

Specification of Joseph Wass : construction of smelting furnaces.

Contributors

Wass, Joseph.

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A.D. 1822 N° 4682.

SPECIFICATION

OF

JOSEPH WASS.

CONSTRUCTION OF SMELTING FURNACES.

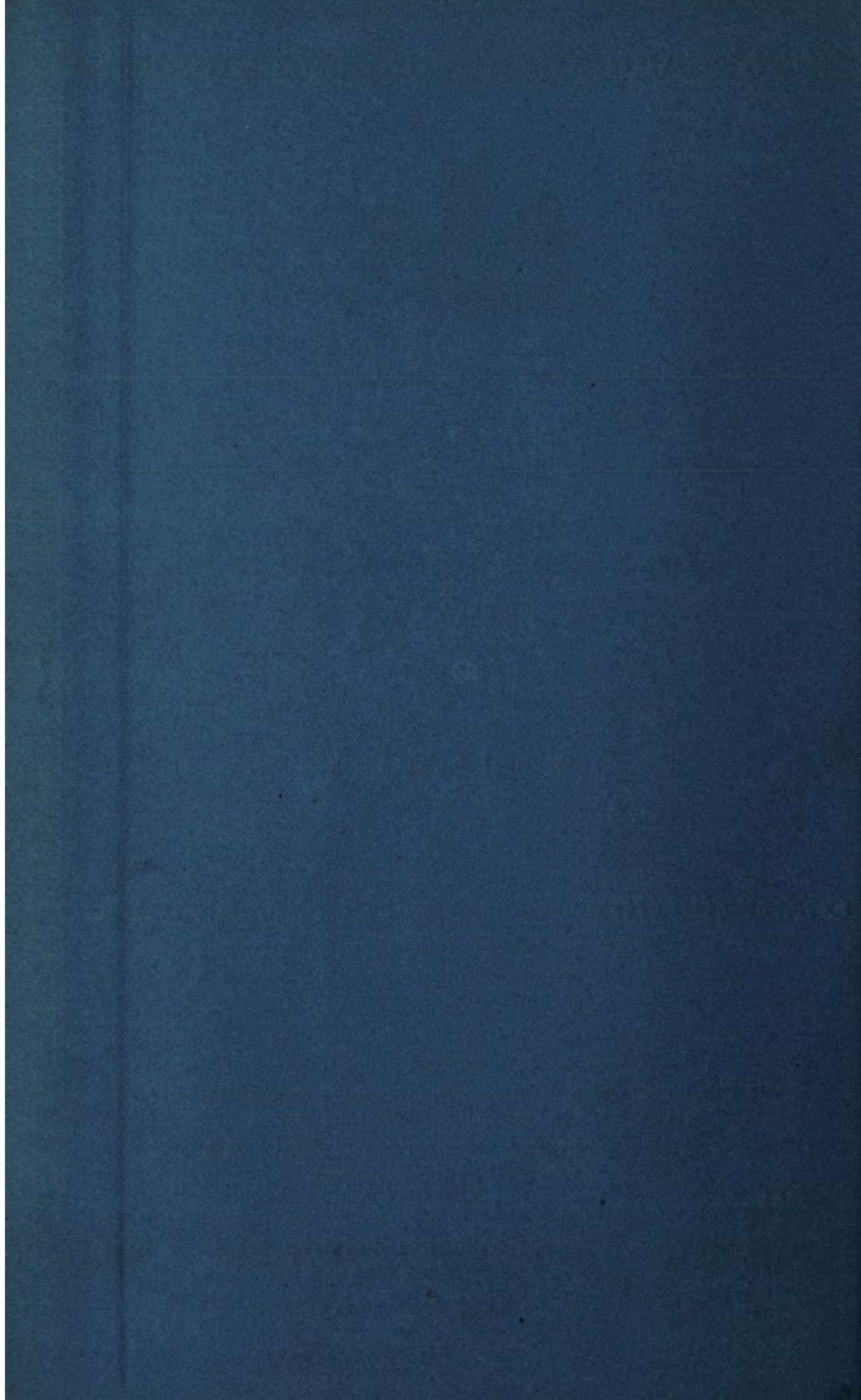
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A.D. 1822 N° 4682.

Construction of Smelting Furnaces.

WASS'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOSEPH WASS, of Lea Wharf, in the Parish of Ashover, in the County of Derby, Millwright and Lead Smelter, send greeting.

WHEREAS His most Excellent Majesty King George the Fourth did, by
5 His Letters Patent under the Great Seal of that part of the United Kingdom of Great Britain and Ireland called England, bearing date at Westminster, the Fifteenth day of June, One thousand eight hundred and twenty-two, in the third year of His reign, give and grant unto me, the said Joseph Wass, my exors, admors, and assigns, His especial licence, full power, sole privilege and
10 authority, that I, the said Joseph Wass, my exors, admors, and assigns, during the term of years therein mentioned, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick upon Tweed, my Invention of "AN IMPROVEMENT WHICH PREVENTS THE ILL EFFECTS TO VEGETATION AND ANIMAL LIFE THAT HAS HITHERTO BEEN OCCASIONED BY THE NOXIOUS
15 FUMES AND PARTICLES THAT ARISE FROM SMELTING OR CALCINING LEAD ORE AND OTHER PERNICIOUS MINERALS;" in which said Letters Patent there is contained a proviso that if I, the said Joseph Wass, shall not particularly describe and as certain the nature of my said Invention, and in what manner the same is to be performed, by an instrument in writing under my hand and seal, and cause the
20 same to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said Letters Patent, that then the said Letters Patent, and all liberties and advantages whatsoever thereby granted, shall utterly cease, determine, and become void, as in and by the same, relation being thereunto had, will more fully and at large appear.

Wass's Improvement for Smelting or Calcining Lead Ore, &c.

NOW KNOW YE, that in compliance with the said proviso, I, the said Joseph Wass, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, are particularly described and ascertained in and by the Drawings hereunto annexed, and the following description thereof (that is to say) :—

My improvement for preventing the ill effects upon animal and vegetable life which have hitherto been experienced from the noxious fumes and particles emitted in the smelting or calcining of lead ore and other minerals, consists in an improved mode of consuming the smoke and ventilating the flues of smelting furnaces, by which the heavier particles of the noxious effluvia will be arrested and the lighter parts or mere vapour be conducted into the atmosphere, at a sufficient height and under such circumstances as will cause it to rise and mix with the air, so as to produce no deleterious effects. These objects will be fully accomplished by a contrivance similar to that shewn in the Drawing hereto annexed, in which Fig. 1 is a plan or horizontal section of a building, wherein the site of four lead smelting furnaces are shewn at *a, a, a, a*. In the center of the building the horizontal flues and chimneys *b, b, b, b*, from the several furnaces are intended to meet and pass into a circular tower. Fig. 2 is a vertical section of the tower taken through the middle, and in which two of the smelting furnaces are shewn with their flues and chimneys passing into the tower. In the construction of these furnaces I claim no improvement (except in the introduction of dampers *O*), but consider the combining of several together to be new. *A, A*, are the external walls of the tower, which must be lofty and capacious, its suitable dimensions depending upon the number of furnaces and flues intended to be connected thereto. Under the circumstances of four furnaces, as shewn in the plan, its internal diameter may be about thirteen feet, and its height, commencing at the top of the chimney at about thirty-six feet from the ground, not less than twenty-four feet, but higher would answer better. *b, b*, as aforesaid, are the flues and chimneys, extending from the smelting furnaces *a, a*, and rising up into the central passage at any desired height, as shewn by the dotted lines. It is found that lead smelting furnaces in general consume a great part of their smoke (except at the first igniting, before the furnace has arrived at a smelting heat), but from the powerful draft much of the noxious and pernicious particles have hitherto been found to pass through the flues and chimneys and escape into the air. To prevent this, I have contrived a cap *B*, which I suspend over the throat *C*, under which a part of the smoke will be consumed and the heavier particles of the effluvia be impeded in their progress and prevented from passing up the tower. *G, G*, is the lodge floor, upon which a great portion of the heavy particles deposit themselves, and from whence they

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are occasionally collected and conveyed to a wasting furnace. The cap B is suspended by a perpendicular rod D, which passes up the center of the tower; this rod is supported by a sort of stirrup iron E, attached to the beam F, which is placed across the tower. At the upper end of the rod D there is a screw
 5 nut for adjusting the height of the cap B above the throat C of the chimney; and H, H, are three or more upright bars or standards, passing through the matrice holes in the cap B, upon which, by means of bolts or pins, it is supported. By these means the cap having become a fixture, in order to regulate the width of the opening or passage between it and the throat of the chimney, a rim or
 10 hoop I, I, is attached to the cap, which is made capable of adjustment in order to contract the passage to any desired dimensions. The lighter particles and the vapours which pass through this opening from the flues ascend into the upper part of the tower, which, as aforesaid, is high and capacious. An horizontal section of the tower is shewn at Fig. 3, cut through a little above the
 15 cap B, the top side of which is seen, and also the lodge floor G. The top of the tower is covered with a flat roof J, J, which assists in driving back any of the smoke and dence vapour which may have passed the cap, and also excludes the rain, hail, or snow from the tower and the chimney. Through this roof the shaft K of a vane passes and rests upon the cross beam F. A number of vent
 20 holes or openings L, L, L, are made through the walls of the tower at its upper part for the purpose of allowing the light vapours to escape from the inside; but to prevent stormy gusts of wind from driving back the vapour into the flue and obstructing the working of the furnaces, all the holes on the windward side of the tower are kept continually closed by a semicircular shutter M. This
 25 shutter is supported by arms attached to the shaft K, and is more perfectly seen in Fig. 4, the horizontal section of the tower, cut through at the vent holes near the top. At the top of the shaft K, on the outside of the tower, a vane N is attached, which, being acted upon by the wind, swings as the wind changes and turns the shaft round, carrying with it the semicircular shutter, by which it
 30 will be seen that from whatever point the wind blows, the vent holes on that side of the tower next to the wind are closed by the shutter, and the holes on the leeward side being unobstructed, the vapour from the smoke or steam, which is lighter than the common atmospheric air, will then escape, leaving the grosser and more pernicious particles deposited in the chimney below or upon the lodge
 35 floor, as above said. Besides preventing the nuisance occasioned by smelting or calcining furnaces of the old construction to the neighbourhood in which they may be erected, the heavy particles thus retained are extremely valuable; and hence, when the deposition has sufficiently accumulated, it is removed from the lodge floor and carried to the wasting furnace. This is done at a time when

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the smelting furnaces are not at work, by a man entering at the door below and passing up the winding staircase shewn at *d* in the plan, Fig. 1, which conducts to the lodge floor above, when, by a shovel, the deposited matter is thrown down the well of the chimney and thence drawn off by barrows to be roasted and afterwards smelted. The flues of the furnaces must be supplied with dampers 5 or shutters, as shewn at *O, O*, Fig 2, in order to cut off the communication with the chimney of any one of the furnaces which may not be at the time in use. By the employment this improved apparatus smelting and calcining furnaces are divested of their pernicious effects, and such works may in future be erected in any convenient situation, either near to dwelling-houses or by the 10 sides of public roads, on the banks of navigable rivers or canals, and thus, in many cases, produces a very great economy in the expence of carriage. The saving effected by this apparatus in preserving a quantity of valuable matter which would otherwise, as heretofore, escape, to the injury of the neighbourhood, would of itself amount in one year, where four lead furnaces are employed, as 15 described in the plan, to a sum equal to the entire cost of the improved apparatus, that is, of the upper part of the tower, with its roof, cap, vane, shutters, and appendages. Among other advantages, I propose that the tapping sides of my furnaces shall be opposite to each other, as shewn at *e, e*, and *e, e*, Fig. 1, so that, when required, the hot lead from both may be run into pigs or conveyed 20 into one receiver, and from thence into a mould, so as to be formed into thick sheets ready for milling or rolling, by which a great saving of labour and expence will be effected, and the trouble and waste of remelting the lead avoided. I have, for the better understanding of my improvement, described many parts (as the furnaces) which are not new, but I wish it to be clearly understood that 25 my Invention consists simply of the apparatus described as placed above the ordinary chimney of the smelting furnace, and the various parts of which are marked in the Drawing and referred to by capital letters, which apparatus I believe to be perfectly new as applied to that object, and therefore claim under my Patent the sole and exclusive right of employing the same. 30

In witness whereof, I, the said Joseph Wass (party hereto), have hereunto set my hand and seal, the Eighth day of October, in the year of our Lord One thousand eight hundred and twenty-two.

JOSEPH (L.S.) WASS.

A.D. 1822. JUNE 15. N^o 4,682.
WASS' SPECIFICATION.

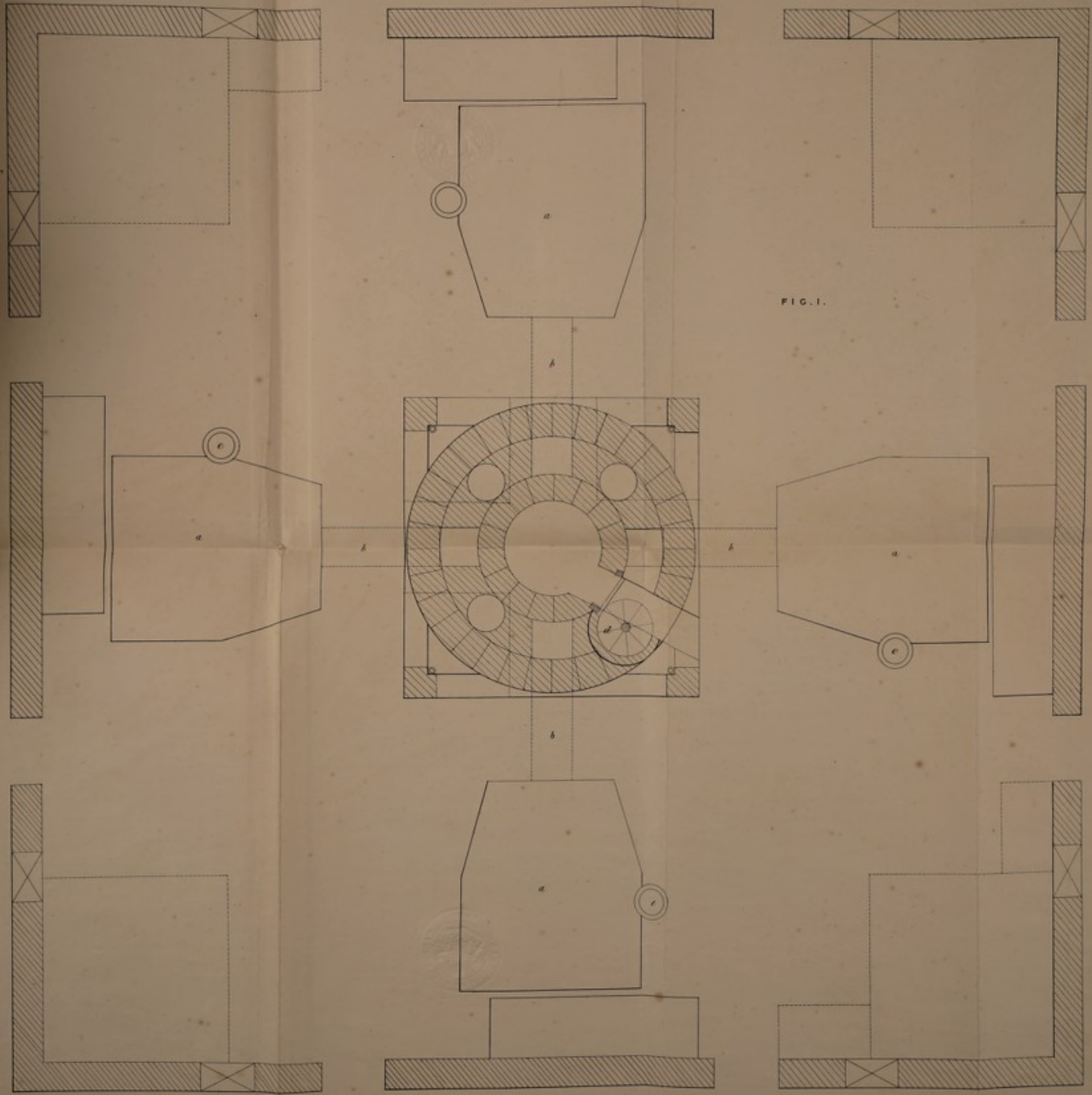


FIG. 1.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 feet

The enrolled drawing is colored.

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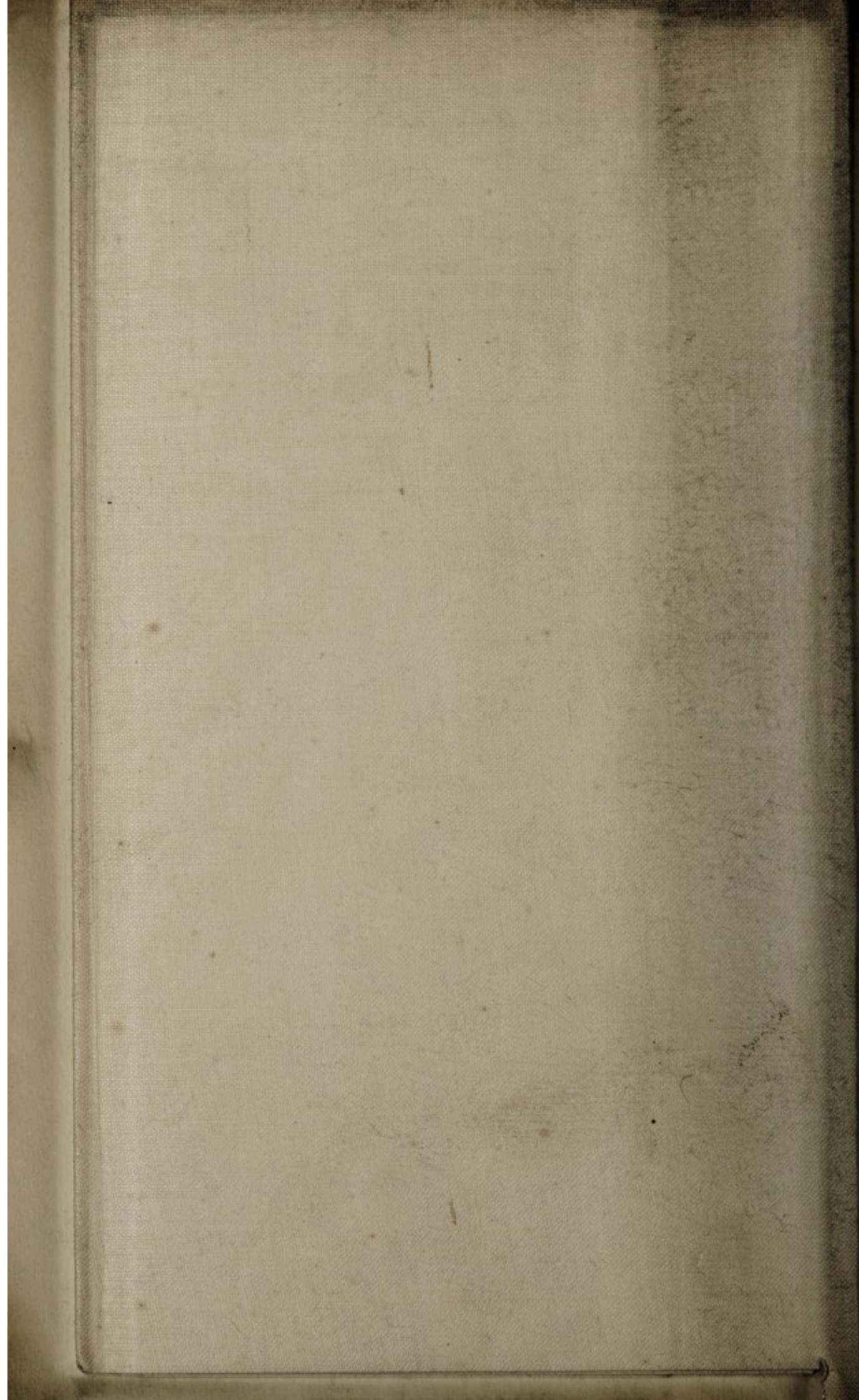
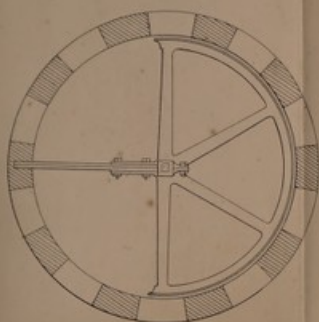


FIG. 4.



F I G . 3 .

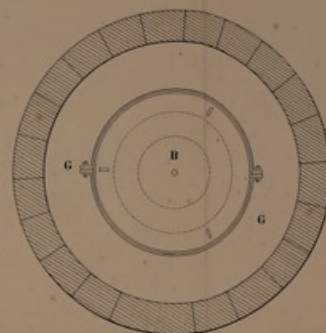


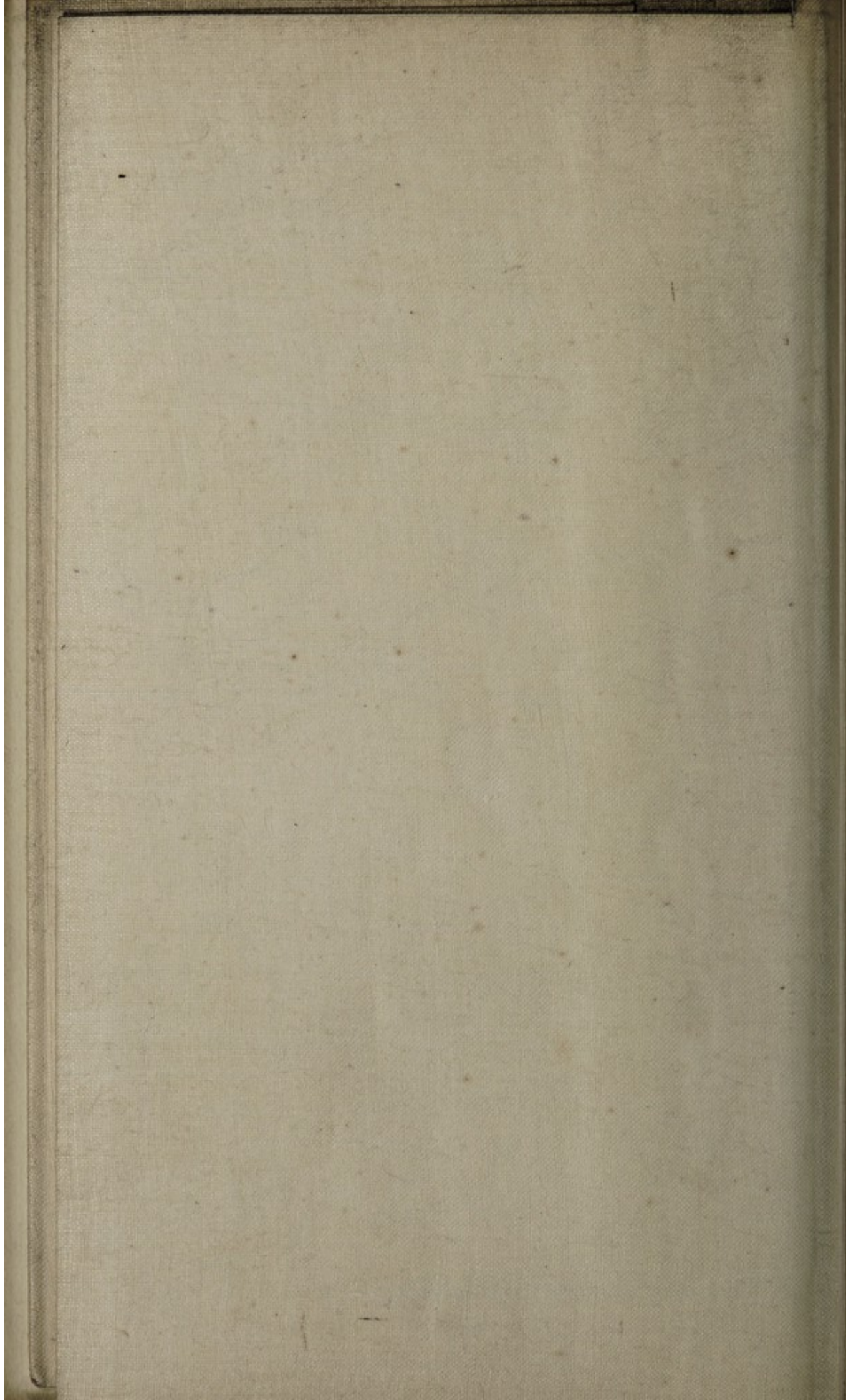
FIG. 2.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040

The enrolled drawing is colored.

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Wass's Improvement for Smelting or Calcining Lead Ore, &c.

AND BE IT REMEMBERED, that on the Eighth day of October, in the year of our Lord 1822, the aforesaid Joseph Wass came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And
5 also the Specification aforesaid was stampt according to the tenor of the Statute made for that purpose.

STEPHEN.

Inrolled the Fourteenth day of October, in the year of our Lord One thousand eight hundred and twenty-two.

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