

H. CORY.
COKE DRAWER.

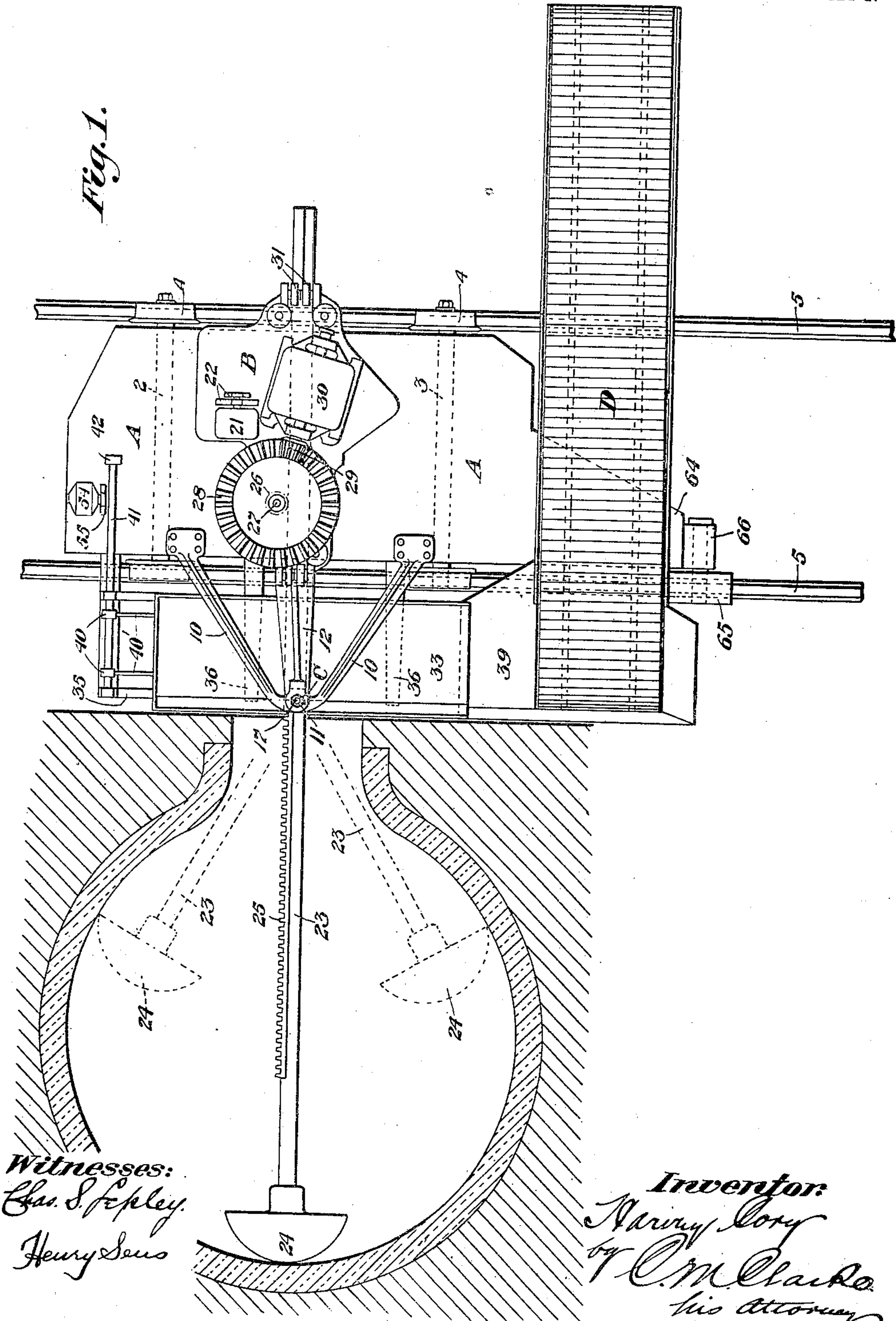
APPLICATION FILED MAR. 17, 1908.

923,410.

Patented June 1, 1909.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

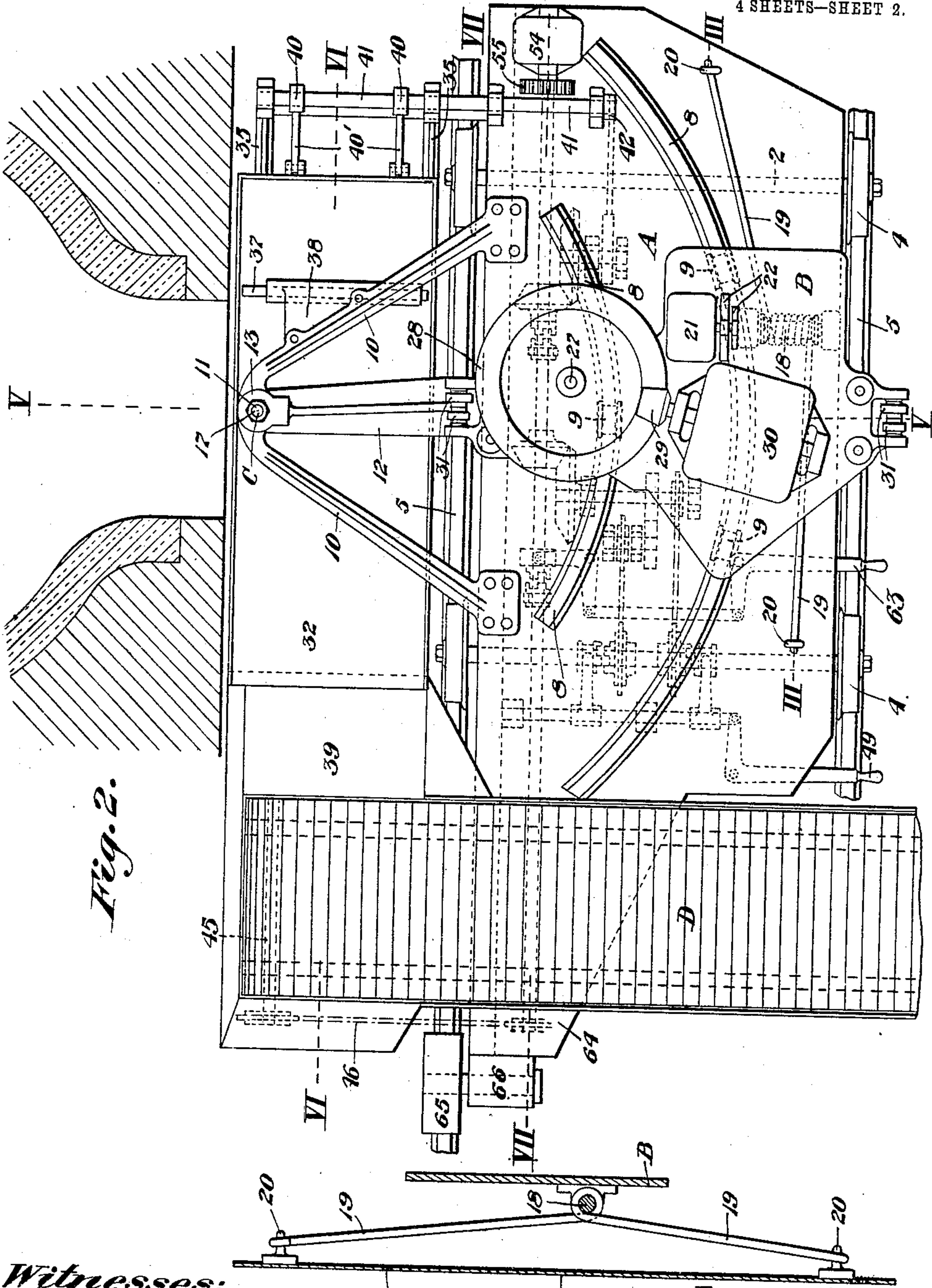


Fig. 2.

Witnesses:
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Fig. 3.

Inventor:
Harvey Cory
by C. M. Clando
his attorney

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4 SHEETS—SHEET 3.

Fig. 4.

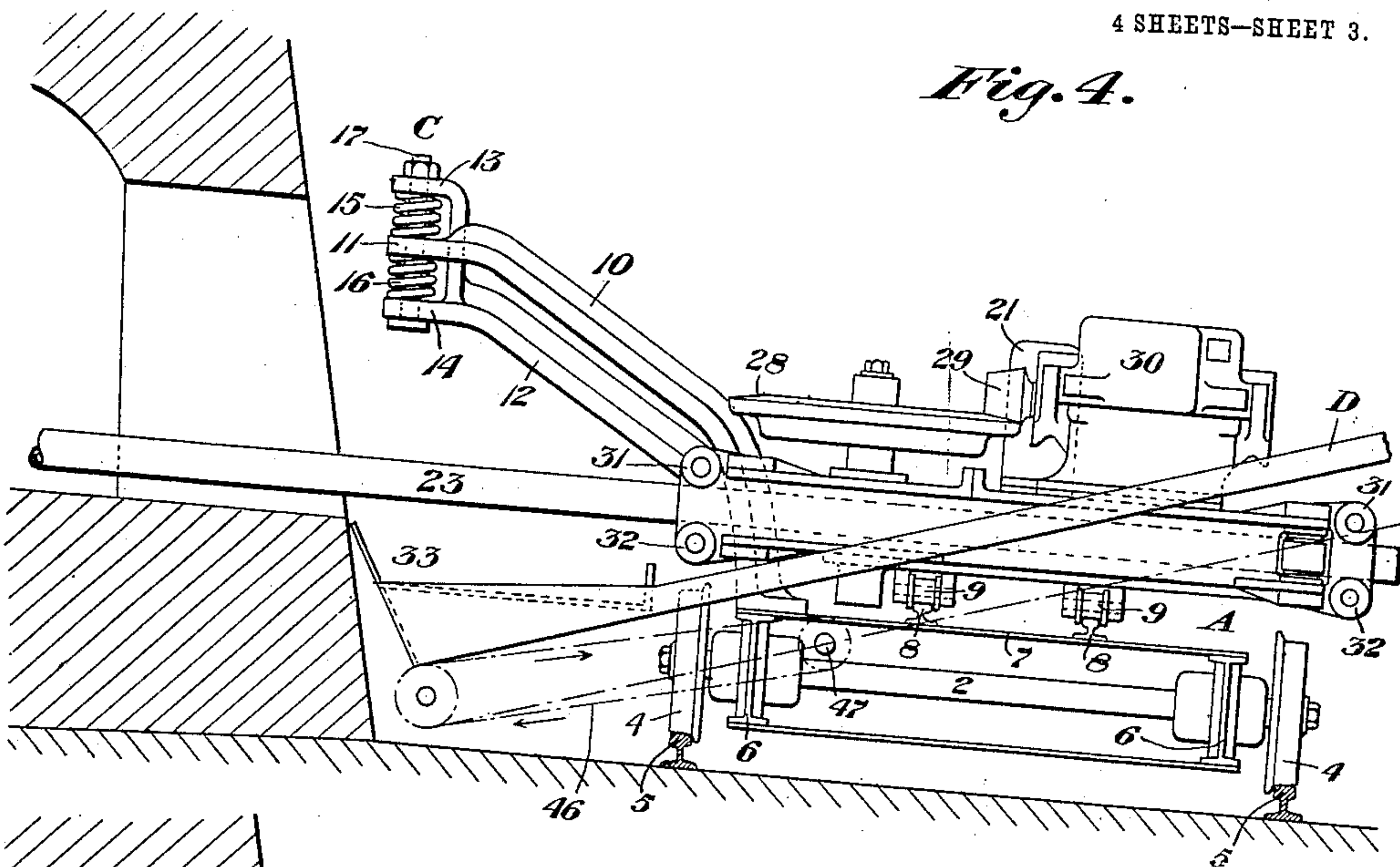


Fig. 5.

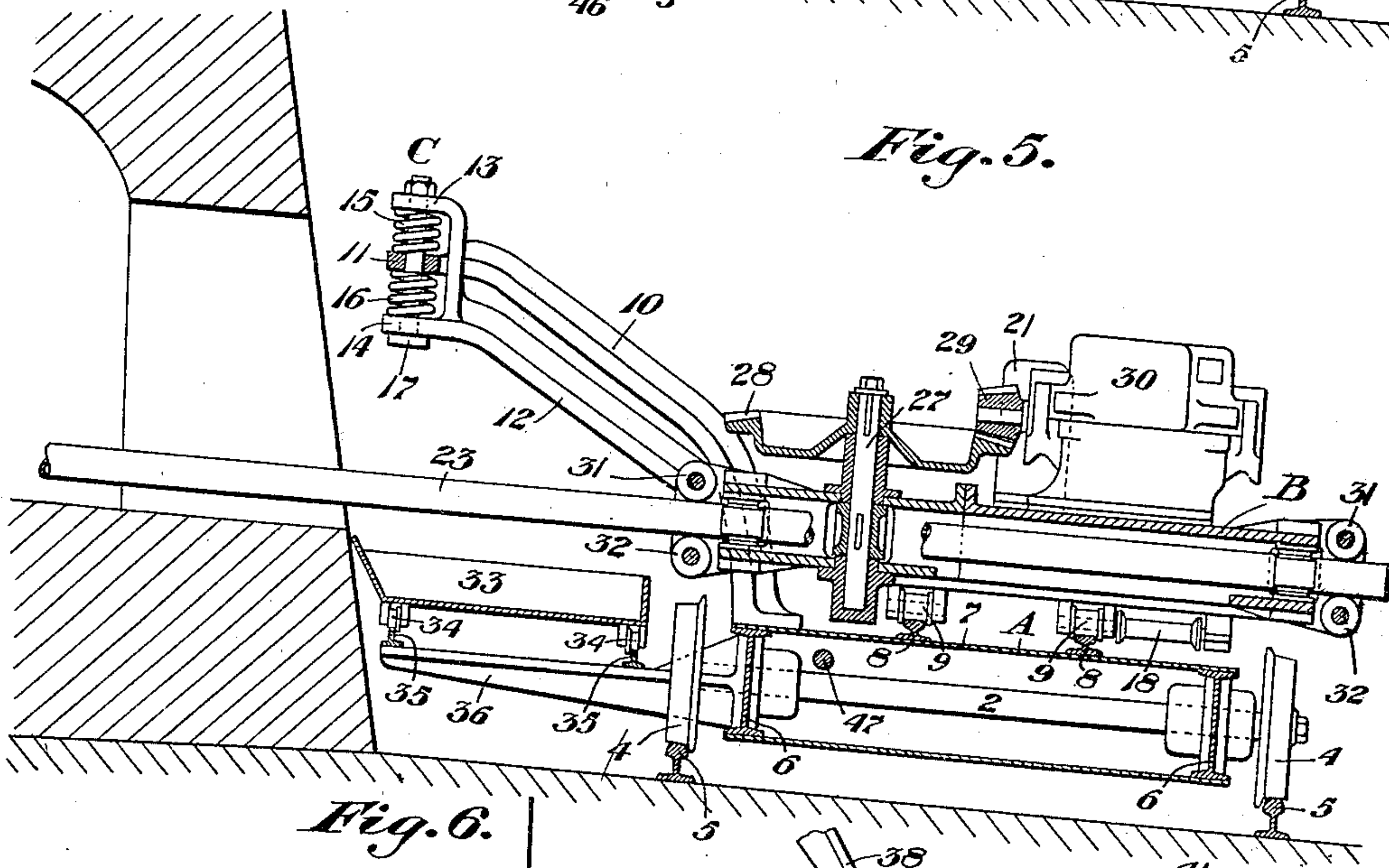
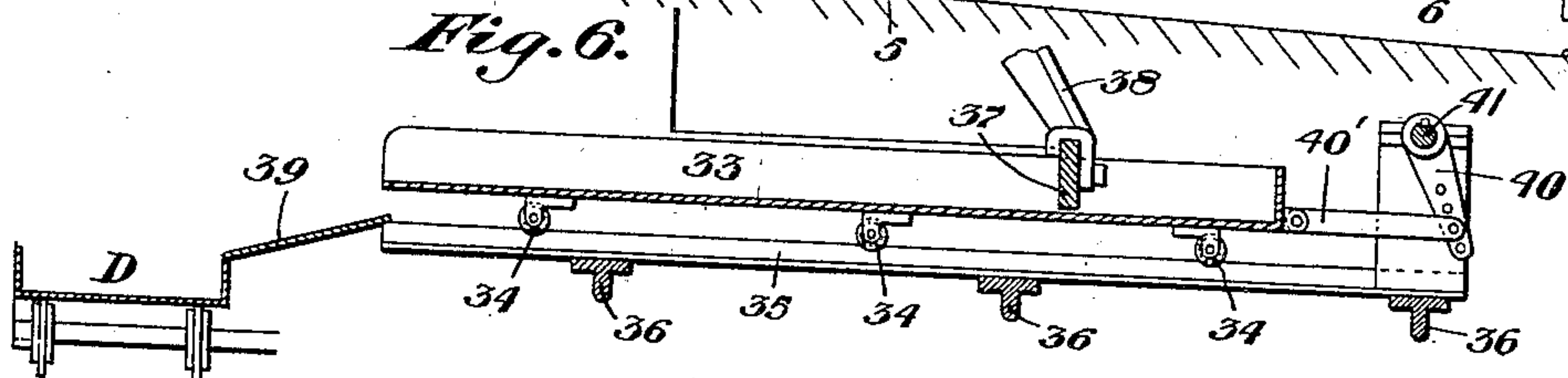


Fig. 6.



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4 SHEETS—SHEET 4.

Fig. 7.

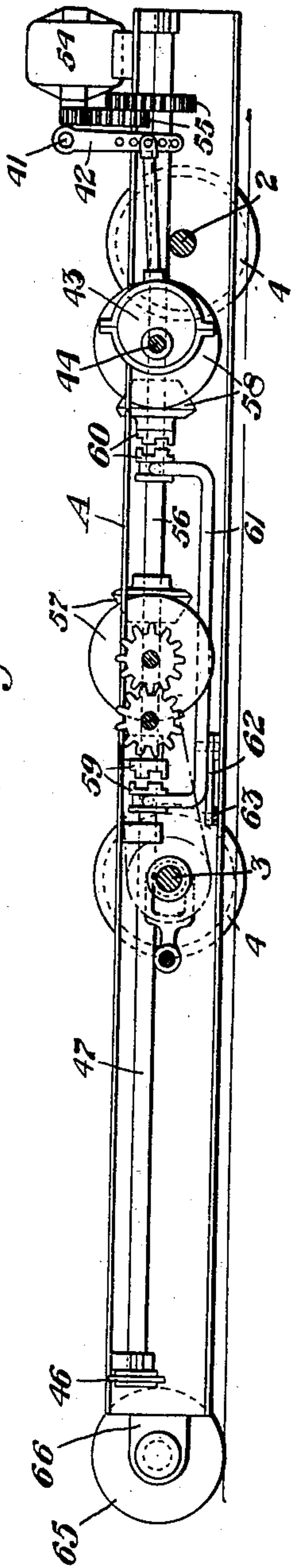
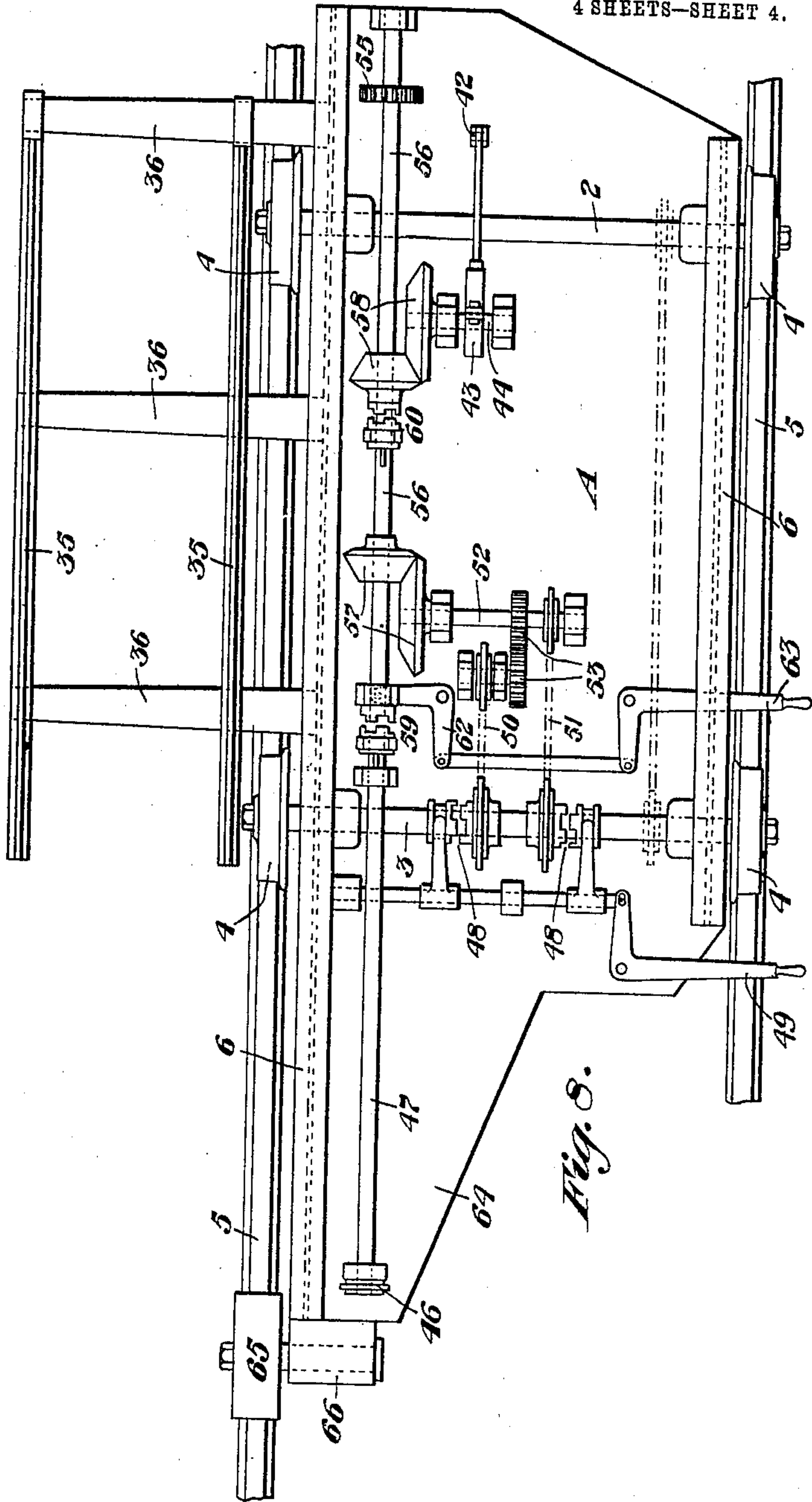


Fig. 8.



Witnesses:

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UNITED STATES PATENT OFFICE.

HARVEY CORY, OF PITTSBURG, PENNSYLVANIA.

COKE-DRAWER.

No. 923,410.

Specification of Letters Patent.

Patented June 1, 1909.

Application filed March 17, 1908. Serial No. 421,682.

To all whom it may concern:

Be it known that I, HARVEY CORY, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Coke-Drawers, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention refers to improvements in coke drawing apparatus for the purpose of extracting coke from the oven, and is particularly designed for use in what is known as the "bee-hive oven."

It has for its objects to provide mechanism by which the extracting element of the device may be easily and conveniently located in operative relation to the oven, and to each oven of a series successively; means whereby the extracting element may be adjusted laterally to explore the area of the oven independently of its supporting carriage, except as pivotally connected therewith; means whereby the extracting element may be inserted and withdrawn from the oven; means whereby the coke as drawn from the oven may be received and delivered to a conveyer and thereby carried to any suitable point of discharge; means whereby the apparatus may be moved along a track in front of the bank of ovens, and means for supplying and distributing the power of a plurality of motors to the different utilizing elements of the apparatus, together with the various features or details of construction, as shall be more fully hereinafter described.

Referring to the drawings, Figure 1 is a general plan view showing the extracting and conveying apparatus assembled, in position for operation in an oven. Fig. 2 is an enlarged plan view of the apparatus showing various features of construction in detail. Fig. 3 is a sectional detail view indicated by the line III. III. of Fig. 2. Fig. 4 is a view in side elevation of the apparatus shown in Fig. 2. Fig. 5 is a longitudinal sectional view indicated by the line V. V. of Fig. 2. Fig. 6 is a transverse sectional view on the line VI. VI. of Fig. 2. Fig. 7 is a similar sectional view on the line VII. VII. of Fig. 2. Fig. 8 is a plan view of the lower portion of the truck, gearing, etc., the upper portion having been removed.

The apparatus comprises generally a truck A having supporting axles 2, 3, and wheels

4 mounted upon tracks 5 extending along in front of the bank of ovens and in suitable relation thereto, said truck supporting the extracting element and its laterally adjustable carriage B.

The truck A is composed of a main framework, preferably of structural steel, having longitudinal side members 6, 6, of I beam, channel or other suitable form, with intervening transverse sills, and may if desired be provided with an upper floor plate 7 for supporting the extractor carriage tracks 8, 8. These tracks may however, be laid directly upon the transverse cross sills or in any other suitable manner, and are curved to a radius developed from the pivotal center C around which swings the carriage B in tracks 8, as shall be hereinafter more fully described. The extractor carriage B comprises a structure of any suitable or convenient form, so arranged that it may be moved laterally to the right or the left upon flanged supporting wheels 9 running on tracks 8 and as controlled by the pivotal center C, so that it will in its movement to one side or the other always conform to said center. For the purpose of providing such pivoting center in a substantial manner, and with a sufficient degree of flexibility to permit of upward or downward variation of the extractor carriage and extractor as effected by variations in the levels of the oven floors or for any other reasons, I provide an upwardly and outwardly extending bracket composed of over-arching arms 10, 10, bolted or otherwise secured to the side of the truck A on the working side, which arms converge toward the pivoting terminal 11 and which thus provide ample space underneath for clearance of the extractor beam and its carriage in extreme positions, as indicated in dotted lines in Fig. 1.

The extractor carriage B, which is mounted for lateral travel on tracks 8 at the top of the main truck A, is provided with a similar upwardly and outwardly extending arm 12 having upper and lower terminals 13 and 14, between which and pivoting terminals 11 are mounted cushioning springs 15, 16, surrounding the pivotal bolt 17 which passes through the several terminals, as clearly shown. By this construction, the extractor carriage B is pivotally mounted at a point outwardly beyond the main machine and sufficiently close to the front of the oven for operation (see Fig. 1) so that without

moving the truck A, the extractor carriage B may be swung around to one side or the other to the desired position for insertion and withdrawal of the extractor so as to explore the entire area of the oven at any position.

The extractor carriage B is of any suitable construction to provide strength and rigidity, having the supporting rollers or wheels 9 referred to at each side of its center, properly spaced to insure stability, and when so mounted and pivotally connected with the supporting framework 10, may be located at any position and will be firmly braced against either pushing or pulling strains.

For the purpose of shifting the extractor carriage B, I provide a spool or sheave 18 rotatably mounted by its shaft in suitable bearings, upon which sheave are wound the inner terminals of cables 19, 19, secured at their other extremities to fixed anchoring bolts or other holding fixtures 20, 20, of the main truck A. When sheave 18 is rotated in one direction or the other it will cause the shifting of the extractor carriage B correspondingly, while the cable 19 at each side will be taken up and paid out at an equal rate and will operate to positively hold the extractor carriage in any desired position when stationary.

For the purpose of supplying winding motion to sheave 18 I employ a separate motor 21 mounted on extractor carriage B and geared with the shaft of the sheave by gearing 22, the desired degree of speed rotation being readily secured by proper proportioning of the gears.

23 is the extractor consisting of a beam having a terminal extracting element 24 of any suitable design or construction, that shown in the drawings being of wedge form for underworking, although any other design may be utilized. The beam of the extractor is provided with a longitudinal rack 25 into which meshes the driving pinion 26 of shaft 27 mounted in suitable bearings and having a gear wheel 28 driven by the pinion 29 of an independent motor 30 mounted upon and traveling with the extractor carriage B, or the power of the motor may be transmitted through other suitable gearing.

The extractor 23 is maintained in alignment by means of suitable guide rollers 31 and 32 located above and below and at each side of the extractor beam and at the front and back of the extractor carriage respectively as shown, or in any other suitable manner whereby to maintain the extractor beam in operative position at all times.

For the purpose of receiving the coke as drawn from the oven door and for delivering it into the continuously traveling conveyer D, I have provided a reciprocating pan 33 of sufficient length to extend beyond

the oven door at each side and to always receive the coke as drawn, said pan being slidably mounted on rollers 34 on tracks 35 extending parallel with the inner side frame of the machine and mounted upon bracket arms 36, or in any other suitable manner.

37 is a stationary abutment supported by a bracing frame 38 and extending downwardly into and across the interior cavity of pan 33, so that as the pan, when full of coke, is drawn backwardly, said abutment will oppose the back travel of the coke, arresting it and causing the coke at the front end of the pan to be discharged onto conveyer D or upon an inclined apron 39 leading thereto.

Reciprocation of pan 33 is imparted in any suitable manner as by means of lever arms 40 and connecting links 40' from shaft 41 which is adapted to be given an intermittent movement by lever 42 and eccentric or cam 43 on shaft 44.

Conveyer D in turn is designed to be continuously operated during operation of the reciprocating pan 33 and is preferably driven at its lower end by means of shaft 45 driven through sprocket gearing 46 from shaft section 47.

In use the apparatus is designed to be shifted along in front of the ovens upon tracks 5 by rotating one or both axles 3, and for the purpose of driving the axle in both directions, it is provided with any suitable clutch mechanism 48 adapted to be shifted in one direction or the other by lever 49 so as to utilize the power imparted through sprocket or other gearing 50 or 51. It will be understood that said separate gearings rotate in opposite directions, power being imparted to them from shaft 52 through suitable reversing mechanism as gears 53, or directly. If desired, both axles may be driven simultaneously by means of connecting sprocket mechanism, as indicated in Fig. 8.

In the construction shown in the drawings I have provided a single motor 54 for the several functions of reciprocating pan 33, actuating conveyer D, and for driving the supporting axle to move the carriage. Power is imparted from said motor through suitable reducing gearing 55 to shaft 56 from which shaft power is taken through gearing and clutch mechanism to reciprocate the pan, drive the conveyer, and impart traveling movement to the carriage.

It is designed that the pan and conveyer shall remain stationary during travel of the carriage, when the power of the motor is utilized for such travel, and that when the travel imparting gearing is thrown out, the pan and conveyer may be thrown in. The clutch mechanism already described whereby power is taken from shaft 52 to drive axle or axles 2 and 3, utilizes the power of shaft 56 through bevel gearing 57, while for the

purpose of reciprocating rock shaft 41 by eccentric 43 of shaft 44, said shaft is geared with shaft 56 by similar bevel gearing.

It is designed that the pan-reciprocating mechanism shall be thrown into and out of gear simultaneously with the starting and stopping of shaft section 47, for which purpose shaft 47 is arranged to be coupled to or uncoupled from shaft 56 by clutch mechanism 59, the driving bevel of gearing 58 on shaft 56 being similarly provided with clutch mechanism 60. Simultaneous coupling or uncoupling of said clutches 59 and 60 will therefore impart simultaneous motion to the pan and conveyer, and for the purpose of coupling or uncoupling both of said clutch mechanisms 59 and 60 together, they are actuated by a common shifting bar 61 engaging the movable element of each movable clutch, splined on the shaft, and operated through lever mechanism 62 and 63 by the operator, as will be readily understood. As thus constructed it will be seen that the power may be taken from the motor for the several purposes at the proper time, the motor running continuously, or that all of the operations may be stopped by merely stopping the motor.

For the purpose of supporting the conveyer D, the main frame of the machine may be extended outwardly underneath the rear portion of the conveyer as indicated at 64, and is preferably mounted upon a supporting wheel 65 carried by bracket 66 and running on the inner rail 5.

The outer portion of conveyer D may be supported by any suitable mechanism and may be raised or lowered at any desired inclination within the province of the designing engineer. As thus constructed the apparatus is comprised within a single traveling self-contained structure, adapted to receive power for the several motors through any convenient trolley mechanism, it being understood that the machine is provided with the customary controllers located at any suitable position and is thereby under the control of the operator at all times.

The advantage of pivoting the laterally traveling extractor carriage in the manner described is that the location of the pivoting center closely adjacent the oven door enables the operator to locate the carriage at any desired angle within its range of movement, which is sufficient to explore the entire oven without intermediate shifting of the carriage.

The spring mounting of the pivotal connection gives sufficient resiliency to the apparatus to provide for vertical movement where necessary; the mounting of the extractor carriage on the arc-shaped tracks described from the pivotal center and engagement with said tracks of the flanged supporting wheels, combined with the pivotal mounting, strongly braces the extractor carriage at all positions;

the mounting of the motor for shifting the extractor carriage on the carriage itself locates it at a position where it is readily accessible for repair, etc.; the reciprocating pan for receiving the coke and delivering it to the conveyer, being of easy slow movement, avoids the crushing or grinding of the coke and delivers it to the conveyer without appreciable fall; while the conveyer itself may be of the slat construction shown, mounted on flexible chains, or may be of any other convenient form, as for instance flexible belting, for the purpose of preventing breakage of the coke.

The driving of the several mechanisms either by their separate motors or by the utilization of power from a single motor is provided for in a simple, efficient and convenient manner, and the entire structure will be found to give satisfactory results, as to efficiency, economy of time and labor, and with a minimum breakage.

It will be understood that the invention may be changed or varied by the skilled mechanic in various details, or otherwise modified in structure or design, but all such changes are to be considered as within the scope of the following claims.

Having described my invention, what I claim is:

1. In a coke drawer, the combination of a truck provided with an outwardly extending pivoting frame and supporting tracks concentric with the pivoting center of said frame, and an extractor carriage mounted on and entirely above said tracks provided with a reciprocating extractor and a bracket arm pivotally connected with said frame.

2. In a coke drawer, the combination of a truck provided with an outwardly extending pivoting frame and supporting tracks concentric with the pivoting center of said frame, an extractor carriage mounted on and entirely above said tracks provided with a reciprocating extractor and a bracket arm pivotally connected with said frame, and means for moving the extractor carriage around said pivoting center upon the supporting tracks.

3. In a coke drawer, the combination of a truck provided with an outwardly extending pivoting frame and supporting tracks concentric with the pivoting center of said frame, an extractor carriage mounted on and entirely above said tracks provided with a reciprocating extractor and a bracket arm pivotally connected with said frame, and means for moving the extractor carriage around said pivoting center upon the supporting tracks and for actuating the extractor.

4. In a coke drawer, the combination of a truck provided with an outwardly extending pivoting frame and supporting tracks concentric with the pivoting center of said

frame, an extractor carriage mounted on said tracks provided with a reciprocating extractor and a bracket arm pivotally connected with said frame, and means mounted
5 on the extractor carriage for moving it around said pivoting center upon the supporting tracks.

5. In a coke drawer, the combination of a truck provided with an outwardly extending
10 pivoting frame and supporting tracks concentric with the pivoting center of said frame, an extractor carriage mounted on said tracks provided with a reciprocating
15 nected with said frame, and means mounted on the extractor carriage for actuating the extractor.

6. In a coke drawer, the combination of a truck, an extractor carriage mounted thereon,
20 for lateral travel, an extractor and means for actuating it mounted on said carriage, a sheave and a motor therefor mounted on the extractor carriage, and tension devices wound
25 on the sheave and having oppositely extending terminals rigidly connected to the truck, substantially as set forth.

7. In a coke drawer, the combination of a truck provided with an outwardly extending
30 pivoting frame and supporting tracks concentric with the pivoting center of said frame, an extractor carriage mounted on said tracks provided with a pivoting bracket
arm and a reciprocating extractor, and a
35 motor-actuated sheave mounted on the extractor carriage provided with tension devices having oppositely extending terminals
rigidly connected with the truck, substantially as set forth.

8. In a coke drawer, the combination of a
40 truck provided with an outwardly extending pivoting frame and supporting tracks concentric with the pivoting center of said frame, an extractor carriage mounted on said tracks provided with a reciprocating
45 extractor and a bracket arm pivotally connected with said frame, and means providing for vertical movement of said bracket
arm with relation to the pivoting frame.

9. In a coke drawer, the combination of a truck provided with an outwardly extending
50 pivoting frame and supporting tracks concentric with the pivoting center of said frame, an extractor carriage mounted on said tracks provided with a reciprocating
55 extractor and a bracket arm pivotally connected with said frame, and cushioning means providing for vertical movement of said bracket arm with relation to the pivoting frame.

10. In a coke drawer, the combination of a
60 truck provided with an outwardly extending pivoting frame and supporting tracks concentric with the pivoting center of said frame, and an extractor carriage mounted
65 on said tracks provided with a reciprocating extractor and a bracket arm pivotally connected with said frame and having means providing for independent relative movement of the bracket arm with relation to the
70 pivoting frame.

11. In a coke drawer, the combination of a truck provided with an outwardly extending
75 pivoting frame and supporting tracks concentric with the pivoting center of said frame, and an extractor carriage mounted
on said tracks provided with a reciprocating extractor and a bracket arm pivotally connected with said frame and having cushioning springs incorporated with such pivotal
80 connection.

12. In a coke drawer, the combination with a truck having an outwardly extending
85 frame provided with a pivoting terminal, of a relatively movable extractor carriage having a divided bracket arm terminating in
upper and lower pivoting terminals, a pivoting bolt connecting said terminals, with the
90 terminal of the truck frame, and springs intervening between said terminals, substantially as set forth.

In testimony whereof I affix my signature
in presence of two witnesses.

HARVEY CORY.

Witnesses:

C. M. CLARKE,

CHAS. S. LEPLEY.