

No. 887,416.

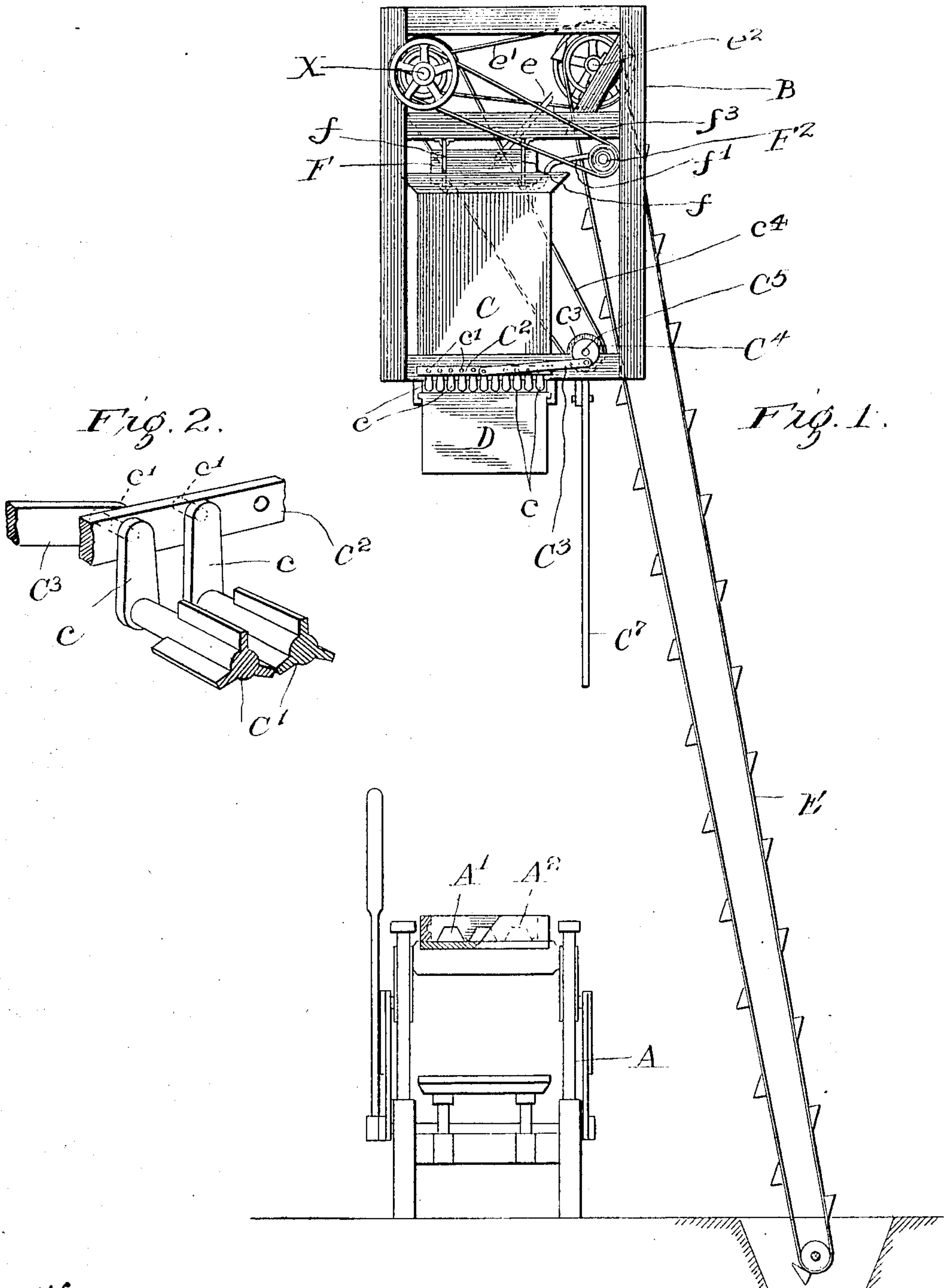
PATENTED MAY 12, 1908.

C. MORGAN.

APPARATUS FOR MAKING SAND MOLDS.

APPLICATION FILED JULY 17, 1906.

2 SHEETS—SHEET 1.



Witnesses:

A. M. Cornwall
J. E. Sherry

Inventor:

Charles Morgan
by Bitner, Wiles & Sherry
Attys

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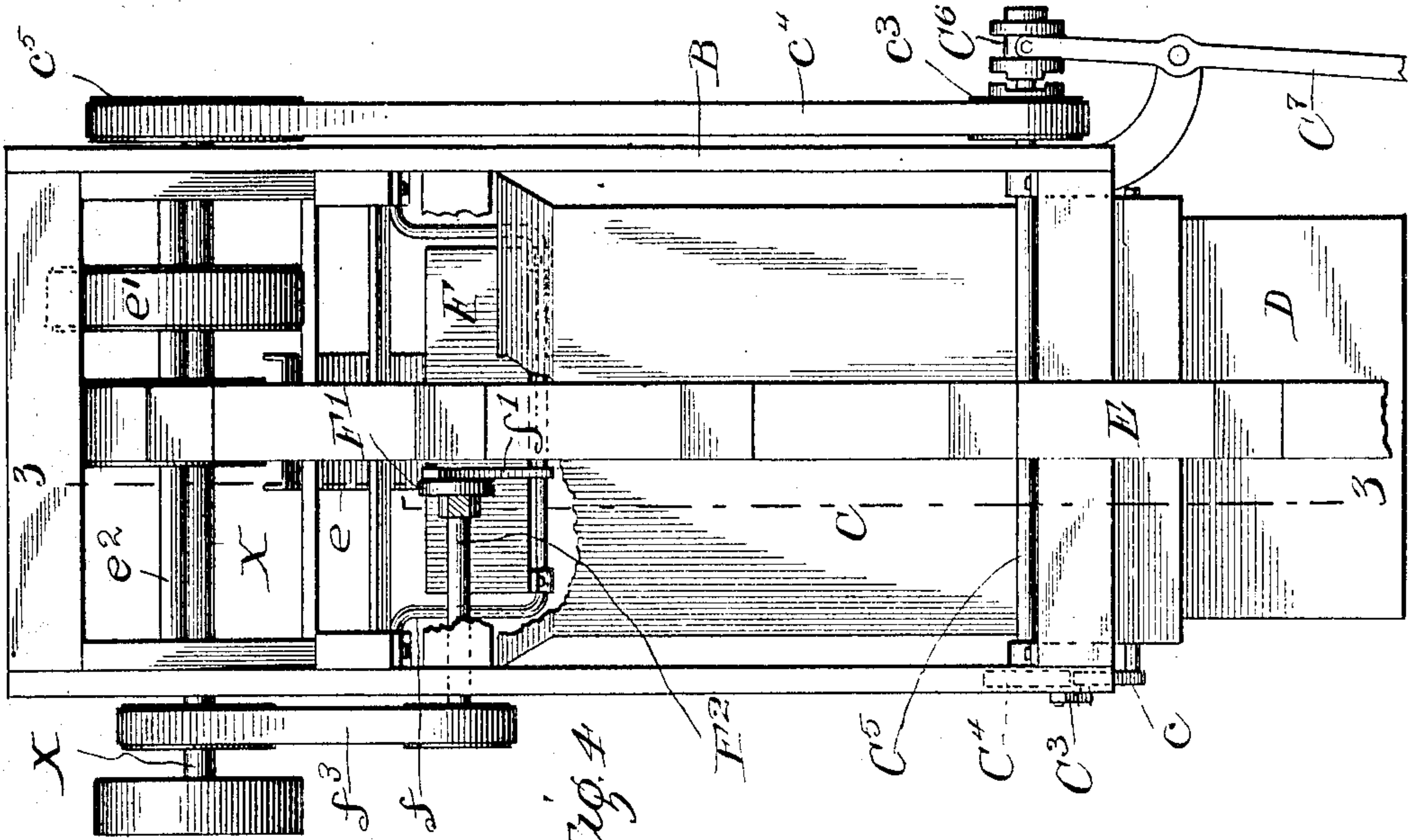


Fig. 4

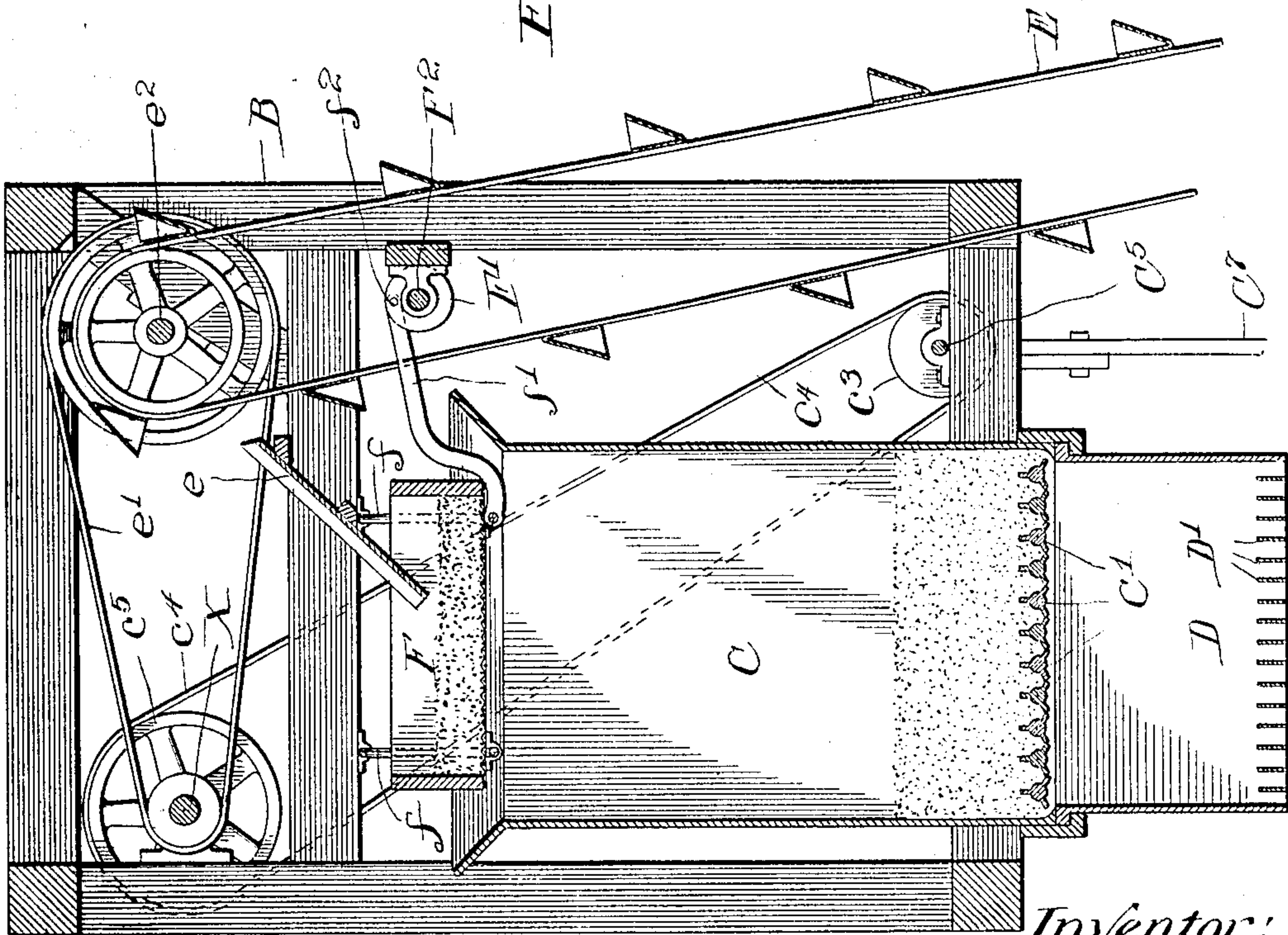


Fig. 3

Witnesses:

A. M. Cornwall
J. E. Sherry.

Inventor:

Charles Morgan,
by Pitman, Miles & Sherry
Attys

UNITED STATES PATENT OFFICE.

CHARLES MORGAN, OF FREEPORT, ILLINOIS, ASSIGNOR TO ARCADE MANUFACTURING COMPANY, OF FREEPORT, ILLINOIS, A CORPORATION OF ILLINOIS.

APPARATUS FOR MAKING SAND MOLDS.

No. 887,416.

Specification of Letters Patent.

Patented May 12, 1908.

Application filed July 17, 1905. Serial No. 269,910.

To all whom it may concern:

Be it known that I, CHARLES MORGAN, a citizen of the United States of America, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Apparatus for Making Sand Molds, of which the following is a specification.

My invention relates to improvements in apparatus for making sand molds, and is fully described and explained in this specification, and shown in the accompanying drawings, in which

Figure 1 is an elevation partly in section of my improved molding apparatus; Fig. 2 is a sectional perspective showing the grate bars; Fig. 3 is a transverse section in the line 3—3 of Fig. 4; and Fig. 4 is a side elevation of the parts seen in Fig. 3.

Referring to the drawings, A, is a molding machine, preferably of the type shown in patent, issued July 4th, 1905, Number 793,860 to Henry Tscherning. This molding machine supports a pattern A¹, here shown as in the form of a match-plate, but which may be of any other desired form; and the machine also supports a flask section, A², of the ordinary form. Directly above the machine is a frame B, which carries a hopper, C, the lower end of which is closed by grate bars, C¹, each of which has projecting from one end a crank, c, carrying a pin, c¹, said pins engaging corresponding holes in a transverse bar, C², which can be reciprocated by means of a link, C³, the opposite end of which is eccentrically pivoted to a plate, C⁴, on a shaft, C⁵, mounted in the frame, B. This shaft carries a loose pulley, c³, driven by a belt, c⁴, running over a pulley, c⁵, on a main driving shaft, X. The loose pulley, c³, can be thrown into engagement with the shaft, C⁵, by means of a clutch C⁶, controlled by a hand lever, C⁷, extending within reach of the operator. When this clutch is thrown in, the plate, C⁴, will rotate, causing the reciprocation of the bar, C², and the consequent rocking of the grate bars. This will discharge sand in a divided condition from the hopper, which sand will pass through a reducer, D, removably secured in place below the hopper, striking in its fall a coarse screen, D¹, preferably constructed of vertical plates of metal. This reducer with its coarse screen will divide the sand up evenly and will also cause the falling column of sand to take the

same size and shape as the cross section of the flask below it. These reducers are made of varying sizes to accommodate various styles of flasks, so that the same apparatus can be used with any shape of flask by merely changing the reducer.

Sand is supplied to the hopper by means of a conveyer, E, which drops sand on to a chute, e, which shoots it into a sieve, F, hung on links, f, so as to be capable of horizontal reciprocation. This sieve is connected by means of a link, f¹, with an eccentric pin, f², on a plate, F¹, mounted on a shaft, F², which is driven by a belt, f³, running from a pulley on the shaft, X. The conveyer is driven by a belt, e¹, running over pulleys on the shaft, X, and a shaft, e², supporting one of the conveyer pulleys.

Sand can be shoveled around the lower end of the conveyer in a rough way and will be dumped on the sieve, F, where it will be sifted and eventually fall into the hopper. The operator of the machine will then place a flask in place upon the pattern and move the clutch handle to discharge the sand. The sand will then fall in a vertical direction and in a divided condition directly into the flask which is in practice located at a distance of from two to eight or ten feet below the end of the reducer, the preferred distance being about four feet. The sand in this vertical fall gains considerable momentum and when it strikes the pattern, embeds itself firmly about the same, filling every crevice and depression of the pattern with a solid and compact body of sand.

It has heretofore been customary to sift a certain amount of loose sand into the flask by hand, the sand falling a few inches or possibly a foot before coming to rest. A body of sand so deposited is very loose, and if a pattern with depressions of any considerable size is used, it must be tucked by hand into any of these depressions before the flask is filled up. After such tucking is accomplished, the flask is usually filled up with a shovel. This rough shoveling of sand on to the tucked lower layer is likely to disarrange the mold, consequently causing an imperfect casting. I have discovered that if the sand is dropped vertically into the mold from a considerable height, it will embed itself firmly about the pattern, for each particle of sand has sufficient momentum to tamp or partly tamp the sand which fell before it. As a result, when

the clutch lever of my device is moved in the proper direction, a shower of swiftly-falling sand strikes the flask and the flask is filled almost instantly with a solid body of compact sand which fills all the interstices of the pattern. Were the sand dropped from a less height, the body would be comparatively loose and when squeezed into a molding machine, the top layer of sand would become solidified and pressure would not be properly transmitted to the sand in the hollow of the pattern.

The apparatus here shown is the form which I prefer at the present time for practicing the method described and claimed in my application filed on even date herewith, and allotted Serial Number 269,909. The apparatus is obviously capable of very great variation in construction without departing from the spirit of my invention.

I am aware that it has heretofore been proposed to form sand molds by dropping sand into them from a height sufficient to cause a compacting of the sand, but the molds so formed have not, so far as I know, been subjected to any squeezing operation after the sand is dropped, nor any facilities for such squeezing been provided. I am also aware that the use of molding machines for squeezing sand molds is old and common. It is, however, novel to combine the two devices in such a way that a thoroughly homogeneous body of sand having a considerable degree of compression is obtained in the mold, which body of sand can be brought into close and thorough contact with the pattern by squeezing in the molding machine. By using the two devices in combination, *i. e.*, the mechanism for dropping the sand and the mechanism for squeezing the mold, I obtain molds which are thoroughly homoge-

neous throughout and which have a complete and perfect contact with the pattern and which give better castings than can be produced by any other apparatus. Furthermore my improved apparatus can be worked at almost double the speed of any ordinary molding machine and can be worked far faster than can any machine which merely drops the sand into the molds, for in my device the compacting of the last layers of the sand is produced by squeezing and not by falling sand.

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

1. The combination with mechanism for dropping the sand in a finely divided condition and in an even, free and unobstructed stream into a flask and means for squeezing the flask after the sand has entered it.

2. The combination with means for discharging sand in a finely divided condition and in an even, free and unobstructed stream into a flask at a sufficient speed to cause its compacting by the force of its impact, of means for squeezing the compacted body after it is in place in the flask.

3. The combination with a molding machine adapted to squeeze a flask, of a sand receptacle directly above the same, mechanism for discharging the sand therefrom in an even, free and unobstructed stream and in a finely divided condition into a flask upon the molding machine.

In witness whereof I have signed the above application for Letters Patent at Freeport, in the county of Stephenson and State of Illinois, this 12th day of July, A. D. 1905.

CHARLES MORGAN.

Witnesses:

FRED E. BOEDEKER,
CHARLES MILLER.