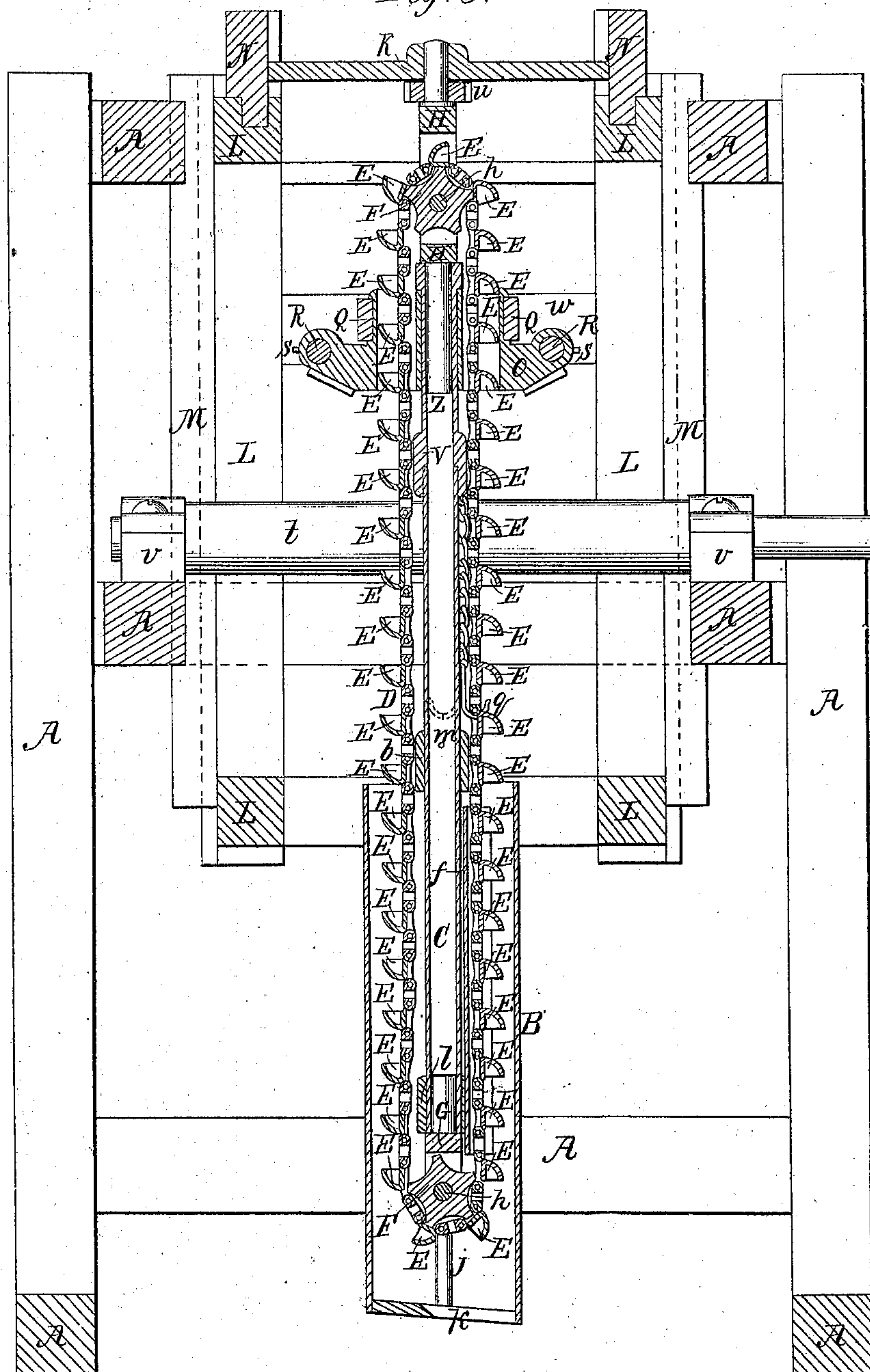


Sheet 3-3 Sheets.

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Fig: 3.



c Fig: 4.

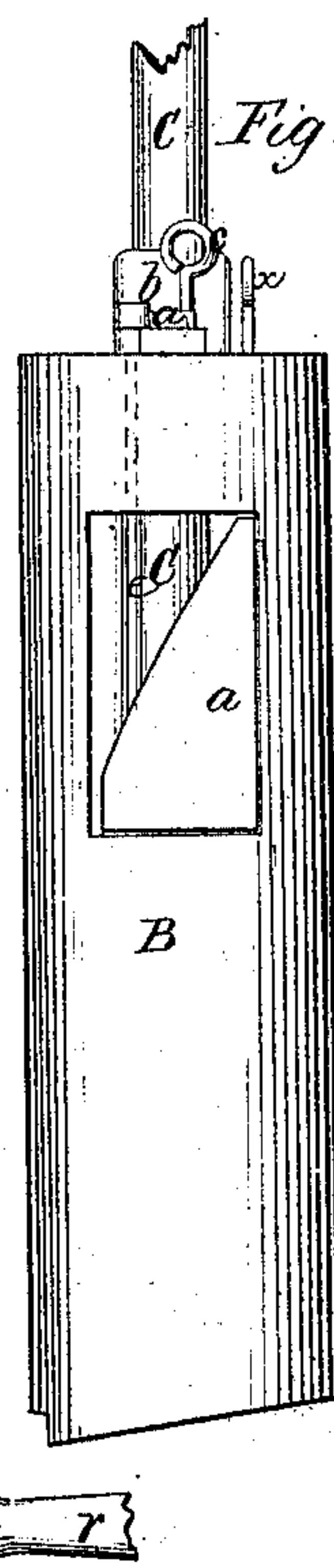
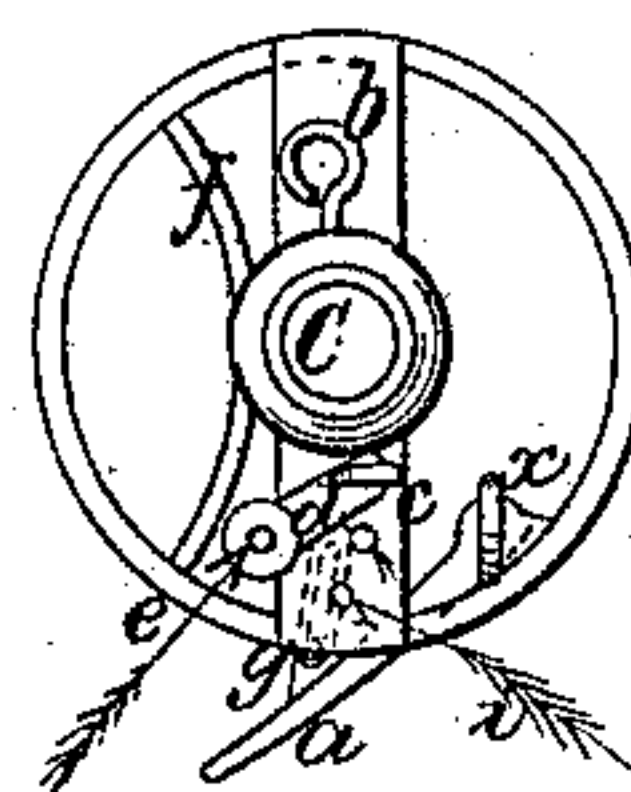


Fig. 5.



UNITED STATES PATENT OFFICE.

JOHN F. MANAHAN, OF LOWELL, MASSACHUSETTS.

MACHINERY FOR BORING WELLS.

Specification of Letters Patent No. 12,688, dated April 10, 1855.

To all whom it may concern:

Be it known that I, JOHN F. MANAHAN, of Lowell, county of Middlesex, and State of Massachusetts, have invented a new and useful Machine and Auger for Boring Artesian Wells and for other Purposes; and I hereby declare that the following is a full, clear, and exact description of its construction and use, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Of the said drawings Figure 1, denotes a plan; Fig. 2, a side elevation; Fig. 3, a transverse and vertical section at A B of Fig. 1. Fig. 4, is an elevation of the cylinder detached from the frame. Fig. 5 is a plan of the cylinder.

The nature of my invention consists of an Artesian auger or boring cylinder made of iron or steel and operated, or revolved so as to bore into the earth its own diameter by means of the cutter in its lower end, and so that it will enlarge this hole by the adjustable cutter placed in a hole which is cut in the periphery of the boring cylinder so as to let a pipe, the inside of which is of a greater diameter than the outside of the boring cylinder, follow the auger or cylinder down the hole, and allow it to be drawn up out through the pipe by the shutting or swinging in of the cutter in the periphery of the cutting or boring cylinder.

The earth or other substance as it is cut away by the lower and upper cutters of the auger, passes into the inside and is taken by the chain of buckets and carried up to the desired elevation, by the moving of these buckets so that the auger can be continuously revolved and kept clear of dirt, all being arranged and operated as hereafter described.

To enable others skilled in the art, to make and use my invention, I will proceed to describe the same as follows.

I construct a frame of wood as seen at A, A, to which I attach four guides made of wood as seen at M, and into the grooves of these guides is fitted the movable frame of wood as seen at L for the purpose of carrying the main movable parts of the machine, this frame slides down as the auger penetrates the earth, the weight of the frame L answering to feed or force the auger downward.

At P can be seen the small bevel gear which is firmly attached to the shaft W at

the inner end of it, and this shaft properly fitted so as to revolve in a box or bearing attached to the movable frame L, a part of this shaft near its out end is properly fitted so as to revolve in the stand *y* which is secured to the sliding frame L as seen in the drawing.

At the out end of the shaft W I attach a crank as seen at Y into which I place a pin X for the purpose of propelling or turning the auger, and chain buckets.

The bevel gear P gears into another bevel gear double its size as seen at O, which turns in the adjustable box or stand as seen at Q, this stand is composed of two parts which can be opened so as to let the well tube through, the two parts of the stand Q being hinged at one end as seen at Figs. 1 and 2, so as to be shut together, holding the gear O, and fastened by the latch Z.

I design to use an iron pipe or tube as seen at C for turning the metallic auger B, it being fitted to the metallic cross head *b* and thus held by the pin *m*, each of the ends of this cross head being firmly secured to the cylinder or auger B, the tube C passes down from the crosshead *b* to the crosshead *l* to which it is made fast, near to each end of this cross head, is secured the upper ends of two iron rods one of which is seen at *j*, to the lower end of them the steel cutter *k* is secured, this cutter having a recess formed in its edge, and a corresponding projection made on the inside of the cylinder B so that the cylinder, cutter, and tube will turn firmly together, and not twist as the power is applied to the machine, the lower cutter *k* and pipe C can be removed from the cylinder by removing the pin *m*, from it and drawing it out from the under or lower end of the cylinder.

At the upper end of the tube C I attach a secondary piece of iron tube *z*, by the socket V, to this tube I fasten the iron gear O, it being made in two parts so as to be easily separated and removed for the purpose of putting in the pipe or curb to the well, the two parts of the gear O is held together by the studs R and keys S, it being held to the secondary tube *z*, by friction created by driving the keys S, the inside surface of the two parts of the gear O do not quite approach each other so that the pressure caused by the keys is received by the tube *z*, in the upper end of this tube, I fit the stand H so as to revolve with it carrying the chain or

bucket wheel F, the bevel gears I and J and the gear T.

The upper end of the stand H is fitted so as to revolve in the self adjustable metallic bar K which forms the bearing for the stand H to revolve in, and slides in the stands N for the purpose of keeping the gears U and T together when the chain is taken up or let out. The gear U being fastened to the bar K which can be easily removed from the sliding frame L for inserting or letting down the pipe or tube which is designed to form the lining of the well.

The gear T being revolved around the stationary gear U, revolves the gear T and turns the shaft to which it is attached and also the iron bevel gear J which is attached to this shaft, and which gears into and revolves another similar bevel gear as seen at I which is attached to a horizontal shaft and on this shaft is fitted the upper chain or bucket wheel as seen at F, which as it is revolved, carries or moves the chain of buckets so as to receive the dirt or other substance in the boring cylinder B, and leave this dirt or substance, the desired elevation.

At the lower end of the tube C is fitted and fastened a stand as seen at G in which is fitted the pin *h*, on which the chain wheel revolves.

I construct a metal chain of buckets for elevating and discharging the dirt or other substance from the cylinder, the links carrying the buckets can be cast of brass or otherwise made as seen at E and the intermediate links as seen at D, the links are connected together by wire pins, the ends of which are seen in section at Fig. 3, the buckets E are recessed on the back side of them, so as to receive the teeth or arms of the upper and lower chain wheels F as seen at Fig. 3, there should be a partition cast or otherwise fixed in the augur or cylinder B as seen at *f* for the purpose of allowing the chain of buckets to pass freely down to their lowest position, then to pass under the partition *f* and then receive the dirt, water or other substance and carry it to the desired elevation as before stated.

The cutter as seen at *a*, in the cylinder B is made of steel, one of its edges swinging or turning on the pin as seen at *x*, and is properly adjusted so as to cut the desired diameter, by the arm *g* one end of which is connected to the cutter *a*, and the other end to an arm shown only in dotted lines at Fig. 5, which is firmly attached to the lower end of the upright shaft *e*, near the lower end of this shaft is fitted to a stand or projection which is cast on the inside of the cylinder, and near to the upper end of this shaft or rod is fitted to a hole that is drilled in a projection on the cross head *b*.

On the top end of the shaft *e* I fit and fasten an arm as seen at *a*, and in the out end

of this arm there is a pin as seen at *c* fitted to this arm, and also to the holes as seen at *i* for adjusting the cutter *a*, so as to cut or enlarge the hole as required, which will be readily understood by inspection of Figs. 4 and 5.

It will be understood that as the auger penetrates downward, the length of the tube C will have to be correspondingly increased, which can be done to any extent by attaching additional lengths of pipe or tube as will be necessary in progressing with the boring.

To the frame A I attach two bearings as seen at *v*, and into them is placed an iron or wood cylinder as seen at *t*, which can be revolved or turned by the crank *s*, and pin *r*, to this cylinder I attach a chain as seen at *p*, having a grapple connected to its lower end as seen at *q* for the purpose of raising the auger B. In cases where the chain buckets are not used, the upper end of the chain can be attached to the hook *n*, in the gear *o*. The lower end of the chain remaining in the auger so that the chain will be revolved with it, and when the auger B is stopped to clear it of dirt or other substance, the upper end of the chain can be connected to the cylinder *t*, and the auger drawn up out of the ground by turning the crank *s*, to clear it of dirt or other substances as before mentioned.

To operate my machine I place it over the spot selected for boring, then apply power to the driving shaft which will turn the boring cylinder B, the weight of the frame L will press the cylinder downward the cutter K first coming in contact with the earth, and boring the same diameter of the cylinder until the adjustable cutter *a* comes in contact with the earth cutting it, and removing it into the inside of the auger, the enlarging of this hole both allows the auger to continue its boring without binding or sticking, and to allow of the pipe descending as the boring is continued, after the boring has progressed a short distance, I remove the cross bar K from its position, and the large bevel gear O from its position on the tube C, then I take a section or piece of a hollow log of wood or tube of metal which has been previously prepared to line the well, so as to enter the hole which has been cut by the auger B, and place one end of this tube or hollow log as the case may be, down into the hole upon the top of the auger, then I replace the gear O and cross bar K, fastening the gear O to the tube C by the keys S, then again apply the power to the driving shaft and the auger will be revolved, cutting the earth as it descends, and allowing the log or tube to descend with it to the desired depth, adding from time to time sections of tube if required, by the process just re-

cited, the dirt or other substance being removed from the auger by the chain buckets, and carried to the desired elevation, this chain of buckets being constructed as described, and operated by the same power that turns the auger, as hereinbefore described.

So that the lining and boring of the well is going forward at one and the same time.

10 And the boring auger B, can be drawn up through the tube by the means before-mentioned, the cutter *a*, swinging or moving inward so as to allow the auger to be elevated freely, as set forth.

15 I do not claim an endless leather band carrying leathern buckets around two stationary revolving pulleys, as used in flouring mills as such are well known.

1. The boring cylinder B, having a cutter 20 at its lower end, and an adjustable cutter

in its periphery for enlarging the hole, so that the auger cannot bind when in use, and so that the tube designed to line the well, can follow the auger or cylinder B, downward and allow this auger to be drawn 25 up through the lining tube, by the shutting or moving of the enlarging cutter, all being arranged and operated in the manner and for the purposes set forth.

2. I also claim the metallic chain of buckets E in combination with the earth cutter B operating, or moving, in such manner within it, as to receive the earth as fast as it is cut from the ground, and elevate it to the desired height, essentially in the manner 35 and for the purposes set forth.

JOHN F. MANAHAN.

Witnesses:

SHUBAD P. ADAMS,
I. W. LUCAS.