

No. 751,034.

PATENTED FEB. 2, 1904.

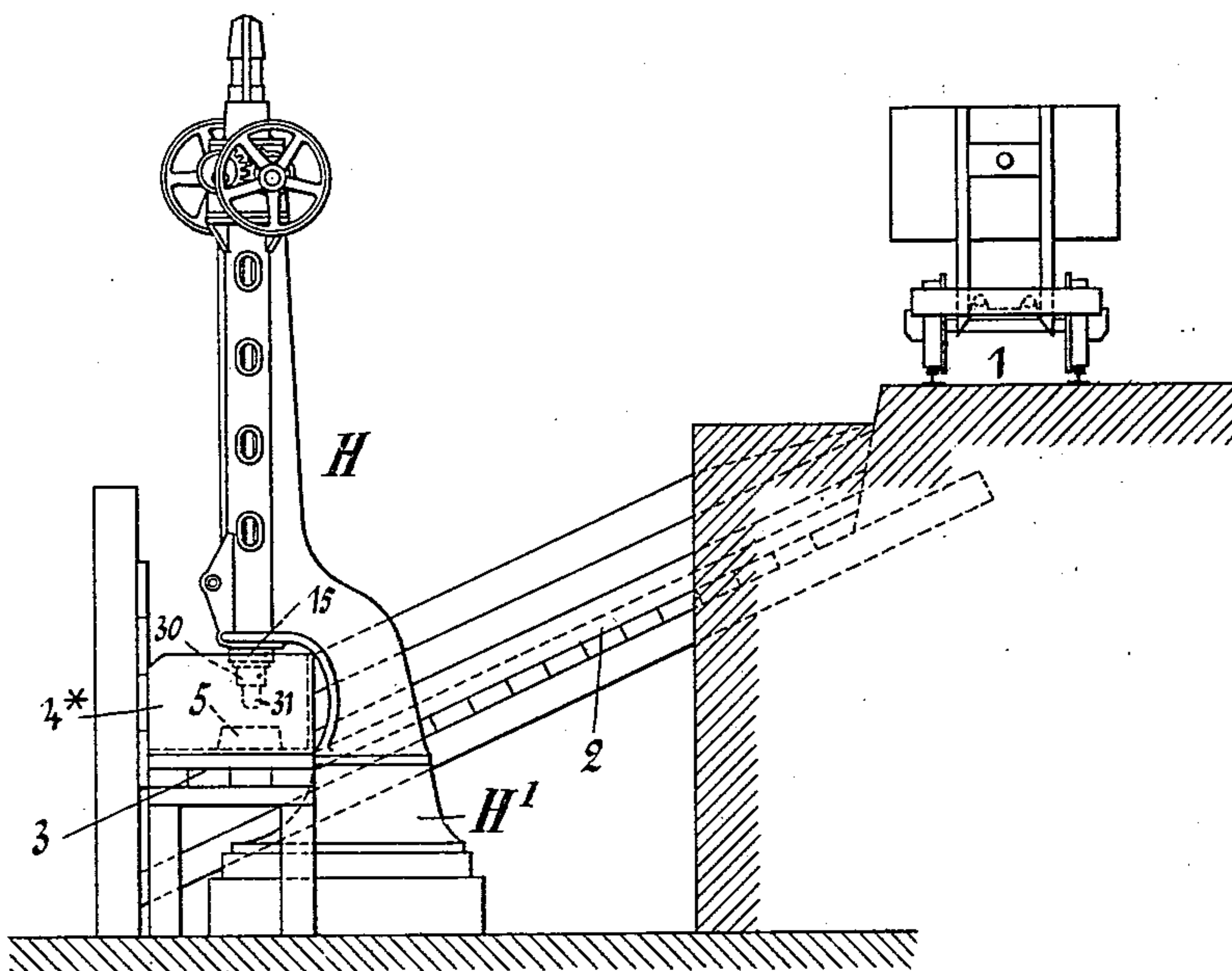
F. J. H. WEILLER.
MACHINE FOR BREAKING OR SPLITTING STONE.

APPLICATION FILED JAN. 2, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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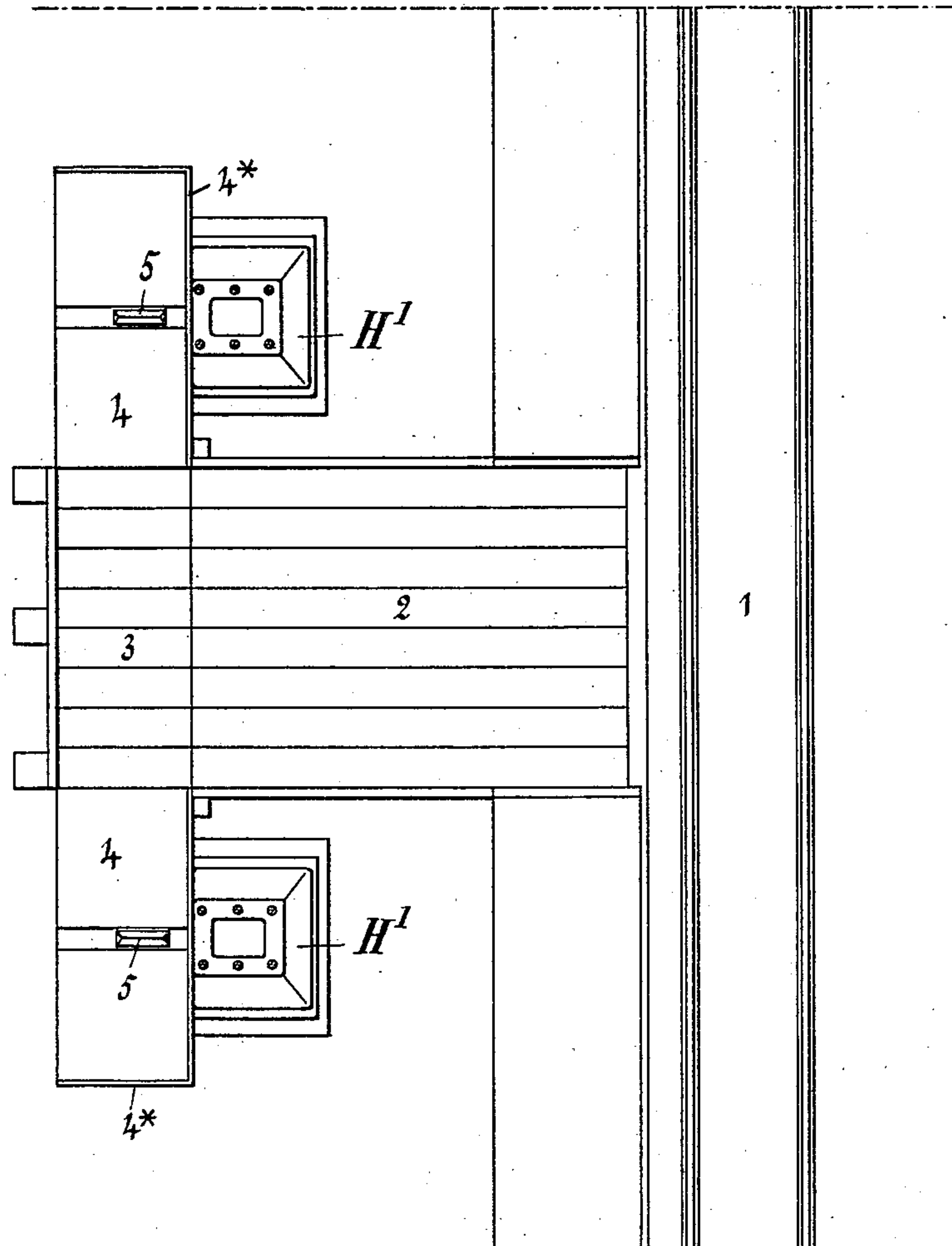
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NO MODEL.

3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

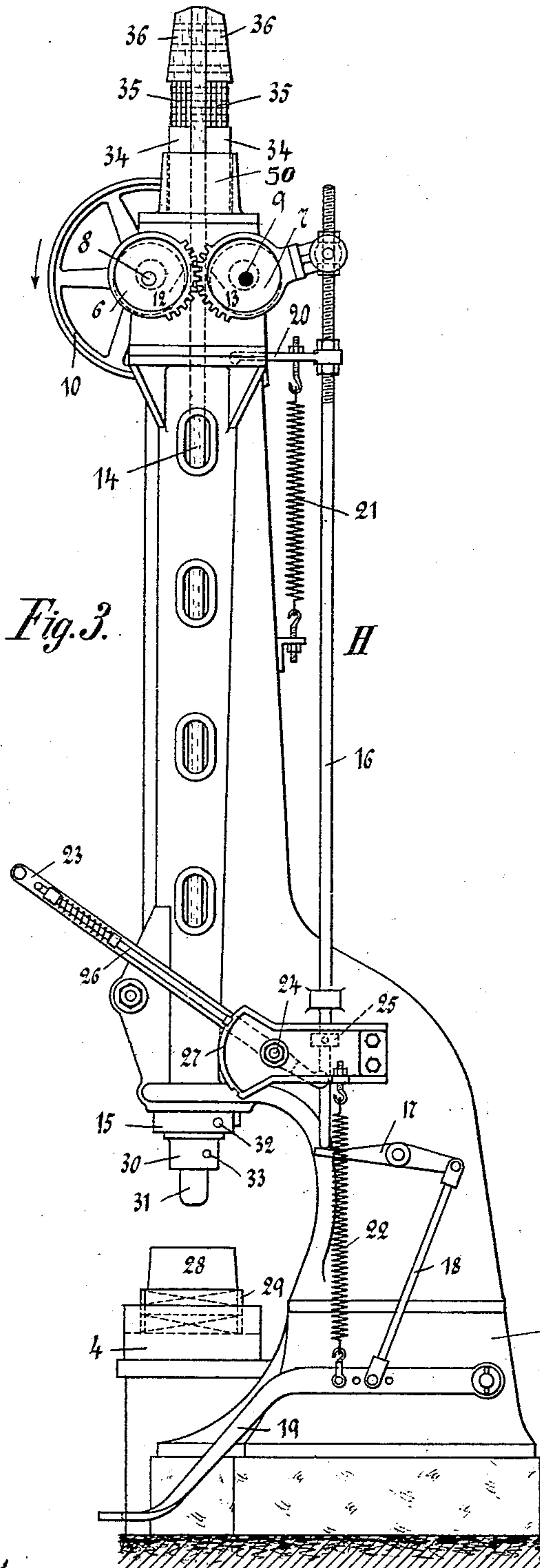


Fig. 3.

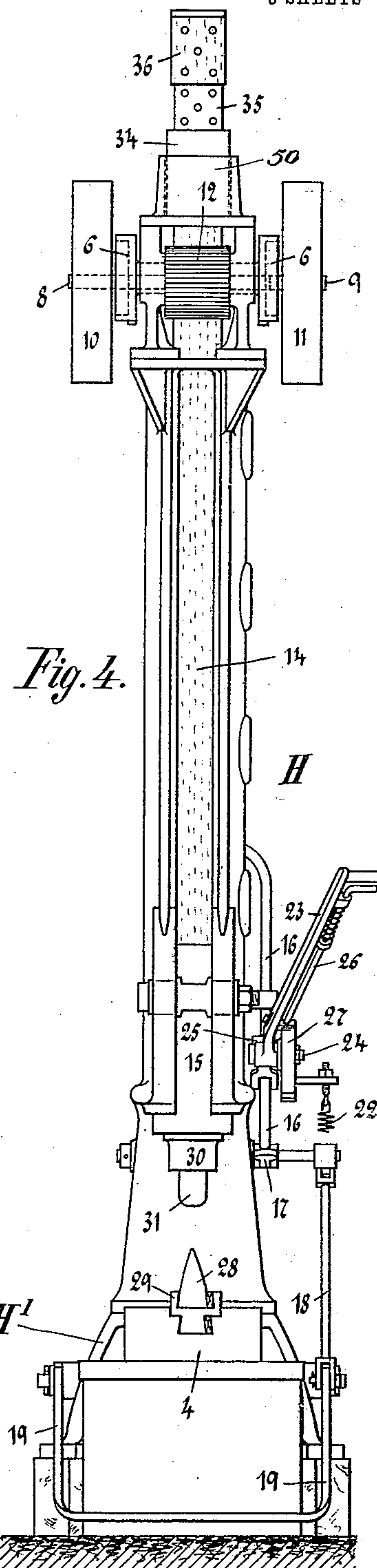


Fig. 4.

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UNITED STATES PATENT OFFICE.

FERDINAND JULIUS HUBERT WEILLER, OF SANDVIG, NEAR ALLINGE, DENMARK, ASSIGNOR TO AKTIESELSKABET BORNHOLM GRANITVAERK, OF COPENHAGEN, DENMARK.

MACHINE FOR BREAKING OR SPLITTING STONE.

SPECIFICATION forming part of Letters Patent No. 751,034, dated February 2, 1904.

Application filed January 2, 1902. Serial No. 88,196. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND JULIUS HUBERT WEILLER, a subject of the German Emperor, and a resident of Sandvig, near Allinge, Island of Bornholm, Kingdom of Denmark, have invented certain new and useful Improvements Relating to Machines for Breaking or Splitting Stone, of which the following is a specification.

10 The breaking or splitting of larger stone blocks, especially for the preparation of paving-stones, is carried out in the most simple manner by means of a hand-hammer, while for larger output a drop-hammer may be used. 15 The latter may be constructed in various manners and arranged so as to have the hammer-block raised either by manual power or by steam or air pressure. As with this arrangement the power applied is caused to act direct upon the hammer-block and must always be started and stopped for operating or for arresting the hammer-block, it is naturally difficult to provide simple means whereby the person who manipulates the stone block 25 beneath the hammer-block can also attend to the starting and stopping of the driving power. Ordinarily this is impossible to arrange, owing to the fact that the said manipulator may often be required to use hands and legs to obtain a firm stand or seat and lift and handle blocks of stone of great weight beneath the hammer-block. It is therefore necessary to employ an assistant for operating the hammer-block. This has the disadvantage that 35 such assistant must follow very carefully the operations executed by the former in order to prevent serious accidents to the manipulator through the carelessness of his assistant. Obviously the manipulator who handles the 40 stone block is far more able to judge the proper time for starting and operating the hammer-block; and it is the object of this invention to provide means to enable one single person only to perform the various operations. The arrangement adopted is a friction-hammer combined with a slideway or chute in such a manner and also with regard to the 45 supply-station of the stone blocks that each

stone block is directly delivered to the working place near the hammer and at the height of the anvil-block, so that the manipulator is no longer required to lift the stone blocks, but need only push or roll them under the hammer, and can therefore easily use one foot to operate a foot-lever for disengaging the friction 55 rollers or disks from the tail-bar of the hammer, and thus cause the latter to fall exactly at the proper moment to suit the work.

In the accompanying drawings, Figure 1 is an end view, and Fig. 2 a top view or plan, of 60 a stone-splitting-machine plant embodying my invention. Fig. 3 is a side view, and Fig. 4 a front view, of my improved stone-splitting machine proper.

Similar symbols refer to similar parts 65 throughout the several views.

In carrying my invention into practice preferably two friction-hammers H, placed each on a suitable base H', Figs. 1 and 2, are provided, one at each side of a slideway or chute 2, 70 communicating with a railway 1. The stone blocks are brought by the railway straight from the quarry and discharged into the slideway or chute, where they slide on a platform 3 midway between the two hammer anvil-blocks 75 4, provided with suitable guard-plates 4*. The operative of each hammer pushes the stone blocks one at a time upon a stone-rest 5, preferably chisel-shaped, and after correctly adjusting the stone block the drop-hammer 15 80 30 31 is allowed to drop. If one block has been reduced, another is immediately introduced under the drop-hammer, and so forth, the heavy stone block requiring only to be pushed along horizontally, and a single operator is therefore capable of starting the hammer at the proper time. 85

A specially-suitable form of friction-hammer for the present purpose is shown in Figs. 3 and 4 and constructed as follows: At each 90 side of the upper end of the hammer-frame are provided two disks 6 and 7, formed with segmental teeth in gear with each other. Eccentrically and loose in the trunnions of the toothed sector-disks 6 is fitted a spindle 8 and 95 in the trunnions of the toothed sector-disks 7 a

spindle 9. On the spindle 8 is mounted concentrically at the outside of the frame a belt-pulley 10 and within the frame a serrated friction-roller 12. On the spindle 9 is mounted
 5 outside the frame a belt-pulley 11 and within the frame and in the rear of the roller 12 a second serrated friction-roller 13, Fig. 3. These two friction-rollers are therefore arranged opposite each other with the tail-bar
 10 14 of the drop-hammer 15 30 31 between them. To the pair of toothed disks 7 is pivotally connected a pusher-rod 16, which with its lower extremity rests upon an appropriate lever-and-link mechanism 17 18 of a foot-lever 19, said
 15 pusher-rod carrying near its upper end a lateral arm 20, projecting into the path of the drop-hammer block 15, the said arm 20, together with its pusher-rod 16, being constantly pulled downward by the action of a suitable
 20 tension-spring 21, a second tension-spring 22 being provided for raising the foot-lever 19 upward. If the operator desires to drop the hammer from any elevation, he depresses the foot-lever 19, and thereby causes the pusher-
 25 rod 16 to move upward. In consequence the toothed sector-disks are turned round in such a manner as to cause the two friction-disks 12 13 to separate from the tail-bar 14 of the drop-hammer and allow the said bar and drop-ham-
 30 mer to drop, while the pulleys 10 11 and friction-disks 12 13 rotate idly in an opposite direction. As soon as the operator releases the foot-lever 19 the spring 21 pulls the pusher-bar 16 downward, and at the same time the toothed
 35 sector-disks 6 7 are so turned back that the friction-disks 12 13 grip between them the tail-bar 14 of the drop-hammer and raise the same till the hammer-block 15 strikes against the lateral arm 20 of the pusher-bar 16. By this
 40 means the pusher-bar is slightly lifted, and consequently the pressure of the friction-disks 12 13 against the tail-bar 14 of the drop-hammer is so far reduced as to prevent the bar 14 from being lifted any further, it being merely kept
 45 suspended till the operator depresses the foot-lever to release the hammer.

To enable the drop-hammer to be also operated by hand, a hand-lever 23 is fulcrumed at 24 to the frame and is formed with a forked
 50 end which embraces the pusher-bar 16 beneath a suitable collar 25. The said hand-lever may be secured or locked in position by means of a spring-actuated latch 26 cooperating with a notched segmental guide 27.

55 The drop-hammer or ram-hammer and the stone-rest are of special form. The stone-rest consists of a sharp-edged chisel-shaped cutter 28, secured by means of a wedge in a slot in the supporting-anvil 4. When after a time
 60 the sharp-edged tool 28 becomes blunt, it can be sharpened anew and placed in a separate shoe 29, which latter is then secured in the slot previously occupied by the cutter 28 itself, and in this manner the original height of the cut-
 65 ter 28 is insured.

The drop-hammer or ram-hammer comprises the hammer-block 15, the hammer-head 30, and a blunt striker or beater 31. The hammer-head 30 is inserted with a shank or shaft into
 70 a suitable recess of the hammer-block 15 and retained therein by bolt 32, whereas the beater 31 fits with a stem or shaft into a recess of the hammer-head and is secured in the latter by means of a bolt 33. The use of a separate
 75 hammer-head between the hammer-block and beater or hammer proper has the advantage that when the shaft or stem of the hammer proper breaks and remains in the interior of the hammer-head 30 it will only be necessary
 80 to remove the hammer-head from the hammer-block and replace it by another, whereas if the shaft of the hammer or beater had been inserted directly into the hammer-block and then broken off the said hammer-block would
 85 have to be bored out at great expense and loss of time.

In order to reduce the effects of the drop-hammer blows upon the frame and also to permit the stroke of the drop-hammer being altered or varied, interchangeable wooden blocks
 90 34, held in a recess 50, cast in the head of the machine-frame, and suitable rubber buffers 35 may be arranged between the frame and the supporting traverse or head 36 of the tail-bar of the drop-hammer.
 95

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

1. In a stone-splitting machine, the combination with a tail-bar, and a hammer thereon,
 100 of mechanism to frictionally engage the tail-bar to raise it and means actuated by the hammer to reduce the friction between the tail-bar and said mechanism to that required to maintain the tail-bar elevated, substantially
 105 as and for the purpose set forth.

2. In a stone-splitting machine, the combination with a tail-bar, a hammer thereon, eccentrically-mounted friction-rollers to engage
 110 the tail-bar, and a lever-and-rod connection to move the rollers into and out of engagement with the tail-bar, of an arm projecting into the path of the hammer and engaged thereby to partially move the rollers to reduce the
 115 friction to maintain the tail-bar stationary, substantially as and for the purpose set forth.

3. In a stone-splitting machine, the combination with a tail-bar, and a hammer thereon;
 120 of mechanism to frictionally engage the tail-bar to raise it, and means actuated by the hammer to reduce the friction between the tail-bar and said mechanism to that required to maintain the tail-bar stationary, and interchangeable buffers to fix the lower limit of the
 125 hammer and tail-bar, substantially as described.

4. In a stone-splitting machine, the combination with a tail-bar and a hammer thereon;
 130 of mechanism to frictionally engage the tail-bar to raise it, means actuated by the hammer

to reduce the friction between the tail-bar and
said mechanism to that required to maintain
the tail-bar stationary, and manually-operated
lever connections to completely disengage said
5 mechanism, substantially as described.

5. In a stone-splitting machine, the combi-
nation with a tail-bar and a hammer thereon;
of mechanism to frictionally engage the tail-
bar to raise it, and means to automatically re-

duce the friction between said mechanism and 10
tail-bar to that required to maintain the tail-
bar elevated, when said tail-bar reaches its up-
per limit, substantially as described.

FERDINAND JULIUS HUBERT WEILLER.

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